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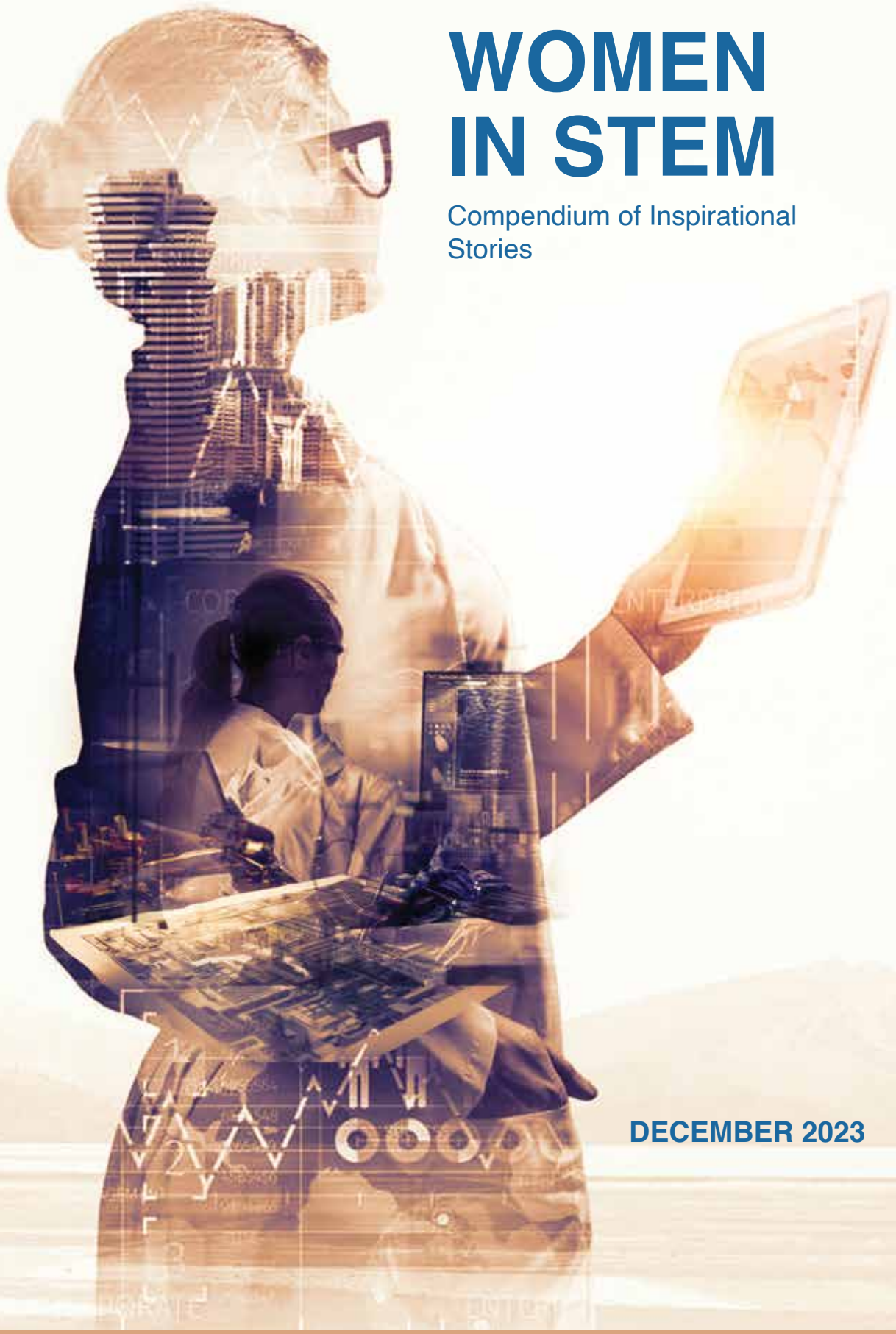
Confederation of Indian Industry

WOMEN IN STEM

Compendium of Inspirational Stories



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FOREWORD

Mr. Alok Nanda

Co-Chair, CII National Committee on Technology; Innovation & Research;
CTO, GE Aerospace India & CEO GE India Technology Centre, GE Global Research

Science, Technology, Engineering, and Mathematics (STEM) is vital for India, as it is for any country, due to its potential to drive economic growth, innovation, and overall societal development. STEM fields are at the forefront of innovation and technological advancements leading to the development of new products, processes, and industries but the number of women in STEM is not nearly balanced in the workforce today.

Women's underrepresentation in STEM and STEM careers have been well documented and there is a need to scale up the commitment and efforts to build a more diverse workforce. To encourage women in STEM, the entire ecosystem comprising the government, industry and academia will have to make collective efforts to encourage and enable women to choose STEM in their education and as a career. Robust programmes, schemes and policies would be important to support this advancement.

As more women scientists grow at their workplace and become role models, young girls will be able to envision themselves in these roles as future leaders in the field of STEM.

Taking forward the agenda of encouraging Women in STEM, CII is working on this as a mission to enhance gender equality in the STEM workforce to a minimum of 50 per cent by 2047, with an interim milestone of 35 per cent by 2030.

With this objective in mind, CII launched its first compendium on Women in STEM: Vanguards of India@75 recognizing women achievers leading the way across STEM in 2022. With the immense success of the first edition, CII presents the second edition of the compendium on Women in STEM that brings out the rich talent and passion of India's women in STEM fields as well as draws on the captivating stories of their education and careers.

This compendium does not just celebrate the contribution of Women in STEM, but also inspires the young generation of women in their role as potential and equal contributors for the sustainable growth of the society.

EXECUTIVE SUMMARY

The historical challenges faced by many women, stemming from societal barriers and gender biases, have constrained their participation in STEM fields. Nevertheless, significant progress has been achieved over time to cultivate gender parity and kindle inspiration among women to pursue STEM careers.

The **Azadi ka Amrit Mahotsav** serves as a momentous occasion to spotlight and commend the remarkable contributions of Women in STEM (Science, Technology, Engineering, and Mathematics). The Indian government has introduced a series of strategic initiatives to bolster gender equity in STEM, encompassing scholarships, fellowships, and specialized programs aimed at incentivizing and supporting women's participation in STEM education and pioneering research.

Aligned with this overarching mission, the Confederation of Indian Industry (CII) has unwaveringly committed to launch a movement to recognize and empower **'Women in STEM'** nationally and globally. The goal has been one of the pivotal objectives of the **CII National Mission on Technology, Innovation, and Research**.

CII is launching the compendium 2.0 titled **"Women in STEM: Compendium of Inspirational Stories"** distinctly summarizes CII's visionary pursuit of gender parity, exemplary of our collective journey towards an empowered future.

The compendium highlights the exceptional accomplishments of 105 women spanning diverse sectors, including Government, Academia, and Industry. This pioneering endeavor is meticulously woven together through a rich tapestry of case studies, offering an insightful lens into the transformative trajectories of women who have surmounted obstacles and indelibly influenced the realms of Science, Technology, Engineering, and Mathematics (STEM) and serves as beacons of inspiration.

The Compendium resonates throughout the expanse of our nation and society, nurturing a robust dialogue on gender equality and charting a trajectory toward a future where barriers yield to empowerment, where innovation transcends boundaries, and where women's pioneering contributions redefine the outlines of STEM.

We would like to thank and acknowledge the guidance and support of members of CII Committee on Technology, Innovation and Research, for their persistent leadership and guidance on this initiative. The CII compendium has taken its final shape, also because of a very strong synergy among various departments and CoEs within CII. The task of synthesizing the information, scientific research, data analytics and inter departmental efforts for knowledge generation were led by the CII Technology in synergy with CII IWN.

CII is determined to sustain the momentum and celebrate the unwavering spirit of women achievers, acknowledging their enduring contributions to the realm of Science and Technology.

CONTENTS

Table of Contents

Dr. Abha Sharma

Associate Professor

National Institute of Pharmaceutical Education and Research
NIPER - Raebareli

I was born and brought up in a family where a girl child is encouraged to pursue education in her area of interest, which is the most important blessing, showered on me by the Almighty. In my time of education, majorly students choose Maths or Biology to pursue their studies for becoming engineers or doctors. I opted for science for my higher secondary education.

I did B. Sc. followed by M. Sc. in entirely my subject of choice 'Chemistry' and completed my education with a Doctor of Philosophy at Defence Research Development Establishment with research fellowship, a degree awarded by Jiwaji University, Gwalior, Madhya Pradesh where I worked in equipment development for the active removal of toxicants to provide protection to the user and environment, especially needed for soldiers of our country at the time of war for national security. Then, I got married luckily in a family where also all members of family keep education as the most priority. They motivated and supported me in all my professional endeavors.

Academic Qualifications:

- **B.Sc. (Biological Sciences)** Jiwaji University, Gwalior, MP (India) 07/1998
- **M.Sc. (Organic Chemistry)** Jiwaji University, Gwalior, MP (India) 07/2000
- **Ph.D. (Chemistry)** Jiwaji University, Gwalior, MP (India) 06/2006
- Qualified M.P State Level Eligibility Exam (SLET) to qualify for Lectureship.
- Post Graduate Diploma in Internet Programming (PGDIP)

Publications

1) Abha Sharma, Amit Saxena Beer Singh, Mamta Sharma, MVS Suryanarayana,K Ganeshan, K Sekhar &K K Dwivedi Development and evaluation of modified whetlerite, an adsorbent material for in-situ degradation of sulphur mustard, Carbon,44,(2006) 907-912. Impact Factor: 11.3
2) In-Situ degradation of sulphur mustard and its simulants on the surface of impregnated carbon systems, Abha Sharma, Amit Saxena, Beer Singh, Mamta Sharma, MVS Suryanarayana, RP Semwal, K Ganeshan and K Sekhar, Journal of Hazardous materials,B 133, (2006) 106-112. Impact Factor:14.2
3) Kinetics of adsorption of sulphur mustard on Al2O3 nanoparticles with and without impregnates. Amit Saxena, Abha Sharma, Avanish Kumar Srivastava, Beer Singh, Pranav Kumar Gutch and Rajendra Prasad Semwal, Journal of Chemical Technology & Biotechnology, 84/12, (2009) 1860-1872. Impact Factor: 3.7
4) In-situ degradation of sulphur mustard using (1R)-(-)-(camphorylsulphonyl) oxaziridine impregnated adsorbents. Abha Sharma, Amit Saxena and Beer Singh, Journal of Hazardous Materials, 172, (2009) 650–653. Impact Factor: 14.2
5) Kinetics of adsorption of 2-chloroethylethylsulphide on Al2O3 nanoparticles with and without impregnate. Amit Saxena, Avanish Kumar Srivastava, Abha Sharma and Beer Singh Journal of Hazardous Materials, 169/1-3, (2009) 419-427. Impact Factor: 14.2

Awards/Honours of the research scholar of my group Poster award:

- Design, Synthesis and Evaluation of uncharged oximes as reactivators against organophosphorus intoxication 11th NIPER-R Symposium 14th-15th Feb, 2019 "Natural Product Based Therapeutics in Drug Development" 3rdaward to Ashima Thakur, PhD scholar
- Quinoline-based fluorescent portable chemo sensor for the selective detection of hydrazine in environmental and biological samples. International Symposium on Toxicology & Applied Pharmacology from 29th Sept 2022 – 30th Sept 2022. 1st award to Dheeraj Pandy, Ph.D. scholar

Oral Award

- Design, Synthesis, and Evaluation of uncharged oximes as reactivators against organophosphorus intoxication Translational Research & Drug Delivery System, February 15-16, 2021. 1staward to Ashima Thakur, Ph.D. scholar

What is unique about working as a Woman in STEM compared to other fields?

Women working in STEM must accept that in this field they need to keep updating their skills and development in the field. One should be able to manage work effectively in a team as any development is multi-disciplinary work. The STEM field job is not limited to office hours only, as a researcher constantly your brain is occupied with finding out the solutions to the objectives of your aim. STEM women should be enabled themselves to make a balance between work and family life for their happy life.

What are your key contributions to your work area?

My professional journey started as a research associate at Indian Institute of Toxicology Research, Lucknow, UP where I was involved in the collection, retrieval, and compilation of research data on various topics, mainly on the toxicological aspects. The turning point of my life was joining the National Institute of Pharmaceutical Education and Research, Raebareli as a Lecturer in the Department of Medicinal Chemistry where I was engaged in teaching MS Pharm. and PhD students. After a gap of years, as Associate Professor, here I restarted my research journey in the area of neurodegenerative disease as per the mandate of the Institute. We are developing drug-like and fluorescent molecules against the various targets and biomarkers of Alzheimer's disease for its treatment and diagnosis. The recently funded UP-CST and CRG-SERB-DST projects work are based on the synthesis of small molecules for the treatment of Alzheimer's disease. Besides this, we have developed fluorescent probes for sensing various types of analytes in the environment and biological system. The research findings have been published in reputed peer review international journals. Small steps and continuous work would enable me to contribute significantly to this area.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues/ Professional mentors, etc.)?

I would like to mention that whenever I see established professionals like professors, doctor, engineers, and many more. This always inspired me to achieve something in my area of interest. STEM as a career option, it was entirely my choice and curiosity for the subject.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

I was the only Ph.D. scholar under my Guide during my tenure of Ph.D. in his research group. I expected that my lab mate senior would be there to help me in learning techniques and discussing an experiment before its execution, but this scene was not there. This circumstance made me confident to plan my research work alone. On the other hand, it was a disadvantage that translations of research experience directly from my seniors to me did not happen which I considered a challenge to me. The work environment is conducive and friendly till the Women only listen to their colleague's views, but it becomes unconducive when women put their strong opinion against any issue discussed in official committees and adhere to it.

Women can conquer any challenges of their life with their willpower, hard work, and commitment towards their work. STEM professional needs to ask questions to themselves, pertaining to research problems for finding their solution. Be mentally strong in your professional journey as it helps to handle any obstacles coming on the way. I am thankful to all my mentors who were very supportive of me and believe in my hard work despite many other things lacking.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

The theoretical teaching at the school level should be correlated to experiments more in order to inculcate scientific temper in the students. This way of teaching would incline the interest of the girl child toward science subjects. The teaching to students should be oriented toward finding the solutions to real-life problems, ultimately STEM professionals would be working for society's welfare. The most critical thing is that several Govt. policies are made for the girl child/women to encourage them to take science as a career but to enhance their involvement and contribution in science, more focus should be taken for availing of those opportunities by them.

Ms. Ananya Nath

Ph.D. Scholar, Mechanical Engineering

IIT Delhi

I am a Ph.D. Student in the Department of Mechanical Engineering at IIT Delhi. This is a direct Ph.D. after graduation, which was from NIT, Durgapur, West Bengal. I was born and brought up in a small town located in the outskirts of Kolkata, namely Barasat in the district of North 24 Paraganas West Bengal.

My schooling is at Barasat Girls High School. I worked in Additive Manufacturing during my Graduation and published a few international was at conference papers and one journal paper. I got the best presentation Award at the 35th National Convention of Production Engineers and National Conference under the Aegis of Production Engineering Division Board, IEI, and got the "Special presentation award" at the 2nd international conference on Industrial and manufacturing systems organized by the Punjab Engineering College & Dr. B R Ambedkar National Institute of Technology, Jalandhar. Apart from these, I got an invitation from Springer Nature to contribute a book chapter in their book entitled "Advances in Processing of Lightweight Metal Alloys and Composite". It was my great honour to accept the offer and recently published a chapter on "Process Modelling of Laser-based Metal Additive Manufacturing of Metal Alloy". During my BTech I was involved in one Technology transfer of an indigenously developed portable oxygen concentrator "Pranayam". I participated in a few innovative design competitions like "Aakruti" by Dasult system and "Innovation Competition", organized by IIIC NIT Durgapur. Presently, I am the recipient of "The Prime Minister's Research Fellowship (PMRF)" to continue my research work in blue laser-based Additive Manufacturing.

What is unique about working as a Woman in STEM compared to other fields?

Women in STEM face unique challenges and opportunities compared to women in other fields. One of the biggest challenges is the presence of gender bias and discrimination, which can make it harder for women to succeed and advance in their careers. However, women in STEM also can break stereotypes and pave the way for future generations of women in these fields. They have the chance to challenge the status quo, contribute to innovative research, and make a difference in the world through their work. Women in STEM fields can also benefit from a sense of community and support from other women in similar positions, as well as the potential for high-paying and meaningful careers.

What are your key contributions to your work area?

As a BTech student, I designed an additively manufactured mask for the frontline COVID warriors which were later published in a reputed newspaper in West Bengal. I contributed with my own innovative and more efficient designs for some parts of oxygen concentrator called "Pranayam" which was made indigenously for the COVID-19 affected patient. Furthermore, I did reverse engineering to customize and make a powered wheelchair for the physically disabled and old age people under supervision of a company, Krypton industries limited. During my summer internship and BTech final year project I worked in the in house developed Directed Energy Deposition (DED) machine at CSIR- CMERI Durgapur and my work was related to process parameter optimization and some build part related modelling.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

My father has always been my inspiration forever. He is a teacher in a West Bengal Govt school. His passion towards his work, time management, work-life balance, everything helped me to build myself for what I am today. My mother

is a homemaker. Her guidance was the key to achieve whatever I aimed for and got since childhood. During my BTech, many professors mentored me. Among them, Prof. Shibendu Shekhar Roy helped me a lot. Without his continuous guidance and support, I could not even know about this field. They helped me in every possible way to achieve my target i.e., to get a direct PhD in the area of Additive Manufacturing in one of the top universities in India. In PhD also, I have got the most understanding and supportive supervisors Prof. Sagar Sarkar and Prof. Abhishek Das, whose continuous encouragement and guidance helped me to decide my PhD topic on my own and be on the right track in this tough and competitive field.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

I am from the Department of Mechanical Engineering in which everybody expects most of the population to be men. Nobody really suggests women choose mechanical engineering as their career. Since childhood, some of the major challenges were maintenance of the work-life balance, gender biases and discrimination. Also, during the initial stage of my career, I struggled to find mentors and role models who can provide guidance and support in a male-dominated field.

What is your advice to next-gen women science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

Setting a goal is an essential step in achieving success, but it's not enough to simply choose a goal and start working towards it blindly. To ensure that you are on the right track, it is important to take time and gain a thorough understanding of your goal before taking any steps towards it. One should have a very clear idea about all kinds of pros and cons that may come in her career for that field. This means researching and gathering information about your goal, understanding the steps required to achieve it, and assessing your current skills and resources to determine what additional support or development you may need, should be a continuous process. Once you have a clear understanding of your goal and the path to achieve it, you can start taking the necessary steps with confidence. Regularly revisiting and reassessing your goal will also help you to adjust your course as needed and stay on the track towards achieving your desired outcome. After that, building a strong professional network and finding a mentor who can provide guidance and support can be invaluable in navigating the challenges of a career in STEM. Additionally, it is important to be proactive in seeking out opportunities to gain hands-on experience and develop your skills. Don't be afraid to take on new challenges and seek out feedback to help you grow and improve. Finally, remember to prioritize self-care and maintain a healthy work-life balance, as this will help you to sustain your passion for science in the long term.

Dr. Anindita Chakraborty

Principal Scientist

Surface Engineering Research Group, R&D
Tata Steel

My original and specific contribution to my work area can be broadly divided into 2 (two) segments. The original research contributions include my work in the field of galvanizing and galvannealing in Tata Steel Limited. I have contributed to the development of new products for Tata Steel through research of developing process models, benchmark surfaces in the coated steel segments, developing new and innovative solutions in the field of coatings for hot stamping application.

- **Portfolio leader of Advanced Hot Dip Metallic Coating (April 2020 – present), R&D, Tata Steel Limited**
  - Leading a group of 6 research professionals and 3 support staff
  - New coated product development for automotive and construction
  - Development of state-of-the-art research equipment and infrastructure
  - Active collaboration with academia (India & overseas) – IISc Bangalore, IIT (Kharagpur, Chennai, Mumbai), Galvanizers Autobody Partnership (consortium), Swansea University, UK
  - **Core technical member in developing roadmap for Technology Leadership in coating area, R&D, TSL**
  - **Project team leader in Hot Dip Metallic Coating (2010-2020), R&D, TSL**
  - Principal Scientist, 2021 – present
  - Principal Researcher, 2016-2021 (includes 6 months Maternity leave)
  - Researcher, 2010-2016 (includes 1 year leave for PhD work)

- **Awards & Achievements:**
  - 'Young Metallurgist (Ferrous category)' by Ministry of Steel, Govt. of India, 2016
  - Best project award, Tata Steel, 2012, 2018
  - Best paper award in International Conference on Nanotechnology and Biosensors, Vishakhapatnam, 2010
  - National Scholar recognition by Government of West Bengal, for Madhyamik Examination (Std. 10), 2002

- **Membership:**
  - Lifetime member of Indian Institute of Metals, since 2016
  - Technical core committee member of world's largest galvanizing conference Galvatech, 2023
  - Executive member of Indian Institute of Metals, Jamshedpur Chapter (2020-present)
  - Convener, International Conference on Coating and Corrosion Control (i3C), 2021
  - Convener, International workshop on Advanced hot dip coatings (online), 2021
  - Core editorial committee of Tata Search, in-house journal of Tata Steel
  - Regular reviewer of international peer-reviewed journals

I have filed 12 patents, out of that, 5 patents are granted. Published 8 papers in international peer-reviewed journals. And has 3 book chapters to her credit.

What is unique about working as a Woman in STEM compared to other fields?
Women are traditionally considered for jobs that are more mundane and clerical in nature. In the society, still women are considered for day-to-day jobs that balances and maintains the system. Jobs that require much muscular efforts and require strong and logical minds are never a playground for women.

STEM has always been my preferred field of occupation as I love mathematics and can't consider my life in a job/project/challenge without mathematics. STEM, as a field, is unique. I get the opportunity to challenge myself with new and more difficult problems. Each piece of knowledge generated by us, each new understanding developed during work execution, every innovation is thought provoking, enlightening, and empowering for me. I enjoy the scholarly challenges and the experience of writing a code, doing a laboratory experiment, carrying out implementation work. It is satisfying to be involved in solving real life problems/issues directly impacting the wellbeing of millions.

Apart from the enriching experience of working in STEM, there are additional challenges faced, being a woman. More challenges make me more intense and stronger. It's indeed rare to be the only woman researcher amongst 25 researchers and exciting to place my opinion about any problem without compromising on the quality of the solution and make that count. I must thank and appreciate the work culture and diversity drives in Tata Steel, the single most employer I have worked with till date, for all the encouragement and opportunities provided to me.

What are your key contributions to your work area?

My original and specific contribution to my work area can be broadly divided into 2 (two) segments.
The original research contributions include my work in the field of galvanizing and galvannealing in Tata Steel Limited. I have contributed to the development of new products for Tata Steel through research of developing process models, benchmark surfaces in the coated steel segments, developing new and innovative solutions in the field of coatings for hot stamping application. I am also involved in developing high strength coated steel grades for the expansion project of Tata Steel in Kalinganagar. I have 12 filed patents, 5 grated patents and 18 published papers in international peer-reviewed journals.

I have contributed the last 2 years to excel the galvanizing research in Tata Steel. The major changes that I could implement is collaboration between different teams within and outside Tata Steel who are experts or practicing galvanizing. We have developed an ecosystem to acquire and transfer knowledge across these teams. I have also been instrumental in spreading the network globally and connecting with overseas universities, consortiums, consultants, and research labs to expand our research domain. In the process I have also focused on people development and imparted training, organized international conferences, supervised BTech (5) and MTech (2) students.

I want to thank my senior management of Tata Steel Limited for their unending support either in execution of my projects or building the ecosystem in every possible way.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

My parents are my first inspiration for taking up STEM as the preferred career option. They have always supported my choices and helped me continue my higher studies in the field of STEM. Despite being from non-STEM career fields, they had the courage to support their only child, a daughter to follow her path. I must then mention my teachers from high school and engineering, who had observed and understood the potential in me and always inspired me to go ahead in this career. I would also like to mention about my senior colleague Dr Monideepa Mukherjee, who has inspired me passively by her own inspiring research work. Also, my mentors in the company, who have always considered me worthy for best of the problems. I am grateful to Dr Debasish Bhattacharjee, Vice President, Technology & NMB, Tata Steel for his thoughtful strategies in improving the career of Women in Technology. Under his aegis, we had great opportunities to grow. I would also like to mention Dr Sanjay Chandra, Ex Chief, R&DSS, Mr Vinay Mahashabde, Chief R&DPTG, Dr Atanu Ranjan Pal, Chief Process TG, Dr Sourav Kundu, Chief, Corporate Sustainability, Dr Monojit Dutta, Chief Researcher, Product Research Group, Dr Rahul Verma, Chief, Product Research, Dr Siddhartha Misra, Chief Process Research and Dr A N Bhagat, Head, Surface Research Group, Tata Steel. All of them at some point of my career during last 12 years have considered my capabilities and inspired me to deliver as much as possible. My sincere gratitude to my academic supervisors, Dr SB Singh, Professor, IIT Kharagpur and Dr Nishith Verma, Professor, IIT Kanpur for enlightening me with knowledge and imparting adequate training to pursue and excel in my career.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

The challenges faced by me during my career in STEM for the last 12 years have been many and the nature of the problems have changed with time. Initially it was more to do with the acceptability of female colleagues in areas like manufacturing units, where it was always required to put forward some extra efforts to prove the worth and make the mark. However, as time progressed, I could successfully develop my skills and knowledge and my acceptance improved. But I understand gradually that the biological clock and career clock of a woman runs in completely opposite direction. Then the challenge was more to maintain the quality and timeliness of the output, to progress in career. At the home front, there will be a child waiting for me, who may fall sick and needs to be taken to school at the same time, that clashes with a meeting I cannot skip. I think this has been the toughest part, as, being in STEM, the sole important thing that can't be compromised is upgradation of knowledge and making oneself aware as well as relevant for the current technical space. The support system of TSL creche service, house help, family and partner are extremely crucial to not only sustain but also to grow in career.

What is your advice to next-gen women science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

The first and foremost advice that I want to give to my junior friends is to create and seek professional advice from a well-connected network of women in STEM, internal to the organization as well as external. The doubts are many and the people who generally come forward to clear such doubts are not having adequate experiences. So, it is required to seek support from people who have gone through the journey and can share real-life experiences rather than vague perceptions. In addition to that, I strongly recommend learning and developing expertise in respective domains. Being relevant and innovative is extremely important for career progression. These days learning has become extremely easy, with easy availability of resources. So, utilizing these opportunities can be excellent. Last but not the least, I would suggest that women friends and colleagues must ask and fight for tough challenges and perform to deliver. Equal opportunities and equal responsibilities should continue together for all my next-gen colleagues.

Ms. Anita Kanishk

Global Head

Pharmacovigilance Quality Assurance
Dr Reddy's Laboratories Ltd.

I am Anita Kanishk, working as Global Head of Pharmacovigilance Quality Assurance at Dr. Reddys Laboratories. I am based out of Hyderabad but hail from Chennai, India. I did my master's in molecular biology from University of Madras campus – Institute of Basic Medical Sciences (IBMS) followed by a research project at IIT- Madras.

At the start of my career there were limited opportunities in Indian Pharmaceutical industry with regard molecular biology work. As a result, I moved to clinical research and have been associated with organizations focusing on various stages of drug development. My area of expertise is ensuring that all the quality standards and requirements set forth by the various health authorities globally are met during the drug development process and after the products are in the market.

What is unique about working as a Woman in STEM compared to other fields?
STEM requires a lot of parallel thinking and prioritizing delivery and his is a skillset that women are born with. With the right platform having a women STEM professional would be a win-win for the employee and the organization. I have been keen on science because of the intuitiveness that it creates. So, for me, my work has been an amalgamation of my passion and a sense of making a difference in people's life.

What are your key contributions to your work area?
Working for one of the largest Indian Generics companies, I play my part in making safe and affordable medication available for patients globally. It gives me immense happiness and pride when one of our products is launched and it improves the quality of life of a patient anywhere in the globe.

The pharmaceutical industry is highly regulated and there are strict standards that we must adhere to. My role in Quality Assurance allows me to ensure all the regulatory requirements are met and thereby bridging the gap between the expectation of the health authorities and implementation of these regulations.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
I have been fortunate to have great women mentors who have also been my managers. They were a positive influenced and gave advice on how to deal with issues specifically faced by women in STEM. Sometimes a push that you can do is much needed, and they have always been there to encourage me. My parents' gift of education is something I am truly grateful for. My parents and husband are my pillars. They have been extremely supportive, and they patiently deal with the demands of my role.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
The research and pharmaceutical industry have come a long way and there is a significant culture shift. In the organization that I now work for, there is a conscious effort to ensure there is gender diversity, and equal opportunities are provided. At the start of my career, I had challenges getting roles even though I met the requirements from a qualification perspective. People would take decision based on notion that a women employee would not be able to stay late in the laboratory to finish of experiments if it runs late or would not be able to travel to meet the role needs. At times it took double the effort to make people realize that we take our careers seriously.

What is your advice to next-gen women science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

My advice to women in STEM is that one can have a successful career and great personal life provided the boundaries are well defined. For the long run, one has to maintain a good work life balance and it is ok to communicate this to your manager/ organization. It is also important to ask for help or support when needed.

Create your own professional network and keep yourself updated on what is happening in the industry that you are working in. Have a mentor or sponsor who can act as your sounding board and provide advice, if need be.

Support fellow women leader or provide mentorship or buddy a junior women STEM professional.

Move out of your comfort zone and take up new challenges. You will be surprised at how much you can achieve when you extend your horizon.

It is important to talk about your ideas and be part of forums where you can get information on regulations and innovation that has happened in your domain of expertise. Do not shy away from vocalizing achievements.

It is OK to have setbacks or failures but want is important is that these should not stop you from your pursuit or goal.

Ms. Anju Khanna

Head
Patents Department
Lall & Sethi (L&S)

I head the Patents Department at an IP boutique law firm, Lall & Sethi (L&S), based out of New Delhi, India. I have been working in the IP field for nearly 20 years. Prior to joining L&S, I headed the Intellectual Property Cell at the National Institute of Fashion Technology (NIFT), Delhi. Earlier I worked with two law firms, Chitale & Chitale Partners and InttlAdvocare and set up their IP and Patents Departments, respectively.

I have had the opportunity to work as a scientist at the Centre for Polymer Science & Engineering and Department of Chemistry, IIT Delhi in the initial part of my career.

I obtained my PhD from the Department of Chemistry, Indian Institute of Technology, Delhi. I obtained my BSc. (Hons) and MSc. (Hons) from G.N.D. University, Amritsar, Punjab.

I obtained the UGC-CSIR fellowship for PhD and the CSIR fellowship for post-doctoral research. I was a gold medalist for both undergraduate and post graduate degrees. I was a member of the Patents Committee of the Asian Patents Attorneys Association from 2016-2018; Design Committee of INTA from 2016-2017; Parallel Imports Committee of INTA from 2020-2021. Currently I am a member of the Unfair Competition Committee of INTA for the years 2022-2023.

What are your key contributions to your work area?
I have set up a new practice at my current firm that turned out to be a successful venture. In my opinion, Patent law in India needs reforms. It has served the country very well so far, but now it is stymieing innovation. I try my best to engage with various stakeholders that includes the government, institutions, and clients to present my ideas across so that everyone benefits: the society, country and of course the clients.

Who inspired you to take up this field as a career option (mention, friends, siblings, professional mentors, etc.)?
I must thank my father, Late Shri M.L. Khanna and my sister Dr. Anu Khanna (an Oxford graduate) for instilling in me an interest in science. At home, dinner table conversations would be about scientists like C.V. Raman and Har Gobind Khurana, and several of our professors and teachers in school and universities and many brilliant friends who are now pioneers in their own fields (and whom I do not want to name for the fear of leaving out someone). My childhood was surrounded by books, journals, newspapers and more. Politics and science were always hot topics of discussion. My mother, Mrs. Raj Khanna, was always the quiet support, which she still is.

I have had the opportunity to work with some great minds, but always felt that the field was dominated by men. There was a point in my life when I found myself at a crossroads vis-à-vis my professional career (and personal life). I decided to get into a field where I could apply my scientific knowledge and Patents seemed like a very good option. My first job in patents was with IntllAdvocare with Mr. Hemant Singh as the Managing Partner. From here began a very interesting and fulfilling journey as a Patent attorney. It was a fast-developing field, and it was already clear that India would become TRIPS compatible by 2005. It was envisaged that Patents would play a significant role in India in innovation and commerce. Whether that promise has been fulfilled or not remains debatable, but patents do occupy a substantial time and mind space in the field of IP.

My journey with my current firm, L&S, began more than a decade ago with the brilliant and dynamic Mr. Chander M Lall at its helm. That it has been a roller coaster ride would be an understatement. Mr. Lall ensured that L&S does not become a family run firm and took the bold step of leaving the firm to the partners to further the legacy of the firm.

The patent law has matured in the past two decades with some major decisions coming out of the Indian courts, of which Mr. Lall has been a part.

I also had the opportunity of working with the brilliant Justice Pratibha Singh when she was a Senior Advocate. It was a most fulfilling experience: it would not be an understatement to say that she has single handedly changed the patent landscape in India and continues to be a fountainhead of some much-needed reforms in the IP ecosystem.

While much water has flown under the bridge since 2005 and we have come a long way, we still have a long way to go.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
I have always received a lot of encouragement and support, both from family and colleagues. But the societal pressures do not spare. I took a break in my career to look after my children when they were small. I will not call it tough or a barrier, though some may see it like that. I will just say that I had to work doubly hard to come at par with my peers when I joined back, and I still feel that I am behind them. But I do not regret taking that break. But not everyone gets an opportunity to get back. Yes, it is a man's world, there is no doubt about it. And women have to work more than men to get equal results, our society is unfortunately fabricated in such a way. I feel that now it is our responsibility, as parents, to train the next generation to change the fabric of society. To give equal rights and opportunities to women. Believe me, this is a simple sentence, but is not easy to achieve given the prejudices ingrained in society. I am proud to say that in our firm, Lall & Sethi there are more women partners than men and more women lawyers than men.

What is your advice to next-gen women science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
Be a role model. This is irrespective of gender. Do not expect others to do what you yourself cannot do. Make perfection a habit. Instil it in your team. You will be surprised to see that your team is what you are. And it is always a team effort. A single person can never achieve the level that a team can.

Do not ask for unreasonable favours at the workplace. You undermine your own position. Make yourself valuable to the organization, so that the employer feels the need to accommodate your requirements. And work hard. Despite all the technological advances, the fundamentals do not change, there is no substitute for hard work. I can add that there is no substitute for smart work either!

Ms. Anuradha Acharya

Founder & CEO

MapMyGenome

I have had some great mentors along the way like Dr Anula Jayasuriya and others who have been able to guide me through. My dad, Prof HN Acharya was my biggest influence in taking this as a career. The rest of the family have played an equally important role including my husband, brother and sisters.

- **Academic qualifications**: Bachelors and Master's at IIT Kharagpur, pursued two masters at the University of Illinois, Chicago

- **Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)**
  - Honoured with 'She is': 75 Women in STEAM (fields of Science, Technology, Engineering, Arts, and Maths)
  - WTI Award (NITI Aayog)
  - Woman Entrepreneur of the Year Award (Indian Express) (2022)
  - Woman Entrepreneur of the Year Award (Zee Business)
  - Special Recognition (Leaders Category) by Indian Express
  - Pride of Telangana Award (2018)
  - IIT Kharagpur Distinguished Alumnus Award
  - Young Leaders Forum of British High Commission
  - Young Global Leader of World Economic Forum Class of 2011

What is unique about working as a Women in STEM compared to other fields?
Innovations that can have a positive impact on society. This makes the work incredibly exciting and fulfilling, as we can see the tangible results of our efforts. Working in STEM allows us to be a part of a community of like-minded people who are passionate about solving complex problems and making a difference in the world.

What are your key contributions to your work area?
Making people familiar with the concept of genomics. Creating innovative healthcare products and services at an affordable cost to the people. Also, we combine genomics and machine learning to empower people to lead healthier lives. We also introduced a concept called HarGharDNA with an aim to reach out to consumers directly making healthcare more accessible to them.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
My dad, Prof HN Acharya was my biggest influence in taking this as a career. The rest of the family have played an equally important role including my husband, brother and sisters. I have had some great mentors along the way like Dr Anula Jayasuriya and others who have been able to guide me through.

What is your advice to next-gen women science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
Be confident in your abilities and don't be afraid to take risks. Build a strong network of mentors and peers who can guide and support you throughout your journey. Stay passionate and remain curious. This field can be challenging but it can also be incredibly rewarding.

Ms. Aparna C Sheila-Vadde

Principal Engineer

General Electric

I am leading the design and development of sensors and systems for various inspection/ monitoring applications in Aviation, Oil and Gas, Renewables and Power.

Academic Qualifications:

- B. Tech in Electronics and Communication from College of Engineering, Trivandrum
- M.S in Electrical Communication Engineering from Indian Institute of Science, Bangalore
- Ph.D in Electrical and Computer Engineering from Carnegie Mellon University, PA
- 13 ranted patents, 16 Publications (Journal + Conference Proceedings) and 20+ Conference Presentations

What is unique about working as a Women in STEM compared to other fields?
Getting to solve real world, technically challenging, inter-disciplinary problems while working with brilliant teams.

What are your key contributions to your work area?
Design and development of customized sensors and algorithms for defect detection and monitoring of component fractions in flow medium.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
Early on, I was inspired by my grandmother who several decades back travelled far to do a master's in chemistry and worked as a professor. I have also been inspired by many others with deep technical expertise.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
I have been fortunate to have all the support from my family and my team at work and to be in a company that provides flexible work options.

What is your advice to next-gen women science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
Given the rapid changes we see in technology, the more open and eager one is, to learning new domains and applying that to solve problems, the easier it will be to adapt to changing requirements and succeed. Rather than being in a hurry to get work done, it is important to spend enough time thinking through clearly and systematically, on the best way to get to the solution for each problem and then execute the tasks. Gaining the necessary skills and establishing one's credibility in each assignment helps in building up a career.

Dr. Aparna Gunjal

Assistant Professor

Dr. D. Y. Patil, Arts, Commerce & Science College
Pimpri, Pune, Maharashtra

I, Dr. Aparna Gunjal, is currently working as an Assistant Professor in the Department of Microbiology, Dr. D. Y. Patil, Arts, Commerce & Science College, Pimpri, Pune, Maharashtra.

Previously worked with H. V. Desai College, Pune, Maharashtra. I have 9 years of teaching and 12 years of research experience.

Birthplace: Nagpur city, Maharashtra

Academic qualifications (mention details of institutes and universities)
M.Sc. in Microbiology and Ph. D in Environmental Sciences from Savitribai Phule Pune University, Pune, Maharashtra.

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

a) **Award of Recognition as "Environmentalist"** in 2019 by Scire Science in the International Conference of SciCon Series on In Sync – With Next Generation Biosciences held at Goa, India.

b) **Appreciation Award for contribution to Environmental Conservation** in 2019-2020.

c) **Best Article of the Month Award** in May 2020 from Vigyan Varta- an international e-magazine for Science Enthusiasts.

d) **The Outstanding Scientist of the Year Award** in 2020 from Vigyan Varta- an international e-magazine for Science Enthusiasts for outstanding contribution in the field of Microbiology and Environmental Sciences.

e) **Most Impactful Article of the Month Award** in January 2021 from Vigyan Varta- an international e-magazine for Science Enthusiasts.

f) **Award for Excellence in Reviewing Research papers** from International Journal of Plant & Soil Science in 2022.

g) **Award of Recognition from Magnus Group of Spain and USA for phenomenal and worthy Oral Presentation** at the 6th Edition of Global Congress on Plant Biology & Biotechnology" online Conference from 24-26th March 2022.

h) **Senior Scientist Award** in 2023 from Microbiologists Society India.

i) **Award of Recognition of ISTEAMIar from Rollascripting Nigeria country** in 2023 for working on a project related to free education to children.

j) **Award from Pune Municipal Corporation** for research work in Environmental Sciences.

k) **DST SERB Travel Grant**.

What is unique about working as a Woman in STEM compared to other fields?
Working as women in STEM will benefit society and industries. The percentage of women in science and research is increasing and is unique.

What are your key contributions to your work area?
I have contributed to the field of research in bioremediation; composting; plant growth-promoting rhizobacteria; wastewater treatment and waste management-related aspects. I have 150 publications to my credit and have received many National and International awards. My research work is communicated in my Journals, Magazines, Reports, and Newsletters.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
My parents have inspired me to take Science as a career option. I have an immense interest in research and my own deep immense interest has also helped me to take this field as a career option.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
Mainly funding for my research work is the main obstacle I face in my journey as a woman in STEM.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
I would advise next-gen women science to work toward novel and significant aspects in research which will be helpful to society, many individuals, and industries. The next-gen women in science should try for start-ups or entrepreneurship and contribute immensely towards research in science.

Prof. Archana Chugh

Professor

Kusuma School of Biological Sciences IIT Delhi

I have always been passionate about science and more so exploring and appreciating the link between science and society. I have also been actively working in the research areas of intellectual property rights for more than a decade now.

Academic qualifications (mention details of institutes and universities):

- Schooling (10+2) Kulachi Hansraj Model School, Delhi
- BSc (Botany Hons) Kirori Mal College, University of Delhi
- MS (Biotechnology), GNDU, Amritsar
- PhD (Plant Molecular Biology) University of Delhi
- Qualified Patent Agent, Indian Patent Office

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)
Awards and Honours:

1. WIPF 2023 and 2021, Legal award for Powerful Woman in Intellectual Property India, by World Intellectual Property Forum.
2. Listed among the 75 Indian Women in the book- She Is 75 Women in STEAM. Honoring 75 women in STEAM in India as part of #AzadiKaAmritMahotsav, The announcement made by Principal Scientific Adviser to GOI Prof. K. Vijay Raghavan & His Excellency British High Commissioner Mr. Alex Ellis, 2022.
3. Featured in UNESCO flagship publication ' A Braided River: The Universe of Indian Women in Science', 2022.
4. ESF-grantee for ESF-COST High-level research conference on Marine Biotechnology, Italy 2010.
5. Microsoft Outstanding Young Faculty Award (2009), IIT Kharagpur.
6. Science Merit Award, University of Delhi BSc (Botany Hons)

Fellowships:
Visiting Fellowship awarded by Natural Science and Engineering Research Council (NSERC), Ottawa, Canada. (2004-2007)

Membership:

1. **Lifetime member**: Indian Peptide Society
2. Member, European and American Peptide Society

Patents: 02 US Patent, one patent granted in Seven countries, 03 Indian patents, 07 Patents filed
Publications: Journals: 50, Invited Reviews: 07, General Articles: 02 July 2021. Press releases of our work on peptide-mediated therapeutics for fungal keratitis received wide media coverage.

Video:
(English): https://www.youtube.com/watch?v=M9QfFt5AqGM
(Hindi): https://www.youtube.com/watch?v=8IIXkbfiOzE
June 2018: Article published in Science magazine Research Matters - "What makes some varieties of rice resistant to drought?" based on our work on Rice Phenomics.
February 2018: Article published in Science magazine Research Matters - "Spider venom-A novel weapon against bacteria" based on the development of a new cell-penetrating antimicrobial peptide.

What is unique about working as a Woman in STEM compared to other fields?
I have always been passionate about science and more so exploring and appreciating the link between science and society. I have also been actively working in the research areas of intellectual property rights for more than a decade now. My experience in STEM has taught me that science cannot be separated from society and that all fields of STEM

are interlinked. A multi-disciplinary and holistic approach can yield a translatable deliverable of a scientific challenge be it in the field of agriculture or health sciences.
For women working in STEM can be equally challenging and rewarding. Challenging as the field requires a lot of time to work on a problem to reach a solution. You need a lot of focus, exploration of thoughts, and planning to reach the achievable. At the same time a solution to a scientific problem after years of hard work can be really rewarding. Since the investment of time and resources is for the long term, women in STEM are placed under unique circumstances where courage, persistence, and willpower to continue is of para-amount importance. Such qualities are required not only for sustainability and to be successful in STEM but also to encounter the personal challenges a woman might face from time to time in the present gender-biased social milieu.

What are your key contributions to your work area?

1. Developed a novel peptide-mediated strategy for triticale (energy crop) transformation (Patent granted in seven countries and technology licensed to Agri-companies in Canada)
2. Developed a novel peptide-mediated strategy for the management of fungal keratitis- an important ocular disease for tropical countries. (Press release)
3. Designing and developing peptide-mediated tools to combat antimicrobial resistance, neglected tropical diseases such as Leishmania. We aim at developing a repertoire of peptides from under-recognized and largely unexplored fields of marine resources and venoms and toxins against chronic and non-chronic diseases.
4. I have also been actively working in the field of Governance issues (with special focus on IP regime) of novel life science technologies such as synthetic biology, and nano- biotechnology.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues /Professional mentors, etc.)?

I am more of a self-motivated person. I realized quite early in life that mysteries of biology gravitate to me. I would conduct small self-thought and designed experiments.
Secondly, my father has been an inspiration although he does not come professionally from a STEM background, but his encouragement to be closer to nature, respect nature and keen observation of the plants grown in the garden left a deep impact on me. Also, his strategic and systematic approach to a solve a problem helped me mould into a scientist.
My sister, while studying for a Law degree, encouraged me to take up Intellectual Property Law as during our discussions, we always felt that science and technology have strong dependence over society and vice versa. Therefore, it is important to have a robust regulatory regime of IPRs for boosting our economy.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

I must say that challenges that I faced in my professional journey were not glaring often but latent at several junctures. I became mother of two children at the age of 40 and 41.5, respectively, which meant maternity leaves almost back-to-back. I would generally get the vibe that being a woman I will have to prove my mettle, more so after having children. Raising two small children at home without much support system and working doubly hard to make my presence felt professionally has been challenging many times. I have been often led to realize that for women the bandwidth of acceptability is very narrow.
Invisibly, though such women-specific breaks affect one's natural course of promotion and in general people in the community may not be always very encouraging. It is then, one's self- motivation can play a lead role in driving you amidst all the challenges.
The other challenge I have felt is participation in events and travel gets restricted once a woman takes the role of a primary caregiver. Such limitations can sometimes affect the progress, although currently online meetings have been a boost as they help women effectively maintain work-life balance.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

To be confident and have faith, society has not changed in a big way yet and will take time, as efforts are being made at several levels, so be prepared. Interact with senior female faculty, who can at various times give you inspiration and pearls of wisdom at the same time.
Never lose focus, and remain self-motivated, hard work always pays. Be an inspiration to others who are not privileged to have the position you are in.
Developing a robust support system and paying heed to health and self-care.

Prof. Aruna Tiwari

Professor

Computer Science and Engineering
Indian Institute of Technology, Indore

I am Aruna Tiwari working as Professor in Computer Science and Engineering, Indian Institute of Technology Indore previously worked as Associate Professor, Department of Computer Science and Engineering, IIT Indore (Feb 2017-Feb 2022), Assistant Professor, Department of Computer Science and Engineering, IIT Indore (June 2012 - Feb 2017), Associate Professor in Shri Govindaram Sakseria Instt. Of Technology & Science, Indore (MP) from 2008 to 2012.

I was also a reader in Shri Govindaram Sakseria Instt. Of Technology & Science, Indore (MP) from 2005 to 2008, Lecturer in Shri Govindaram Sakseria Instt. Of Technology & Science, Indore (MP) from 2001 to 2005 and Lecturer in Shri Vaishanav Instt. Of Tech. & Sc., Indore from 1997 to 2001.

I am Residing in Indore, Madhya Pradesh and born in Rajgarh district MP.

Academic qualifications:

- Ph.D. (Computer Science & Engineering), RGPV Bhopal (MP)
- M. E. (Computer Engineering), Shri Govindaram Sakseria Instt. Of Technology & Science, Indore (MP)
- B.E. (Computer Engineering) Shri Govindaram Sakseria Instt. Of Technology & Science, Indore (MP)

Notable achievements/Awards/ Fellowships:

1. Merit scholar in SSC & HSC
2. Honors UG & PG Degree

Publications:

Books:

1. Editors: Dr. Aruna Tiwari, Dr. Kapil Ahuja, Dr. Anupam Yadav, Dr. Jagdish Chand Bansal, Dr. Kusum Deep, Dr. Atulya K. Nagar **Soft Computing for Problem Solving**, Advances in Intelligent Systems and Computing, Proceedings of SocProS 2020, Volume 1, ISBN 978-981- 16-2709-5, 2021
2. Editors: Dr. Aruna Tiwari, Dr. Kapil Ahuja, Dr. Anupam Yadav, Dr. Jagdish Chand Bansal, Dr. Kusum Deep, Dr. Atulya K. Nagar **Soft Computing for Problem Solving**, Advances in Intelligent Systems and Computing, Proceedings of SocProS 2020, Volume 2, ISBN 978-981- 16-2712-5, 2021

Book Chapters:

1. Chandan Gautam, Raman Bansal, Ruchir Garg, Vedaanta Agarwalla, Aruna Tiwari, **A Fast Adaptive Classification Approach Using Kernel Ridge Regression and Clustering for Non-stationary Data Stream**, e-book: Advances in Intelligent Systems and Computing, M. Tanveer, R. Pachori, Springer, Singapore, 978-981-13-0923-6, 2018.
2. Neha Bharill, Om Prakash Patel, Aruna Tiwari, Megha Mantri, On Construction of **Multi-class Binary Neural Network Using Fuzzy Inter-Cluster Overlap for Face Recognition**, e-book: Advances in Intelligent Systems and Computing, M. Tanveer, R. Pachori, Springer, Singapore, 978-981-13-0922-9, 2018.

Patents:

1. Dr. Ashish Verma, Dr. Aruna Tiwari, Dr. Neetesh Kumar, Sanjay Patidar, Upendra Singh, **Road Asset Management**, India, 202041057251, 2020 Published

Memberships of scientific academies:

- Life member of the Computer Society of India.
- Member of IEEE Computational Intelligence Society.
- Life member of the Soft Computing Research Society.

Collaborations:

- **C-DAC**: Centre for Development of Advanced Computing, Pune, India
- Council of Scientific and Industrial Research - Central Electronics Engineering Research Institute (CSIR - CEERI) Pilani,
- **ICAR Institutes**: Indian Institute of Soybean Research Indore, and Central Institute of Agriculture Eng. Bhopal
- University of Technology Sydney Po Box 123, Broadway NSW 2007 Australia
- University of York, UK (Dr. Stephen. L. Smith Graduate Admissions Tutor, Department of Electronics, University of York, UK)

What is unique about working as a Woman in STEM compared to other fields?

- Time management in personal & professional life.
- Applying STEM in societal outcomes, specifically the last 8 years in the agriculture sector and strong follow-up in this domain.
- Always analyzed real-life scenarios in STEM hence attracting students community/colleagues/Govt. officials towards STEM

What are your key contributions to your work area?

I am a Professor of Computer Science & Engineering at IIT Indore, with more than 22 years of research experience in rge areas of Artificial Intelligence, Machine Learning, Soft-Computing, Data Mining, and Data Analytics. My work is around artificial neural networks, fuzzy clustering, evolutionary computation, and their applications to bioinformatics, and medical diagnosis. My research directions are towards the design of intelligent computing algorithms for classification, clustering, and feature selection that can handle Big Data. I have more than 30 journal publications of international repute including more than 10 IEEE transactions & Elsevier journals of high impact factor and has published more than fifty research articles in the ranked conferences. I have established a big data handling lab in IIT Indore which is funded by the Council of Science & Industrial Research (CSIR) Govt. of India in 2017. I have enabled MOUs, collaborating with the Indian Institute of Soybean Research, Indore, ICAR-CIAE Bhopal, and CSIR-Central Electronics Engineering Research Institute, Pilani. I am working on multiple govt. funded projects on AI/ML including a consortium project on Artificial Intelligence which is approved by the Ministry of Electronics & Information Technology (MeitY) Govt. of India. There are nine PhDs and more than 25 Masters awarded under my guidance.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

My cousins, niece, and my students to whom I mentored masters/PhD/UG projects.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

Underestimated by colleagues but based on performance, issues were settled in a timely manner.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

Patience is the key to success, be joyful whenever work together and face adverse situations, which is common in everyone's life, Have Team Spirit, Courage. Ensure that nothing is impossible in the world.

Ms. Bhanu Shashi

Cyber Security Design Chief Expert

SAP Labs India Pvt Ltd

I am a Cyber Security Design Chief Expert, working at SAP Labs India, Bengaluru. Two decades ago, I started my career as a corporate trainer on Microsoft Technologies. In my short stint as a trainer, I soon picked up various technologies and went on to join Siemens Information Systems Ltd. There, I got to work with some amazing minds from whom I learnt software design and development.

I ventured into overseas opportunities and a great share of my learnings on how to work with clients, design and build software that creates value for businesses came from there. Thereafter, I joined SAP Labs India and there was no looking back since then. SAP provided me every opportunity to satisfy my passion to work on technology in different roles and environments. I have spent almost my lifetime at SAP working on design and development of software, technology strategy and governance, development support for customers, quality assurance and now in product security including Cybersecurity and Data Privacy.

- **Academic qualifications (mention details of institutes and universities)**
  Bachelor of Engineering in Computer science, Kuvempu University

- **Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)**

- Certified Information Privacy Professional/Europe (CIPP/E) from International Association of Privacy Professionals (IAPP), USA
- DSCI Certified Privacy Lead Assessor (DCPLA)
- Certified Cloud Security Knowledge (CCSK) from Cloud Security Alliance, USA
- Project Management Professional (PMI, USA)
- Professional Member, Data Security Council of India – Bangalore chapter
- Professional Member, International Association of Privacy Professionals – Bangalore chapter

What is unique about working as Woman in STEM compared to other fields?
I strongly believe that women have the innate ability to excel in any chosen field.

When women choose and come out to build careers, they come out with a lot of determination for success. STEM oriented careers provide women the right opportunities to create an impact in the society. There are many instances that have shown women come out with human centric solutions to create a win-win situation for everyone involved.

In my career of over two decades, I have explored a variety of technical roles in completely new domains. It worked for me as I applied my skills and experience holistically into redefining these new roles that took my work to the next level. My broad perspective on several aspects helped me win subscribers to my ideas. At one point, I was described as a one size-fits all resource in my team.

This comes from the emotional intelligence that women bring to work that compliments their skill and determination.

What are your key contributions to your work area?
I belong to SAP Global Security, a centre of excellence for Product security covering cybersecurity and privacy. We

define product standards for security, guidelines and best practices that enable SAP cloud products and services to be designed, built, and operated securely.

My focus areas are security by design, privacy by design and data security for secure cloud operations. I define, cascade product standards to the development community and provide consulting to enable building of compliant software and services for our cloud portfolio.

I have developed various processes and methodologies to assess and mitigate security risks in heterogenous cloud landscapes. In practice, I apply lot of lateral thinking that comes from my experience to compliment these methodologies.

In the light of enforcement of EU-GDPR in May 2018, I supported implementation of Privacy by design in all of SAP Products to help SAP customers stay technically compliant with EU-GDPR.

Further, I worked with over 100 SAP partners to bring them up to speed in delivering compliant software on time before enforcement of EU-GDPR. This involved coaching, training, review and advice on the architecture and design of the partner solutions.

In the past, I have led large security programs globally, that were launched to intensify efforts to offer best in industry security standards in SAP software. This included raising security awareness and initiatives to inculcate security culture within the organization.

Below are some of my ongoing and recent contributions –

- Cybersecurity Defensive architecture – I develop solution concepts, best practices, and guidance in Data Security to strengthen secure cloud operations.
- Data Protection and Privacy compliance for AI Based solutions - I was instrumental in defining product standards that address potential privacy challenges that arise out of algorithmic bias, explain ability of algorithms and security of data used in training AI models.

Training and Mentoring

I have a flair for teaching and so regularly deliver trainings on security at SAP. In addition, I host security workshops for upcoming security professionals and mentor security enthusiasts to become security professionals.

External contributions

Recently, I have volunteered to be on the **advisory panel of Indo-German chamber of commerce** to support development of cybersecurity curriculum that will benefit its member companies comprising of reputed companies like Bosch, Lufthansa etc.

My experience with Data Security and Privacy took me to several conferences as a speaker, panellist etc.

I was invited to present at Grace Hopper Celebration 2017, a woman only Technology conference at Orlando (Florida), USA. I delivered a talk on **Security and Privacy Considerations in Smart Buildings and Internet of Vehicles**.

Am an active member of International Association of Privacy Professionals (IAPP), Bangalore chapter. I have hosted a chapter meeting, have been a speaker and participated as a panellist in several panel discussions.

As a professional member of Data Security Council of India, I have been invited to roundtable meetings setup primarily to collect insights and feedback from Industry experts on government's cybersecurity initiatives like Personal Data Protection Bill, End-point security etc.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

Having born and brought up in Bengaluru, I had a natural inclination towards Engineering. I was growing up in a community that already had girls choosing Engineering over other traditional professions. My mother with her determination and father with his technical background, would not settle for anything else. My elder sister led the way and soon I did catch up by choosing computer science in engineering as Silicon Valley of India slowly started evolving.

Fortunately, I fell in love with my subject and never questioned myself over my choice. This stands valid even to this day.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

My role involves review and validation of design and architecture of solutions to verify compliance with legal security requirements.

The whole process comprises of technical discussions and the outcome can often have tough implications on delivery of products.

Consequently, any critical feedback necessary to build compliant solutions is not easy to pass through. More so in a global setup, especially if it is coming from an Asian woman of color. There is some resistance in accepting feedback, though in a respectful way.

Now, such situations can be career limiting for me if things don't move forward the way it should.

To address this challenge, I had to gear myself up with people skills to convey the parcel in a friendlier way to make it more acceptable and that helped raise their trust in me.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

- Forget your gender and follow your inner calling.
- Grab opportunities for which you have a calling, even if you think you are only 50% qualified.
- Don't expect discounts on your performance by gender.
- Be a good learner - Stay up to date with the current trends in your area of work and be a continuous learner.
- Don't underestimate your contribution. Try to assess the value that comes out of your work, position it and market it.
- Build a network of followers who subscribe to your expert views.
- Be part of external professional communities related to your area of work. Build and participate actively.
- Feel empowered, not overpowered.

Ms. Bithiah Grace Jaganathan

Professor

Department of Biosciences and Bioengineering
Indian Institute of Technology Guwahati

I established the first stem cell research lab at IIT Guwahati and was a pioneer in establishing collaborations with several hospitals for research.

Experience:
Postdoctoral research fellow at Cancer Research UK, London, UK under the mentorship of Dr. Dominique Bonnet

Born and brought up in Tamil Nādu, India.

Academic qualifications (mention details of institutes and universities):

PhD in the field of stem cell biology from Johann Wolfgang Goethe-Universität Frankfurt am Main under the mentorship of Prof. Dr. Reinhard Henschler.
M.Sc. in Life Sciences from Bharathidasan University, Trichy, India

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

1. Pilot project grant award for young investigators in cancer biology, DBT
2. Rapid grant for young investigators award, DBT
3. Fast track young scientist award, DST
4. International travel award, DST
5. Post-doctoral research fellowship from European Community STREP, THERCORD, London, UK
6. PhD fellowship from German Ministry of Research and Technology, Frankfurt, Germany under "Biotechnology 2000".

What is unique about working as a Woman in STEM compared to other fields?
Although STEM is traditionally male-dominated, it also provides many unique opportunities to learn from colleagues, both male and strong females, who have excelled in their fields. Sometimes, the opportunities and support received as a woman works rather as a motivating factor amidst several challenges faced by women in such fields. Also, I was fortunate to form a strong bond with other successful women, although few, to achieve our goals.

What are your key contributions to your work area?
I established the first stem cell research lab at IIT Guwahati and was a pioneer in establishing collaborations with several hospitals for research. To further improve the network between the researchers at IIT Guwahati and the clinicians in the hospitals at North-East, I organized a workshop on "Research in cancer for societal impact in northeast India," which helped some of my colleagues to initiate collaborations with clinicians for their research.

The scopes of my collaborations with the specialist clinicians in the hospital are
(ii) to obtain clinical samples to perform translational research and
(iii) to understand the clinical perspectives of the disease from the doctors so that our research questions are formulated in line with clinical requirements. My research students and I have frequent discussions on our research with the collaborating hospitals and doctors to include new analysis methods to better understand the

diseases. Supported by several grants as principal investigator (PI) from the funding agencies (DBT, SERB, and ICMR), I could establish a research lab of international standard where we actively perform extensive stem cell and cancer research. My students and I strived hard and established several techniques and methodologies required for our research.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

My father has been a strong motivation and inspiration throughout my life, and my husband supported me constantly and encouraged me to never give up and rise up to the challenges. My strong work ethic was learned from my mother. One of the great influences I had in my professional life is my post-doc mentor Dr. Dominique Bonnet who, through all the challenges, worked and supported me professionally whenever I needed her advice and help. Some of the strong women students whom I had been fortunate to mentor during my tenure are my motivation to face every day work challenges.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

One of the significant challenges I face is work-life balance, to give sufficient time to the children without compromising the work. It was particularly difficult to spend long hours or travel to attend conferences and balance the child-care responsibilities.

What is your advice to next-gen women science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

As a woman or as anyone pursuing STEM field will face challenges particular to this field and as a woman who is underrepresented. I would advise that women should form a strong network with both men and women who can guide and support them in their career.

Also, be resilient and embrace failures. Instead of being demotivated, use setbacks as opportunities to analyze, learn, improve, and grow. Be it a man or a woman, everyone faces challenges, and there are not many challenges that cannot be overcome by hard work.

Dr. Chandrika Kambam

Medical Director

EVEN Healthcare

I am a qualified Internal Medicine Consultant from United states of America. After working as Hospitalist in United States, I returned to India in 2007. Joined Columbia Asia Group of hospitals primarily to start the concept of Hospital Medicine. Along the journey, I gradually moved from clinical practice to an administrative role. After working for 13 years in Columbia Asia, I moved on to HCG as their Director Clinical services and held that position for 2.5 yrs.

I currently hold the position of Medical Director, for Even Healthcare, India. And have occupied this position since April 2022. With over 20 years of experience in both clinical medicine and administration, I help to deliver value-based health care with lean thinking concept. My strength has been to identify strategic programs that will benefit the organization and envision future trends and formulate thought processes from ideation to implementation. Integrating technology and using technology to improve patient care and the medical quality dashboard has been my biggest achievement for over a decade. Being innovative and continuously striving to get better in all the initiatives that I have taken up. Specialties: Internal Medicine, Finance, Medical Quality, Healthcare administration, P & L management Even healthcare is a company focused on building Managed care programs for consumers. As Medical Director, I will be overseeing the clinical aspects, designing the programs and plans appropriate for consumers and helping them through their health care journey. Hope to bring back the concept of family physician back in the forefront - guiding consumers to navigate the complex healthcare systems.

HCG - Healthcare Global Enterprises Ltd Director of Clinical Services, November 2019 - April 2022 (2 years 6 months)
Key areas: As Director – Clinical Services, my primary focus is on business development- i.e., looking at acquiring doctors, reviewing productivity, containing costs. Columbia Asia Hospitals Pvt. Ltd. Vice President, April 2015 - November 2019
Key areas: As a Vice President – Clinical Services, my primary focus is on business development- i.e., looking at acquiring doctors, reviewing productivity, containing costs. Manage costs that contribute to 27% of our revenue. Able to reach every benchmark given by the board in containing costs and improving revenue. I was primarily responsible for putting the medical program of our new hospital together along with the Unit GM. Combination of a good medical program, brand value and service level helped us to achieve operational break even in eleventh month of operation and EBITDA break-even in 18 months into operation.
General Manager, June 2011 - March 2015 (3 years 10 months)
Key areas: As General Manager of Clinical Services my primary focus was on bringing in standardization across all hospitals in areas of clinical care. Identifying key performance indicators – Clinical and Financial. Not only establishing clinical governance structure and monitoring was my responsibility, I also took corrective and preventive actions, so that there is overall improvement in the system. During this period, I also participated in the recruitment of doctors along with the Medical Director and participated in the opening of three units of Columbia Asia group of hospitals.
Senior Manager, April 2009 - June 2011 (2 years 3 months)
Key areas: Establishing central medical quality counsel. Implementation of NABH indicators across all units. Standardization of Mortality and Morbidity meetings. Established Peer review committee protocols. Created checklists and protocols for audits.
Columbia Asia Hospitals, India, Hospital Medicine Coordinator, November 2007 - March 2011 (3 years 5 months)
Between 2007 and 2010 I was on the faculty of Hospital Medicine, Columbia Asia Hospitals in Bangalore and functioned as the coordinator of this service. Instrumental in starting this specialty in Columbia Asia and ensuring that it is applicable to the Indian Scenario. Brockton Hospitalist, September 2006 - August 2007 (1 year)

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

- Executive healthcare from Cornell
- Certified corporate Director
- Award: influential and inspiring women in healthcare
- Blogger, Written numerous articles in various portals- Print and digital.

What is unique about working as a Woman in STEM compared to other fields?
Women in all aspects of work bring in their unique perspective, get teams together, grow together. Women's inquisitive mind helps in STEM in research and development and her empathy quotient sure scores high in healthcare.

What are your key contributions to your work area?
Innovation, building teams, creating a vision following up on the ideas to implementation and making dreams a reality.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
Parents, mentors, and common man

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
Being a doctor, it is hard to balance family responsibilities and patient demands. Working 24/7, nights, evenings, weekends is no mean task. Both roles need a lot of patience, reliance, and focus. Sometimes it is exhausting.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
It takes time to know yourself first. Understand what you want, how you want to plan your life- Professionally and personally. So, take time, do not rush into committing yourself into any long-term relationships or responsibilities, until you fully understand the consequences of the same. Being economically independent is the first step to achieve your dreams and goals. Life and career are like tracks of a railway line, they run parallel, and it is not one after the other. So, plan your life, accordingly, do not bite more than you can chew. Do not compare yourself to others, your life is your journey.

Ms D. Tejaswini

Manager

Mishra Dhatu Nigam Limited

I am D. Tejaswini, presently working as a Manager in Mishra Dhatu Nigam Limited, a public sector enterprise located in Hyderabad. I did my graduation from Osmania University, Hyderabad. I was born and bought up in Hyderabad. I am awarded as the best women employee in MIDHANI in the year 2020. I have received a certificate of appreciation for outstanding performance and contribution in the area of engineering services from MIDHANI in the year 2022.

What is unique about working as Women in STEM compared to other fields?
Working on the shop floor, i.e., directly in the field gives immense work satisfaction and working in such a challenging environment at early phases will make you capable enough for any challenges in future. But being women, you need to prove yourself for your opinions to be considered.

What are your key contributions to your work area?
I have been working for the Electrical Maintenance department in MIDHANI since 2011. My major role since then was to make myself aware of technological advances in the field of Electrical and to implement it in the best way possible in MIDHANI.

We as a team in MIDHANI have implemented Programmable Logic controllers (PLC), Variable Frequency drives too much equipment to improve the process parameters. As all these upgradations were done in-house, we could achieve cost savings.

During maintenance of induction furnaces, with the intention to learn and be self-reliant we have internally carried out total insulation of damaged copper induction coils multiple times as per requirement.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues/ Professional mentors, etc.)?
My Father, his love and dedication to his work inspired me a lot.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
At the time of my posting in 2011, I was the first women employee in my department who got posted to work on the shop floor. Being immediately coming out of university, it took me some time to get acquainted with work on the shop floor with all the men's staff. Nevertheless, I received support from management and as per requirement in the next year, 2 more women employees were posted to the same department.

Secondly, due to work emergencies, I occasionally left the office at a late hour. Security on the shop floor at late hours and commute were the major issues at such times. Despite staying late and putting extra effort into the company, we have faced criticism for staying late as this was not positively considered by many co-workers.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
Women at the initial phase need to stay strong emotionally and have faith in themselves. Be aware of all the career opportunities and choose as per their own interests.

In my opinion, to work directly in the field is not a cakewalk as it seems, there will be highs and lows. We must move forward despite all the hurdles we face.

Many times, your work and efforts may not be recognized, but this should not be a reason to let you down. You need to be self-motivated and work towards acquiring knowledge believing that recognition will fall in place itself.

Dr. Deepa Kachroo Tiku

Partner

K&S Partners, India

I am a partner at K&S Partners, India's top tier intellectual property (IP) law firm, based out of the Gurgaon Office. I am a patent attorney and a registered patent agent of the Indian Patent Office since 2004. I was born in Delhi. Due to my father's work profile, my growing up years up until class 12 were spent mostly in Delhi and Srinagar with a couple of childhood years in Iran. However, I completed my undergrad and postgrad degrees from Patiala, Punjab after being displaced from Kashmir in 1990.

Academic qualifications (mention details of institutes and universities)

a. M.Sc. (Biotechnology) – Punjabi University, Patiala (1996)

b. Ph.D. (Biotechnology) – Delhi University and Institute of Genomics & Integrative Biology (IGIB), Council of Scientific and Industrial Research (CSIR), 2005

c. Bachelor of Laws (L.L.B.) – CCS University, Meerut, 2012; Certificate to practice from Bar Council of India, 2012.

d. Patent Agent Examination – 2004

e. DSCI Certified Privacy Lead Assessor (DCPLA©) – 2022

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

Patents (Biotech & Biosciences):
Dr. Deepa Kachroo Tiku is a partner at K&S Partners and based out of the Gurgaon (National Capital Region) office and has been practicing in the field of patent law since 2004 with a prior experience of working in the microbiology division of Dabur India Limited (1997-99), a prominent Indian FMCG company as well as a researcher at Institute of Genomics and Integrative Biology (IGIB), a premier CSIR research institute of India (2000-2003). Deepa qualified the Indian patent agent exam conducted by the Indian Patent Office in year 2004 and later completed her degree in law. As a registered patent agent and attorney at law with a scientific background, Deepa specializes in Life Sciences patents, particularly biotechnology and allied areas as well as biomedical, nanotechnology, chemistry, and polymer related inventions. She advises both domestic as well as international clients in all aspects of Indian patent law and practice, including enforcement of patents, freedom to operate, due diligence, technology transfer and licensing. She also handles matters related to plant variety protection as well as the Indian biodiversity law.

Deepa's contribution to research led to the filing of 21 patents worldwide in which she is a named inventor. Deepa is a prolific writer and a speaker and has several publications and articles to her credit. With her unique blend of science and rich legal experience, Deepa is considered as a go-to person for handling and advising on complex patent matters in India.

Deepa is currently serving on various national and international committees as:

1. Member of the National Biotechnology Committee of CII, the premier Chamber of Commerce in India;
2. Reporter - CET 5 Biotechnology and Pharmaceuticals, Federation of Intellectual Property Attorneys (FICPI); and
3. Member of the IP and Technology Management Committee of the Technology Transfer Office (TTO) at Biotech Consortium India Limited (BCIL).

Achievements and Honours:

1. Distinguished Practitioners in IP - Asialaw Profiles (2021 & 2022)
2. Patent Star India - Managing Intellectual Property (2018, 2019, 2020, 2021 & 2022)
3. The World's Leading Patent Professional (Prosecution) - IAM Patent 1000 (2019, 2020, 2021 & 2022)
4. Leaders League: Excellent lawyers in 'Patent Prosecution and Litigation' in 2022
5. Indian Business Law Journal (IBLJ): Highly commended by clients during IBLJ's research interview process (2021)
6. Frequent lead partner key patent cases - Asialaw Profiles (2020)
7. Listed in Top 250 Women in IP - Managing Intellectual Property (2019 & 2022)
8. Global Excellence Awards - Most Influential Woman in Biotech Patent Law in India (2018)
9. Distinguished Alumni Award, Department of Biotechnology, Punjabi University, Patiala, India (2019)
10. Senior Research Fellowship, awarded by Council of Scientific and Industrial Research (CSIR) (2000-2003)

What is unique about working as a woman in STEM compared to other fields?
Innovation, creativity, problem solving, impact on society.

What are your key contributions to your work area?
During my research tenure, I worked in the area of bioremediation of wastewater pollutants, particularly difficult to degrade pollutants such as lignins, tannins found in pulp and paper and tannery wastewaters. My research results were widely published, and the novel microbial consortia co-developed by me and my team in the lab were found to be extremely efficient for the above objective. My contributions as an inventor in this area ended up in grant of 21 patents worldwide for CSIR as an applicant.

I began my IP career with one of India's top IP Firm and was perhaps one of the first few Indian patent agents in the country with an advanced technical degree. In my almost two decades of practice as a patent attorney in India, I have handled thousands of patent applications in diverse areas of technology but more focused broadly in the life sciences space, particularly pharmaceuticals, biotechnology, and chemical sciences. I am proud to have contributed to the success of several global and Indian innovator companies, research institutes and universities in these areas by helping them draft, prosecute, and protect their innovations under Indian laws.

I serve as a member of the National Committee of Biotechnology of CII and in that capacity, continue to contribute to policy and advocacy related to research, innovation and IP. I am also a member of the IP Committee of Biotech Consortium of India (BCIL) and advise them on tech transfer and commercialization related issues related to IP portfolios.

I have recently been appointed as a Reporter in the Pharma and Biotech Study and Commission Group (CET) of the International Federation of Intellectual Property Attorneys (FICPI). This is the first time that an Indian IP attorney has been appointed in an official position in the International executive group. The key objective of the group is to develop knowledge and information across different countries of the world and improve the existing IP laws.

I have also recently been appointed as a Diversity and Inclusion Officer in the IP and Entertainment Law Committee of the International Bar Association (IBA).

I also contribute actively towards IP policy issues in India with the objective of making India an innovator and IP friendly jurisdiction. I mentor women in STEM who are either pursuing an IP career or are interested in entering this field.

As a senior partner in my Firm, I ensure that our work policies are friendly and supportive for our women colleagues. I am also a member of the POSH committee of our Firm.

I am having professional membership(s) of Bar Council of Delhi, FICPI (International Federation of Intellectual Property Attorneys), International Bar Association (IBA), Asian Patent Attorneys Association (APAA), Licensing Executive Society India (LESI), The Indus Entrepreneur (TiE), Women's Law Network (WLN).

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

My parents always wanted and encouraged me to take up medicine as a profession, but I remained passionate about the world of biotech, and I worked in space to earn a Ph.D. degree. A stroke of destiny and a nudge from a friend made me apply for the position of technical expert in a major IP Firm thus making me an accidental patent lawyer. However, I fell in love with the profession from day one and received the support and guidance of some exceptionally brilliant colleagues and mentors throughout my journey so far. Since I get to deal with brilliant innovators daily, I am never away from this amazing scientific field.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

Being a STEM professional is quite demanding as an individual needs to devote endless hours patiently working on problems and solutions that can have real world implications. Women STEM professional sometimes can find it difficult to balance personal life with the professional demands and this can sometimes even deter them to pursue careers in this field. Also, limited or lack of adequate stable job opportunities in STEM fields can create a further challenge in terms of financial stability for women. Add to it, workplaces that are not supportive enough for the female gender can be an impediment too. As a researcher in my younger days, I always felt that our fellowship stipends were very meagre and not in line with the time, efforts, and hard work that one had to put in. Compared to it, my friends who pursued simple graduations, MBAs, etc. entered professional careers much earlier and got paid way more. This was often demoralizing. Over the years, however, this has improved substantially. Good and timely guidance from seniors and mentors at this critical juncture is essential.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

Associate yourself with a reputed research/tech institute doing great science. Try and get into a specific area of research which is future oriented. Don't go for short cuts. Look for mentors and seniors who can help you with your journey in the field of your choice. Be creative, innovative, well informed about global trends in your area and take the challenges head on. But the key mantra is that all this will only succeed if you have a passion for science/tech and enjoy doing what you are choosing to do.

Dr. Devasena M

Professor, Department Civil Engineering

PSG Institute of Technology and Applied Research, Coimbatore

Born on 25th October 1976 at Trichy, Tamilnadu, India, I did my schooling at Holy Cross Anglo Indian Convent, Tuticorin and at St James Higher Secondary School, Trichy. I obtained my PhD degree from the group of Dr Indumathi Nambi at IIT Madras. My five years of research was on transport of mercury and its entrapment in porous media.

My work also included in situ remediation of entrapped mercury using polysulphides. I obtained her M.S degree from Nanyang Technological University, Singapore where my dissertation was on excessive nutrients and heavy metals removal in constructed wetlands. I found my interest in Environmental Engineering during my undergraduate studies in Chemical Engineering at Annamalai University, India. Currently, I am working as Professor & Associate Director Research at PSG Institute of Technology and Applied Research, Coimbatore.

What is unique about working as a Women in STEM compared to other fields?

- Women are free thinkers with exorbitant problem-solving skills, and they work in synergy with the team.
- Women can effortlessly solve the various challenges faced in the real situation with right skills.
- Women stay disciplined and determined and make holistic contribution to their work.
- Women are not only good decision makers; they are change makers of the society.
- Women can work in transdisciplinary projects and set motivation for younger generation.

What are your key contributions to your work area?

My research interest is driven by a commitment to sustainable environment in terms of waste management, water, soil and agriculture. This has led to innovative sustainable phosphorus fertilizer recovery from cow urine and to receive the prestigious Chaatra Vishwakarma Award for the same from the Honorable Vice President of India Shri. Venkaiah Naidu on January 21, 2019. I was honored with the 'Women Researcher of 2021' with 1,10,000 trusted votes and reviewed by the jury amongst 600 global nominations at Humcen Awards 2021.

The Fast Track Young Scientist Award from DST helped me to focus on remediating explosive contaminated soil with the help of green biosurfactants. The collaborative project with Iran focusses on transport of methane plumes in groundwater. I have been granted a patent on Wetland system to treat industrial wastewater in the year 2021. I wish to focus more on Sanitation projects for the public's benefit, like recovery of nutrients from waste and wish to give people a modular way to manage waste. Environmental related profession, according to me, is an intrinsically fascinating hobby and such motivation would strengthen and professionalize my identity as a socially responsible person and further increase my commitment to society.

I am an active participant in Siruthuli, Yuva Foundation, NGOs based in Coimbatore. In the longer term, I will continue to develop critical and timely projects to build a reputation for excellent work in waste management and water management and help restore our clean and green environment. My area of work "Sustainable Environmental Management and Restoration" has reached its importance and made an impact outside my immediate group of research colleagues. Research, according to me, is an intrinsically fascinating hobby and the award would strengthen and professionalize my identity as a researcher and further increase my commitment to teaching.

Currently I am working on projects to eliminate single use plastics. Branded as EcoVise Straws, these straws are made from an indigenous river-based plant. They are hassle free, environmentally friendly straws that meet Sustainable Development Goal 12. They act as the ultimate solution to plastic and paper-based straws.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

- My Grandfathers who were both Engineers themselves
- My mother is differently abled but possess a strong will power.
- My PhD Supervisor Dr. Indumathi Nambi from IIT Madras
- My Professor Dr. Ligy Philip from IIT Madras
- My ever-supportive bubbly friends
- My own determination

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

- Negatively stereotyped
- Stressors related to marriage and childcare.
- Additional responsibility of running of households, childcare and elder care

What is your advice to next-gen women science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

- Never, ever give up your dreams and goals.
- Do not limit yourself.
- Learn to say No if your responsibilities are not shared.
- Take credit for the work you do.
- Read the book "The Power of Rude" – A woman's guide to asserting herself.
- Make time for your health and wellbeing.
- Refuse taking "Minutes of the Meeting" if it is consistently given to you.
- Showcase your talents and earn the credit.
- Learn negotiating skills.

Dr. Era Upadhyay

Associate Professor
Amity Institute of Biotechnology, Amity University Rajasthan, Jaipur

I am Era Upadhyay working as an Associate Professor at Amity University Rajasthan, Jaipur. I have Research Interest in the Biochemical and morphological analysis of plants, Physico-chemical properties of soil and plant samples, Monitoring and modeling of Air Quality, Data Analysis, Risk Assessment, Occupational Safety, and Health research and Global Issues and Health

Educational & Professional Development

1) Ph.D. in Botany (Environmental Sciences) awarded in 2004 from Aligarh Muslim University, Aligarh.
Title of Ph.D: Impact of Particulate Air Pollutants on Brassica juncea L. and Linum usitatussimum L.
2) Master of Science in Botany (Plant Pathology) in 1997 from Dr. B. R. Ambedkar University, Agra

Working Experiences

3) Ansal Institute of Technology, Gurgaon
4) Research Officer (September 2008 - September 2010)
5) Assistant Professor (September 2010 - August 2011)
Job profile: Research & Teaching, Ansal Institute of Technology & Management, Lucknow
6) Assistant Professor (August 2011 - August 2015), Job profile: Academic- Research & Teaching, Administrative- Head-International programs and Administrative Hostel Warden, Amity University Rajasthan, Jaipur
7) Assistant Professor (November 2015 to January 2017), Job profile: Teaching & Research, Amity University Rajasthan, Jaipur
8) Associate Professor (January 2017 to till date), Job profile: Teaching/Research/Timetable Coordinator/Ph.D.
9) Program Co-coordinator (2019-2021)/Nodal Officer- Directorate of International Affairs and other routine departmental activities.

Academic qualifications

1) Ph.D. in Botany (Environmental Sciences) awarded in 2004 from Aligarh Muslim University, Aligarh.
Title of Ph.D.: Impact of Particulate Air Pollutants on Brassica juncea L. and Linum usitatussimum L.
2) Master of Science in Botany (Plant Pathology) in 1997 from Dr. B. R. Ambedkar University, Agra.

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

1) 'Women Researcher Award' by VDGOOD Professional Association (International Scientist Awards on Engineering, Science and Medicine) Coimbatore, India, February 2021
2) 'Certificate of Appreciation' from ASTIF, Amity University for extraordinary research accomplishment of Coauthoring high impact research papers in The Lancet and Nature Medicine in the year 2020
3) 'Best paper award'. Gulshan Sharma and Era Upadhyay*. Encouraging Ecological Sustainability in Biomass Harvesting. The International Conference on Global Entrepreneurship Trends & Empowerment through Innovation (ICGETEI-2021)' was held on March 05-06, 2021, at Amity University Rajasthan.

4) ‘Third prize in oral presentation’. Gulshan Sharma and Era Upadhyay*. Hydrocarbon liquid fuels produced by pyrolysis of medical waste polymers. Conference- International Conference on Advanced Materials for next Generation Applications (AMANGA 2021) organized by School of basic Sciences, Galgotia University, 29th September 2021.

5) Elected Fellow of the 'International Society for Conservation of Natural Resources (ISCON)' and awarded FNRS for meritorious contribution in conservation and valuable cause of the society by ISCON in 2006.

6) ‘Excellent Faculty Award’ at Ansal Institute of Technology & Management, Lucknow, 2012.

7) Appreciation for delivering a talk om “Connecting People to Nature” on World Environment Day (5th June 2017).

8) ‘Outstanding contribution in reviewing’ by Environmental Research (Elsevier).

9) ‘Elsevier Reviewer Recognition’ for reviewing since 2017 from the Editors of 'Environmental Research.'

10) ‘Excellence in Reviewing’ by International Neuropsychiatric Disease Journal, Asian Journal of Environment & Ecology, Physical Science International Journal, Journal of Geography, Environment and Earth Science International, Physical Science International Journal, Economics, Management & Trade, Engineering, Research & Report, Journal of Geography, Environment and Earth Science International, Physical Science International Journal etc.

What is unique about working as a Woman in STEM compared to other fields?
Women hold multiple identities so may access many advantages, such as hands-on experience, social interaction, time management etc. These advantages are very helpful in developing skills and capabilities. The problem-solving attitude is another advantage which may create many powerful innovative ideas. Women specially in STEM can identity and solve the interferences which may come out of pressures, cultural norms, expectations, conflicts of work-family issues. STEM education provides the ability to address potential problems in the simultaneous representation of the woman and scientist identities.

What are your key contributions to your work area?
Environmental Science, Data Analysis, Risk Assessment, Occupational Safety and Health research, Global Issues and Health.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
Family inspiration: My father who is a mathematician, (late) grandfather (freedom of fighter), (late) grandmother, (late) mother, and brother are the main inspiration to choose this as a career option. Professional inspiration: (Late) Prof. MP Singh, Founder of Atmospheric Science Centre, IIT Delhi.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
Few female representations during studies, sociocultural issues after marriage, security challenges, and work-life balance were the main challenging experiences.

Dr. Ezhil Subbian

Co-Founder and CEO

String Bio

Dr. Ezhil Subbian is the Co-Founder and CEO at String Bio. She currently resides in Bengaluru, India. She played key roles in biobased product innovation at different startups/early-stage companies in the Silicon Valley ecosystem. Ezhil was part of early technology development at three companies, Gevo, Codexis and Intrexon, in the biobased sector - All three companies have had successful IPOs.

Building on her experience over the last 20 years in biobased product commercialization and market growth, Ezhil's drive is to leverage the technology prowess of the west and the manufacturing capabilities of the east to develop innovations that can have global impact. Ezhil has been an invited speaker and panelist at multiple conferences. She serves on the board of ABLE-India and CII-National Biotechnology Committee. Ezhil's work was most recently recognized with the Women Transforming India Award 2018 from United Nations/NITI Aayog. Ezhil has a B.Tech in Industrial Biotechnology from Anna University, India and a PhD in Molecular Biology & Biochemistry from Oregon Health and Sciences University, Oregon.

What is unique about working as a Women in STEM compared to other fields?
Women are under-represented in many STEM fields, and this requires us to work harder to prove our work and gain respect from colleagues. As a woman scientist, I strive to work towards creating a gender balance in my company, promote more women in scientific positions and support other women in the ecosystem. There are multiple opportunities for women to make a positive impact in STEM fields and I try my best to mentor fellow colleagues and promote the need for more women to take up senior positions in STEM fields.

What are your key contributions to your work area?
At String, we've developed a proprietary platform (SIMP: String Integrated Methane Platform) that leverages advances in synthetic biology, fermentation technology, chemistry, Compendium 2.0 CII Women in STEM Movement and process engineering to enable a circular value chain from methane. Using deep technology, we are creating carbon-friendly products using GHG as raw material - ranging from proteins for human as well as animal nutrition to agriculture inputs & cosmetic ingredients. Our products have significant performance differentiators that empower an easier transition to a low carbon economy & sustainable manufacturing. We have won multiple national and international awards including Future Food Asia Award, L'Oréal Innovator Runway Award, Hello Tomorrow Food & Agriculture Winner, BIRAC Innovator Award and Unreasonable Impact Member.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
I've had multiple role models over the years – Steve Jobs & Elon Musk on innovation and selling a lifestyle not just products; Bezos on building an indispensable global business; Dr. Kiran Mazumdar Shaw on breaking barriers; my parents on ethics and values.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
We are today a society where women have taken on career roles in addition to their roles at home. The reverse has not happened with men. So, women continue to be the primary caregiver at home. Balancing demands and expectations - both self-imposed and ecosystem enabled - at home and at work is a continuous optimization exercise.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
My advice to budding female leaders would be: Believe in yourself and your potential. Shed your inner inhibitions and follow your dreams. This has been my experience – When you don't hold yourself back from within, external biases don't seem to exist. If you truly believe in an idea, put in work behind it. Doesn't matter if it takes time - clarity comes from action, not thinking. Any idea, change or transformation takes time and energy to execute well so make it worth your while.

Professor Geeta Rai

Associate Professor

Department of Molecular and Human Genetics
Banaras Hindu University

I am Geeta Rai, an immunologist working in Women and Child Health, with more than two decades of experience and four granted patents, having a penchant for innovation, technology development and drug discovery. I work as an Associate professor at Dept of Molecular and Human Genetics, Banaras Hindu University, Varanasi.

I am Geeta Rai, an immunologist working in Women and Child Health, with more than two decades of experience and four granted patents, having a penchant for innovation, technology development and drug discovery. I work as an Associate professor at Dept of Molecular and Human Genetics, Banaras Hindu University, Varanasi. Before, joining BHU in 2006, I worked as a Visiting Scientist in National Institute of Health, Bethesda, USA for 4 years, where I studied autoimmune disease Systemic lupus erythematosus which affects women primarily and was instrumental in developing a disease model.

I currently reside in Varanasi and was born in Ghazipur, UP. My father's transferable job as a PCS officer, gave me an opportunity to travel and imbibe the social and cultural heterogeneity of different cities like Varanasi, Kanpur, Mathura, Ghaziabad, Lucknow etc. which eventually shaped my personality and outlook towards life.

I have travelled to various cities for education. This led to my schooling in six different schools and higher education in three different Institutes in different cities. I was fortunate to get accepted in premium Institutes of the country like BHU, Varanasi for BSc, GBPUA&T, Pant Nagar for MSc, and SGPGI, Lucknow for PhD.

Some of my notable achievements are: selected among 75 women in STEAM, by Principal Scientific Adviser (PSA) to the Prime Minister and British High Commissioner (featured in book 'She Is: Women in STEAM' launched by PSA and British High Commissioner, invited and nominated by Ministry of Science and Technology, Government of India to be a part of Indian Delegacy to United Nation COP-27 Global meeting, held in November 2022, Egypt, GATI award for excellence in science', DST-BHU, (2022), Co-ordinator for Nationally Operated Tele Digital Health program of Govt of India for Electronic Health Record (EHR) generation, 'Wonder Woman of BHU' consecutively for two years 2022, 2023, nominated as member, subject expert committee on Women Scientist Scheme –A (WOS-A), Department of Science and Technology, New Delhi, Nominated Member, General Assembly, International Union of Immunology Societies (2019-22;2022-25), Elected Vice President, Indian Immunology Society, (2022-), Honorable Jury Academic Brilliance Award 2018, Award of Appreciation for contribution in proctorial duty, 2018 and many others.

Publications Summary (Total: 121+05)
Patents: 05; Research Articles: 51; Book: 1, Book Chapters: 05; Papers in Conference Proceedings: 54, NCBI novel sequence and protein structure submissions:11

What is unique about working as a Women in STEM compared to other fields?
Science and other areas of STEM function best in a wide range of diverse perspectives. When STEM fields include women, they include a wide range of extremely talented scientists and technologists that can add a fresh and diverse perspectives / approach to solving scientific problems.
Women represent a primary resource for adaptation through their experience, responsibilities, and strength. There is ample information for women playing a much stronger role than men in the management of ecosystem services. Hence, sustainable adaptation must focus on gender and the role of women if it is to become successful including the scientific innovations and developments of technologies.

What are your key contributions to your work area?

After working at NIH for around 4 years, I joined as an Assistant professor in a newly incepted department of Molecular and Human Genetics, at BHU, in 2006. Delivering my primary duties of teaching and student interactions, as a researcher my current research program on Women and Child Health comprises of several independent but synergistically interacting projects with major focus on autoimmune disease (SLE), defective innate immune mechanisms in low birthweight newborns, drug development and stem cell studies.

My studies on low birthweight newborns are impacting both in the national as well global perspective, as low birthweight is the leading cause of human death in low-income countries and 5th leading cause globally, WHO-2019. With India sharing 30% of the global burden of low birth weight (LBW) newborn's mortality, my research efforts have led to delineating the compromised immune mechanisms including Netosis in low-birth-weight newborns to improve their survival. Our efforts towards development of a formulation for increasing the efficiency of Netosis aimed to reduce the mortality rate of the LBW newborns has been recognized and our patent granted recently (Patent No.392096). Currently, the formulation is in preclinical testing stage after which we would go for clinical trials in collaboration with an industry partner which is desirous for the technology transfer.

My research achievements include a satisfying publication track record of more than 50 publications in indexed/international journals with a google scholar H-Index of 17 and >800 citations. I have been able to attract more than Rs 4 Cr of competitive grant funding and so far, successfully completed 8 projects. My reset the market output and deliveries include four granted patents (Patent Nos 392096, 364083, 419319, 376542) two patents filed, two products developed under my scientific consultation to the pharma companies are in market today.

Upon invitation by Elsevier, I have authored a book on Netosis which is the first authored book internationally. NETosis, is a relatively recent discovered immune process underlying several inflammatory diseases and established as a potent killer in COVID-19. My strive for innovation led to my appointment as scientific advisor to various pharma companies (Neiss Labs India Ltd, NWIL, Agathi Health care (Mumbai)) wherein my supervision has enabled successful development and launch of products in the market.

Further, my research work has led to seven novel protein structure submissions in Protein Database, two nucleotide sequence submissions in NCBI. I feel happy supervising a team of 12 PhD scholars, 8 of them have been awarded the PhD degree and share with great satisfaction and pride that most of them have been accepted in excellent labs in USA and Europe for their higher postdoctoral studies based on their high impact research publications and two have obtained independent faculty positions in Indian Institutes.

My international research collaborations including NIH, USA and Canada and my research work has resulted in development of a 'novel model for autoimmune disease SLE'.

Invited and Nominated by Ministry of Science and Technology, Govt of India to be a part of Indian Delegacy to United Nation COP-27 Global meeting, 6th-18th November 2022, Egypt I have contributed by presenting the national perspective on 'Technology needs assessment' in Health Care technologies on the prestigious global platform of United Nations.

I am currently coordinating as an academic partner a Tele Digital Health Pilot Program of TIFAC, DST, New Delhi, and contributing towards our Prime Minister's Initiative on Electronic Health Record generation in the rural districts of Varanasi. The program aimed at improving Women and Child health receives immense support from Govt of India and was launched at BHU by the Hon'ble Minister of Science and Technology and Earth Sciences, Dr Jitendra Singh, GOI.

Further, as a Coordinator, North Zone, I am contributing towards TIFAC, DST, New Delhi led (Upon Prime Minister's directive) Technology Vision -2047 national consultative meeting organization at BHU towards development of TV-2047 Document on Futuristic Technologies.

It gives me immense satisfaction to serve as a member of the National Expert Committee of the Flagship program -Women Scientists Scheme (WOS-A)' of Department of Science and Technology, New Delhi because that helps me enable many deserving women scientists enter mainstream Science after their long career gaps due to marriage or childbirth.

Further, as an elected Vice President of the Executive committee, Indian Immunology society, my efforts involve encouraging students and teacher's participation in the subject of Immunology, which is a cutting edge and specialized field of science.

Appointed as a National Mentor, INSPIRE-Academy Panel of Department of Science and Technology, Ministry of science, New Delhi, my responsibility includes travel across the country to deliver lectures and inspire and motivate the minds of young students of 11th and 12th grade towards science.

As a Vice Chancellor's nominee of Lucknow University, for Assistant professor recruitments, I continue to enable human resource generation in academics. Also contribute as a member, of Nirikshan mandal team as subject expert, in Higher Education department of UP Government.

Besides, I feel fortunate to have been blessed with international recognition for my scientific contributions, I am a Nominated Member to The General Assembly, of International Union of Immunology Societies and represent Indian Immunologists.

And since I and my team only pick up those research questions that promise to deliver outputs in form of technologies or bioproducts that can directly touch human life, so recognizing my chief strength in technology development I am a member, Executive committee for the BIRAC/DST sponsored BioNest incubator at BHU and help to promote self-reliance (Atma Nirbhar Bharat) and biotech start-ups.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

Influences in Personal Life. For me as a child My Father, Mother, are the primary pillars of my life. My mother infused in me a strong value system that characterizes me as the person that I am today. My father, a strenuous supporter of gender equity, girls' education, employment, and financial independence fanned the fire within me to dream big and become ambitious for achieving goals in career and life. Hence, my primary inspiration to pursue a career in STEM comes from my father.

Professionally, the most influencing memories that comes to my mind effortlessly is that of my M.Sc. teacher Prof S K Garg, of Pant Nagar University. His exemplary style of teaching Immunology, a paper that was offered by very few institutions back then enkindled my fervor and passion for the subject which continues till date. He was very definitive in shaping my career as an immunologist because then after I became intent on pursuing PhD in Immunology.

I would like to add special mention for my post Doc mentor Dr Rose Mage at NIH, USA who not only trained me in various modern-day tools of research but also to formulize quality research questions.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

In every endeavour one undertakes, there will be a lesson worth learning and challenges in a journey is not a one-time thing. There have been occasions when I used to yearn for a mentor's support in my professional journey, who could guide me especially during my early stage of career. My recruitment was in a department that was created by some senior scientists of the University and of the 5 faculty members that were recruited, 4 were their own students, and I was an outsider. So, I used to really miss the mentorship, support and guidance that my other colleagues received all through, but after much agony I came to terms with it and in fact that emboldened my spirit to work harder for myself and create my niche with my dedicated and sincere efforts.

My daughter was born a year after my marriage in 2001, when I was still in the mid of my Phd. It got challenging balancing responsibilities of a wife, motherhood, and science. However, with my strong will and the support of my family I worked harder to achieve all of it and secured a scientific research position in National Institute of Health, USA in 2003. Living with my little daughter in the USA all by myself, with no family around, taking care of her while pursuing my research work aggressively to manage it around her day care timings had also been one of the most challenging phases of my life.

Today my positive experience from surviving through those challenges is that if you work with all zeal, sincerity and determination, success will find you.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

Identify a mentor who can handhold you, recommend you, and guide you during the early phase of your career. It helps in professional networking and growth. Be prepared for challenges and meet them with enthusiasm as a smooth sea does not produce and skilled sailor.

Dr. Harshita Krishnatreyya

Scientist/Technical Supervisor-II
Department of Pharmaceutics
NIPER, Guwahati

As a woman in STEM and especially from the pharmaceutical research field, I feel there is scope to contribute significantly towards the betterment of medicine and healthcare facilities in different health complications and diseases of the masses.

Job experiences:

1. December 2020 – January 2022: Assistant Professor (Pharmaceutics) in Girijananda Chowdhury Institute of Pharmaceutical Sciences, Tezpur, Assam, India
2. November 2015 – November 2020: Ph.D. Research Fellow in the Division of Pharmaceutical Technology, Defence Research Laboratory (DRL), Assam, India
3. I was born and brought up in Tezpur, Assam, India.

Academic qualifications (mention details of institutes and universities):

1. Registered Ph.D. scholar at the Department of Chemical Technology, University of Calcutta, Kolkata, India
2. Master of Pharmacy (Pharmaceutics) from the Department of Pharmaceutical Sciences, Dibrugarh University, Assam, India
3. Bachelor of Pharmacy from Girijananda Chowdhury Institute of Pharmaceutical Sciences, Gauhati University, Guwahati, Assam, India.

What is unique about working as a Woman in STEM compared to other fields?

As a woman in STEM and especially from the pharmaceutical research field, I feel there is scope to contribute significantly towards the betterment of medicine and healthcare facilities in different health complications and diseases of the masses. STEM provides women with the opportunity to perform advanced research on issues that are of quintessential importance and utility in the health sector.

What are your key contributions to your work area?

As someone who has completed her doctoral research studies but is yet to pursue any further research, I am yet to make the biggest contributions in my work area. My research was a defense-related project which involved the study of ocular inflammation caused by pepper sprays in experimental animals and amelioration/prevention of the same using a novel pharmaceutical formulation. The research was significant as there are cases where defense personnel get exposed to pepper sprays during situations of riot control. The study was preclinical and would be more rewarding if continued further into the clinical domain. As an Assistant Professor of Pharmaceutics, I taught B. Pharm students, which helped in my personal growth as well. In my current capacity as a Technical Supervisor, I am helping maintain all instrumental facilities in our laboratory so that students might utilize the same for their essential research. There is the scope to provide instrumental analysis for external samples, which helps in the progress of the institute. In my administrative capacity as Assistant Warden of the Girls Hostel, I have tried in looking after hostel students and attending to their needs and requirements.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)

I was interested in the Pharmaceutical Sciences sector as it seemed a vibrant, emerging, and resourceful field during

the time. Being involved in research, there are a lot of innovative methods and techniques to address health issues in people. My family, including my parents and sister, have always supported me. Both my Ph.D. My supervisor and Joint-Supervisor have been extremely supportive in shaping my career to this point. The friendly and supportive environment with colleagues during research inspires me to further progress in the field of pharmaceutical research.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

This is the start of my professional journey and as a single woman, I have not yet faced many challenging obstacles as of now. However, as I move forward, I have observed from some of my female colleagues and family members how difficult managing Family, Motherhood, and a Job, all at the same time, can be for most women. I think balancing all these together in an organized manner, is the biggest challenge for any professional working woman.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

My advice to a next-generation STEM woman would be to work hard and do her job dutifully with full faith in oneself. I would advise her to not be intimidated by stereotypes or under-representation in the field. She should seek out mentors who can provide guidance and inspiration.

Prof. Hemangee K. Kapoor

Professor

Department of CSE IIT Guwahati

I am Hemangee K. Kapoor. I work as a professor at IIT Guwahati. My research interest is in Computer architecture and Computer Systems. As a faculty member, IIT Guwahati, Teaching, Research, Project supervision, Administration. Previously I have worked with DAIICT, Gandhinagar, faculty member, Assistant Professor, Teaching, Research, Project supervision, Administration, 2004 – 2007 and Persistent Systems, Pune, Senior Member of Technical Staff, Software design and implementation, 2000 – 2001.

I am Hemangee K. Kapoor. I work as a professor at IIT Guwahati. My research interest is in Computer architecture and Computer Systems. As a faculty member, IIT Guwahati, Teaching, Research, Project supervision, Administration. Previously I have worked with DAIICT, Gandhinagar, faculty member, Assistant Professor, Teaching, Research, Project supervision, Administration, 2004 – 2007 and Persistent Systems, Pune, Senior Member of Technical Staff, Software design and implementation, 2000 – 2001. I have born in Nagpur, Maharashtra and did my Schooling in Maharashtra as well and Graduation from Pune University, Masters from IIT Bombay and PhD from London South Bank University UK.

Academic qualifications (mention details of institutes and universities):

1) B.E. (Computer Engg.) College of Engineering Pune, Pune University
2) M.Tech. (CSE) Indian Institute of Technology Bombay
3) Ph.D. (CSE) London South Bank University, UK

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

1) Vice President ACM India, 2020-22, ACM India
2) Member of the ACM DEI council at the international level
3) Associate Editor, Elsevier Journal of Systems Architecture
4) Associate Editor IEEE Design and Test
5) Member of the Steering Committee of IEEE Transactions on Sustainable Computing, 2019-22, IEEE
6) Elected member of ACM India Council, 2014-22, ACM India
7) Member of ACM Elections Committee at the International level
8) Senior Member of IEEE, 2013, IEEE
9) Senior Member of ACM, 2014, ACM
10) Associate Dean Students at IIT Guwahati 2016 – 2019
11) Associate Dean Alumni and External Relations 2022 - 2023
12) Guest editor for CACM India Region special issue
13) Executive Committee of Smart India Hackathon 2019, under the Innovation
14) Cell of the Human Resources Ministry, Govt. of India.
15) Invited as a panel member in the international conference CCGrid for diversity discussion and mentorship sessions
16) Panelist member in Women's history month panel organized by ACM – USA for a worldwide live webcast

Publications: International Journals = 40, International Conferences = 74

What is unique about working as a Woman in STEM compared to other fields?

There is a general perception that women are less capable of doing STEM. Additionally, there are social and cultural barriers for progressing in this field. While doing teamwork, most of the team members are not women and this is

difficult when it comes to scheduling meeting timings and occasional prolonged working hours. Inherently, women have commitments outside their professional life, and they need to strike a balance between them. If this is not balanced, it can affect either work or outside-work environment.

What are your key contributions to your work area?
My research group at IIT Guwahati works in the broad area of computer architecture, with focus on improving the effective utilisation of emerging non-volatile memory technologies. Non-volatile memories, on account of their low leakage power and higher density, are a good replacement for power hungry SRAM and DRAM technology-based devices. However, they are slow in write access times and have limited endurance compared to others. The data access patterns of the applications are not uniformly distributed and lead to several writes to certain memory locations compared to others. Such heavily written locations are prone to wear-out and once they become unreliable it is not possible to use the complete memory device without error corrections.

We handle this non-uniformity using three major approaches:
(i) Observing application access patterns, we develop methods to evenly distribute the accesses across the overall memory capacity to reduce the wear-out pressure on heavily written locations.
(ii) Observing the redundancy in data values, we propose methods that avoid writing such redundant values, thus prolonging the wear-out.
(iii) Frequent writes can be re-directed to temporary SRAM/DRAM partitions, sparing the NVM from getting written with such frequent accesses. This method utilises the concept of hybrid memories.

Another interesting problem my group works on, is in near memory accelerator design for neural networks. Convolutional Neural Networks (CNNs) have widespread use in several applications, especially in the domain of visual imagery or computer vision. The CNN models have grown deeper with several hidden layers to achieve high accuracy (and learn better features). Consequently, real-time inference has become costly in terms of computations and memory requirements. To handle this computation challenge, we work on the design of accelerators: (i) that are area and power efficient for close integration with memory; and (ii) they also exploit sparsity in the inputs and models to eliminate in-effectual computations, thus saving on energy and execution time.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
From childhood, I had a liking for mathematics and science. My parents were always very encouraging and supportive. They helped me to get the best training at the school and college levels. They instilled values in me that built the spirit of being an independent thinker and an independent professional. Throughout my study and professional life, I have met supervisors and mentors who have motivated me. Support from family members and friends is the backbone of one's career advancement.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
It is difficult to convince people that women are equally capable to deliver outcomes. Be it product development, research mentoring, or sponsored research. I found it difficult to attract funding despite having a good research profile and competitive problem statement. Taking up and managing administrative positions was challenging due to the long- and prolonged-time commitment for these tasks.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
One should set reasonable targets and achieve them. Make sure to present your work and gain visibility. Professional networking is very important. Working and volunteering for a professional organization helps to connect with peers and learn new ways of thinking and contributing. Using your knowledge and expertise to help underprivileged or under-represented communities is a satisfying as well as rewarding experience. Team building and leadership skills help, but one can gain them with experience. It is very important to have self-confidence because that is what we need to rely on for most of occasions. Setting up a priority list and time management are very important for success and growth in professional as well as personal life.

Dr. Henam Sylvia Devi

Research Associate

Indian Institute of Technology Delhi

I am Dr. Henam Sylvia Devi. I was born and brought up in Manipur, one of the seven sisters of Northeast India, in a small town called Nambol Phoijing, Imphal West. I studied at Bethel English School and St. John English High School, Nambol, Manipur. And High Secondary (11-12th) schooling from Human Resource Development Academy (HRD) Ghari, Manipur. I did my B.Sc. and M.Sc. from Ramjas College, Delhi University.

After completing my M.Sc. in chemistry, I pursued my Ph.D. from the National Institute of Technology, Manipur, under the supervision of Dr. Thiyam David Singh and Dr. N. Rajhumon Singh. Earned my Ph.D. Degree in December 2016 and majored in "Fabrication of metal, metal oxide, bimetallic nanoparticles using green approach and its applications in degradation of organic pollutants." During my Ph.D., I have published nine International SCI/SCIE/Scopus index journals, two National Journals, and 2-conference papers. After my Ph.D., I joined the National Institute of Technology (NIT) Srinagar as a research associate (8/3/2017-25/9/2017) in a DST Nano mission Project titled "Growth and characterization of nanomaterials employing Green approach" under Prof. M.A Shah, Prof. Seemin Rubab of NIT Srinagar and Prof. Abdul Hamid Wani, Department of Botany, University of Kashmir, Srinagar. My work was focused on synthesizing nanoparticles/materials using green chemistry and studying their antimicrobial activities. During this time, I have published five papers in internationally reputed/SCIE/Scopus index journals. After completing the project, I joined IIT Delhi as a research associate (1/2/2018-30/9/2018) under Prof. Madhusudan Singh, Functional Materials and Device Lab (FMDL), Department of Electrical Engineering. Considering my keen research interest, my supervisor advised me to apply for the Institute's post-doctoral fellowship (PDF). On October 2018, I joined as an IPDF in the same lab. It was a turning point in my research career. Published the highest impact factor paper of my research work in Green Chemistry journal (11.034), which focuses on publishing innovative research on developing alternative green and sustainable technologies. Apart from this, I have published two conference papers and am co-inventor of five Indian Patents (one granted and four filled). During IPDF, my role in the lab was to synthesize various materials from nano to the bulk level, characterization of the synthesized materials using sophisticated instruments, the cooperation of these materials in devices (solar cell, memristor, sensors), understanding of the working mechanism, development of safer/green routes for obtaining materials without losing its efficiency, etc. I have also worked with groups of Ph.D. scholars, helping them with their material-related research work and chemistry problems. Currently, I am working at the Nanoscale Research Facility (NRF), Indian Institute of Technology Delhi, under the supervision of Prof. Madhusudan Singh (Department of Electrical Engineering) and Prof. Neeraj Khare (Physics Department). Here, I devote most of my time in the research lab synthesizing new materials for various applications and rest by operating an X-ray diffractometer at NRF. I am trained in handling instruments like XRD, DLS, Zeta potential, UV-Vis spectroscopy, IR spectroscopy, Photoluminescence (PL), etc. In my research career of 10 years, I have published 19 International Journal Papers, one national Journal Paper, 4-Conference papers, one book chapter, and five patents (one grated and four filled).

Academic qualifications:

- 10th from ST. John's English High School, Manipur (2004) – First division
- 12th from Human Resource Development Academy, Manipur, Manipur (2006) – First division
- B.Sc. Ramjas College, Delhi University, Delhi (2009)- First division and college topper
- M.Sc. (chemistry), Ramjas College, Delhi University, Delhi (2011)- First division
- Ph. D (Nano chemistry), National Institute of Technology Manipur (2016) – Completed
- Research Associate: National Institute of Technology, Srinagar (7 Months) 8/3/2017-25/9/2017.
- Research Associate: Indian Institute of Technology, Delhi (8 Months) 1/2/2018-30/9/2018.

- Post-Doctoral Fellow: Indian Institute of Technology, Delhi (3 years) 8/10/2018-8/10/2021.
- Project Scientist: Nanoscale Research Facility, Indian Institute of Technology, Delhi, 8/11/21-Till now

Achievements:

1. Member of Royal society of chemistry. Member ID: 703569
2. Lifetime member of Association of Environmental Analytical Chemistry of India (AEACI).
3. Nation Postdoctoral Fellow (NPDF) 2019, Science and Engineering Research Board, New Delhi, India.
4. RULA Peace Award, International Best Researcher in Nanoscience 2019. Awarded by United Medical Council and World Search Council.
5. International Travel Grant fellowship (ITS) for attending MRS Fall 2019 by Science and Engineering Research Board (SERB), New Delhi, India.
6. Best paper Presentation award for presenting paper entitled "Green synthesis of Ag2O, CuO, Al2O3Nanoparticles Using Urtica dioica and Their Antifungal Activities" at international conference Advancing Green Chemistry: Building a Sustainable Tomorrow organized by Green Chemistry Network, Delhi University Delhi during 3-4th Oct 2017.
7. College topper award 2006-2009 by Ramjas College, Delhi University.

Publications:

19 International Journal Papers, 1-National Journal Paper, 4-Conference papers, 1-book chapter and 5 patents (one grated and 4 filled).

What is unique about working as a Woman in STEM compared to other fields?

Working in STEM exposes me to cutting-edge topics and keeps me updated about new technologies, findings, etc. It empowered me and pushed my confidence level. Help shape me as a critical thinker, better understanding of problems, and develop problem-solving skills. Working in science for around ten years made me a strong person and motivated me to get involved with more girls/women to create a pipeline of strong women.

What are your key contributions to your work area?

My key contributions are:

(1) Implementation of green technology/route to improve the present scenario of our environment by using green synthesized nanoparticles to treat organic pollutants.

(2) To replace hazardous materials/routes with environmentally friendly materials/routes. A simple, environmentally safe, and easy-to-scale-up method for the synthesis of nanoparticles has been demonstrated in many of my works (published papers). Our environment is already under stress due to the use of harsh, toxic chemicals and improper disposal of these chemicals. Avoiding the use of such poisonous solvents and reducing and capping agents, all possible efforts were made to implement a benign by-design approach in my research work. Alternative synthetic pathways were designed, proposed, and executed against the traditional methods using green solvents, reducing, and capping agents.

(3) Use of green technology at the device level, i.e., use of green synthesized material in the devices and lower the energy conversion index of the process. I am trying my best at National and International to draw the attention of researchers and colleagues towards Green Chemistry/technology in nanoscience for safer chemistry and the environment.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

Several people inspire me to take up this field. First, my mother (Hemam Premila Devi, Associate Professor of Botany) encouraged me to go for science and do Ph.D. My elder brother (Henam Premananda Singh, Assistant Professor in Chemistry) has been my role model in this journey. My high school teachers who have tirelessly demonstrated the importance of science, especially the beauty of Chemistry in life. My supervisors, Dr. Thiyam David Singh and Prof. Rajmuhon Singh have provided unconditional support and strength to advance in this field. Prof. Khumanthem Manglem Singh and Associate Prof. Jina Yambam of NIT Manipur has imparted the knowledge and importance of research ethics in my journey. Prof. Seemim Rubab of NIT Srinagar has always inspired me; her talk on "Women in physics" and the blog "A tribute to women in science" motivates me to carry out meaningful research. I have also enhanced my interdisciplinary research skills while working with Prof. M.A shah and Prof. Abdul Hamid Wani. My PDF supervisor, Prof. Madhusudan Singh, has inspired me the most. He taught me to be resilient and inspired me to think

outside the box, think critically, and create courage through Knowledge. He has been very supportive of me. I have learned and grown a lot in the last five years. Working with him is an enjoyable journey. I am very grateful for all the support.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
In my journey till now, I have faced a few obstacles, like the lack of transparency regarding pay. In one of the incidents, my supervisor had instructed me to wait to pay until the desired paper/results were obtained, lasting 5-6 months. It was very disappointing; however, the issue was resolved with the help of a higher authority.

Another obstacle is finding a female mentor in science and engineering, as fewer women are employed as faculty in the Department. Even if we managed to find one, they preferred to take a male candidate, which is unfair.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
Dear women, do not be afraid to ask for help. We are equally capable of pushing the boundaries of possibilities as Men. Do not hesitate to ask why? and always ask questions. Bring out your inner scientist, do things that will improve your knowledge, and help one another. Different from the old days, many global to national resources/funding/supports are available for women/girls in STEM (can be avail in India too) to help achieve your dreams/careers, which I was unaware of at an early stage. And will also advise you not to prioritize societal pressures in your life.

Prof. Ispita Roy

Professor

National Institute of Pharmaceutical Education and Research, (NIPER), Mohali

I am working in the Department of Biotechnology at the National Institute of Pharmaceutical Education and Research (NIPER) S.A.S. Nagar. My designation is that of Professor and currently, I am also the Head of the Department. I have been working in this Institute since 2005. I was brought up in New Delhi from where I did my schooling, bachelor's, masters' and doctoral studies but am currently based in Mohali, Punjab.

I completed B.Sc. (Hons.) in Chemistry from the University of Delhi, followed by M.Sc. in Chemistry from the Indian Institute of Technology Delhi and PhD from the Indian Institute of Technology Delhi, with Prof. M. N. Gupta as my PhD advisor. With a score of 99.75 percentile, I was ranked 4th on All India-basis in Graduate Aptitude Test in Engineering (Chemistry) in 1996.

I received the prestigious and highly competitive Alexander von Humboldt research fellowship and worked at the University of Bonn, Germany. I have been mentioned in the top 2% of scientists in world rankings for three consecutive years (published by Stanford University) and have been featured in the Life of Science organization list of "#365IndianWomeninSTEM". I have been successful in publishing about 140 papers, some of which have been highly cited. I am one of the inventors of a patent which was granted in the US/PCT/Japan and have filed applications for a few others. I am a member of the National Academy of Sciences, Prayagraj.

What is unique about working as a Woman in STEM compared to other fields?

One unique feature of working in STEM as compared to any other area, irrespective of gender, is the number of hours that one devotes. For most of the time, these hours are invisible, with nothing tangible to show for it. The idea(s) that one develops while thinking (many a times outside the lab) will bear fruit (if it ever does!) several years down the line. Compare this with any other domain where work output can, and is, quantified, within a defined period, with concrete and visible results. Being a woman in this sector makes this job a bit tougher. It is not simply the 'expectations' of others but day-to-day challenges; for example, travelling through the city late at night. Many a times, experiments run longer than anticipated, so planning any activity becomes difficult. In these cases, the woman need not, and should not, be considered as a 'superwoman' and expected to spend an equal amount of time for domestic chores no matter what but as just another human being, with an equal right to decide on their daily activities.

What are your key contributions to your work area?

Our research group has been able to establish cells models of several protein conformation disorders. We are using them to search for agents of therapeutic intervention among clinically approved molecules, what is more commonly referred to as 'drug repurposing'. We have been successful in developing nucleic acid aptamers as tools to modulate protein activity and stability, both outside and inside the cell. We were the first laboratory to show that aptamers could function as 'universal' stabilizers and could protect proteins against different types of stress conditions as compared to small molecules which provide protection only against a particular kind of stress. We are quite excited to develop aptamers as aggregation inhibitors as well as biosensors.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

I was interested in studying chemistry since school. It was during my undergraduate studies that I was really fortunate to come in touch with teachers who nurtured this interest and showed me the various facets of what

chemistry could do. One of these was its application in life sciences. I am fascinated by how chemistry controls how proteins fold and function. However, it was my PhD advisor from whom I learnt not only about science but strong work ethics too. Since then, there have been students, both at the Masters' and doctoral levels, who remind me every day that this was a good choice to make.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

I don't think the obstacles that I have faced are due to my being a woman in STEM but rather, being a professional woman. Many a times, people mean well but don't have a clue as to how to treat you. In many meetings, your opinion is not sought or is sought once everyone else has finished speaking. I have found that in such cases, polite but clear communication, and what your expectations are of that individual/group, works well. These ingrained biases will not change overnight but they will never change if no start is made.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

One needs to be assertive and not accept any and every extracurricular job that is dumped on them. One should also shy away from being a superwoman. In the initial phase of starting professional lives, there are too many other aspects to factor in. One can decide what proportion of their time they devote to what and put their foot down for the rest. Also, if possible, one should slowly build a network or be a part of one (in addition to the professional one) more like a support group where one can talk freely.

Ms. Jancy Ayyaswamy

Scientist-F, Technology Information, Forecasting and Assessment Council (TIFAC)

Department of Science and Technology

I am working as Scientist-F in the Technology Information, Forecasting, and Assessment Council, an autonomous body under the Department of Science and Technology, Government of India.

Scientist-F (August 2019-till date): Special Projects, Techno-economic feasibility reports, Technology Foresight, Materials, Manufacturing, Technology Needs Assessment in Climate Change, Forecasting on Advanced Technologies.

Scientist-E /D/C/B (Till August 2019 from November 1997): Extensive experience in Technology Visioning, Technology Foresight in Materials, Manufacturing and emerging technologies, Technology Needs Assessment in Climate Change, Policy Making, Academia-Industry Collaboration, Innovation Support

Residing City: New Delhi since 1997 (25yrs)

Born in Vellore and Brought up in Chennai. Did my Schooling from Don Bosco Matriculation School, Chennai and my Engineering Degree from PSG College of Technology, Coimbatore, Tamil Nadu

Academic qualifications: Bachelor of Engineering, Metallurgy (1993-97), PSG College of Technology, Coimbatore

Notable achievements

1. Publications (Papers/Book Chapters): 20+
2. Technical Reports: 15+
3. Invited talks and paper presentations (National and International) :>25
4. Deputations abroad: 10 Countries (USA, UK, China, Italy, Luxembourg, Portugal, Malaysia, Brunei Darussalam, Singapore, Thailand)
5. Reviewer of Technical Journals- Foresight (Emerald Publishing), Expert for Assessment Committees- e.g., AICTE, etc
6. Advisor (Honorary) for Knowledge Academy-skill upgradation
7. Professional Member-American Society of Metals, Indian Institute for Metals
8. Expertise in Technology Foresight, Technology Visioning, Technology Road-mapping
9. Professional technology foresight trainer to impart training to Industry, Administrative service personnel, State Govt Officials

What is unique about working as a Woman in STEM compared to other fields?
There are several unique advantages to pursuing a career as a woman in STEM (science, technology, engineering, and mathematics) compared to other fields:

- STEM fields are at the forefront of innovation and technological advancements. Women who pursue careers in STEM can play a crucial role in developing new technologies and solutions to complex problems.
- STEM careers offer many opportunities for career advancement and professional development. Women who pursue careers in STEM can climb the career ladder and take on more challenging and rewarding roles.
- STEM domains are in high demand and are expected to continue growing in the future. This means that there are more job opportunities and greater job security for women who pursue careers in STEM.
- Most of STEM careers allow women to make a positive impact on society and contribute to solving global issues such as climate change, healthcare, and cybersecurity
- Women who pursue careers in STEM typically earn higher salaries than those in other fields. This can provide greater financial stability and independence.

What are your key contributions to your work area?
Future thinker, Expertise in Technology Foresight, Visioning, Roadmap development, Practitioner in foresight techniques and methodologies (Scenario, MCDA.) Performing roles of Scientist, Program Manager, Extensive experience in project coordination and technical writing and as a Coordinator for networking between academic institutes, research organizations, and Industries and involved in monitoring and evaluation of projects

- Currently working on preparing technology foresight reports on emerging technologies in New Materials and Advanced Manufacturing technologies, Semiconductor, Hyperloop, Energy Storage, and Renewable Energy.
- Member of the Technology Foresight team of TIFAC which brought out the Technology Vision 2035 document- the visionary document for India.
- Instrumental in preparing the Technology Roadmaps on Materials and Manufacturing.
- Played a key role in bringing out Technology Needs Assessment Study reports on key sectors, especially Industrial Processes and Products and Wastes sector.
- Active member of the Global Technology Watch Group, targeted in collating green technologies in key sectors, especially in Manufacturing.
- Member of the core team for drafting the Policy on Scientific Social Responsibility, a novel policy to augment the science-society connect.
- Worked on advanced technology interventions for weavers of the Silk industry.
- Member of the core team of TIFAC for imparting hands-on training on technology foresight methodologies to Industry, Administrative service personnel, and State Govt Officials.
- Worked on key projects dealing with the translation of technologies for real-life applications and also worked on a Mission mode program for Industry-Academia Collaboration which targeted churning out industry-ready manpower. Played a key role in setting up such Centres across India for higher technical education.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
Science and Technology has always been my passion since childhood. My parents were my moral support, especially my father (late). Despite being from a lower middle-class family, they always inspired me to study well without bothering about financial difficulties. Their persistent attitude with sacrifice inspired me to focus on my studies and secure college admission in a premier institution in Tamil Nādu on a pure merit basis. One of my best friends in college instilled strength in me, to take life head-on and not be swayed by gender bias at any point of my life. My uncle was my mentor in the selection of Metallurgy as a career option.

The founder and Executive Director of TIFAC, Dr. Y.S. Rajan was my mentor in 1997, when I joined TIFAC as a 21 years-old fresher. He along with my senior colleague Sh. D. Bhatnagar provided me the much-needed guidance, grooming, and mental support in the initial years. My organization TIFAC gave me ample scope to work on projects in my domain area of Materials as well as expand to other multi-disciplinary domains. The innovation support programs taught me the nuances of project management. The projects on International Cooperation with ASEAN gave me exposure to international trends and technology forecasting. Prof. Anand Patwardhan and Prof. Prabhat Ranjan, both Executive

Directors of TIFAC encouraged me to focus on Innovation Policy & support mechanisms (World Bank Project) and Technology foresight initiatives in Materials & Manufacturing. Prof Pradeep Srivastava, the current Executive Director, with whom I am posted in the technical cell currently, has provided me with an excellent platform to work and study emerging technologies, which are interdisciplinary. His entrepreneurial spirit and innovative ideas potential have introduced several new initiatives in TIFAC. This has given me the opportunity to expand my work domain and knowledge. My senior colleague Dr. G. Goswami had always provided necessary encouragement and support while working on the prestigious Technology Vision 2035 document, technology roadmaps, climate change projects, and also for conducting training programs. In addition, I owe my success in my professional career to my spouse T. Selvan and my Children – Sahana & Siddharth for rendering un-wavering support and my friends Mini, Adarsh, and Neeraj for being my pillars of strength throughout the two decades of my career till now. All these people have inculcated in me a strong sense of self-belief to pursue my interests in my career with passion.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

Women generally face stereotypes and biases related to their gender that can affect their confidence, self-efficacy, and their ability to succeed in STEM fields. But I am fortunate to be working in this organization TIFAC, where there is no bias or gender inequality. Any official be it male or female is given equal opportunity in work and upgradation.

As a woman in STEM, I have faced one critical challenge of achieving a work-life balance. Balancing work demands with personal life is a challenge that anyone can face. However, as a woman in STEM, I have experienced additional pressures and expectations that have made this balancing act even more difficult. Managing challenging projects with strict timelines has proven to be a significant obstacle for me.

But it is important to acknowledge these challenges and work towards creating more inclusive and equitable workplaces for women in STEM fields. This can involve policies and initiatives to address gender bias, creating more opportunities for female role models and mentors, and fostering a more supportive and inclusive work culture.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

Some quick tips for young women scientists in STEM are

Networking is key in any field, particularly in STEM. Hence, the need to connect with other women in STEM to seek out mentors who can offer guidance and support.

Take advantage of opportunities to gain experience and build your skills. This might include internships, research assistantships, or attending conferences and workshops.

Pursue topics and areas of research that one is passionate about. This will help in staying motivated and engaged in the work.

Effective communication is critical in STEM, both in written and verbal forms. Work on developing communication skills, including presenting the research to both technical and non-technical audiences.

Seek feedback from colleagues, mentors, and supervisors. This will help in identifying areas where one can improve and build upon her strengths.

Pursuing a career in STEM can be challenging, but it is important to be persistent and persevere through any setbacks or obstacles that one may encounter.

STEM fields benefit from a diverse range of perspectives and backgrounds. Embrace diversity and seek out opportunities to work with people from different cultures and backgrounds.

We need to remember that success in STEM is a journey, and it takes time and effort to build a rewarding and fulfilling career. Keep an open mind, stay curious, and be willing to learn and grow along the way.

Dr. Jessy Jose

Associate Professor Physics

IISER Tirupati

I am an observational Astrophysicist working in the field of star and planet formation. I use national and international ground-based and space-based multi-wavelength telescopes to conduct my research. The fundamental questions which I am trying to understand are 1) how the early phase of star formation affects the formation and evolution of planets around them 2) what the mass distribution of lowest mass objects formed out of a star-forming event 3) The role of environmental effect such as chemical composition in the star formation mechanism.

Present Designation: Associate Professor in Physics, IISER Tirupati, since July 2022 (Teaching underground and master's students as well as doing research in Astrophysics)

- Assistant Professor in Physics, IISER Tirupati, September 2017 – July 2022 (Teaching and Research)
- Post-Doctorate Fellow, Kavli Institute for Astronomy & Astrophysics, Peking University, Beijing (2014-2017)
- Post-Doctorate Fellow, Indian Institute of Astrophysics, Bangalore (2011-2014)

Residing city: Tirupati, AP

City (born and brought up): Muvattupuzha, Ernakulam district, Kerala

Academic qualifications (mention details of institutes and universities)

- PhD in Physics, Aryabhatta Research Institute of observational sciencES (ARIES), Nainital
- MSc in Physics, Christ/Bangalore University, Bangalore
- BSc in Physics, Nirmala College, M.G. University, Kerala

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)
Fellowships/Awards:

- One of the two Indian scientists, who procured observing time at the recently launched James Webb Space Telescope by NASA
- 2022 POWER Grant, SERB-DST, Govt. of India
- 2022 Short-term visiting fellowship to IPAG, University of Grenoble sponsored by Embassy of France in India and The French Institute in India, Nov 2022
- 2019 Start-up Research Grant, SERB-DST, Govt. of India
- 2019 Fulbright-Nehru Specialist Program by World Learning Center (USA) and USIEF (India)
- 2017 Peking University Outstanding Post-Doctor Award, Beijing
- 2016 Ninth China Postdoctoral Foundation Special Research Fund
- 2015 China Postdoctoral Science Foundation General Grant

Academic memberships

- Member, International Astronomical Union (IAU),
- Member, Astronomical Society of India (ASI)
- Member, American Astronomical Society (AAS)
- Member, Scientific Advisory Committee & International Science Development Team (ISDT), Thirty Meter Telescope, Mega Science Project, DST, Govt. of India

Selected Publications:
Total refereed publications in international journals = 49
4 in press, 2 under review
H-index = 22, i10 index = 31 (as per Google citations)

- S.R. Das, S. Gupta, P. Prekash, M. R Samal, J. Jose, 2023, Astrophysical Journal, 948,7, Membership analysis and 3D kinematics of the star forming complex around Trumpler 37 using Gaia EDR3
- S. Dubber, B. Biller, L. Albert, J. Jose et al., 2023, Monthly Notices of Royal Astronomical Society, 520, 3383, A Novel survey of young stellar objects with the W-band filter IV, Detection and characterization of low-mass brown dwarfs in Serpens Core
- S. Patra, N.J. Evans, K. Kim, M. Heyer, J. Kauffmann, J. Jose, et al. Astronomical Journal, 2022, 164, 129, Tracers of dense gas in the outer Galaxy
- S. Gupta, J. Jose, S. More, S. R Das, G.J. Herczeg et al., 2021, Monthly Notices of Royal Astronomical Society, 508, 3388; Subaru Hyper Suprime-Cam Survey of Cygnus OB2 Complex - I: Introduction, Photometry and Source Catalog
- B. Damian, J. Jose, M. R., Samal, E. Moraux, S. R. Das, S. Patra, 2021, Monthly Notices of Royal Astronomical society, 504, 2557, Testing the role of environmental effects on the Initial Mass Function of low mass stars

What is unique about working as a Woman in STEM compared to other fields?
I have felt that compared to other fields, women feel more comfortable and welcome in STEM. STEM provides equal opportunities to men and women and whoever has the talent and is ready to work hard will certainly achieve great things, irrespective of their gender. It is also encouraging to note that there are many new schemes and scholarships sponsored by the government which help and encourage women to come forward to explore career opportunities in STEM.

What are your key contributions to your work area?
I am an observational Astrophysicist working in the field of star and planet formation. I use national and international ground-based and space-based multi-wavelength telescopes to conduct my research. The fundamental questions which I am trying to understand are 1) how the early phase of star formation affects the formation and evolution of planets around them 2) what the mass distribution of lowest mass objects formed out of a star-forming event 3) The role of environmental effect such as chemical composition in the star formation mechanism.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
It would be difficult to list every individual who inspired me to pursue a career in STEM. However, if I have to pick a few, I will start with my PhD advisor (late Dr. Anil K. Pandey) and my post-doc Advisor (Prof. Gregory J. Herczeg). They played a vital role in showing me the way forward, guiding me through many tough situations, and helping me in many ways to overcome the multitude of obstacles I had to face to complete my doctoral and post-doctoral fellowships. More importantly, my husband is a real support for me to continue in this career, and he used to be a constant motivator throughout my journey.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
As a woman in STEM, the most important challenge I have faced was how to balance my professional aspirations and my family obligations. As a woman I have to ensure that I give equal importance to family and my career. Doing this balancing act is tough at times and I was able to manage this due to the unwavering support from my family.

Another challenge I faced during my college days was the lack of visibility on the opportunities in STEM. It was by sheer luck that I got the opportunity to move to a metro city to complete my master's, and that is where I started getting exposure to the avenues open in STEM.
What is your advice to next-gen women science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

The most important piece of advice I have for young women is to use the power of technology you have at your fingertips to become aware of the various options and opportunities you have. There are great opportunities for women to grab, which will lead them to a successful career in STEM. It is just a matter of identifying the right one, having confidence in yourself, and concentrating your efforts on the same.

Ms. Kajal Bhambhani

Vice President & Head- Regulatory Affairs, Biologics

Dr. Reddy's Labs

I was born and raised in Panvel, Maharashtra and come from a very humble background, wherein parents had their hard times in terms of finances to raise me and my other two siblings. Graduated as a STEM (Biomedical) Engineer with obligations to support family. Started my career as Sales & Service Manager for a medical equipment company.

Present Designation: Vice President & Head- Regulatory Affairs, Biologics, Dr. Reddy's Labs and Chairperson of Dr. Reddy's Apex Disciplinary Committee for POSH (Prevention of Sexual Harassment).

Current Job Function: Responsible for filing and approvals of Dr. Redddy's biosimilars assets in global markets. Interacting with Regulatory agencies of various countries for alignment on the data package prior to submission of registration dossiers for approvals.

Post marriage (married to an Indian Air Force officer), had to relocate and initially continued with similar field of medical equipment working as Product Manager of a Diagnostics company SIEMENS (formerly known as BAYER Diagnostics). Subsequently, got an opportunity in Pharma sector and got involved in Clinical Research. During this period of a decade, gained vast and diverse experience in clinical research ranging from conduct of different phases of clinical studies, setting up of clinical lab in line with CAP standards and obtaining accreditation for the lab which is considered the gold standard in the diagnostic industry. Thereafter for last ten years, have been associated with Dr. Reddy's Labs and have led multiple functions ranging from Clinical Business Affairs, Project & Program Management, Pharmaco vigilance & Regulatory Affairs thus gained insights encompassing the entire drug development lifecycle.

Academic qualifications (mention details of institutes and universities):

- Bachelor of Engineering-Biomedical from Mumbai University (Mahatma Gandhi Mission's College of Engineering & Technology, Navi Mumbai)
- Diploma in Management Studies from Mumbai University (Bharati Vidyapeeth, Navi Mumbai)

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

- Member of International Generic and Biosimilar medicines Association (IGBA)
- Member of Association of Biotechnology Led Enterprises (ABLE)
- Achieved the recognition of "Wonder Women of Dr. Reddys."
- https://www.linkedin.com/posts/dr--reddys-laboratories_wonderwomanofdrreddys-drreddysxsustainability-activity- 7036249022415724544-0x2F?utm_source=share&utm_medium=member_android

What is unique about working as a Woman in STEM compared to other fields?

Being a woman in STEM, allows you to be part of the core operations team. A functional role tends to give a higher degree of satisfaction since the output, performance, achievement is measurable in most cases. The organizations' growth & performance is directly linked to the contributions of a STEM professional.

What are your key contributions to your work area?

On one hand, my work involves facilitating a regulatory pathway in keeping with the highest safety, quality, and

regulatory standards to take our bio-similar assets to patients in need. On the other hand, I play a key role in creating a safe, fair and inclusive environment at the workplace through my work as POSH committee head. My work is uniquely placed to address the needs of patients and external stakeholders as well as our own employees.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
Was passionate to take up the field of medicine right from childhood, however, could not secure a MBBS seat and thus post discussion with my teachers and family, opted Biomedical Engineer as I would still have an opportunity to be associated with medical field. As years passed, was thankful that had mentors who believed in me and provided me a platform to deliver and excel. I have been fortunate enough to garner the support of my family throughout and hence could focus on my work and reach the stage where I stand today with an immense degree of satisfaction in terms of achievement, recognition & fulfilment.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
The biggest challenge/obstacle that I faced was to gain acceptance in the male dominated working environment. Whether it was in my initial years of career when I was working as sales & service representative and travelling all over or even today when there is only 20% women representation in the senior leadership forum.

It really took years of hard work to create a niche for myself, to overcome the pay parity bias and to deal with the mind-set that a woman is not the sole bread earner for the family and hence cannot be treated at par with the male counterparts.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

Few tips which I would wish the next-gen women to consider are:

- Self-belief: unless you believe in yourself how can you expect others will believe in your potential/capability
- You need to be good at what you do/take up. You must aim to gain thorough knowledge about all aspects not only to your field/work domain but ancillary functions too.
- Form a goal for yourself in terms of "Where would you like to see yourself five / ten / fifteen years from now" and work towards it. But do not tend to be over ambitious.
- Always try to strike a balance between your personal and professional life. Often, managing work, family, kids, bosses, social commitments etc. is the biggest challenge. In an effort to manage all this, a woman often tends to grossly neglect her own self.
- Last but not the least support, encourage, guide, coach, mentor women around you to believe in themselves and aspire for more and more....so that they can achieve what they desire.

Dr. Kalpana Chaudhary

Associate Professor, Department of Electrical Engineering

Indian Institute of Technology (BHU)

Working as a woman in STEM is a most rewarding and challenging experience for me. Woman has penetrated in almost all the challenging professional field and are outperforming. There was Male dominance in field of STEM across the world and particularly in India. However, several progressive Government policies opened the door for woman in almost all field including the STEM field.

Some of the notable achievements are:
Fellow, Institution of Engineers from Institution of Engineers, India, Senior Member, IEEE and SERB Power Fellow.

List of Publications: Books Published:

1. "Satellite Solar Power Station" by Kalpana Chaudhary, November 2011,
2. Lambert Academic Publishing GmbH & CO. KG, Germany, ISBN-13: 978-3-8465-9101-7.https://www.amazon.in /Satellite-Solar-Power-Station-
3. Architecture/dp/3846591017/ref=sr_1_18?dchild=1&keywords=satellite+solar+power+station&qid=1624294122&sr=8-18

Books' Chapter:

1. D Kumar, K. Chaudhary, "Design of 5.8 GHz Rectenna for Space Based Solar Power", Advances in Electronics, Communication and Computing, Springer, pp. 705-712.
2. D Kumar, K. Chaudhary, "Design Study of 5 GW Base Load Power Drawn from Satellite Solar Power Station", Advances in Power Systems and Energy Management, Springer, pp. 655-663.
3. D Kumar, K. Chaudhary, "5.8 GHz Antenna Array Design for Satellite Solar Power Station", Advances in Smart Grid and Renewable Energy, Springer, pp. 659-666.
4. Kumar M., Kumar K., Chaudhary K. (2021) Modified Non-isolated Bidirectional DC–DC Converter for Regenerative Braking for Electric Vehicle Applications. In: Mohapatro S., Kimball J. (eds) Proceedings of Symposium on Power Electronic and Renewable Energy Systems Control. Lecture Notes in Electrical Engineering, vol 616. Springer, Singapore. https://doi.org/10.1007/978-981-16-1978-6_7.

Sponsored Research Projects: Two (Ongoing as Principal Investigator):

1. **Project Title:** Prototype Development of Fuel Cell and Photovoltaic-Based Innovative Hybrid DC Power Pack for Remote Applications.
   Funding Agency: Science and Engineering Research Board (SERB), Govt. of India
   Cost of Project: INR 38.10 Lakh
   Project Status and Duration: Ongoing (Three Years, Started w.e.f. 25.03.2021)

2. **Project Title:** Development of Energy Efficient and Compact Electric Drive Train for Fuel Cell Electric Vehicle.
   Funding Agency: Science and Engineering Research Board (SERB), Govt. of India
   Cost of Project: INR 49.17 Lakh
   Project Status and Duration: Ongoing (Three Years w.e.f. 23.02.22)

What is unique about working as a Woman in STEM compared to other fields?
Working as a woman in STEM is a most rewarding and challenging experience for me. Woman has penetrated in almost all the challenging professional field and are outperforming. There was Male dominance in field of STEM

across the world and particularly in India. However, several progressive Government policies opened the door for woman in almost all field including the STEM field. Even after various traditional and rudimentary beliefs, woman have outshined steadily in a very shorter period. It requires extra efforts for a woman to be successful in STEM, but once she gets recognition and experience, she gets special respect in the social front and professional front. Thanks to the Government and Industries for recognizing the talent of women and creating a conducive environment for women to outshine.

My profession gives me a twofold privilege i.e., working in STEM and working as an academician in a technical Institute of eminence (I. I. T. (B.H.U.)). Technical teaching has always been my passion and due to that, I have never taken any break during my 21 years of profession. My biggest key contribution is in developing thousands of technocrats (Electrical Engineers) in my professional journey. Being an electrical engineer, I have researched various unconventional green energy-based methods of electrical power generation to present an alternative to baseload power. The aim of taking up this research is to reduce the dependency on fossil fuel and to reduce carbon emission. The Science and Engineering Research Board (SERB) has recognized my contribution in the field of STEM and conferred a most prestigious award "SERB POWER FELLOWSHIP". I was the pioneer of this award at the time of its launch in 2021. POWER itself means "Promoting opportunities to a woman in Exploratory Research".

What are your key contributions to your work area?

My key contributions in the field of STEM are:

(a) Recipient of prestigious "SERB POWER FELLOWSHIP" Award.
(b) Recipient of award "Outstanding Researcher in the Field of Specialization" hosted by Venus International in 2021.
(c) Recognized by Institute of Electrical and Electronics Engineers (IEEE) to get elevated to "Senior Member" IEEE.
(d) Became "Fellow" of Institution of Engineers (FIE) in 2019.
(e) Produced four Ph. D and 50 M. Tech as Sole Supervisor.
(f) Served various administrative responsibilities at Institute level and Departmental level such as Member, Woman Grievance Cell, Member, Internal Complaints Committee, Member, Anti ragging Squad, DPGC Convenor for two years, Purchase Secretary, Convenor, Library Committee, Member, Staff Committee, DC Secretary and Convenor, Timetable Committee
(g) I am Principal Investigator of two challenging SERB funded ongoing projects.
(h) Published a book "Satellite Solar Power Station" as Sole author.
(i) Published 24 papers in reputed international journals and published **14** papers in conference proceedings.
(j) Published four book chapters.
(k) I am indulged in various outreach activities of national importance and have also disseminated my knowledge in the form of several expert lectures.
(l) One of my research outcomes **"Multi mode Electric Vehicle"** is in the process of Patent filing.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

My parents have been the source of inspiration who always give me strength to take up challenging tasks and become successful. My father "Late Shri R.P. Chaudhary" was a Group C Employee in Food Corporation of India in Gwalior, and my mother "Mrs. Sushma Chaudhary" is a house maker. We are five sisters and only brother. With the sincere efforts of my parents, it is a proud mention that all my sisters including me have established ourselves in the field of "STEM". I was the eldest child of my parents and my parents had lots of aspirations for me. I did my schooling in Gwalior in "Model School" operated by Kerala Samajam. All my teachers and staff of the school were woman, and they all were fantastic and my inspiration. I have not seen any gender biasness right from my family and school and probably this is the reason of my success as woman in "STEM". I completed my Graduation from Govt. Engineering College in Gwalior.

I went for higher studies (M. Tech) to I.I.T. Delhi in 1997. I did my teaching assistantship under my Professor G. Bhuvaneswari Madam. She inspired me in those days as I learnt from her about how to manage the family and workplace properly to become successful. Professor G Bhuvaneswari is a renowned name in the field of Electrical Engineering now.

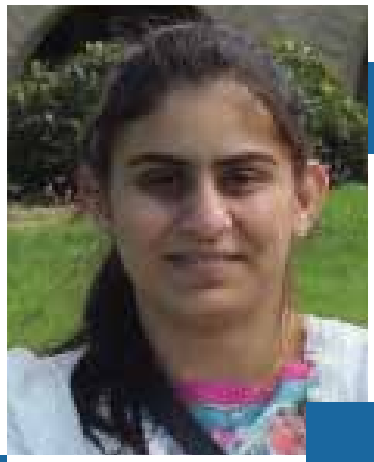
It is worth mentioning that my family has been very supportive in accomplishing my professional duties with flying colour. I have two daughters and a son. Both of my daughters have chosen the "STEM" field, the eldest one is doing B.

Tech in I.I.T. Kanpur and younger one has cracked prestigious JEE Mains exam and is among top rankers. My daughters are even a source of inspiration for me.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
I am quite blessed that my professional journey has been enjoyable, and I have not experienced any obstacle because of my gender. I remember the day, when I sent a request to my R&D Head to recommend my name for the prestigious "SERB POWER Fellowship" and to my surprise, he recommended my name the same day. It is due to his support that I am the pioneer and only SERB POWER Fellow of my Institute.

It has been quite difficult for me to develop a rapport and sometimes this adversely affected transmitting my research abilities to the higher authorities of the Institution. Sometimes, I feel that I deserve a better position, but this will not prevent me from working harder to attain my goals.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
I have my own experience that with the progressing years, the gap of gender difference has minimized. The physical difference between a man and a woman is evident and can't be obviated. Woman must take up some additional responsibility as a daughter, mother but this responsibility comes with emotional dividend. Next gen woman in STEM need to believe themselves and should try to take extra efforts during initial phase of their career. They should not leave or take a break in their career in the initial phase because it may become very difficult to start a career after a break.



Ms. Kalpana Dhaka

Associate Professor, Department of Electrical & Electronics Engineering

Indian Institute of Technology Guwahati

I am Kalpana Dhaka presently working as Associate professor at Department of Electrical & Electronics Engineering Indian Institute of Technology Guwahati.

Present and Past Designations:

1. **Associate Professor** (Aug. 2021 - Present), Department of Electrical and Electronics Engineering, Indian Institute of Technology Guwahati, India.
2. **Assistant Professor** (May 2013 – Aug. 2021), Department of Electrical and Electronics Engineering, Indian Institute of Technology Guwahati, India.
3. **Research Associate** (Jan. 2013-Mar. 2013), Department of Electrical Engineering, Indian Institute of Technology Delhi, New Delhi, India
4. **Postgraduate Teaching Assistant** (Jan. 2009 –Nov. 2012), Department of Electrical Engineering, Indian Institute of Technology Delhi, New Delhi, India
5. **Graduate Teaching Assistant** (Aug. 2006 – Jun. 2008), Dhirubhai Ambani Institute of Information and Communication Technology, India

Academic Qualification

1. **Ph. D., Electrical Engineering** Jan. 2009-Nov. 2012, Indian Institute of Technology Delhi, New Delhi, India.
2. **M. Tech., Information and Communication Technology** Aug. 2006-Jun. 2008, Dhirubhai Ambani Institute of Information and Communication Technology, India.
3. **B.E., Electronics and Communications Engineering** Aug. 2001-Jun 2005, Mody Institute of Technology and Science, University of Rajasthan, India.

Professional Achievements

- Member of IEEE
- Reviewer of Transactions on Communications, Transactions on Vehicular Technology,
- Transactions on Wireless Communications, Transactions on Wireless Communications Letter, IET
- Communications, IEEE
- Communications Letter
- TPC member and reviewer for ICC, NCC, SPCOM, WACI, OWT, ANTS
- Member of local organizing committee for National Conference on Communications 2016 (Reception & Registration and Accommodation & Hospitality)
- Member of best paper selection committee for SPCOM 2020.
- Chair for National Conference on Communications 2023 WIE Session
- Publicity Chair for National Conference on Communications 2023

Publications
International Journals:

1. M. B. Tsegay, K. Dhaka, and R. Bhattacharjee, "Performance Analysis of Underlay DF Relay System under Beaulieu-Xie Fading," Physical Communication (submitted).
2. P. Rathore, K. Dhaka, and S. K. Bose, "Network coding assisted reliable multi-source multicasting over a multi-hop wireless mesh network," Computer Communications, vol. 172,

   pp. 130-141, 2021.
3. P. Kumar and K. Dhaka, "Average SER analysis of two-hop WP DF relay system under kappamu shadowed fading," IET Communications, vol. 15, no. 1, pp. 1-13, 2021.
4. P. Kumar and K. Dhaka, "Performance of Wireless Powered DF Relay System under Nakagami-m Fading: Relay Assists Energy-Constrained Source," IEEE Systems Journal, vol.14, no. 2, pp. 2497-2507, 2020.
5. P. Rathore, K. Dhaka, and S. K. Bose, "Network coding assisted multicasting in multi-hop wireless networks," Computer Communications, vol. 138, pp. 45-53, 2019.
6. P. Kumar and K. Dhaka, "Average BER and resource allocation in wireless powered decodeand- forward relay system," IET Communications, vol. 13, no. 4, pp. 379-386, 2019.
7. P. Kumar and K. Dhaka, "Performance analysis of wireless powered DF relay system under Nakagami- m fading," IEEE Transactions on Vehicular Technology, vol. 67, no. 8, pp. 7073-

   7085, Aug. 2018.
8. P. Kumar and K. Dhaka, "Performance analysis of a decode-and-forward relay system in kappamu and eta-mu fading channels," IEEE Transactions on Vehicular Technology, vol. 65, no. 4, pp. 2768-2775, April 2016.
9. K. Dhaka, R. K. Mallik, and R. Schober, "Optimisation of power allocation for asymmetric relay placement in multi-hop relay systems," IET Communications, vol. 7, no. 2, pp. 128-136, January 2013.
10. K. Dhaka, R. K. Mallik, and R. Schober, "Performance analysis of decode-and-forward multihop communication: A difference equation approach," IEEE Transactions on Communications, vol. 60, no. 2, pp. 339-345, February 2012.

International Conferences:

1. M. B. Tsegay, K. Dhaka, and R. Bhattacharjee, "Interference cancellation in multiple D2D underlaying LTE cellular networks," in Proceedings of the International Conference on Computer, Communication and Signal Processing (ICCCSP), Chennai, 2020, pp.1-5.
2. P. Rathore, K. Dhaka, and S. K. Bose, "Multicasting in wireless networks with correlated links," in Proceedings of the IEEE Region 10 Conference (TENCON), Singapore, 2016, pp. 1798-1802.
3. K. Dhaka, R. K. Mallik, and R. Schober, "Optimal power allocation in a multi-hop decode-and forward communication system," in Proceedings of the IEEE International Conference on Communications, Ottawa, Canada, June 10-15, 2012, pp. 4458-4462.
4. K. Dhaka, R. K. Mallik, and R. Schober, " Performance analysis of a multi-hop communication system with decode-and-forward relaying," in Proceedings of the IEEE International Conference on Communications, Kyoto, Japan, June 5-9, 2011, pp. 1-6.
5. K. Dhaka and R. P. Yadav, "V-BLAST MAP detection in correlated channel condition," in Proceedings of the International Conference on Advances in Computing, Communication and Control, Mumbai, India, January 23-24, 2009, pp. 664-667.

National Conferences:

1) P. Kumar and K. Dhaka, "Average BER Analysis of NOMA Systems under TWDP fading," in Proceedings of the National Conference on Communications, Guwahati, India, 2023, pp. 1-6.
2) M. B. Tsegay, K. Dhaka and R. Bhattacharjee, "Performance Analysis of a Relay-Assisted D2D Underlay Cellular Network," 2022 National Conference on Communications (NCC), Mumbai, India, 2022, pp. 397-401.
3) P. Rathore, K. Dhaka, and S. K. Bose, "Network coding assisted reliable multicasting in multihop wireless networks with two sources," in Proceedings of the National Conference on Communications, Kharagpur, India, 2020, pp. 1-6.
4) P. Kumar and K. Dhaka, "Performance Analysis of Wireless Powered Decode-and-Forward Relay System," in Proceedings of the National Conference on Communications, Bangalore, India, 2019, pp. 1-6.

Thesis Supervision

- Ph.D.: two (completed) and one (completed synopsis)
- M. Tech: eleven

What is unique about working as a Woman in STEM compared to other fields?
Working in STEM provides with an opportunity to work and contribute in the current areas of research. Also, the people working with you are highly educated which assures a good working environment for Women in STEM.

What are your key contributions to your work area?
Along with the students working with me, I am actively contributing on the technologies which are considered for future wireless communication systems, like, device-to-device communication, millimetre wave communication, non-orthogonal multiple access, vehicular communications, relaying, and wireless energy harvesting. My work has been published in the International Journals and National and International Conferences.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
The choice of working on science is mainly due to my interest in this area and the support from the family to pursue a carrier in science. My education at DAIICT and IIT Delhi along with guidance from my MTech project supervisor and the PhD thesis supervisor has provided me a deeper understanding of working in STEM.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
Working in STEM in itself is very challenging as you have to be continuously updated about the advancement in technology. People all over the world are working for new findings so it is always challenging to be able to produce outcome before others.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
The technology is evolving so it is extremely important to stay updated. Continuous hard work along with focus is important to achieve the desired outcome at your work.

Dr. Kavitha Kandasamy

Deputy General Manager

Head Corporate Quality Management, CavinKare

I began my career as a microbiologist and gained valuable experience in basic research. I have developed extensive expertise in testing and preserving the efficiency of diverse products, including food, agricultural products, cosmetics, dairy, and Ayurvedic Ayush products. My specialized knowledge also encompasses conducting antimicrobial testing for cosmetics, sanitizers, and disinfectants, as well as evaluating microbial parameters for various products to support formulators in developing innovative solutions.

Over the course of my career, I have actively participated in projects that have been recognized with awarded patents.

Subsequently, I transitioned into a leadership role as the Head of Corporate Quality, which provided me with the opportunity to further expand my knowledge and skills. I thoroughly enjoyed tackling challenges and closely collaborating with cross-functional team members. This experience not only enabled me to enhance my problem-solving abilities but also allowed me to make valuable contributions to the overall quality assurance of our organization.

Awards & Patents

" A process for manufacturing synergistic anti-microbial compositions" Patent Number 228451

" Process for the manufacture of antidandruff hair oil compositions" Patent Number 197985

"Antimicrobial Composition Containing Triclosan And At Least One Functionalized Hydrocarbon" International Publication Number WO 2007/077573 Al

"Antidandruff Formulation/Composition" Application ID 3634/MUM/2015, Publication Number13/2017.

"A Synergistic Antimicrobial Composition" Patent No. 428789 [201621012537].

Project

Biodegradation of tannery effluent by Aspergillus niger, Curvularia lunata, Actinomycetes sps. ETP - Research Yields Rewarding Results, Indian Express Coimbatore Edition 29 February 2000, page 3.

Trainings

Attended training on Milk processing and value addition organized by NDRI Karnal, 5th to 14th March 2018

Tetrapak Quality Workshop 2.0, 19-20 November 2018.

Tetrapak Package Evaluation Training 29-30 November 2018.

Certified as Lean Six Sigma Green Belt from MSME, 17 February 2019.

Completed Laboratory Assessor Course as per ISO/IEC 17025: 2017

Completed BRC, Global Standard for Food Safety Issue 8: Lead Auditor.

Attended, Integrated Assessment: Importing countries and Domestic Regulations requirements on 26.07.2020

Participated in "General Requirements for Proficiency Testing" as per ISO/IEC 17043: 2010 conducted by NABL in November, 2022.

What is unique about working as a Women in STEM compared to other fields?

- **Underrepresentation**: Feelings of isolation and the need to navigate predominantly in the society because

generally women are historically underrepresented in STEM fields, particularly in higher-level positions and leadership roles.

- **Lack** of Role Models: Due to less visibility of female role models in STEM can make it challenging for women to envision themselves in successful STEM careers.

- **Work-Life Balance**: Balancing work and personal life can be particularly demanding in STEM fields, where long hours, intensive research, or project-based work are common.

Diverse teams with women's contributions can lead to more comprehensive solutions and advancements in STEM fields. While challenges exist, women continue to make significant contributions to STEM fields and strive to create more inclusive and equitable environments for future generations of women in STEM.

Who all inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)
Due to my personal interest, I chose Microbiology as my main field of study during my education. Throughout my career, I have been fortunate to interact with colleagues and peers in the field who have been a constant source of inspiration and motivation. However, the turning point in my career was triggered by one of my mentors, Dr. Meenakshi Narayanan, the R&D Head of CavinKare.

Following my transition to the role of Corporate Quality Assurance, I was very lucky to have C.K. Ranganathan, Chairman and Managing Director of CavinKare Pvt Ltd as coach to lead CQM. Under his guidance, I adopted daily learning habits that allowed me to continuously expand my knowledge and skills. He emphasised the importance of regular MIS reviewing, enabling me to stay organised and focused. Furthermore, he encouraged me to calculate the return for the time I invested in various activities, which enhanced my decision-making abilities and prioritisation skills.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
Work life balance as a mother, as a daughter and as a successful STEM was a challenge but with the help of parents and team member support was able to manage successfully.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
Every person possesses unique strengths. It is important to showcase these strengths with grace and kindness. Remember, nothing is impossible. Be bold in facing challenges and stay focused on your goals. Nourishing your own passion will lead you to success, and you will shine in flying colours.

Ms. Kavitha Krishnan

Head, Innovation Center Network

SAP Labs India Pvt. Ltd., Bengaluru

With 25 years of experience in the IT business, I have successfully led strategic, complex, and multi-disciplinary engineering projects across the entire lifecycle. My expertise encompasses various crucial aspects, including identifying and defining market problems, formulating product requirements, project planning, execution, schedule management, risk assessment, stakeholder communication, and assembling high-performance engineering teams.

I have actively contributed to product roadmaps, strategized, and designed products from inception to launch, with a relentless focus on ensuring customer success.

My role has involved collaborating closely with international stakeholders, including Managing Directors and Board Members of SAP, demonstrating my adeptness at handling products and effectively communicating with individuals at all levels of management. I have cultivated specialized knowledge in domains such as AI/ML applications for businesses, Analytics and Big Data utilizing Data Science, Internet of Things (IoT), Mobile and Web Analytics, Retail (specifically Bottom of the Pyramid and Precision Retailing), Financial Accounting, CRM Service, Crowdsourcing, and Procurement Space.

This extensive experience and expertise enable me to bring a wealth of insights and capabilities to diverse projects and organizations within the IT industry.

Currently serving as Head, Innovation Center Network, Bangalore, built the team from scratch, driving the research, contextualization, development, incubation and early adoption of new, transformative technologies that could represent massive disruptions to or significant unlocks for SAP over the next two to five years. My passion is identifying the right problem to solve and how to apply technology and build great products that customers love to buy. Few projects I am working on are Digital Me, Anomaly detection using Air Borne Sound, Psychological Capital (SAP SFSF), Immersive Services on BTP (Metaverse for Employee Onboarding). In this role, my project Digital Me topic is selected in the SAP Innvent challenge 2021 (Start-ups by Employees at SAP). I also conceptualized, executed University Hackathon on emerging technologies solving real SAP business problems with 1730 Indian Universities (https://sap-code.hackerearth.com/). In addition, I drive 'Patents Initiative'; 'Campus Engagement Initiative'; 'Technology and Innovations Thought Leadership Pillar', 'co-chair of Technology Leadership Group which comprise of Chief Architects from SAP Labs India, and I am a member of the Senior Leadership team in SAP Labs Bangalore.

Present designation: Head, Innovation Center Network, Bangalore

Academic qualifications: MCA – PSG College of Technology, Coimbatore

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

a. 21 pending patents in USPTO on Machine Learning and other domains.
b. Winner of Innvent 2021 (Startup opportunities at SAP by employees)
c. Grand Champions Award 2021 - Star Leader (Nominated)
d. Grand Champions Award 2020 - Top 3 Nominees
e. Finalist for the WEquity 2020 Awards under technology category.
f. Q3 2021, Q2 2019, Q4 2019 SAP Innovation Award among ~12000 employees.
g. 10 (Year 2021) and 8 (Year 2020) SAP Appreciate Awards from the Stakeholders.

h. Idea-a-thon 2017 Winner across 40+ teams across all entities of SAP.
i. Appreciated by Board Member for the 2013 excellent people survey result and high NPS score.
j. Won various awards at SAP viz. 'SAP ByDesign Best Innovator (2010)', 'SAP Wall of Fame (2009)', 'Certificate of Innovation (2009)', 'SAP Top Talent (2006)'.

What is unique about working as a Women in STEM compared to other fields?
I consider myself fortunate to have witnessed the significant evolution of technology, spanning from radios, postcards, trunk calls, and telegrams to the latest emerging technologies that profoundly influence our lives and businesses. This ever-changing landscape is intellectually stimulating, characterized by rapid technological innovations and advancements that outpace many other areas of development.

What are your key contributions to your work area?
With 25 years of experience in the IT business, I have successfully led strategic, complex, and multi-disciplinary engineering projects across the entire lifecycle. My expertise encompasses various crucial aspects, including identifying and defining market problems, formulating product requirements, project planning, execution, schedule management, risk assessment, stakeholder communication, and assembling high-performance engineering teams. I have actively contributed to product roadmaps, strategized and designed products from inception to launch, with a relentless focus on ensuring customer success.

My role has involved collaborating closely with international stakeholders, including Managing Directors and Board Members of SAP, demonstrating my adeptness at handling products and effectively communicating with individuals at all levels of management. I have cultivated specialized knowledge in domains such as AI/ML applications for businesses, Analytics and Big Data utilizing Data Science, Internet of Things (IoT), Mobile and Web Analytics, Retail (specifically Bottom of the Pyramid and Precision Retailing), Financial Accounting, CRM Service, Crowdsourcing, and Procurement Space.

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Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
I landed up in this stream by chance and not by choice. The computer science field was emerging rapidly then and due to my good academics, I happened to be chosen in this field. I would also mention my father's name who constantly encouraged and inspired me to be independent and supported my education (I am the first women in my entire family and relations to join the workforce, most of the women in my family are home makers.)

As a mother there were one or two moments when I wanted to quit the workforce and at that point in time, it was my husband who encouraged me not to quit and supported at home as well.

I am very thankful to my mentors who have helped me to shape what I am today. They are always a call away.

The leaders who inspire me are Abdul Kalam Azad, Steve Jobs and A R Rehman. It is truly for their passion, simplicity and Innovations in their respective field and can-do attitude.

In addition, I learn plenty from many people with whom I interact with on daily basis, my team members, mentors, leaders at SAP, family, friends etc.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

Balancing work responsibilities with personal life, particularly upon returning from maternity leave, posed a significant challenge for me. However, I am grateful that apart from this, I did not encounter any other major challenges. Throughout my career, I have taken complete charge of my professional journey, and I have been fortunate to have excellent mentors, coaches, teams, family members who have supported and guided me along the way.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

Here are few tips to begin with (not exhaustive)

1. Identify your passion and strengths and choose a workstream that aligns with them. When you pursue what you are truly passionate about and utilize your strengths, you set yourself up for a fulfilling career.

2. Stay curious and maintain a thirst for knowledge. Embrace a mindset of continuous learning by actively seeking research opportunities, fellowships, and training programs. This commitment to learning will keep you at the forefront of your field.

3. Cultivate a growth mindset and develop resilience. Embrace challenges as opportunities for growth and learning. Be adaptable and resilient in the face of obstacles, knowing that they are steppingstones on your path to success.

4. Stay ahead and be relevant in your field. Keep up with the latest developments, advancements, and emerging trends. Stay informed about cutting-edge technologies, methodologies, and research findings to maintain your professional edge.

5. Remember, all glory comes from daring to begin. Have the courage to take the first steps towards your goals and aspirations. Don't let fear or self-doubt hold you back. Be willing to take calculated risks and embrace new opportunities.

6. Act with confidence and take charge of your career. Believe in your abilities and take ownership of your professional journey. Seek out mentors, build a strong network, and advocate for yourself. Take bold steps towards your goals and make strategic decisions that align with your long-term vision.

Ms. Komal Shah Bhukhanwala

Director R&D and IP

SML

I am Komal Shah Bhukhanwala, Director R&D and IP at SML, an Indian company promoting agri inputs in crop protection, crop nutrition and biologicals globally in over 50 countries worldwide.

Founder & Director at InnovarIP, a boutique intellectual property services firm specializing in patents.

I am born and raised in Mumbai, India. My **academic qualifications are** BS Chemical Engineering, Christian Brothers University, USA, MA Biochemistry, Boston University, USA, and MBA, IESE, Spain

Some of my notable achievements are ABSA Award for Women making impact in Agriculture (2021-22); SML has a global patent portfolio of over 500 patents worldwide and publications https://www.tandfonline.com/doi/abs/10.1517/13543776.16.12.1609

What is unique about working as a Woman in STEM compared to other fields?
Working as a Woman in STEM is not unique per se. While there are fewer women in leadership positions in STEM, we have several women led teams in our organization.

What are your key contributions to your work area?
Guiding, directing, and leading the R&D efforts of the organization and developing and leveraging the patent portfolio for the company. We have a team of 50 scientists, including synthetic organic chemists, formulation chemists, microbiologists, biochemists, plant pathologists, entomologists, soil scientists, agronomists, etc. with two R&D sites for development of agri-inputs in crop protection, biologicals and crop nutrition solutions and the early screening of novel compounds and products, working to provide sustainable and efficient solutions in agriculture for farmers around the world.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
I was always interested in Sciences and Engineering. While my inclination was to work in life sciences and healthcare, my father encouraged me in my early days to take up intellectual property. The rest is history, as working in depth in intellectual property has led me to where I am today.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
As a woman in STEM, it was challenging to balance work and children when they were young.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
Pursue and persist with work that interests you. There are challenges in the early years when raising a family. With long years of commitment, with support from your family and workplace, one can achieve goals. There is a need of high-quality research in various fields, and with the added aspect of sustainability and environmental concerns, women in STEM can find opportunities in various roles, including early to late-stage R&D, regulatory, intellectual property, and even business development for bringing to market new technologies.

Prof. Krishna Pramanik

Professor, Department of Biotechnology and Medical Engineering

National Institute of Technology Rourkela, Odisha

I am Dr. Krishna Pramanik working as professor in Department of Biotechnology and Medical Engineering, National Institute of Technology Rourkela, Odisha since July 200 previously worked as Assistant Professor-National Institute of Technology, Warangal (Mar-1999-Jul 2006), Assistant Professor- Pravara Rural Engg. College, Pune University, MS (Jul 96-Mar 1999), Senior Research Fellow (Engg.)-CSIR, New Delhi (Jul1991-95), Technical Officer (Res. & Lab)- M/s Allied Resins & Chemicals Ltd. (May 87-Jul1991) and Foreign Assignment as Visiting Professor- Asian Institute of Technology, Bangkok (Jan 2007- May 2007).

I am a resident of Rourkela, Odisha and born in District Medinipur (Currently East Medinipur), West-Bengal. I have done B. tech in University College Science & Technology, Calcutta University in Chemical Technology, M. Tech in Petrochemicals Petroleum Engineering and PHD in Chemical Technology.

Administrative experience:

- **Member of BOG**-NIT Raipur (2011-2014)
- **Dean** (Student Welfare)- NIT Rourkela (2008-2011)
- **Head** - Department of Biotechnology & Medical Engg., NIT Rourkela (2012-2014)
- **Coordinator (TEQIP-II)** - NIT Rourkela (2011- till date)
- **Head** - Center of Excellence in Tissue Engineering of NIT Rourkela (2013- till date)
- **Head** - Center of Excellence in Orthopedic Tissue Engg. & Rehabilitation (2013-till date)
- **Head** - Department of Chemical Engg. College of Engg. Paravanagar, Pune Univ. (1997-1998)
- **Head** - Res. & Lab. Division of M/s Allied resins & Chemicals Ltd (1989-1991)
- **Hostel Rector** - College of Engg. Paravanagar, Pune University (1997-98)
- **Hostel Warden**, NIT Warangal (2001-2004)

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)
Awards / Recognition

- **Women Scientist award** for Research work in the area of Development of Bio-fuel under Women Renewable Energy Development (WRED) Scheme of Ministry of Non-conventional Energy Sources (MNES), Govt. of India for the year2002
- **The Sir Ganga Ram Memorial Award** (2005) for research entitled "Use of Artificial Neural Networks for prediction of Cell mass and Ethanol Concentration in Batch Fermentation using Saccharomyces Cerevisiae Yeast' –Institution of Engineers (I)
- **Best paper award** (2011) for the paper entitled "Low Temperature molecular dynamic simulation of apoptotic protein"-International Conference in Tissue Engineering & Regenerative Medicine (ICTERM 2011)
- **Best paper award** (2000) for the paper entitled "Catalytic Studies on Trans- esterification of Jatropha Oil for use as Diesel Fuel"- Indian Institute of Chemical Engineers (CHEMCON)
- **Best paper award** (2013) for the paper entitled "Importance of Cord Blood Stem Cells for skeletal muscle differentiation and preparation of cell scaffold construct with novel scaffolds"- International Conference in Tissue Engineering & Regenerative Medicine
- **Awarded** (2014) for Outstanding Contribution in the Field of Medical Engineering and Biotechnology conferred by Youth Movement Federation of India (NGO working in the field of safety, health and education).

- **Awarded** (2014) by The Institute for Applied Environmental Biotechnology innovation is for outstanding contribution in the field of Bio fuel and Environmental mitigation for the year 2014
- **Best Poster** Award-Fabrication of Functionalized 3D composite scaffold by rapid Prototyping for bone tissue Engineering Application, National Conference on Tissue Eng. & Regenerative Medicine, 19 -20th Jul, 2017

Memberships of Scientific Academies
National:

- **Fellow** -The Indian Chemical Society
- **Life Member** - The Indian Institute of Chemical Engineers
- **Life Member** - The Indian Society for Technical Education
- **Life Member** - The Institution of Engineers (India)
- **Life Member** - The Solar Energy Society of India

International:

- **Member** of Tissue Engineering & Regenerative Medicine (TERMIS)
- **Member** of Association of Regenerative Medicine of România(REGENERO)

Position Hold:

- **Executive Member**-Ind. Inst. of Chem. Engineers. Hyd. Regional Centre (2004-2006)
- **Executive Member**-Institution of Engineers(I), Warangal Local Chapter (2005-06)
- **Vice-Chairman**-CAFET-INNOVA Technical Society (National) (2012-2016)
- **Vice-Chairman**-CAFET-INNOVA Technical Society-Orissa Section (2010-2014)
- **Council Member**- Indian Chemical Society (2004-2006)

Publications:

Total Publications	:	306
Books & Book Chapters	:	21
Journal	:	165 (Citation~6900)
Conference Proceeding	:	120

Other academic activities

- **No. of Research Scholars guided**: 06 post docs, 19 PhD scholars and more than 40 MTech scholars
- **Overseas Visit**: USA, UK, Germany, Austria, New Zealand, Singapore, Thailand, Romania
- **Member of Academic Audit** of NIT Raipur (2015-till date)
- **Member of Recruitment /Promotion** Committee of NIT Raipur, BIT Mesra, JNTU etc
- **Member of Expert Committee of AICTE** (2013 onwards)
- **Member of Board of Studies** (VC nominated) GIET, Gunupur (2017 onwards)
- **Member of Board of Studies** of the North-Eastern Hill University (NEHU)-2016 onwards
- **Member of Board of Studies** of VSS Sai University-2014 onwards
- DFAC Chairman for faculty Recruitment- NIT Rourkela-2017
- Fellow of **Salzburg Seminar** "The Asian Energy Challenge and Implications for OECD-Asia, the United States, and Europe "-2005
- **Member of Women advisory board** of American Biographical Society (2004)
- **Member of advisory committee** of Asian Advanced Materials Congress (ASAMC-2017), Singapore

Lecture delivered - Total 18 (selected list)

- **Plenary lecture**: Global Congress & Expo on Biomaterials" May 13-14, 2019, Kuala Lumpur, Malaysia.
- **Keynote Speech**: Global Webinar on Traditional & Alternative Medicine Nov.27-29, 2020

- **Invited speech**: 3rd International Webinar on Material Science & Nanotechnology Oct 21-22, 2020.
- **Keynote Speaker**: International Conference on Regenerative Medicine (REMEDIS 2010), Iasi, Romania 15-18 July 2010
- **Keynote Speaker**: International Conference on Biological Sci &Engg (ICBE- 2010), 22, Hyderabad, August 2010
- **Invited lecture**: Indo-US Conference on Bioengineering and Regenerative Medicine (ICBR-2020), 27-29th Feb 2020
- **Invited lecture**: International Conference on Bioproducts and Environmental Research (CABHBE19) 13-14th Dec 2019

What is unique about working as a woman in STEM compared to other fields?
Women in STEM can contribute better towards technological development for societal needs, contribute to fair administration of any organization.

What are your key contributions to your work area?
I have been a researcher and teacher of Biochemical Engineering, Biotechnology and Biomedical Engineering more than two and half decades. I worked in Industry before taking up the teaching/research career, an experience that has given a strong practical direction to most of my work. My contribution can be seen under 3 broad heads: (a) Tissue Engineering, (b) Energy and Environment Academic Administration

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
Family

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
I went through many challenging experiences throughout my professional journey some of which include the family burden, jealousness of male dominant colleagues for my upliftment or progress, deprivation of giving due promotion although having high credentials in non-transparent way, obstacles in career advancement e.g., not forwarding my application for administrative position without valid reason, in carrying out research although securing high value projects and others.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
My best advice would be to women entering STEM fields they must be aware of the past possible hurdles, and plan future goal to achieve with confidence. They should feel comfortable with trying new things, take challenge to build their career and not to be fear to reach out to others.

Ms. Lakshmi T

Senior Distinguished Scientist

CavinKare

I was born in a village in Pudukkottai district. I did my schooling and graduation at Cuddalore and I have been living in Chennai for the last 28 years. I have joined as a trainee in the R&D Centre, I have been serving CavinKare last 32 years and my current designation is Sr. Distinguished Scientist. I did my graduation in Chemistry from Madras University and post-graduation in Chemistry at Alagappa university.

I have contributed 18 patents in the personal care category.

What is unique about working as a Women in STEM compared to other fields?
There is a new learning opportunity every day. Every day is energizing and challenging as well; there is no monotonous activity. There is a lot more freedom to explore and experiment opportunities to contribute and grow.

What are your key contributions to your work area?
Having worked in Product development team within R&D, I came out with first of its kind of formulations in the hair wash category. I was the first formulator of a popular hair wash powder and a 50p shampoo; With a scientific approach, I can maintain the cost of 50p shampoo for more than 2 decades, mitigating inflation, without losing quality. Through such accomplishments, directly impacting millions in the bottom of the pyramid can avail daily use hygiene maintenance products. We are pioneers in ensuring the availability of grooming and hygiene products to millions of people in the bottom of the pyramid. Establishing brands like Chik, Meera, etc., which makes life of mass majority of people happier by giving affordable haircare, are some of the accomplishments in CavinKare.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues/ Professional mentors, etc.)?
My father drove me to choose Chemistry; Chemistry fascinated me to get into R&D. My sister showed me to CavinKare. Our CMD Shri C.K Ranganathan inspired me to continue here.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
Fortunately, being in CavinKare, where gender equality and woman's strengths and capabilities are valued and respected, I haven't come across any obstacle as a woman. With a supportive and understanding family I can manage obstacles that come in the way of a professional journey.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
Do not look out for short term solutions; always go in-depth; keep passionate- learning as an everyday affair and invest in your intellectual bank account; wherever you are, make a mark for yourself; Be adaptive and stay relevant.

Ms. Laxmi Mukund

Principal Engineer

Cisco

Laxmi Mukund is a Principal Engineer at Cisco with a master's in computer science and networking, bachelor's in Electronics and Communications and about 22 years of industry experience. She has worked on various routing, switching and security products across Enterprise, Service Provider and Data Centers.

Her main contributions have been in the architecture, design and development of features in the areas of core routing and switching, prefix convergence, NetFlow, access control, quality of service, secure policy access and LISP (Locator Identity Separation Protocol). She is currently working on security with privacy as an important component.

She was the co-founder of a startup that used autonomous drones to collect aerial images and processed these images for various applications like agriculture, city planning and windmill blade crack detection. Rice for example will show white colour when infested with pests and yellow for nitrogen deficiency. These colours can be detected using aerial images and pesticides and fertilizers can be applied exactly to those parts.
She has a Cisco pioneer award and patents in the area of networking. She is on the Industry advisory board in IISc. She has been associated with the GHC India (conference for women in computing) and was instrumental in bringing the IEEE collaboration to the conference. She is the APJC co-lead for women in Cisco. She was featured in the following economic times article. https://economictimes.indiatimes.com/ lessons-for-pm-narendra-modis-smart-cities-from-ciscos-smart-campus-in-bangalore/articleshow/45058047.cms

What is unique about working as a Woman in STEM compared to other fields?
Science and technology give one wings. I truly believe that a lot of our ideas can be powered and given life by our learnings from STEM. It is a fantastic world of new thoughts and ideas that keep evolving. There are no barriers and is a language understood all over the world and maybe someday by the whole universe. STEM opens our minds to the wonders of the universe and keeps us grounded and humble. It also opens our mind to explore all the other fields and appreciate the greatness in all of them.

What are your key contributions to your work area?
I started my journey in Cisco after my masters as a micro coder for its routing platforms. It involved writing assembly code for the micro controller that Cisco had built. Since then, I have been involved in feature development for different platforms ranging from enterprise to data center. Working with customers, understanding their requirements, solving their problems with technology has been my forte. My journey from an engineer to a Principal engineer has been extremely rewarding and soaked in technology. The catalyst series of products on which I have been working have a huge install base in the networks of the world and are the flag ship products of cisco making millions of dollars. The role of a Principal engineer is to lead a strong team of around 400 engineers in their technical journey and spearhead new technology innovations.
The pioneer awards in Cisco are given for the most innovative technology every year and the team and I won the pioneer award for software defined access. https://newsroom.cisco.com/feature-content?type=webcontent articleId=1950131
This was the technology I had been working on for the past 5 years. The technology involves Locator Identity Separation Protocol and VxLAN and I am currently working on the enhancements of these technologies. I have a patent in this area for duplicate IP address management.

Data is now the mantra for running all businesses. I enabled the complete infrastructure of business intelligence telemetry data for the Identity services engine which has enabled taking of some very critical business decisions using this data.

My current focus is on privacy and how one can still secure products while still honoring the privacy of endpoints. In this age where all our information is all over the place accessible to anyone, privacy is key, and I am trying to ensure all the products provide a privacy option to the user.

I have had the privilege to work with young engineers as interns and new hires, mentor them and see them soar. I have mentored more than 20 engineers during my career, and I am proud of what they have achieved. I also contribute to many conferences as reviewer and organizer inside and outside of Cisco. I have been involved with GHC India, a conference for women in computing organized by Anita Borg Institute that has over 3000 attendees every year. I have been the program chair for this conference since last year (and technical chair before that), the responsibilities of whom include putting together the whole technical track of sessions. As a part of the GHC campaign here is a feature - https://www.facebook.com/AnitaBorgIndia/videos/we-have-laxmi-mukund-principal-engineer-cisco-join-us-in-our- mycode-series-she-l/701237950236184/

Technology deep dives, workshops, talks on new and cutting-edge innovations both inside and outside Cisco are also something I enjoy. I have always felt that sharing knowledge is the best way to inspire people and to learn.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
My mom is one the first woman engineers and she has done a lot of work in the field of communications during her stint at Indian telephone industries. Her passion for her work and technology inspires and motivates me every day.
I love cars and as a child growing up my aim in life was to learn to drive a car. My dad made a pact with me that only when I completely understand how a car works will he teach me how to drive. That advice has stayed on with me and I believe that being hands on is the only way to understand something deeply.

My mom's friend came home one day when I was in middle school and showed me a satellite iridium phone that made connections to satellites to complete a call. I remember being so enamoured by that and I think that was when I fell in love with the world of communications and networking.

These were the people who sowed the seeds of passion and curiosity in my mind which went on to motivate me to choose STEM.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
The biggest obstacle I have faced is when I need to pick up a complex project which I don't have any background about. The initial fear of whether I will be able to understand the technology and be able to contribute was the biggest obstacle. But just telling myself that once I learn it well nothing is as fearful and complex, helped.

Another challenge I face is being heard. I have a soft voice and a nonaggressive personality. In a meeting room where heated design discussions happen, I used to have a hard time getting my voice through because my voice would very easily get drowned. I have worked around this by just going to the whiteboard and drawing out my idea or sending out a summary email of the discussions adding my own opinions. Slowly people started to pause to see if I had anything to say. These challenges had nothing to do with the fact that I was a woman.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
Be hands on and keep learning. Be passionate about technology but don't have a technology religion. Read a lot of books, journals, and publications because each one of these will create a connection in your brain which might inspire a creative or innovative thought in your brain.

Dr. Manashi Adhikari

Head, Failure Analysis and Plant Metallurgical Group, Scientific Services, Technology and New Materials Business
Tata Steel Limited

Core function is to investigate and analyze the root cause of metallurgical failures of engineering components used for various operations across the Tata Steel value chain. Post analysis we recommend engineering solutions for their life enhancements thereby reducing/ eliminating plant breakdowns and business losses. Additionally, I am looking after the quality control and improvement of engineering spares by suggesting material specifications and formulating quality assurance plans.

I have worked in various profiles in the past. As Head of Metallurgical labs, Scientific Services, Tata Steel, I was associated with product defect investigation in reducing internal rejections and customer claims in Tata Steel finished products (both flat and long rolled steel) and long product quality certification. Prior to that, I was associated with Hot rolled Steel Quality Assurance, New Product development and process improvement of Cold Rolled Products, Formulation of Technical Delivery Conditions of TATA STEEL- Nippon STEEL JV (JCAPCPL) Cold Rolled Products, preceded by Product Application Engineering for Eastern India Automotive customers and Distributors of Tata Steel. I played a pivotal role during Deming Grand Prize preparations in 2012, on behalf of NPD and Technology team of Flat Products.

I am currently based out of Jamshedpur, Jharkhand. I was born in Siliguri, a small town in Darjeeling district of West Bengal and brought up in Shyamnagar, a small town in the district of 24 parganas (North) in West Bengal, suburbs of Kolkata.

Some of my notable achievements are as follows:

Awards

1. 2nd Best TATA Search Paper award for the year 2006 and 2015
2. TQM APEX Award of 'Top 10 Knowledge Management Evaluator' for FY18 and FY19
3. 2 TQM APEX award for new product development projects
4. TATA INNOVISTA regional award 2012
5. Certificate of Appreciation from MD TATA STEEL, for contribution in 'Deming Grand Prize 2012'
6. Three 'E-Hackathon' Awards from Titan, TATA AIA and TATA Sons in TATA Group Innovation Platform
7. Recognized as one of the 'Top 10 Ideator award' at TATA STEEL INNOVISTA function, Aug 2022.
8. Winner of Photography contest of '100 years of SNTI' and Snap and Post contest of 'Founder's Day' 2022.
9. 2nd winner for article on "Quality Leads" at Tata Steel's Quality month, 2013.
10. Recognized as PSTA (Problem Solving and Task Achieving) expert (Level 2) of TATA STEEL

Fellowship/ Membership

1. Nominated member in CII 'Women in STEM' sub-committee, 2022.
2. Empaneled NABL Assessor as per ISO/IEC 17025:2017 for assessing competence of testing laboratories across India since FY18.
3. TATA STEEL representative member of BIS committee MTD22 (Heat treatment and metallography), since 2015
4. Life Member of Indian Institute of Metals (IIM) since 2011

Publications etc.

1. 42 publications in National/ International Journals and Conferences.
2. 1 book chapter in Springer Proceedings in Materials
3. 5 patents filed, 4 granted.
4. 2 Invited talks (one on ISO17025 at Indian Chamber of Commerce and one on Engineering Failure Analysis at IIT Bhubaneshwar)

What is unique about working as a Women in STEM compared to other fields?
Working as a Women in STEM keeps my creative muscles active. Through exploration and application of STEM, I can resolve engineering problems not only in my organization but in the entire eco-system whenever and wherever. Diverse job profiles within the Technology Cluster so far, have helped me gain an overall wholistic approach towards problem understanding, analysis and solution. I am fortunate to be able to continue in my core area by deploying the learnings from my STEM subjects during my college, graduation, and doctoral years.

What are your key contributions to your work area?
As mentioned earlier, I am currently leading a technical group which looks after metallurgical failure analysis of engineering components used at Tata Steel. I am responsible for arriving at the root causes of metallurgical failures and recommending solutions for their life enhancements thereby reducing/eliminating plant breakdowns and business losses. Additionally, I am looking after the quality control and improvement of engineering spares by suggesting material specifications and formulating quality assurance plans.

I have worked in various profiles in the past, as Head of Metallurgical labs, Scientific Services, Tata Steel I was associated with product defect investigation in reducing internal rejections and customer claims in Tata Steel finished products (both flat and long rolled steel) and long product quality certification. Prior to that, I was associated with Hot rolled Steel Quality Assurance, New Product development and process improvement of Cold Rolled Products, Formulation of Technical Delivery Conditions of Tata Steel- Nippon STEEL JV (JCAPCPL) Cold Rolled Products, preceded by Product Application Engineering for Eastern India Automotive customers and Distributors of Tata Steel. I played a pivotal role during Deming Grand Prize preparations in 2012 on behalf of NPD and Technology team of Flat Products.

I have also been responsible for the formulation and creation of digital interventions in work processes in order to improve efficiency and effectiveness related to customer complaint management process, application engineering reports, new product development process, metallurgical investigation processes.

My key contributions in a span of ~22 years at TATA STEEL has been majorly in Failure Analysis, Quality Inspection, Material Specification, Metallography, Application Engineering, Product development, Process Improvement, Process Control, Quality Assurance and Quality Management.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
I have always been a sincere learner and student from my childhood. I never obtained anything other than the first position in academics in my school years. I had an inherent urge to do well in my studies. My parents, especially my mother, were the discipline and moral compass till I owned my responsibility to excel in all my life endeavors. With that background, science was a natural and obvious choice after my ICSE. I never demonstrated choice, rather went with the flow and the best available at any point of decision. However, I opted out Biology and therefore Medical as I was afraid to dissect a frog in my +2. In fact, my brother had a lot of liking for engineering, and therefore preferred that I must choose Statistics. I deliberately chose a college where I could get something other than Biology as my additional subject and Scottish Church at Kolkata was one of the few institutes which offered Statistics as additional subject in science stream. Meanwhile, I was a day scholar (commuting in local trains for almost 3-4 hours every day). I never went to tuition (during 1996, this was a rising trend) and therefore was a self-learner. Worried that I may not make big in my +12 and competitive exams, my mother searched out a few professors with whom I associated on giving mock exams (as I was too late to reach them, and they had almost finished the teaching courses). My father inspired me to sit for various competitive exams and only on the self-read capital, I started my journey in the

competitive market. I made to West Bengal JEE on the first chance. Metallurgy at Jadavpur University, Kolkata came again as a given thing and not as a choice as that year of 1997, better stream seats got occupied by IIT cracked students (IIT paper had leaked somehow) and therefore I moved out of the natural counselling choices of Chemical, Electrical and Mechanical. I was the only girl in my batch of 16 in Metallurgy. But I went for it. Nevertheless, my father mentioned that 'Metallurgy' can help me get into TATA STEEL and VOILA, it just happened 3.5 years later. TATA STEEL came for campus as a sheer co-incidence to Jadavpur University and I got selected.

So, cutting the long story short, Metallurgy happened to me by luck and Tata Steel has been the best thing that happened thereafter. In my organization, I have learnt a lot with exposure and freedom to try out what I wanted. I am also fortunate to have the favorable eco-system in terms of friends, acquaintances, colleagues, seniors, juniors who make my professional life joyful and fulfilling.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
I do not recall any significant challenge or experience as my organization gave a level playing field right from my entry as a graduate trainee. In fact, most of my superiors were very much supportive and wanted me to shine. They were there to support me during my personal difficulties as well.

In few circumstances, I experienced difference in perspective specially when my surrounding eco-system was not accustomed to interacting with a women officer or they may not have known that I would need something.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
I would say that just do what you feel and want to do. Nothing can be a barrier unless your mind is. It's the numerous 'ifs and buts' in our mind that plays the evil game that subdues our will to take up a challenge. Controlling the mind and listening to your heart is the key to your success. If you are really interested in STEM, please be in it, other things will fall in place eventually. Your initial grit in STEM career is the game changer for your next 5 years in career graph.

Prof. Mani Mehra

Professor in Department of Mathematics,
Indian institute of Technology Delhi

I am Mani Mehra and I have been working with the Department of Mathematics, IIT Delhi, since 2008. My research interest includes wavelet methods for PDEs, numerical methods. I have earned the M.Sc. degree in Applied Mathematics from Indian Institute of Technology Roorkee, India, July 2000 and Ph.D. degree in Mathematics from the Indian Institute of Technology Kanpur, April 2005. From 2005 to 2007, I was a post-doctoral fellow at the Department of Mathematics, Mcmaster University, Canada.

I am Residing in Delhi and born and brought up Najibabad, Dist. Bijnor, Utter Pradesh

Present designation, current and past job functions

a. (April 2022-Continuing) Professor in Department of Mathematics, Indian institute of Technology Delhi, India.
b. (Feb. 2015-April 2022) Associate Professor in Department of Mathematics, Indian institute of Technology Delhi, India.
c. (Sep. 2019-Continuing) Associate faculty with DST Centre of Excellence in Climate Modeling, IIT Delhi, India.
d. (Jan. 2022-Continuing) Associate faculty with Yardi School of Artificial Intelligence (Yardi ScAI), IIT Delhi, India.
e. (Jan. 2008-Jan. 2015) Assistant Professor in Department of Mathematics, Indian institute of Technology Delhi, India.
f. (June--July 2019) Visiting professor position at Friedrich-Alexander University (FAU), Erlangen, Germany
g. (June 2018) Visiting professor position at Friedrich-Alexander University (FAU), Erlangen, Germany
h. (June-September 2017) Visiting professor position at Friedrich-Alexander University (FAU), Erlangen, Germany
i. (May-July 2013) Visiting professor position at University of Bremen, Bremen, Germany
j. (July 2012) Visiting position at University of Bremen, Bremen, Germany
k. (May 2008-July 2008) Visiting position at ENS, Paris, France
l. (July 2005-2007) Postdoc Fellow with Nicholas Kevlahan in Department of Mathematics & Statistics, McMaster University, Canada.

Academic qualifications (mention details of institutes and universities)

School / College / Institute	Date	Name of the Board / University / Institution	Degree
M. D. Kanya I C Najibabad, Bijnor	1991-1993	U.P	High School
M. D. Kanya I C Najibabad, Bijnor	1993--95	U.P	Intermediate
Sahu Jain College, Najibabad	1995--1998	M. J. P Rohilkhand University, Bareilly	B.Sc.
Indian Institute of Technology, Roorkee	1998--2000	Indian Institute of Technology, Roorkee	M.Sc.
Indian Institute of Technology, Kanpur	2000--2005	Indian Institute of Technology, Kanpur	Ph.D

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

Awards, fellowships, memberships of scientific academies

1) SERB POWER Fellowship, Science & Engineering Research Board, Department of Science and Technology, 2021
2) IMS membership, 2021
3) NASI membership, 2020
4) Outstanding young faculty fellowship from IIT Delhi, 2008
5) Got the president of India cash prize for the best paper award in the 48th ISTAM held during 18-21, December 2003 at BITS Mesra, Ranchi, Bihar, India.
6) Qualified Joint CSIR-UGC Eligibility for Lectureship-National Eligibility Test -2000 (All India Rank-among 50).
7) Qualified All India Graduate Aptitude Test (GATE) 2000 (The Indian equivalent of Subject GRE, conducted by The Indian Institute of Technology) with 98.67 percentile, in 2000 (All India Rank-10).
8) Gold Medal (Institute Medal) for standing first in first class M.Sc.
9) Scholarship (in terms of waived fees) for standing first in first class M.Sc.
10) Selected for national scholarship in 1993.
11) Member in the Editorial board Journal of Wavelet Theory and Applications International Journal of BioSciences and Technology.

What is unique about working as a Women in STEM compared to other fields?
It is more challenging as it is male dominated.

What are your key contributions to your work area?
I have impressive fundamental contributions in developing wavelet-based schemes to solve partial differential equations (PDEs) on topologically complicated domains. It also includes differential equations on network-like structures which play a fundamental role in many problems in science and engineering, such as water wave propagation in open channels. The method, which is genuinely addressing multiscale phenomena, promised to be very useful in the context of problems on metric graphs, in particular, as such graphs are not to be seen as differentiable manifolds but as simply connected unions of Jordan curves, coupled at multiple nodes (junctions). The concept of partial differential equations on metric graphs opens a window to a vast number of important applications in engineering and industry. It is obvious that such a system has a multiscale nature, as during operation parts of the entire gas network are at equilibrium while in other parts a significant dynamical behavior is critical. Ultimately, decisions on the level of compressors and valves have to be taken adaptively. Similar observations hold for networks of fresh and wastewater and other networks such as energy networks including transmission lines.

All such applications are extremely important for India and research along these lines appears to be very essential for the development of industrial applied mathematics also at IIT Delhi. In order to foster and develop such research activities, it is important to lay the grounds for the mathematical foundation, in particular optimal control theory for partial differential equations, modelling of PDEs on networks and the corresponding numerical analysis and implementation of algorithms.

Traditionally wavelets are used for space accurate schemes. I initiated the class of different time accurate wavelet schemes to solve parabolic and hyperbolic PDEs. I, along with my collaborators, developed the adaptive wavelet collocation method for PDEs defined on the sphere on a near optimal grid for a given accuracy. The method is more accurate in capturing the local structure than any other traditional method. This work has attracted significant attention from researchers worldwide (as per citation records).

I along with my collaborators also proposed a compact finite difference method for pricing European/Asian/American options; this has been widely used by various researchers (as per citation records). Recently, I, along with my collaborators, studied a nonlinear boundary value problem involving the Caputo fractional derivative on a star graph from a theoretical point of view and established its existence and uniqueness results. Furthermore, an adaptive mesh free spectral graph wavelet method to solve PDEs on sphere/ metric graphs has been proposed by our group; this work is very innovative as it is the first adaptive method to solve PDEs on sphere/metric graphs.

With more than 65 articles in the area of fractional derivative and numerical methods for PDEs, papers have

been published in very important journals in the field of Applied Mathematics and Numerical Analysis, namely SIAM Journals, Mathematical Methods in the Applied Sciences, Journal of Mathematical Analysis and Applications, Applied Numerical Mathematics, Journal of Computational and Applied Mathematics, Advances in Computational Mathematics, and Mathematical control and related fields.

My future work will focus on the application of wavelets and fractional PDEs to fully nonlinear systems on metric graphs, thereby including gas-networks, fresh-water-networks, sewer systems and finally pollution in river systems.

I have also written one book titled "Wavelets theory and its application: A first course", Springer 2018 which is benefiting the students and researchers worldwide.

Apart from international research groups, many research groups also in the country like at Banaras Hindu University (BHU), IIT Roorkee, IIT Guwahati and BITS Goa followed our works and utilized our results for further exploration of the area. Recently, I have been awarded the SERB-POWER fellowship (given by the Department of science and technology (DST), India) to recognize outstanding performance in my area of specialization. Furthermore, I have an impressive list of honors including gold medalist from IIT Roorkee, outstanding young faculty fellowship from IIT Delhi, NASI membership, SERB POWER fellowship in 2021. I also received the president of India cash prize for the best paper award in the 48th ISTAM held during 18-21, December 2003 at BITS Mesra, Ranchi, India. I was selected for a national scholarship in 1993.

I have had and now have a number of students, some of them are also placed in eminent institutes like (Indian Institute of Science (IISc) Bangalore, IIT's etc.), which is very relevant for the society.

I have extensive teaching experience nationally and internationally as I have taught at IIT Delhi, Bremen University, Germany and McMaster University, Canada. I am also extremely dedicated to the concept of education to rural and unprivileged parts of India. Therefore, I have also taught courses on an online platform (e.g., NPTEL). I have also delivered many invited lectures at national/international conferences/workshops/ QIP courses.

I am continuously dedicated to improving the education and life of people of her hometown in many ways. In 2015, I was also honored in her school for her inspirational work.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
Since my childhood, I dreamed of doing something big and relevant for society. Later on, my interest developed in the field of mathematics. So, my instinct and dream inspired me to take up mathematics as a career option.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
I work in the non-traditional sector of science and technology, more specifically mathematics which is considered a very untraditional sector for women. Moreover, I hail from a business class family of small town Najibabad of Dist. Bijnor, Uttar Pradesh (UP), where I did my schooling and under graduation in a very adverse situation as there was no electricity for almost 20 hours in a day in my place during my education time.

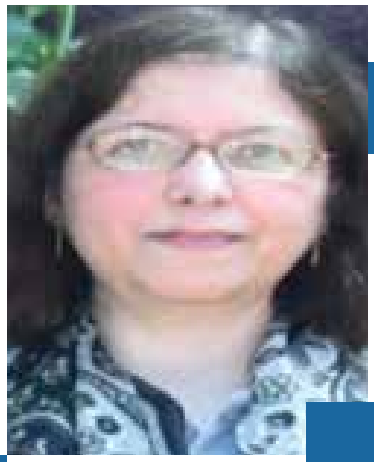
I have been a meritorious student since my childhood. I have also been awarded second prize in a state level Hindi competition. As a part of that I was also bestowed with fellowship to pursue education in Hindi. However, I have chosen mathematics as I was very much inclined towards this. My journey from small town to topper of IIT Roorkee M.Sc. entrance/exit exam and now Professor of IIT Delhi has not been easy. But my story will inspire many young girls to take Mathematics/STEM as a career.

On a personal note, I was also blessed with two children and faced many challenges during their upbringing to balance my professional and personal life but I never left the courage to face the struggle. My family, husband everyone supported me throughout my career according to their capability/wish. Certainly, that

help was not enough as most of the time responsibility of bringing kids lies on my shoulder. Help came from them conditionally depending on their commitment/wish/availability, but it was unconditional for me. The most challenging part is that: every day I have to do extra hours not to earn money! It was just to balance professional (Professor at IIT Delhi) and personal life (role of daughter, wife, daughter in law, mother and many more).

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
My advice to next-gen women science for initial phase of their career is that you should keep the patience. You can be productive, talented, and respected member of the society. In all respects, I believe every woman can gain the maturity to receive any title of national importance which will inspire other women also to take any non-traditional path.

Keep in mind that you can be really a role model (like me) for many females who give up their STEM career because of some challenges they face in their personal life. Society will change if you make an impact with available opportunities.



Ms. Maryam Shojaei Baghini

TATA Trust Chair Professor for Frugal Engineering
Electrical Engineering

Indian Institute of Technology Bombay (IIT-Bombay) INAE Fellow

WORK EXPERIENCE

- Professor, Indian Institute of Technology-Bombay (IIT-Bombay) (2015-till date)
- Associate Professor, Indian Institute of Technology-Bombay (IIT-Bombay) (2011-2015)
- Assistant Professor, Indian Institute of Technology-Bombay (IIT-Bombay) (2008-2011)
- Senior Research Scientist, Indian Institute of Technology-Bombay (IIT-Bombay) (2007-2008)

RESEARCH AND EXPERTISE AREA Proof of concept or translational research in the following areas.

- Circuit & system design and integration for intelligent sensing, processing, and problem solving
- Analog/Mixed-signal VLSI design (AI/ML domain applications, circuits and systems for Neuromophic applications, LV, LP and LE for healthcare, bio-inspired circuits and systems, I/O, highly precise circuits & systems, instrumentation, energy harvesting and more)
- High-frequency integrated circuit design for various applications
- Technologies and estimation methods for sensing
- Integrated circuits and system design with emerging devices
- Energy harvesting and power management circuits & systems
- High-speed data transmission and interconnects
- VLSI design and embedded systems
  Born in Kerman. Residing in Mumbai from year 2000.

ACADEMIC RECORD Degree/Research University /Institute Graduation/Completing Year Major

1. Post Doctorate IIT-Bombay 2006 Microelectronics Electrical Engineering
2. Ph.D. Sharif Univ. of Technology 1999 Electronics (the first Ph.D. graduate) Tehran Electrical Engineering
3. M.S. Sharif Univ. of Technology 1991 Electronics Tehran Electrical Engineering
4. B.S. Shahid Bahonar University 1988 Electronics (First rank of the batch) Kerman Electrical Engineering

AWARDS, HONORS AND RECOGNITION

1. Distinguished Lecturer of the IEEE Sensors Council 2022-2024.
2. One of 51 selected Women Achievers in STEM all over India by CII and the released e-book, 2021.
3. Qualcomm Faculty Award (Launched very first time in India) 2021
4. Fellow of Indian Academy of Engineering (from 2020)
5. TATA Trust Chair Prof. for Frugal Engineering, 2020-2023
6. Joint recipient of Arun Kumar Chowdhury best paper award, International VLSI Design Conference, India (2019).
7. Impactful Research Award, IIT-Bombay (2015).
8. Joint recipient of the Richard Feynman Prize for the best paper, ICE (UK) J. of Emerging Materials Research (2013).
9. Project guide and co-recipient of the first-place award all over India in Cadence Design Contest India (2011 and 2012).
10. Project guide for one of the finalist projects in international chip design compe..on in ISIC, Singapore (2011). 11. Project guide and co-recipient of the first-place award in Anveshan Design Contest held by Analog Devices-India all over India (Healthcare category), 2010-2011

11. Co-recipient of the best paper award, IEEE ISVLSI Symposium, India (2011).
12. Project guide and co-recipient of the runner up award all over India in Cadence Design Contest India (2010). 14. Co-recipient of IIT-Bombay Industry Impact Award (2008).
13. Co-recipient of the best research award in the Circuit Design Category, Intel Corpora.on AAF, Taiwan (2008). 16. Guide for the winner project of the first Cadence Student Design Contest among SAARC countries (2006). 17. Co-recipient of the 3rd award on Research and Development in 15th interna.onal fes.val of Kharazmi (2002).

CEP and TEQIP COURSES (3)

1. "From Sensors to Systems for IoT", TEQIP Workshop on IoT, IIT-Bombay, June 2021.
2. "Case study of Soil Moisture Monitoring System for Agriculture", CEP Course, IIT-Bombay, September 2019. 3. "Signal Digitization with Focus on IoT Applica<ons", CEP Course, IIT-Bombay, July 2019.

INTERNATIONAL TECHNICAL ACTIVITIES AND RECOGNITIONS

5. Invited lecture, tutorials and and talks (total: 70)
6. Coordinator of training programs, SemiX IIT Bombay.
7. Member of Execu<ve CommiDee of TIH-IoT IIT-Bombay
8. Associate Editor of IEEE Sensors Journal from February 2023
9. Design Contest Co-chair, Interna<onal VLSI Design Conference 2024 (Sister Conf. of IEEE DAC)
10. Member of INAE Sec<onal CommiDee- VI (Electronics & Communica<on Engineering) (2023-2025)
11. Track chair: "Sensing for Smart Ci<es and Village" and Member of Interna<onal Advisory CommiDee of IEEE APSCON 2023. hDps://2023.ieee-apscon.org
12. Associate Editor, TransacDons of Indian Academy of Engineering, published by Springer from 2022.
13. One of the 3 TPC chairs InternaDonal VLSI Design Conference 2022 (Sister Conf. of IEEE DAC) hDps:// www.vlsid.org/
14. Coordinator and one of the instructors of MHRD Sponsored Swayam ARPIT Course "Electronic Systems for Sensing", 2019-2020.
15. Track Chair, Analog/Mixed-Signal/RF/5G and invited speaker InternaDonal VLSI Design Conference 2020 (Sister Conf. of IEEE DAC) hDps:// embeddedandvlsidesignconference.org/
16. Organizer and one of the instructors of SPARC course on "Flexible Bioelectronics - Sensors, Electronics, Energy Harves<ng, and Data Analy<cs." (co-organizer: Pramod Murali), sponsored by MHRD Government of India, December 2019, IIT-Bombay.
17. Track Chair, Sensor Networks, IEEE Sensors Conference 2019 hDp://ieee-sensors2019.org/
18. Co-organizer (Organizer: Prof. Ashwin A. Seshia, Cambridge Univ.): DST-UKIERI workshop:"Emerging Sensor Technologies and Data Analy<cs for Air Quality Monitoring", November 2018, IIT-Delhi.
19. Track Chair, Sensor Networks, IEEE Sensors Conference 2018 hDp://ieee-sensors2018.org/
20. Track Chair, Nanoelectronic VLSI and Sensor Systems IEEE iSES Conference 2018 hDp://www.ieee-ises. org 17. Organizer (co-organizer: Prof. Ashwin A. Seshia, Cambridge Univ.) DST-UKIERI workshop:"Micro- and Nanotechnologies for Environmental Sensing", January 2018, IIT-Bombay.
21. Track Chair, Nanoelectronic VLSI and Sensor Systems, IEEE iNIS 2017 hDp://www.ieee-inis.org
22. Chair, CMOS technology extended, novel systems and approaches, ISIF 2017 hDp://www.e<mesweb.com/isif/home.aspx
23. Invited TPC member, VDAT 2017 hDp://www.iitr.ac.in/vdat2017/TPC.htm
24. Invited member of editorial board, Scien<a Iranica, Transac<ons D: Computer Science & Engineering and Electrical Engineering (2017-2021)hDp://www.scien<airanica.com/en
25. Chair, focus area of NEMS & Sensors, and Exhibi<on & Sponsorship, ICEE 2016 hDp:// www.iceeconf.org
26. Invited TPC member, Emerging Applica<ons and Technologies sub-commiDee, IEEE A-SSCC (Sister conference of IEEE ISSCC)hDp://www.a-sscc2014.org/ (2009-2014)
27. Invited TPC member and Design Contest Chair, Int. Conf. on VLSI Design (Sister conference of IEEE DAC)hDp://www.vlsiconference.com/ (2004-<ll date)
28. Invited technical chair, (Signal Processing and VLSI track), IEEE INDICON hDp://www.indicon2013.org
29. Invited track chair (Analog and Mixed-Signal System Design) and TPC member, IEEE ISED hDp:// ised.seedsnet.org/ 2016 and (2011-2013)
30. Invited TPC member, IEEE ISVLSI Conference hDp://www.isvlsi.org/
31. Invited TPC member, Circuit and System Design, IEDEC and ISQED Conference) hDp:// www.isqed.org/ , hDp://www.iedec.org/

32. Invited TPC member (circuit and system design track), ASQED Conference hDp://www.asqed.com/
33. Invited TPC member, Nanoelectronics Track, IEEE ICM Conference hDp://www.ieee-icm.com/
34. Senior Member of IEEE
35. Reviewer: Journals and conferences (IEEE, IET, Elsevier, IETE, Sadhana-Springer, American ScienDfic Publishers and other technical socie<es/publishers)

What is unique about working as a Woman in STEM compared to other fields?
A woman working in STEM is a contributor to the either of education, research, research towards product development and entrepreneurship. Such contributions, separate from their impact, prove once again that professionally does not depend on the gender. Interest in STEM, quality of work, dedication and passion define the essence of any produced impact by every woman working professionally in STEM.

What are your key contributions to your work area?
Here I provide a brief list of contributions. Their details are given in my CV.
a. Fellow of INAE and contributing to the various activities of INAE
b. Distinguished lecturer of IEEE Sensors Council (2022-2024). I conduct technical talks (national and international) as a part of this activity.
c. Completed 10 projects in collaboration with industry as PI or Co-PI.
d. Co-founding or helping students for co-founding startups.
e. Being one of the lead faculty members in several large projects supported by DST and MeitY in the domain of sensor-systems, IC design and R&D for the product development.
f. More than 150 Journal papers and more than 170 conference papers in the reputed peer reviewed journals and conferences worldwide.
g. Inventor/co-inventor of 29 granted patents (22 Indian patents and 7 US patents).
h. Associate Editor of IEEE Sensor Journal from 2023 and Associate Editor, Transactions of Indian Academy of Engineering, published by Springer from 2022.
i. Establishment of systematic and growth of integrated circuits design (IC design) and chip fabrication & test flow. 32 test chips have been designed, fabricated, tested and used in a prototype system over the span of 15 years at IIT Bombay. All test chips have been a part of Ph.D. and partially M. Tech /Dual degree projects. More than 20 Ph.D. scholars and more than 140 M. Tech and dual degree students have been trained by going through the entire process from design to test. Many of them are working in various national and multi-national semiconductor companies at present. More faculty members joined after promoting this domain, which is one of the key fields under India Semiconductor Mission at present.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
My mother planted courage and interest in education in my spirit from the time I was 5-6 years old. She has been a strong support continuously throughout my education. Even now my entire family strongly support my activities as a professional in STEM domains. My high-school teachers as well as scientists I read about them and their biography along with their work also affected my decision during my school days to pursue university education in STEM. I specifically became interested and encouraged by my teachers in Mathematics, Physics and Chemistry subjects. Later some of my university professors have been key people to create more and more motivations.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
I didn't face a specific obstacle but there has been interrupts due to marriage and maternity. I later noticed in long term such interrupts are a part of life and won't affect the professional journey if there is support from both employee organization or the educational institute and the family.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
I would tell them, "Don't lose your confidence in completing your path at every stage of your career in STEM field if sometimes you think you have more challenges or constraints compared to others. It more often happens you underestimate others' constraints and overestimate your constraints. Being in STEM will bring more and more professionally to you as you give to the society".

Ms. Meenakshi Narayanan

Vice President & Head R&D division

CavinKare

A total of 32 years of work experience in diverse industries and areas – both national and international – including Reproductive Biology, Embryology, Microbiology – Medical, Pharmaceutical and FMCG industry. I have more than 22 years of work experience in the FMCG sector, having headed service & research departments like Microbiology division & Formulation Development team. I am currently the Vice President & Head of the R&D division in CavinKare, responsible for the overall functioning of R&D, encompassing product development & Basic research in Personal care & Foods division.

My core functional deliveries include developing, delivering & sustaining Personal care & Food products to meet the market dynamics; to strategize, initiate & sustain innovation to deliver differentiated products and to develop new technologies & platforms for future development.

My responsibilities also include people development, developing learning & development modules of the scientists in R&D as a part of continuous education program.

I have several publications in leading technical journals and filed 12 patents as an author (7 of which have been granted). I have undergone training in both technical as well as managerial areas both in India & abroad. Under my leadership the formulation development teams in the past few years have filed 40 patents in areas of hair care, skin care, hair colorants & oral care.

Prior to joining CavinKare, I have worked with Orchid Chemicals & Pharmaceuticals (Chennai); Madras Assisted Reproduction Research Center (Chennai); and with Almana General Hospital (Kingdom of Saudi Arabia).

Academic qualifications (mention details of institutes and universities)

Education:
Ph.D Microbiology, Bharathiar University, Coimbatore India.

Diploma in Cosmetic Science, De Montford University & Society of Cosmetic Science, UK. First Rank holder.

Jan. 1991: M.S. Microbiology, Rutgers - The State University of New - Jersey, New - Jersey, U.S.A. & University of Medicine and Dentistry of New - Jersey, Robert Wood Johnson Medical School, New - Jersey. (G.P.A - 3.774 / 4.0)

June 1988: M.Sc. Medical Microbiology, Post Graduate Institute of Basic Medical Sciences, University of Madras, Madras, India. First Class, First Rank in the University.

June 1985: B.Sc. Zoology, Stella Maris College, University of Madras, Madras, India

First Class, Second Rank in the University.

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

Honors & Awards:

* Hibbot Memorial Prize from Society of Cosmetic Scientists
* Gopala Ayyar Memorial prize from University of Madras.

* National Merit Scholarship from Government of India.
* Silver Medal from Stella Maris College.

Abstracts & Publications:

1. Meenakshi Krishnan, S.P.Thyagarajan, V.Seshiah : Immunological studies in Diabetes Mellitus. XI Annual Conference of Indian Association of Medical Microbiologists,1987, Rothak, India.
2. L.C.P.Shah, Meenakshi Narayanan, M.D.Kini, S.A.Munaf, P.S.R.Murthy : Pre and Post Gulf war periods - Probable effect of pollution on human infertility : A preliminary study. 8th World Congress on In Vitro Fertilization and Alternate Assisted Reproduction, Sep. 1993, Kyoto, Japan. Jour. Assis. Reprod. Genetics pp 152.
3. Meenakshi Narayanan, L.C.P.Shah, M.D.Kini, P.S.R.Murthy, S.A.Munaf : Comparative study of In Vitro Fertilization and its outcome from 1989 - 1993 in Eastern Saudi - Arabia. 4th AGM & Scientific Session of the Saudi Obstetric & Gynecological Society, May 1994, Al-Khobar, Saudi - Arabia.
4. Meenakshi Narayanan, L.C.P.Shah, M.D.Kini, P.S.R.Murthy, S.A.Munaf : Effects of Motility Stimulants - Pentoxifylline, Caffeine, Theophylline & 2 - Deoxyadenosine on human sperm. 4th AGM & Scientific Session of the Saudi Obstetric & Gynecological Society, May 1994, Al-Khobar, Saudi - Arabia.
5. L.C.P.Shah, Meenakshi Narayanan, M.D.Kini, P.S.R. Murthy, S.A.Munaf : Seasonal variation in semen quality among men in Eastern Saudi - Arabia. 4th AGM & Scientific Session of the Saudi Obstetric & Gynecological Society, May 1994, Al - Khobar, Saudi - Arabia.
6. Meenakshi Narayanan, P.S.R .Murthy, S. A. Munaf, L.C.P.Shah, M.D.Kini : Antiovarian antibodies and their effect on the outcome of Assisted reproduction. Jour. Assis. Reprod. Genetics, Vol.12, No.9, 1995.
7. P.S.R. Murthy, Meenakshi Narayanan, S.A.Munaf, M.D.Kini : Role of Curl Tail spermatozoa in micromanipulative techniques. IX World Congress on IVF and Alternate Assisted Reproduction. Jour. Assis. Reprod. and Genetics, Vol. 12, April '95, pp. 184S, Abs. # PP - 247.
8. Meenakshi Narayanan, S.A. Munaf, P.S.R. Murthy, M.D. Kini : Decreasing semen quality among infertile males in Eastern Saudi Arabia. Second International Symposium on Recent Advances in Obstetrics and Gynecology, Oct. 1995, Riyadh, Saudi - Arabia.
9. Meenakshi Narayanan, P.S.R. Murthy, S.A. Munaf, M.D. Kini : Use of sub- cutaneous Buserelin versus Goserelin as analogues for pituitary downregulation: A comparative study. Second International Symposium on Recent Advances in Obstetrics and Gynecology, Oct. 1995, Riyadh, Saudi - Arabia.
10. Meenakshi Narayanan, P.S.R. Murthy, S.A.Munaf, M.D. Kini : Intra – uterine insemination - A 5 year experience. Second International Symposium on Recent Advances in Obstetrics and Gynecology, Oct. 1995, Riyadh, Saudi - Arabia.
11. Meenakshi Narayanan, S.A. Munaf, P.S.R. Murthy, M.D. Kini : Effect of Endometrial size of outcome of Assisted Reproductive Techniques and use of exogenous estrogens to improve endometrial size in treatment cycles. Second International Symposium on Recent Advances in Obstetrics and Gynecology, Oct. 1995, Riyadh, Saudi - Arabia.
12. Meenakshi Narayanan, P.S.R. Murthy, S.A. Munaf, L.C.P.Shah, M.D. Kini : Potential health hazards of Assisted Human Reproduction : Immunological complications. Hum. Rep. Vol.11, No.4, 1996, pp 701 - 702.
13. Meenakshi Narayanan. A. Rajasekaran : Practical Considerations in ICSI. 1st Clinical Andrology Conference & Operative Workshop, ANDROCON '97, April '97.
14. Meenakshi Narayanan. A. Rajasekaran: Intracytoplasmic Sperm Injection – Our experience with new technology in Obstructive Azoospermia. Tamilnadu & Pondicherry, Association of Urologists, TAPASU CON - 2, Dec. '97.
15. Meenakshi Narayanan. A. Rajasekaran : Cryopreservation of Human Sperms & Embryos. Tamilnadu & Pondicherry Association of Urologists, TAPASU CON - 2, Dec., '97.
16. Meenakshi Narayanan, P.Sekar, M.Pasupathi, T.Mukhopadhyay : Self preserving skin care cosmetic products. IJABR, 7(1) : 22 – 37; 2016.
17. Meenakshi Narayanan, P.Sekar, T.Mukhopadhyay : Self preserving hair care products with herbal ingredients. IJRSR, 7(3): 9362 – 9368; 2016.

What is unique about working as a Woman in STEM compared to other fields?

I feel as a woman working in the scientific area is unique as very few take up this chosen line. Research is an arduous area requiring focus, perseverance, and dedication. We also need to be creative, find out of the box solutions to problems and multitask. Women are in built with patience and multitasking and hence I think this role is well suited. Also, working in STEM gives us the opportunity to experiment and explore new areas and thereby coming up with

new discoveries and inventions.

What are your key contributions to your work area?

a. Intellectual property for the organization.
b. Ensured development & deliveries of differentiated products for the businesses.
c. Leading projects with emphasis on innovation and translation of research into successful products in the market.
d. Conceptualize strategies & initiate development for understanding new directions of developmental activities keeping in mind future growth / development prospects.
e. Forge collaborations with Academia, Industry, and other stakeholders to develop breakthrough products.
f. Initiated & implemented new /efficient processes in manufacturing process, data management, knowledge processes & documentation.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

My parents have been instrumental in my interest in science. Despite financial constraints, I was allowed to pursue my dreams for higher education in the US. After marriage my husband has been very supportive and has encouraged her to take on bigger responsibilities. This has enabled me to have a better work life balance. My superiors right from the beginning of my career have been my biggest source of strength and support. They showed more confidence in my abilities than me. They have shaped me and allowed me to showcase my potential. Dr. Kini (my first boss in Saudi Arabia), CKR – CMD of Cavinkare who took the risk of moving me from Microbiology team to head of formulation development, Dr. Mukhopadhyay who has been my mentor and guide and Dr. Nambudiry who has motivated me and challenged me – I owe my success to all these wonderful people.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

Working as a woman in Saudi Arabia was one of the most challenging experiences for me. With travel restrictions, dress codes and cultural differences it was a challenge. However, if you are good at your work and prove your capabilities, exceptions were done.

Other challenges I had faced –

- Maintaining good work life balance
- Acceptance of me as a leader from my colleagues as I was from a different background and was given the role of formulation head.
- Understanding the nuances of formulation development, chemistry and science behind it in order to give meaningful recommendations and solutions.
- Managing people with different strengths and weaknesses to deliver the requirements of my function as per the expectation of the management.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

My advice to next gen women in science is not to be afraid to try out new opportunities and not to hesitate to try things you have never done before. Be comfortable with trying new things, and don't be afraid to reach out to others! One should recognize that there are biases existing and one must never let that corrode their self-worth and limit your abilities. Women tend to create their own glass ceilings and we must never stunt our own growth. Many women underestimate their own abilities and dilute their bold personalities to fit the mould constructed for them. Whilst I feel I have been successful in my career as a woman in leadership and STEM, producing innovative, sustainable technologies, it does not stop there. Science has shown that in our ever-changing world, discoveries happen every day. There is no single end goal, and the goalposts are always moving. This pace of change should keep us motivated to continue to climb to the next level and help lead the next generation to create more diversity into the industry.

Prof. Meenakshi Rawat

Associate Professor., Department of Electronics and Communication Engineering

IIT Roorkee

I am an Associate Professor in the Department of Electronics and Communication Engineering, IIT Roorkee. I have joined IIT Roorkee in June 2014 as an Assistant Professor.

I was born and had my primary education in Dehradun, Uttarakhand. I did my B. Tech. from College of Technology, Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, Uttarakhand in 2006. I joined Telco Construction Equipment Company Limited (Joint Venture between TATA Engineering India and Hitachi Construction Machinery Ltd. Of Japan) in Jamshedpur from July 2006 to August 2007. Subsequently, I was with Hindustan Petroleum Corporation from October 2007 to June 2008.

I completed my Ph.D. from the Department of Electrical and Computers Engineering, University of Calgary, Alberta, Canada in September 2012. I was a postdoctoral researcher at the University of Calgary from September 2012 to June 2013. I joined the post of Research Scientist (Sponsored by DARPA and Rockwell Collins) for the project titled Filter-less RF Transmitter Prototyping for Ultra-Wideband Software Defined Radio from July 2013 to June 2014.

I have over 110 publications (55 Journals and 57 Conferences with 1600 citations and an i-10 index of 45), one book chapter, and 3 filed Indian Patents. I have been a member of the IEEE Society for the past 15 years. I have contributed as TPC Chair in WAMS 2022 and MAPCON 2022, which are IEEE flagship conferences. I was Chair for Women in Microwave Session in iMARC 2019 and iMARC 2021 at IIT Bombay and IIT Kanpur, respectively. I am serving as an external expert member for four PMRC committees for projects at DEAL, DRDO, and various SERB Project committees. Currently, there are three active research projects and three completed projects as PI, and two active Projects as Co-PI. On the academic front, I have developed a MOOC course on software-defined-radios in NPTEL, which has been active since January 2018. 6 PhD students and 23 Masters students have completed their degrees under my supervision. Apart from NPTEL, I had the opportunity to contribute to other national programs of importance, such as the Scheme for Promotion of Academic & Research Collaboration (SPARC), Impacting Research Innovation and Technology (IMPRINT2), IMPRINT-II, and Global Initiative of Academic Networks (GIAN).

For my technical and professional contribution, I received a faculty fellowship under iHUB DivyaSampark for year 2022-2023, Institute Research Fellowship (IRF) from 2022-2024, and Young

Faculty Research Fellowship (YFRF) under the Visvesvaraya Ph.D. scheme of Meity, Digital India Corporation 2019-2024.

What is unique about working as a Woman in STEM compared to other fields?

The fields related to STEM (science, technology, engineering, and mathematics) are centered around problem-solving using technological tools, be it simulation or hardware. The innovation rate is very fast, and pace has to be matched. For example, in my field of research, i.e. RF and communication engineering, we have seen the advent of communication systems have rapidly evolved from 3G to 4G to 5G. We are already planning 6G communication and its use cases. An engineer/ Scientist has to get accustomed to ever-changing challenges and accept new possibilities. As a Woman in STEM, I believe the gender ratio disparity is more pronounced in STEM-related fields due to these challenges and the need to be active. Very few women who received their Ph.D. in STEM-related areas are reaching high professional levels due to their social responsibilities.

What are your key contributions to your work area?

The Power amplifier efficiency enhancement has a huge social impact by reducing the CO_2 footprint in the wireless network technology. It is anticipated that upcoming 5 G applications have signals with high PAPR and achieving good efficiency in PA will be challenging in such a scenario. My research is able to tackle these challenges. With help from proposed software-defined-radio-based techniques, the transmitter distortions are reduced while maintaining the efficiency of the PA. In addition, the hardware components of communication systems need to be updated to allow for new requirements according to new waveforms. The proposed research area focuses on adapting the available hardware components using digital pre-processing for the changing communication needs. Another vector of my research area deals with studying the interaction between digital and analog signal processing and proposing the signal processing techniques to allow the communication system to work at minimal hardware cost as well as digital signal processing cost. It is to be noted that while there is a sharp focus on saving energy and alternative energy sources are being sought, there is no emphasis on saving energy consumed by communication systems, the number of which is increasing at a very fast pace.

Recently proposed and patented ideas, such as hybrid predistortion techniques to increase signal quality and reduce energy requirements, have been appreciated. Several workshop invitations have been received from conferences in USA, Europe, and China for disseminating this idea. Currently, I am also providing short courses to industries such as Bharat Electronics Limited, CDOT, and various DRDOs to emphasize importance of such techniques, which have been well received. The commercialization outlet has been provided by adopting such solutions in the start up "Linearized amplifier technologies and services private limited."

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

In life, we get inspired by several people and circumstances. My initial inspiration was my father, who worked as a Khadi and Village Industries development officer and was passionate about implementing biodegradable and alternative energy sources. However, my forte was more in Mathematics and physics rather than biology/Chemistry. I was inspired to be an engineer by my elder brother, who was then a Mechanical engineer in IIT Delhi. As an electrical engineer, I remembered to be fascinated by machines and working of all parts in sync. We participated in a robotics competition during my B.Tech. years, where we Won the "most innovative robot" prize.

When I was doing my Ph.D. at the University of Calgary, my brother was completing his Ph.D at UCLA, and we used to discuss our fields and marvel at numerical method similarities in electromagnetics simulation and Simulations used for fluid mechanics.

After marriage, I was inspired by my Husband, who was working as a scientist in SAC-ISRO and used to design very small circuits that would be practically used in Satellites. It was interesting to note that it was not just a research subject but an earned skill on the design, experiment, and management levels. Exposure to all these inspiring people and different fields has taught me adaptation and humility to respect all areas of innovation and shaped my career into what it is.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

I have faced a few challenges in the early stages of my career due to people's perception that a female engineer may not be suitable for handling hardware or equipment handling; however, they have never proven an obstacle in my career. I felt that initially, a woman has to put more effort than a man to prove her worth, but I also felt that once worth is proven, Women get more appreciation too.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

Recently, there are certainly more support programs for Woman Engineers/Scientists, and it is the best time to be a Woman in STEM-related work. I would advise that they should become aware of various programs for professional development. To name a few, I am aware of SERB offering Power Grant, Power fellowship, Mobility Grant, DST offering, Women Scientists Programs, MeitY – NASSCOM Startup Women Entrepreneur Awards. The next-gen Women in STEM can get an instant boost in the initial phase of their careers by benefitting from such schemes.

Ms. Megha Navalgund

Section Manager: Advanced Design Tools, GE Aerospace

John F Welch Technology Centre, GE India Industrial Pvt, Ltd.

About 5 years back I got the opportunity to start a brand-new team for developing analytics driven software products for monitoring the health of Additive machines. This was a very small team of 5 members, all data scientists. Growing this team to become the go-to team for the business for developing commercial analytics driven products (spanning real-time monitoring, automatic diagnostics, fleet reliability etc.) has been one of the most satisfying experiences.

What is unique about working as a Women in STEM compared to other fields?

I am not sure I can compare it to other fields as I have only ever worked in STEM! I can talk about what is great about STEM though! I have found it to be an excellent field that lets you express your intellect, your creativity, your passion (emotion) .... It is not one dimensional at all! This is a field that grows you holistically; when you are solving problems you do need to think about customer impact and how will it help the end user also so in addition to building your technical prowess you are also building your business and market aptitude. You also need to think about 'what's next', so you are exercising / stretching your imagination and coming up with brilliant ideas that can be game changers. So now you are growing your creative and intuitive skills! The fact that you can explore all the different facets of your brain and your being is an extremely enriching and satisfying experience. And therefore, you have diverse and rich career options in STEM. You could be a Scientist, an Engineer, a Simulation & Modeling expert, an Experimentalist, a statistician, a strategy leader, a people Leader etc. One of the best things that I have experienced in GE is that you don't have to fit into a 'box' to be successful. You are supported if you wish to explore new avenues.

What are your key contributions to your work area?

About 5 years back I got the opportunity to start a brand-new team for developing analytics driven software products for monitoring the health of Additive machines. This was a very small team of 5 members, all data scientists. Growing this team to become the go-to team for the business for developing commercial analytics driven products (spanning real-time monitoring, automatic diagnostics, fleet reliability etc.) has been one of the most satisfying experiences. During this journey, we also enabled multiple leadership roles for the team and grew it more than three folds in 3 years! I also led the strategic expansion of the team's portfolio to include analytics solutions to support the services business which led to several new programs and new roles in the team. Have also been pivotal in influencing the technology and product roadmap for the business. As mentioned earlier, these varied facets of 'problem-solving tough technical challenges', 'defining the future of technology and product', 'enabling growth opportunities for people and helping them fulfill their career aspirations' is one of the most holistic career experiences that one can have and I have been blessed to experience that at GE. Prior to this role, I was at research where I led several exciting low TRL research programs in the areas of Digital Radiography & Computed Tomography and Inspection of inaccessible pipelines. About 3 weeks back, I took on my current role where I lead a team of ~60 brilliant and passionate engineers who develop physics enriched tools to explore next gen engine designs and accelerate their maturation.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

To me taking up STEM was a very very natural decision. My dad was like a math genius, my aunts were all graduates in STEM. My neighbors and friends' parents were all math/ physics professors. So, I grew up feeling 'STEM' as a part and parcel of my life. I always enjoyed STEM, was quite good at it and aspired to be an 'engineer like my dad' from a very early age. I should mention that at one point (during my 8th grade), I started to get confused between pursing engineering and medicine. At that point, I got a new math teacher who made math very exciting, He would never just

give the answer to a problem. He would give us hints and make us come up with the answers. However long it took to get there, it didn't matter, he would wait. He made me realize that my 'true love' and my skill is math and then that made my decision easy! So, he was pivotal towards my decision to take STEM.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
When I was in my X11 grade, I went to a training institute to prepare for the engineering entrance exams. We lived on the outskirts of the city, so I used to wake up at 3 am every day and take a 4am bus. This was quite a challenge not just for me but for my entire family. My mother would wake up and have my lunch box ready by 4am every day. Never complained!! Looking back, I feel they (my parents) were really brave and strong to have a young girl travel that far every day at such odd hours.

During engineering I had several girls in the class but when I went on to do my Masters, the number of girls was very few. The number of women professors were also very few. During this time some of the 'gender diversity' related challenges (feeling isolated, feeling a bit anxious in a room full of men with me being the only woman) started to become visible. It wasn't necessarily an obstacle but something I needed to adapt to.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
What I would urge next-gen women in their careers is:

- Be kind to yourselves and do not try to be superwomen! Everyone needs help, support, and something or the other will need to take a backseat. Sometimes it will be work and sometimes it will be home. Especially during those times, ask for what you need, ask for help (at work and at home).

- You don't have to be 100% ready (nobody is!!) to raise your hand for something new .... Take a bet on yourself, challenge yourself. Trust your potential, remind yourself of your track record and you will shine! Enjoy the journey of new learning. Learn from falling! I took the risk of moving from GE Research after 12 years to start a team in GE Aerospace Engineering. Didn't know if it would work out or not! I could do that because I believed in myself, and I knew I could trust GE to have my back.

- Express yourself. Actively participate and contribute to discussions. It is ok if you are not right .... No one is right all the time!! This is a way to let your unique self be seen, recognized, and appreciated. Passion, gut, and high emotional quotient are a very strong part of my brand. At GE I have never felt the need to suppress or underplay any of these. There are people who have a different brand, and they are successful too. So, be true to yourself and don't hesitate to let it come through.

- Finally, I will share three 'guiding words' that I have relied on in my life: Resilience, Belief, Perseverance.

Ms. Monalisa Panda

Founder, Creed India Foundation & Co-Founder

Sai BioCare Pvt Ltd., Sai Paramount IT Solutions Pvt Ltd.

I believe when its knowledge working in STEM is no different and acknowledgement to your brain and appreciation to the work get delayed.

3rd Member cum activist Human rights, Chair Entrepreneurship CII IWN Odisha Member Quality council of India, member BNI smart C Past President Rotary club under district 3262, Confederation of Indian Industry (CII) elected state council member 2019, Odisha ISO 17025:2017, NABL (applicable for laboratories) certified internal auditor AIRSWEE 2.0 certified and selected 2018. Goldman Sachs 10000 women graduate form IIM 2019, ISB 2020 Trained on Implementor cum Energy Leader ISO 50001; Energy management system Gp Birla Fellowship 2022 Having almost 15+ years of rich and cross-cultural experience in heading People Management Operations & Administration spanning across Environment, waste management, recycling, liaison and consulting business with state and central government, awareness and survey curating and contributing to the Organization's strategic & operational goals. Strong feeling for environment and its safety which allows me to incorporate science and technology to protect and create new goals. Effective and economic recycling techniques development and practicing every now and then to use recycled wastewater for cultivation cleaning, gardening. Incorporating information technology for promoting awareness surveys, campaigns as well as creating revolutionary approaches though web-based application. Promoting sensible use of natural resources and using alternative energy properly blended. Bridging by Imparting technical training and developing skills as per industry need. Creating healthy incubation systems for research and development is the essence of my existence. Industrial Fire fitting system integration.

What is unique about working as a Woman in STEM compared to other fields?

I believe when its knowledge working in STEM is no different and acknowledgement to your brain and appreciation to the work get delayed. I think Women easily get appreciation, fame for fashion beauty or similar industries as the other half human (Men) feel safe and obvious to them. appreciation to creativity and women is quite overly accepted whereas women and brain raise brows.

What are your key contributions to your work area?

In my field of recycling and environment, I had driven the drive since 2008 in Odisha and took 12+ years to establish the fact that recycling is not to be done for guidelines or compliances its necessity. Being an industry, we need to act fast to mitigate the havoc in future. 3) Who all inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)? It's never a career but in fact it's the way to lead life. But the surroundings and especially the problems around made me get into it.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

As working closely with the environment field /site visits were part of the job. women and site visit are an issue as many industrial zones were in outskirts or no man's land. Sometimes you've been judged being women over your knowledge, facts that've been presented have been questioned more (comparatively male counterpart).

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

I guess theoretical knowledge is essential but field /on job or practical application and study of its implications is real learning. We need to be careful when to present facts and when to give solutions. Sometimes your solutions fetch less acknowledgement than they deserve. Lastly give sufficient credit to yourself.

Ms. Najiya Fatma

Reasearch Scholar, Mechanical Engineering

IIT Delhi

I am a research scholar in the department of Mechanical Engineering at the Indian Institute of Technology (IIT) Delhi India. I got direct admission to the doctorate program here at IIT Delhi after completing my undergraduate. I belong to Ranchi, the capital city of Jharkhand.

Academic qualifications (mention details of institutes and universities)

I completed my B.Tech. in Production and Industrial Engineering from the National Institute of Technology Jamshedpur. After that, I had an opportunity to directly pursue a Ph.D. in the department of Mechanical Engineering at IIT Delhi, with a specialization in Industrial Engineering.

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

I was awarded the prestigious Prime Minister Research Fellowship for pursuing a direct Ph.D. at IIT Delhi. I also got an all-India rank of 9 in the Graduate Aptitude Test in Engineering (GATE) examination. Based on my research, I have papers in reputable journals including OR Spectrum, and multiple papers in peer-reviewed conference proceedings. I have also presented my work on multiple platforms- both in-person and virtually. I am also a member of INFORMS, a leading international association for professionals in operations research, management science, and other relevant fields.

What is unique about working as a Woman in STEM compared to other fields?

Being a researcher provides the continuous opportunity to learn something new every day and work on a topic that could help at the community, national, and international levels. Participating in STEM activities also includes presenting work on multiple platforms to a diverse audience. It is rewarding to see how research brings people together across the globe. Discussing and understanding the research of my colleagues who are working on different problems such as fabricating new materials, biomechanics, biosensors, and others aimed to provide solutions to real-life problems excites me. Working in STEM will also help young girls in the future to participate in research activities and contribute equally, breaking the social stigma regarding girls' higher education and scientific endeavours.

What are your key contributions to your work area?

In collaboration with the healthcare administrators and healthcare providers, we are working on multiple objectives that aim to analyse and improve the performances of the existing public healthcare delivery systems from both the patients and the health administrators' perspectives. We developed ways for estimating the expected delays of the patients in real-time visiting public healthcare facilities. Our work can inform policy designed to improve the utilization and quality of care at public primary and secondary healthcare facilities in India.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

Kalpana Chawla has always been a great inspiration for me as she has been for others. Her extraordinary journey inspired me from the very beginning to excel in my field and do my best for others. Another person who inspired me to work in STEM was my science teacher Ms. Kanika. Her courageous never-give-up attitude with an amazing ability to help students has always inspired me.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

Based on my experience so far, I have never felt treated differently when compared to a male colleague. Everyone works depending upon their capabilities and circumstances. To that end, this is also a harsh reality that currently there is a lack of representation of women, especially at the technical institutes. For example, both at my current institute and alma mater, there are/were few female professors. It is welcoming to see STEM disciplines are now recognizing and working tirelessly to bridge this gender gap. However, certain stereotypes such as undermining the capabilities of women in balancing their work and homely responsibilities are always there in a male-dominated society like ours.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

My first piece of advice would be to always have self-confidence and never let self-doubt come in the way. Be in a community of similar-minded people who support you, encourage you, motivate you, and point out your mistakes in a subtle way without making you feel worthless. Think and grab good opportunities that will pave your way to where you want your career to go. Don't be a part of the rat race, be original, and do things that are morally correct.

Ms. Nanadani D

Senior Technical Engineer, Research and Development Center

3M India

My family consisted of one brother, four sisters, and me as the third child. I was born and reared with my maternal grandparents in a small village called Belur in the Shimoga district of Karnataka, where I also completed my primary education in the local Kannada language up till the tenth grade. I then moved to numerous locations in Karnataka in order to pursue my scientific higher education. I've spent the previous 21 years living in Bangalore after continuing my science education in areas like Sagara, Shimoga, and Davanagere in Karnataka.

After receiving my master's in microbiology, from Kuvempu University in 2002 I was engaged as a research associate at the Indian Institute of Science (IISc) Bangalore in Prof. Balaram's group at the Molecular Biophysics Unit. I was given the exceptional chance to employ a range of research instruments to provide analytical responses to several research students at the institute. I had restricted my attention to conotoxins, which were extracts of marine mollusc poisons used to make novel anesthetic medications. I was exposed to experimental science during the three years of my intensive academic career, which also included various research endeavors.

I started my industrial career with the scientific instrument company Waters India Pvt Ltd as an Application Specialist for proteomics. I had the pleasure of assisting the Indian sales team with the instrument's pre- and post-sales client demonstrations, training, and troubleshooting. Publishing reports, summaries, and reviews on the company website while working together with customers, vendors, and scientific/research employees to develop innovative ideas for customers. My understanding of the benefits of interaction and teamwork was substantially enhanced by the chance to learn about the commercial application of scientific research.

I received a job offer from GE India Technology Centre as an analytical chemist for GE Plastic after spending two years at Waters India Pvt Ltd. Here, while working in a cutting-edge lab and actively interacting with researchers from various business groups, I gained exposure to international culture and market-focused research. My perspective on cross-border collaboration without boundaries and a corporate culture was expanded after being exposed to the vibrant and open workplace culture of a global company. I collaborated with others on chromatography and mass spectrometry investigations while working on a variety of high-impact initiatives. I took part in the GE Women Network, sustainability, environmental health and safety, and corporate social responsibility program here. earned a six-sigma green belt and became a Certified Product Steward. I am now a more flexible, globally aware employee with a good eye for the larger picture because to this experience.

After seven years of demanding and knowledge-gaining GE work, I subsequently moved to the SABIC India Technology Centre as a Scientist in the Analytical Chemistry Division. I was given an opportunity to participate in research projects including polymers, Agri nutrients, and petrochemicals. In both GE & SABIC I was in charge of developing analytical procedures, transferring them to toll manufacturers, training their' analytical chemists, and identifying both qualitative and quantitative analysis of impurities and quality control elements. During my tenure there, I played a key role in the qualification of more than 3000MT of monomers from US, Indian, and Chinese suppliers, leading to the purchase of more than 500MM worth of monomers.

Presently working as Senior Technical Engineer in 3M India research and development center. By offering analytical solutions to business problems, I have tremendously benefited various company groups at 3M in resolving business challenges such as customer issue resolution, competition material analysis, alternative supplier's material analysis, new vendor qualification, and manufacturing plant quality concerns using her significant knowledge and expertise in analytical technologies. Through a variety of creative initiatives, I have also taken on the responsibility of improving the analytical team's visibility and collaboration with other business groups. In addition to my primary duties, I am

actively involved in a number of employee resource network activities. I am an active member of NEON (New Employee Opportunities Network) and a general body member of Tech Forum. I am a very active WLF (Women Leadership Forum) member and have a close network. Thanks to the CII IWN EVEMPOWER MENTORING PROGRAM, which gave me the chance to receive mentorship from leaders from other industries, I am gaining new viewpoints from leaders in different sectors. I am leading the visiting wizard program, whose objective is to encourage underprivileged students from government schools to pursue STEM education. This is a distinctive effort of 3M wherein volunteers from the company would go to the public schools and educate, promote, and spark children's interest in STEM education.

Academic qualifications (mention details of institutes and universities)

- Master of Science in Microbiology- Jnanagangotri, Kuvempu University Davanagere, Karnataka
- Bachelor of Science in Biochemistry, Botany and Microbiology – Sahyadri Science College, Shimoga, Karnataka

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

- Six Sigma Green Belt Certification (GE)
- Thank you award from management (GE/SABIC)
- US Patent (SABIC-Declarations for U.S. National Phase Application for Piezoelectric Composite Material and Method based on PCT/IB2021/056064)
- Publication (SABIC-Effect of Electron Beam Irradiation on Polymers, Journal of Modern Materials, Volume 5, Issue 1, pp. 24-33, 2018)
- R&D Championship award (3M)

What is unique about working as a Woman in STEM compared to other fields?

You get to work and live in a cutting-edge atmosphere that is entirely driven by science, facts, and statistics. Our work involves using science to improve quality of life in all of its manifestations in some way. This link to daily life is continuous. In a unique way, women handle every circumstance by combining their emotional, factual, and practical viewpoints. When combined with meticulousness and a methodical approach, it aids in bringing our work to a logical finish. Today my work environment and obligations both support me for a healthy work-life balance.

What are your key contributions to your work area?

- Dynamic and motivated professional with an experience of 20 years out of which 17 years with leading multinational companies and 3 years of academic experience in the field of Analytical Chemistry.
- Expertise with regulatory protocols of EU and USFDA and quality systems. Contributed significantly towards tolling of 12 monomers, with 6 toll manufacturers across the globe qualifying >3000MT monomers from US, India and China manufacturers leading to > $500 MM business (GE/SABIC)
- Published 25 internal technical reports, 30 Standard Operating Procedures, 2 conference publications, 1 external paper, filed 3 invention disclosures letters 1 US patent application are filed.
- Expertise in Waters, Agilent, and Shimadzu instruments of HPLC, UPLC, RRLC, LCMS, GC, GCMS and SFE.
- Safety Delegate, (EHS) coordinator and Safety Health Environment Management (SHEM) member (GE /SABIC/3M) Successfully conducted several EHS / SHEM audits.
- Trained and certified in laboratory quality systems and internal auditor as per ISO 17025 (GE/SABIC).
- Trained and certified ERT (Emergency Response Team) member (GE/SABIC)
- Active member of Corporate Social Responsibility (CSR) team: Contributed to Teaching the children in government schools, participating in blood donation camp, and eye check-up camp for children in government school (Mission for vision) (GE/SABIC), Lead for Visiting Wizard program for promote STEM education among in underprivileged students. (3M)

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

I was fortunate to have good science teachers who piqued my interest in how, what, and why things worked. As a result, they had a significant influence on my choice to major in STEM starting in elementary school. The analytical thought process that strives to comprehend why and how purely based on the facts that analytical experiments bring in has been imprinted at IISc by co-researchers and professors. Undoubtedly, the broad experience and opportunity provided at IISc under the guidance of Prof. P. Balaram played a key role in the decision to pursue a career in the STEM domains.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

As an application specialist at the start of my career, I was obliged to travel widely throughout India in order to support the sales team before and after the sale of the instruments. When I became a mother, managing work-life balance presented even another difficulty. Due to the obligations, I was forced to take a professional hiatus. Despite this, I still feel fortunate to have gotten a job with 3M, one of the ideal companies for women in STEM.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

Making an investment in building your personal brand and expanding your professional network is essential. We regularly miss out on chances and are unable to reach our full potential because of how we see ourselves. In the modern world, being able to communicate effectively is becoming more and more crucial, thus one must always pursue personal development. Be yourself, be certain, and be focused.

Prof. Natasha Sharma

Assistant Professor
Department of Physical Sciences
IISER Berhampur, Odisha

It is really a great feeling. Women were never considered best suited for the STEM fields. But it is now proved that they not only can compete well but also provide leadership in these fields. Working in STEM field helps to show their intellectual

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

- SERB Research Scientist (SRS) from Science and Engineering Research Board, Department of Science & Technology, Government of India.
- Offered Associate Professor position in the Department of Physics, Amity University, Mohali, Punjab. (Not availed)
- Ramanujan Fellowship from Science and Engineering Research Board (SERB), Department of Science & Technology, Government of India.
- Sanctioned research project under Young Scientist Scheme (YSS) from Science and Engineering Research Board, Department of Science &Technology, Government of India.
- Young Scientist Award from Elsevier with a citation and a cash price of 400 Euros for best oral presentation in the international conference QM2015 held at Kobe, Japan.
- Won best poster among 800 posters in the international conference QM2011at Annecy, France.
- Featured articles in ALICE matters at CERN website.
- Featured in Indian Physics Association (IPA) magazine PHYSICS NEWS, Jan.-June 2021, Vol. 51, https://www.tifr.res.in/~ipa1970/news/ 2021/JanJune/23- Meet_the_Physicists_Vol51(1-2).pdf
- Qualified National Eligibility Test (NET) conducted jointly by Council of Scientific and Industrial Research (CSIR) and University Grant Commission (UGC) of India.
- Publications: Peer reviewed journals: 398 (List Attached)
- National & international conference proceedings: 13
- h-index: 85; Citations: 24,849
- Source: Scopus (https://www.scopus.com/authid/detail.uri?authorId=35222505100)

What is unique about working as a Woman in STEM compared to other fields?

It is really a great feeling. Women were never considered best suited for the STEM fields. But it is now proved that they not only can compete well but also provide leadership in these fields. Working in STEM field helps to show their intellectual and scientific temperament.

What are your key contributions to your work area?

I was first person to analyze Large Hadron Collider (LHC) data collected by A Large Hadron Collider Experiment (ALICE) to study nuclei and anti-nuclei production during my Ph.D. time from India. First paper from ALICE, LHC on nuclei and antinuclei production was based on my Ph.D. thesis work [Title: "Production of light nuclei and anti-nuclei in pp and Pb-Pb collisions at energies available at the CERN Large Hadron Collider", Phys. Rev. C 93, no. 2, 024917 (2016)]. Contributed to the discovery of anti-alpha particles from the ALICE experiment, LHC.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

First, I was inspired by mother with her never say die attitude and the confidence she provided us in fulfilling our dreams crossing all hurdles in our life. Then I was admired by my maths teacher, Ms. Sarita Kaushik. The way she

taught us mathematics was really a great experience. Before that I too had a feeling that women are not good in mathematics compared to the males. The way she managed her work and family was a great example for how one can do the things which he/she finds interest in.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

We were not very comfortable with our financial condition. Being from a small town and the family where there was no value of studies was even more difficult. Despite all these hurdles, I continued to follow the path which my heart wanted me to follow. When I started my Ph.D., there were not many girls seriously interested in the research field. It was difficult to work in the experimental field around the clock with almost non-female colleagues around me. When you are married and have two kids, it is very difficult to manage both work and family. When the spouse is working at different places, it is even more difficult.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

I would advise them to keep pushing yourself to achieve your dreams. Don't get scared in any situation and by the people around you. You will face many problems, but if you remain persistent to achieve your goals, you will succeed. Main idea is to keep going.

Prof. Neelima Satyam

Professor
Department of Civil Engineering,
Indian Institute of Technology, Indore

I am Professor Neelima Satyam working as Associate Faculty, Center for Rural Development & Technology, IIT Indore (Feb 2020 - till date), Associate Faculty, Center for Indian Knowledge systems, IIT Indore (Oct 2020 - till date)

Previously worked as Associate Professor, Department of Civil Engineering, IIT Indore (Nov 2017 - Feb 2022), Visiting Researcher, Institute of Geophysics, University of Stuttgart, Germany (June - July 2018), Assistant Professor, Earthquake Engineering Research Centre, International Institute of Information Technology Hyderabad, India (Feb. 2009 - Nov. 2017), Visiting Scientist (JSPS Fellow), Geotechnical Laboratory, University of Tokyo, Japan (Jan. 2013- March 2013), Visiting Faculty, National Academy of Construction, Government of Andhra Pradesh, Hyderabad, India (April 2007 - Feb 2009) and Research Assistant, Department of Civil Engineering, IIT Delhi, India (2002 – 2006) I am residing in Indore, Madhya Pradesh and born and brought up in Tirupati, Andhra Pradesh

Academic qualifications:

- Ph.D., Department of Civil Engineering, Indian Institute of Technology Delhi
  Research Advisor: Prof. K S Rao
  Dissertation: Seismic Microzonation of Delhi Region
  CGPA: 8.9
  Jan 2002-June 2006

- M. Tech., Department of Civil Engineering, Indian Institute of Technology Delhi
  Dissertation: Foundations on Rock
  CGPA: 8.84
  June 2000-Dec 2001

- B.Tech., Department of Civil Engineering, Sri Venkateshwara University, Tirupati
  Major Project: Watershed Management of Kondreddikandriga
  Percentage: 78.2 %
  June 1996- June 2000

Notable achievements/Awards/ Fellowships:
Awards

- JSPS - BRIDGE Fellowship, 2023
- SERB - POWER Fellowship, 2023
- ISET Shamsher Prakash Mid-Career Research award for Significant Contribution in Geotechnical Earthquake Engineering, 2022
- Best Research Paper Award, IIT Indore for the academic year 2020-21
- CIDC Vishwakarma Academician Award 2021, from Construction Industry Development Council (Established by Planning Commission, Government of India and the Construction Industry)
- Overseas famous scientist project (Grant no. 2020A1414010268) from Ministry of Science and Technology, Guangdong, China for visiting Shantou University, 2020- 2021
- Best collaborative team award for Aquasense research project, ITRA-Water, GoI 2015
- JSPS Research Fellow, University of Tokyo, 2012-2013

- Career Award for Young Teachers (CAYT) from AICTE, GoI, 2012
- Young Engineers Award 2011 in Civil Engineering discipline from The Institution of Engineers (India), Kolkata, India
- Young Scientist Research Award, BRNS, Department of Atomic Energy, India 2011
- Young Woman Engineer award from INWES-International Network of Women Engineers and Scientists, 2012

Recognitions

- Reviewer at the Colloquium for Young Researchers: Towards Developing International Collaborations.
- Reviewer for Technical book in English for "Instrumentation for Civil Engineering Applications" course by AICTE.
- Expert Committee member, for deliberation on formulation of BIS guidelines - Safety and mitigation measures for the buildings and infrastructures in landslide affected areas
- Member, International Advisory Committee, CREST-2023
- Convener, Soil Dynamics and Earthquake Geotechnical Engineering -36 International Geological Congress 2020
- Convener, International Cooperation by Indian Geotechnical Society for the term 2019-2020
- Member, Preliminary Review Committee, Shastri Indo-Canadian Institute, MHRD for the term 2018-2019
- Co-opted Member, Program Advisory Committee (PAC), Civil and Environmental Engineering, Science and Engineering Research Board (SERB), DST (2015 - 2019).
- Chairperson, for MONBUKAGAKUSHO: MEXT Scholarships of Japanese Government (for selecting PhD/MS students from India) in Earthquake /Civil Engg stream (Since Feb 2018)
- Member (CPD), Engineering Council of India for Telangana and Andhra Pradesh States (Since Feb 2017)
- Member, Technical Evaluation and Monitoring Committee for design of offshore substructure, NIWE Chennai (2015-2017)
- Honorable Director, Institute and Industry Interaction: Professional Development Council, Association of Consulting Civil Engineers, India (2018-till date)

Journal Roles

Editor of Journals

1. Editorial Board Member, Deep Underground Science and Engineering (DUSE) Journal, Wiley.
2. Editorial Board Member, Smart Construction and Sustainable Cities Journal, Springer.
3. Editorial Board Member, Journal of Rock Mechanics and Tunnelling Technology (JRMTT).
4. Editorial Board Member, KeAi Journal, Elsevier (I.F. 4.996), Biogeotechnics Section.
5. Editorial Board Member, Scientific Reports, Nature (I.F. 4.996), Civil Engineering Section.
6. Editor of Special issue "Role of natural and anthropogenic factors in slope failures", 2022, Frontiers in Built Environment (IF/ CS: 2.6)
7. Review Editor, Frontiers in Earth Science (IF: 3.498)
2. Editorial Board member, Geotechnical Engineering (specialty section of Frontiers in Built Environment), Frontier, since 2022
3. Editorial Board member and Scientific Editor (Geotechnical Earthquake Engineering and Rock Mechanics), Journal of Rock Mechanics and Geotechnical Engineering, 2022-24, Elsevier (Impact Factor 4.338)
4. Editorial Board member, Indian Geotechnical Journal, Since 2022, Springer
5. Editor of Special issue on "Landslide: Forecasting, Assessment and Mitigation", Indian Geotechnical Journal, Springer 2020
6. Editor of Special Issue on "Nature-based Solutions in Geo-environmental Engineering", Sustainability (Impact Factor 3.271)
7. Editor of proposed book "'Predictive Models for the Development of Landslide Early Warning Systems', Elsevier
8. Editor of Proceedings of Indian Geotechnical Conference, 2021 and 2022
9. Editorial Board member for the Innovative Infrastructure Solutions Journal, springer since March 2015

Research Publications

- Publications: International Journals: 97 (Published), Conference Proceedings: 67 (International) 46 (National), Book Published: 1, Edited Books: 3, Book chapters: 21

- Patents: 2 Granted, 2 Published

Books

1. Published AICTE sponsored technical book titled "Geotechnical Engineering (Theory & Practicals)" for II year

Degree students (Link)

Edited Books

1. Pala Gireesh Kumar, Kolluru V. L. Subramaniam, S. Moses Santhakumar, and Neelima Satyam (eds) "Recent Advances in Civil Engineering", Proceedings of the 2nd International Conference on Sustainable Construction Technologies and Advancements in Civil Engineering (ScTACE 2021), Lecture Notes in Civil Engineering, Volume 233, Springer Nature Singapore, https://link.springer.com/book/10.1007/978-981-19-0189-8.
2. C. N. V. Satyanarayana Reddy, A. Murali Krishna, Neelima Satyam, and Ravikiran Vaidya (eds) "Dynamics of Soil and Modelling of Geotechnical Problems" Proceedings of Indian Geotechnical Conference 2020 Volume 5, Lecture Notes in Civil Engineering, Volume 186, Springer Nature Singapore, https://link.springer.com/book/10.1007/978-981-16-5605-7.
3. C. N. V. Satyanarayana Reddy, K. Muthukkumaran, Neelima Satyam, and Ravikiran Vaidya (eds) " Ground Characterization and Foundations " Proceedings of Indian Geotechnical Conference 2020 Volume 1, Lecture Notes in Civil Engineering, Volume 167, Springer Nature Singapore, https://link.springer.com/book/10.1007/978-981-16-3383-6.

Patents

Patents Granted:

1. Minu Treesa Abraham, Neelima Satyam and Biswajeet Pradhan, "Modelling Calibration of Friction Parameters for Debris Flow" Patent No. 2021106606 by the Commissioner of Patents on 10th November 2021, as an Australian Innovation Patent
2. Nitin Tiwari And Neelima Satyam "Process for Culturing Indigenous Bacteria for Treating Clays with Varying Plasticity to Improve Engineering Behavior" Patent application No: 2021105096

Patents Published:

1. Neelima Satyam and Meghna Sharma, "BioChem-Reactor for Biocementation and Method Thereof" Patent application No. 202021051658 (Filling date: 21/11/2020)
2. Neelima Satyam and Nitin Tiwari, "Ground Improvement Technique using Indigenous Bacteria for Biocementation of Expansive Soil Subgrades" Patent application No. 202021057003 (Filling date: 29/12/2020)

Professional Memberships

- Member: Technical committee 203 (TC-203) (Earthquake Geotechnical Engineering and Associated Problems) of International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE) (2022-2025)
- Life Fellow: Indian Geotechnical Society (IGS), LF 0615
- Life Fellow: Indian Society of Earthquake Technology (ISET), LF 61
- Life Fellow: Institution of Engineers India (IEI), F-1289205
- Executive Council Member: Indian Society of Earthquake Technology (ISET) for the terms: 2021-2023, 2023-2025
- Executive Council Member (Elected): Indian Geotechnical Society (IGS) since 2019
- Executive Member: Indian Society of Engineering Geology (ISEG) (Indian National group of the International Association for Engineering Geology and Environment) for the term 2020-2021
- Member: Technical committee 220 (TC-220) (Field Monitoring in Geomechanics) of International Society of Soil Mechanics and Geotechnical Engineering (ISSMGE) (2019-2025)
- Professional Engineer (Civil Engineering): Engineering Council of India (ECI), PE/01153/16
- Member: International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), IND090038, U.K. IND110155
- Member: International Society for Rock Mechanics and Rock Engineering (ISRRE), India, 406/IND/2021-2040
- Life Member: European Geosciences Union (EGU), 414793
- Member: International Geosynthetics Society (IGS), India, 9830
- Member: Earthquake Engineering Research Institute (EERI), M 13174
- Member: American Society of Civil Engineering (ASCE), M 974239
- Life Member: Indian Society of Engineering Geology (ISEG), LM 1511
- Life Member: Indian Concrete Institute (ICI), LM 8667
- Life Member: Indian Society for Technical Education (ISTE), LM 77045
- Life Member: Indian Science Congress Association (ISCA), L 18936
- Life Member: Association of Consulting Civil Engineers India (ACCE(I)), LM 2772; Executive member, ACCE Hyd chapter 2013-15

- Member: American Concrete Institute (ACI), 01223750

What is unique about working as a Woman in STEM compared to other fields?

Being a researcher in the field of Civil Engineering with over 15 years of experience in the field, I can confidently say that working as a woman in STEM is an incredibly rewarding and fulfilling experience.

One of the most positive aspects is the opportunity to challenge stereotypes and break barriers. As a woman in a traditionally male-dominated field, I have had the privilege of shattering preconceived notions and proving that gender does not limit one's abilities. By excelling in my work and achieving milestones, I inspire other women to pursue their dreams in STEM.

Diversity and inclusivity are strengths in STEM, and being a woman brings a unique perspective to the table. Our distinct experiences, approaches, and insights contribute to a rich tapestry of ideas and innovation. The collaborative nature of STEM fields allows us to work with diverse teams, fostering an environment where different viewpoints are valued. This diversity of thought ultimately leads to more robust solutions and breakthroughs.

I take immense pride in serving as a mentor and role model for aspiring women in STEM. Through mentorship programs and initiatives, I have witnessed the transformative impact of guiding and empowering young women. It is incredibly rewarding to witness their growth, see their confidence blossom, and observe them making their mark in the field. By providing support and encouragement, we create a strong network of talented women who uplift and inspire each other.

STEM careers offer numerous avenues for personal and professional growth. The field is constantly evolving, providing opportunities to learn and stay at the forefront of advancements. It is intellectually stimulating and fosters a spirit of curiosity and innovation. As a woman in STEM, I have been fortunate to contribute to groundbreaking research, engage in exciting projects, and make a tangible impact on society.

Moreover, being a woman in STEM allows me to contribute to the ongoing efforts of achieving gender equality and promoting diversity and inclusion. I actively participate in initiatives that advocate for equal opportunities, support women in their career journeys, and create an inclusive environment within our institution. Through my work, I strive to build a more equitable and diverse STEM community for the generations to come.

What are your key contributions to your work area?

Dr. Neelima Satyam is currently Professor in the Department of Civil Engineering at IIT Indore. She obtained her Ph.D. and M.Tech from IIT Delhi and B.Tech from SV University, Tirupati. She worked as an Assistant professor in Earthquake Engineering Research Centre, IIIT Hyderabad, before joining IIT Indore. She was a visiting researcher at the University of Stuttgart (2018) and at the University of Tokyo (2013). She is actively engaged in teaching, research and consultancy in the field of Geotechnical engineering, particularly in Geotechnical Earthquake Engineering, Microzonation and Site Response studies, Landslide hazard and monitoring, Microseismic data processing and Rock engineering. Dr. Neelima received research grants from DST, MHRD, AICTE, ITRA, DAE, NIOT, NRDMS, ISRO, and MoES. She published 150+ papers in International/National Journals and Conferences. Her research publications have received best paper awards from IGS, AGU, and IIT Indore. She is the Co-opted member of PAC Civil and Mechanical Engineering SERB, DST (2015-2018). She has been the Chairperson of the selection committee for MEXT Scholarships of Japan since 2015. She is a recipient of IEI Young Engineers Award 2011; BRNS Young Scientist Research Award 2011; AICTE Career award 2012 and JSPS fellowship in 2013, Young Woman Engineer award from INWES in 2012, CIDC Vishwakarma award in 2021, ISET Shamsher Prakash Mid-Career Research award 2022, and SERB - POWER Fellowship 2022. She is a fellow of JSPS, IGS, ISET and IEI, and she is presently the editorial board member of several reputed journals including Nature Scientific Reports (I.F. 4.996), Journal of Rock Mechanics and Geotechnical Engineering (I.F. 5.915) etc.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

My mother who is a teacher is my big inspiration. My family, teachers, professors, professional mentors, colleagues, and women in STEM have all inspired and supported me in pursuing a career in STEM. Their belief in my potential and their own remarkable achievements have been instrumental in shaping my path and fueling my passion for this field.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

In my professional journey as a woman in STEM, I have faced several challenging experiences and obstacles. These experiences have shaped my perspective and strengthened my resolve to overcome these hurdles. The main challenge is the awareness of negative stereotypes about women's abilities in certain STEM fields created additional

pressure to perform. The fear of confirming these stereotypes or being judged based on them was a constant concern especially in CIVIL engineering. I countered this by embracing a growth mindset, seeking opportunities for professional development, and focusing on my own progress rather than external expectations

Here are some more challenges I have encountered:

- The lack of female representation, especially in leadership positions and as role models, has been a significant obstacle. It was challenging to find mentors who could provide guidance based on shared experiences and envision a clear career path. To overcome this, I sought out opportunities beyond my immediate environment, connecting with women in STEM through professional networks and mentoring programs.
- Achieving a balance between my professional responsibilities and personal life has been an ongoing challenge. The demanding nature of research, teaching, and administrative duties often made it difficult to find time for personal pursuits and family commitments. Striking a balance required effective time management, setting boundaries, and seeking support from loved ones.
- Building professional networks and gaining visibility in the field was a challenge, particularly in male-dominated spaces. It was sometimes difficult to establish connections and gain recognition for my work in such environments. I proactively sought opportunities to attend conferences, present my research, and collaborate with colleagues to expand my network and increase visibility.

What is your advice to next-gen women science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

As a person who is working in the STEM field, and reflecting on my own experiences in the early phase of my career in the STEM field, here is my advice for the next generation of women scientists:

- Follow your passion and explore the areas of STEM that genuinely interest you. Discover what ignites your curiosity and fuels your drive. Embracing your passion will not only make your work more fulfilling but will also provide the motivation to overcome obstacles and excel in your chosen field.
- Find mentors and role models who can guide and support you in your career. Look for individuals who have experience in your specific field of interest and can offer valuable insights and advice. Their guidance can help you navigate the early stages of your career and provide valuable perspective and support.
- Networking is crucial in the STEM field. Connect with like-minded individuals, both within your institution and in professional networks. Attend conferences, seminars, and workshops to meet people in your field and build relationships. Your network can provide opportunities for collaboration, mentorship, and career growth.
- Embrace a growth mindset: Adopt a growth mindset and approach challenges as opportunities for learning and growth. Understand that setbacks and failures are a natural part of the journey. Learn from them, adapt, and persevere. Cultivating a growth mindset will empower you to overcome obstacles and continue progressing in your career.
- STEM fields are constantly evolving, so it is crucial to stay updated with the latest advancements. Invest in continuous learning through courses, workshops, conferences, and staying abreast of current research. This commitment to ongoing education will keep your skills sharp, expand your knowledge, and open doors to new opportunities.
- Have confidence in your abilities and believe in yourself. Recognize your unique strengths and the value you bring to the table. Surround yourself with a supportive community that reinforces your self-belief and encourages you to reach your full potential.
- Be your own advocate and ensure that your achievements and contributions are recognized. Share your goals, aspirations, and accomplishments with supervisors, mentors, and colleagues. Take initiative and seek out opportunities for growth, such as challenging projects, research collaborations, and leadership roles.
- Embrace collaboration and value diversity in STEM. Recognize the power of diverse perspectives and experiences in fostering innovation and problem-solving. Seek out opportunities to collaborate with individuals from different backgrounds and disciplines, as this can lead to unique insights and transformative breakthroughs.

Remember, the journey in STEM may have its ups and downs but remain resilient and persistent. Stay true to yourself, seek support when needed, and never stop learning and growing. By embracing these principles, you can forge a successful and impactful career in STEM while inspiring others along the way.

Ms. Neha Kailash Nawandar

Post-doctoral fellow, Department of Electrical Engineering

Indian Institute of Technology Delhi

I am Neha Kailash Nawandar, and I hail from Amravati, the second-largest city in the Vidarbha region of Maharashtra. I am a post-doctoral fellow in the Department of Electrical Engineering at IIT Delhi, working on the project "Simultaneous localization and soil moisture mapping for agricultural applications." Before this, I held the position of Adhoc Assistant Professor in the Department of Electronics and Communication Engineering at VNIT Nagpur, where I primarily taught fundamental Electronics Engineering courses.

I obtained my Ph.D. in December 2020 on "IoT-based end-to-end adaptive control for smart irrigation" from VNIT Nagpur, where I was a Visvesvaraya Ph.D. scholar and my Master's in VLSI Design from ABV-IIITM Gwalior in 2015 with the second-highest rank in my specialty. I completed my Bachelor of Engineering in Electronics and Communication Engineering in 2012. In addition to being a member of IEEE, I've published in reputable journals, conferences, and book series.

What is unique about working as a Woman in STEM compared to other fields?

We create. We design. We develop. We transform ideas into reality. We empower ourselves and all the women. Most importantly, we offer young girls the confidence that women are as important and capable of making ground-breaking discoveries in the domains dominated mainly by men.

What are your key contributions to your work area?

I work in agro-informatics with a focus on designing agricultural monitoring systems and software and graphical user interfaces (GUI) for end-user applications. I have created an end-to-end system with a distinctive design that merges user demand and crop-specific data to output irrigation requirements. The system combines ground contact and non-contact sensors, evapotranspiration (ET), soil, crop characteristics, and nearly all environmental variables influencing crop irrigation needs. However, it was discovered that the contact sensors disturb the soil after months of operation and offer information at the point level, which is most appropriate for a small target area. It can be expanded to large farms using remote/ proximity sensing techniques. Such non-contact sensor-based mapping is the key to helping smallholder farmers. I am currently working on estimating soil moisture utilizing non-contact sensors and remote sensing techniques.

I have developed a low-cost 4-band Multispectral camera (MSC) using off-the-shelf components that records information in various spectral bands focusing on the vegetative information and can do near real-time analysis on the obtained data. Using GUI/ geographic information system (GIS) based plugins, information from MSC and satellites is processed and evaluated. I have also developed two such plugins for the open-source GIS software QGIS that are accessible online. They are available at https://github.com/nehakn. Some of these works are translated into journals, conference proceedings, and book chapters, and a couple have been lately communicated.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

My parents, sister, and grandparents have always inspired me, and I would not be the person I am today without their unwavering support. Regarding my work choice, I would say that my grandfathers were instrumental. My paternal grandfather was associated with and involved in the management of various educational institutions during his lifetime. He constantly encouraged me to enter a technological career and achieve the finest academic degree possible, and he was never bothered by what society thought. On the other hand, my paternal grandfather is a farmer by choice, recognized by the Maharashtra government, who has devoted his entire life to his farms. So, I

intended to become an engineer and pursue my research in agro informatics, which I did as a full-time Visvesvaraya scholar during my doctoral study and continues to this day. My Ph.D. advisor, Dr. Vishal Satpute, and my current mentors, Prof. Shaunak Sen and Prof. S. Janardhanan, have also contributed to my development. They have always trusted me, which has greatly encouraged me. I am grateful to have supporting individuals in my life.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

I came across some researchers working in a similar domain and found their work intriguing. However, it was challenging to communicate with them because most of my emails went unanswered. Beginning the journey was somewhat difficult and was primarily delayed due to a lack of response. I received only a few responses and had a conversation, but in some places, my marital status seemed to be an issue. My unmarried status gave them the idea that I may depart at any moment, which would halt their research, so it is a waste of time, resources, and energy to invest in such a candidate. I believe such an issue won't tag along or cross their minds if it were an unmarried male researcher.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

If there is one thing that I believe is superior to achieving the required outputs, performing flawless simulations, or achieving what was anticipated, it is identifying where you are going wrong as soon as possible. This will expedite your research and prevent you from falling into a loop. Knowing our mistakes ensures we will never repeat them, indirectly preventing our research from going in the wrong direction. This is achievable if we collaborate. So, begin early. Contact researchers/ academics working in a similar research area, maintain contact with them, and attempt to form a research group/ collaborate. Also, be bold and express your viewpoint. You may believe it doesn't matter, but it does!

Ms. Neha Misra

Technical Director

Cummins India

Some of my notable achievements are Patent on microgrid published, one in filling on Genset controls (Digital Twin) and Publications in National Conferences like Systems Society of India.

What is unique about working as a Woman in STEM compared to other fields?

STEM is a creative field, where we create products to solve real problems and most often improve the standard of living. To me, it is closer to magic and like conjuring the solution that was sometimes not even asked or thought of– as women, we bring in the understanding of the problems, able to articulate the customer wants and needs and then try to solve the same, through a different perspective. Initially, there were fewer women and many stereotypes, around women in STEM but with time and consistent demonstration of good work by women engineers the divides are blurring. Historically other fields were conducive for women workforce but now with smarter products and the infrastructure, the industry is ready for women engineers.

What are your key contributions to your work area?

a. **ISRO** – design and validation of upper atmospherics stages of launch vehicles (cryogenic engines) in PSLV and GSLV (13 operational launches)

b. **Eaton** –
   i. Design and validation of the microgrid controller
   ii. Modeling and simulations of hydraulic and aerospace power management solutions.
   iii. Complete controls development for hybrid and electric vehicles for Asia Pacific region from requirements to integration.

c. Cummins
   i. Systems simulation capability development for BS VI engines, CPCB4+ engines and off highway BS IV engine applications.
   ii. Corporate shared service strategy and automation.
   iii. DBU - development of dual fuel kits for retro fitment, alternate fuel engine, digital strategy for genset application.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

Family- my parents have been the strong support as they let me study in different cities, 25 years ago for a career which was male dominated.

- My personal passion towards science and magic made me naturally take engineering.
- My mentors – who always guided me to improve myself.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

a. Place on the table – to be heard and acknowledged was the first step and then eventually drive the discussions.

b. Prove twice that you are a good engineer and a professional.
c. Respecting personal milestones, which are still mostly borne by the women more, in our society.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

a. Be you. There is a reason you are hired and are there for that role.
b. Keep upskilling yourself and stay relevant.
c. Bring your authentic self to work.
d. Ask questions and seek feedback.
e. Network, create your ecosystem.

Prof. Nidhi Jain

Professor Department of Chemistry
Indian Institute of Technology, Delhi

Associate Dean (Faculty) IIT Delhi
- April 2020- October 2021

Professor-In-Charge, University of Queensland - IIT Delhi Joint PhD program
- June 2019-continuing

Professor, Department of Chemistry, IIT Delhi
- June 2014-May 2019

Associate Professor, Department of Chemistry, IIT Delhi
- December 2010-May 2014

Assistant Professor, Department of Chemistry, IIT Delhi
- July 2008-November 2010 Amity University, Noida, India

Assistant Professor, Amity University, Noida
- Oct 2005-March 2008 University of Rhode Island, RI, USA

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)
- Member of Early Career Advisory Board, Science of Synthesis, 2022-2024.
- CRSI Bronze Medal by Chemical Research Society of India, 2022.
- CRSI Bronze Medal by Chemical Research Society of India, 2022.
- Invited Speaker, Gordon Research Conference on Heterocycles 2019, USA
- Visiting Professor University of Lille, France, June 2017.
- D.K. Banerjee Memorial Award: IISc Bangalore 2017.
- Teaching Excellence Award 2014: UG teaching.
- Outstanding Young Faculty Fellowship 2011-2013.
- DST Young Scientist Award 2012.
- Tetrahedron award for the top 50 most cited articles in 2007-2008.
- Best poster award at 232nd ACS meeting, Sept 2006, SFO, USA.
- CSIR-NET JRF qualified 2001.
- Second position in M.Sc. Chemistry, DU, 1998-2000.
- First position in B.Sc. (H) Chemistry, DU, 1995-1998.
- T.R. Sheshadri Memorial Award: first position in Delhi University in B.Sc. (H) Chemistry 1999.
- Science Talent Scholarship for academic excellence in B.Sc. and M.Sc., 1995-2000.

What is unique about working as a Woman in STEM compared to other fields?
It is a bit more challenging as you are working in a male dominated area and competing against male colleagues who

are in a more advantageous position.

What are your key contributions to your work area?
I am a synthetic organic chemist who works in the following areas:

- **C-H bond functionalization in hetero (aromatic) systems**

In the last one decade, our research has crystallized into new strategies for activation and functionalization of C-H bonds in heterocycles and small organic molecules. We have developed efficient methods for constructing C-C, C-N and C-S bonds through copper and palladium catalysed direct C-H activation as well as chelation assisted model. Regioselective alkylation, acylation, thioalkylation, thioarylation, and amination of biologically potent molecules has been demonstrated.

- **Visible Light and Photoredox chemistry**

From the perspective of contributing to sustainable chemistry, we have developed visible light assisted synthetic methods with and without photocatalysts. From regioselective functionalizations like thiocyanation, halogenation and acylation of heterocycles to ring opening via dual C-C and C-N bond cleavage, a diverse range of reactions has been explored. We have also demonstrated photocatalyzed dehydrogenation of aliphatic N Heterocycles, linear amides and carbamates. Visible light mediated generation of p quinone methides, and their use in multicomponent coupling reactions for constructing tetrasubstituted carbon stereocenter has been developed. All these methods allow access to molecules of high synthetic and commercial value.

- **Medicinal chemistry**

We are also invested into metal-free synthetic strategies using molecular iodine and hypervalent iodine reagents that can offer alternative strategies to medicinal chemists for oxidative synthetic transformations. We have prepared a library of oxazolidinones with fused heterocyclic C-ring substructure as effective antibacterial agents. The protocols developed in our research group have enabled expansion of three-dimensional chemical space for drug discovery, and provide rapid, efficacious, and cost-effective means for synthesis of potential therapeutic agents.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
I have always been inspired by my mother who motivated me to pursue a career in the field of academic sciences. She's constantly been my biggest supporter and her encouragement led me to this path.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
For over a decade, I have been the only woman in the chemistry department at IITD, which is over 30 faculty strong. With the lack of representation and other female colleagues, I have often faced insensitivity and had to adjust to an overly male-dominated space.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
My advice to up-and-coming women in STEM would be to always believe in themselves and their own strengths and abilities. It is inevitable that we will be judged, and while change is occurring, it is certainly slow. Therefore, it is imperative to be cognizant of one's own talents, dedication and to never lose sight of why we started in the first place. Furthermore, women should always uplift each other, and we must become each other's biggest supporters.

Ms. Nidhi Tulsiyan

Senior Technologist, Process Technology Group

Tata Steel Limited

I am a Senior Technologist in the Process Technology group, Tata Steel. Prior to this, I worked as a Business Analyst in the field of blast furnaces. I was also part of the Quality Assurance team for Rebar Mills where I had the opportunity to work for NatSteel, Singapore. Born and brought up in Sasaram, Bihar, I did my schooling from St. Paul's School and currently reside in Jamshedpur, Jharkhand.

I am a B.Tech. from IIT Kanpur in Material Science and Metallurgical Engineering.

I was recognized with the Best Impact Centre Award for Hot Metal and Value Maximization Impact Centre, APEX award for BREX usage at Blast Furnaces and usage of sinter return fines at Blast Furnaces.

What is unique about working as a Women in STEM compared to other fields?

Working as a Technologist gives me the highest level of satisfaction, in terms of pursuing what I have learnt and dreamt of. I would like to specially mention that Tata Steel is an excellent organisation for women who aspire to work in the STEM area. Having strong ethics and values, the organisation highly supports women employees through its various policies.

What are your key contributions to your work area?

- Coke dry quenching dust usage to increase mean size of coke.
- Usage of plastic in coke making – a sustainable action
- Business case formulation for BREX and sinter return fines at Blast Furnaces

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

- My grandfather and brother have always taught me to have a strong value system and inspired me to dream big.
- Mr. Vinit Shah (COMLP, Tata Steel) and Mr. Anup Kumar (Chief Scientific Services, Tata Steel) have provided me with the necessary guidance to excel in my professional life.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

- Being a new mother, at times it becomes difficult to prioritize things. At the same time, motherhood has helped me stay positive during demanding situations.

What is your advice to next-gen women science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

- Earn a Masters' degree (although it took me considerable time to realise this)
- Put maximum effort and dedication to work – regardless of your role and designation. Hard work really pays off.
- Never underestimate yourself, all of us have immense potential.

Ms. Nirmala Raju

Vice President, Head of Biosimilar Product Development

Dr Reddy's Laboratories Ltd, Hyderabad

I am Nirmal Raju, Vice President, Head of Biosimilar Product Development, Dr Reddy's Laboratories Ltd, Hyderabad. I am born and brought up from Chennai, Tamilnadu. I am in Residing in Hyderabad, Telangana. I have over 20 years of industry experience and 8 years of research experience.

- Current Job- Leading a team of 200 + research scientists and engaged in developing Biosimilar therapeutics to meet the unmet needs of the patients.
- Past jobs- played several roles including End to end product development, Process Development, leading Preclinical Biology, Analytical and Bioanalytical functions, Regulatory Affairs, Development Quality Assurance, Vaccine development, Discovery Research

Academic qualifications (mention details of institutes and universities)

- Ph. D in Biochemistry/Biotechnology,1997, University of Madras, Chennai
- Post-doctoral fellow at MD Anderson Cancer Institute, Houston USA, 1998-2002

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)
Fellowship:

- GATE/CSIR- Ph.D program
- Awards: Women Leadership Excellence Award, Dr. Reddy's Laboratories Ltd
- Chairman for Institutional Biological Safety Committee and Institutional Animal Ethics Committee.

- **Research Publications: 20 + publication in international journals, few listed below.**
- Auro Viswabandya, P.V. Prashanthi, C.Nirmala Raju, Reena Rajsekhar, Vikram Mathew,Shivkumar Madki, Dhiraj Abhayankar, Rukmini Kethireddypally , Biju George MD, Mammen Chandy MD, Cartikeya Reddy, Alok Srivastava. Pharmacokinetic and Pharmacodynamic Evaluation of a Biosimilar Rituximab in Newly Diagnosed Diffuse Large B-Cell Lymphoma (DLBCL) Treated with R-CHOP (Rituximab, Cyclophosphamide, Adriamycin, Vincristine, Prednisolone).Blood, Volume 110, Issue 11, 16 November 2007, Page 4491
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What is unique about working as a Woman in STEM compared to other fields?

Research suggests that women in STEM perceive a less positive and supportive culture in comparison to other fields. Lack of critical number of women in STEM fields, especially at senior levels, makes the women at entry level vulnerable to gender conservative men Competitive demands of STEM workplaces compared to other fields.

What are your key contributions to your work area?

1. Being a critical member involved in the first global Biosimilar monoclonal antibody developing by - Functional assessment and clinical bioanalysis.
2. Lead the development of multiple monoclonal antibody pipeline molecules, progressing to approval and few entering clinical trials.
3. Established the first Bioanalytical lab in India.
4. Introduced of new technologies to support the biosimilar development.
5. Talent development and coaching, building functional organization.
6. Creating and establishing new functions- Regulatory Affairs, Formulation and Autoinjector

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

1. Mother played a key role in inspiring me to study.
2. Friends who supported my journey
3. Ph.D and Post-doctoral supervisors
4. Managers who challenged me and provided me opportunities.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

1. Limited female scientist and fewer role models to inspire.
2. Women under-represented at senior position in Scientific role.
3. Have to be exceptionally good to succeed and constantly prove your ability.
4. Working hard and fighting the culture surrounding women in science
5. Contributions getting ignored, sometimes feel unheard.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

1. Have to be technically and scientifically strong.
2. Be confident and authentic
3. Speak Up for yourself
4. Invest in peer networks
5. Having a mentor and understanding the salary (wished I had known when I started)

Dr. Nitika Agarwal

Associate Professor of Mathematics

IISER Bhopal

I am an Associate Professor of Mathematics at the Indian Institute of Science Education and Research (IISER) Bhopal. I was born and raised in Faridabad, an industrial town in Haryana. I did my schooling in Faridabad. I earned my bachelor's in mathematics from Lady Shri Ram College for Women, University of Delhi. I completed my master's and Ph.D. in Mathematics from the University of Houston, Texas, USA. I was awarded for best academic performance each year during my Bachelors.

I received a teaching fellowship for academic excellence from the University of Houston. My PhD research work was supported by the National Sciences Foundation, USA. I have several publications in peer-reviewed international journals and have secured extramural research funding. In the past, I have been the Head of the Department of Mathematics and served as the Dean of Faculty Affairs at IISER Bhopal.

I am a member of the Executive Committee of the Indian Women in Mathematics (IWM), whose activities are funded by the National Board for Higher Mathematics (NBHM), Department of Atomic Energy (DAE) and supported by the Committee for Women in Mathematics (CWM), International Mathematics Union (IMU).

I am also a member of the NBHM Research Grants Committee for the research proposals submitted to NBHM for funding. It makes recommendations for awarding Research Project grants and formulating policies governing the programme.

What is unique about working as a Woman in STEM compared to other fields?
There are fewer role models for women in STEM to derive inspiration from. Also, women in STEM must work much harder than in other fields to make themselves noticed, prove their competence, or be taken seriously. The committees for hiring faculty and funding research funding mostly comprise men, sometimes making it challenging for women to succeed to their full potential.

At the same time, the factors that make it harder for women to succeed in STEM provide an opportunity to show their mettle and be an example for aspiring young women to overcome their hesitation in opting for STEM subjects.

What are your key contributions to your work area?
I work in Ergodic Theory and Dynamical Systems, which cuts across various theoretical areas of Mathematics. India is underrepresented in this branch of mathematics. I am one of the select group of mathematicians in this area. I have published my research in leading journals of mathematics and developed several UG and PhD levels courses in this area. I have contributed to popularizing this area by way of mentoring students at both master's and Doctorate levels, designing and teaching courses, and also disseminating knowledge through giving both popular and research-level talks.

I am also a member of the Executive Committee of Indian Women and Mathematics (IWM), a collective of mathematicians that has been in existence for over a decade now. Through these activities and roles, I have encouraged women to pursue higher education in mathematics and provide an environment, and exposure to new trends, that enable them to take up careers in mathematics. I have been trying to popularize mathematics not only at IISER Bhopal but also at college and state university levels. I have actively participated in discussions on issues that women in mathematics face and the opportunities available to them.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

I have always enjoyed solving mathematical puzzles. Mathematics was my favourite subject during school. My teachers never let gender discrimination come in the way of their teaching. All this motivated me to think of Mathematics for undergraduate studies. Yet, my choice of Mathematics at the bachelor's level was without a long-term goal to study the subject – it was merely based on my liking for the subject. To my surprise, I found that Mathematics at college was very different from what I knew about the subject at the school level. I discovered that Mathematics is more about abstraction at the college level. It is no longer about solving problems using a given set of formulas but about understanding concepts. I really enjoyed the abstraction and logical structure of mathematics. So much so that by the end of my Bachelors, I was sure to pursue an advanced degree in Mathematics. I was fortunate to have excellent professors who exposed me not only to newer dimensions of Mathematics but also to good books and research literature. My parents have always supported me in all my career choices and have been there for me both at the time of achievement to cheer me up and motivate me during the phases of self-doubt.

What were some challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

One of the challenges is to deal with a prejudiced mindset at work. Women seem to have to be comparatively more competent and productive to get attention and appreciation compared to male colleagues. On several occasions, I have noticed that the achievements of women in STEM are attributed to their gender rather than competence. In more recent years, post-marriage, it has been a challenge to keep pace with the productivity of male colleagues due to childcare and family responsibilities.

What is your advice to next-gen women in science in the or initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

It is important to choose a career path of your choice. If you are passionate about any of the STEM fields, go for it. Do not undermine your capabilities by falling prey to common misperceptions about women via-a-vis the STEM. If you have conviction and reasons to believe you are meant for a STEM subject, you can convince your family about your aspirations. Make good use of family, friends and teachers' support to overcome the challenges that will come your way in your professional journey. Specifically for women in STEM doing academic research, it is vital to establish research collaborations. Identify a role model whose career journey inspires you and who can also serve as your mentor. Based on my personal experiences, I would like to advise early-career women in STEM not to let negative experiences pull you down. This is a part of growing in any profession.

Ms. Padmini Anoor Ramesh

Engineering Operations Leader, GE Aerospace, Bangalore Engineering Centre

John F Welch Technology Centre, GE India Industrial Pvt, Ltd.

I was born in a small village in Karnataka, in Chikkamagalur known for growing coffee. I completed all my education in the small town nearby. Growing up I saw my grandfather build equipment and machinery required for coffee farming and processing. He engineered standard equipment available on the market to suit his needs. This inspired coming generations to be hands on. Choosing to be a mechanical engineer was natural for me.

Notable achievements (awards, fellowships, memberships of scientific academies etc.

- GM award for delivery with focus.
- Women in Learning and Leadership

Who inspired you to take up this field as a career option (mention, friends, siblings, professional mentors, etc.)?

Given this space has always had very few girls, it pushed me to be independent and efficient as a student and in my early professional career.

The culture at the workplace has always been very inclusive and celebrates diverse constitution of teams. This has fostered varying interests and abilities which has helped me grow further as a professional and as an individual

What events, incidences encouraged you in your professional growth (any anecdotal experiences)?

GE has invested in developing leadership abilities during every step of the career junction. This has always inspired me to think about how we can be best versions of ourselves and deliver the outcomes needed for business. Several leaders I have worked with have shown the value of networking. They have invested in me to take up tough challenges and that has taught me to do the same for my teams. One such incident very early in my career was when I was asked to lead a large team and work with cross functional experts to deliver a project. Given it was a global project, it taught me how to deal with different cultures and build networks across time zones. This has helped me become a more mature professional in the days to come.

What were some of the tough experiences or barriers you faced in your professional journey as a woman?

I was amongst very few women to take up mechanical engineering as a field of choice. This allowed me to break the stereotype that women cannot be successful in this industry. In my early career, I worked on the shop floor in a small mechanical firm in very uncomfortable working conditions. While I always had an option to switch domains, my perseverance paid off and I was able to make it count with job opportunities in my domain.

Once I joined GE, the culture at the workplace has been conducive and fostering my growth. This has helped me take on responsibilities in my professional career even as I have had an enriching growth on the personal front as a mother of two young girls. I believe this has allowed me to be a role model for my daughters and provide them encouragement that women can pursue whatever they wish to.

What are your key contributions to your work area?

I have played multiple roles over the past 19yrs of which 17yrs has been with GE India. Today, I lead the entire operations effort for an Engineering team of 500+ engineers at the India Centre. As part of this role, I am responsible for enabling the team to deliver business impact on new engine program, Services & in region customer support, and

technology development for future sustainable aircraft engines.

In my previous roles, I have been part of Gas turbine components engineering for various new product development and sustaining established fleet. I was leading a team of engineers working on one of the Indian Government funded program to develop Microturbine for aerospace application with IIT Madras where the entire product was developed, and prototype tested in India in collaboration with prominent research labs and academia. https://www.financialexpress.com/defence/make-in-india-iit-madras-and-ge-aviation-innovation-programme-goes-for-testing/2569409/

I have also led efforts for External collaborations for Bangalore Engineering team working on aerospace technologies. Exploring collaboration opportunities with Indian academia, research and industrial bodies. I have led efforts to establish a state of art Additive Manufacturing centre with Tamil Nadu government Called TAMCoE (Tamil Nadu Additive Manufacturing Centre of Excellence) Stalin launches TAMCoE set up by GE Aerospace

What is your advice to next-gen women who wish to be in leadership roles?

- Be authentic: Find your area of interest and motivation.
- Persevere: Never let stereotypes and barriers stop you
- Build your network of support: Never shy away from asking for help. Find the mentors, and coaches who help you with different aspects of personal and professional needs
- Enjoy: Never forget to enjoy the journey!

What's your advice for women who wish to take up a career in your field?

There are many challenges to solve in today's world that require engineering skills. While we tend to explore newer ways to exploit resources to support us, I believe that we should do the following:

- Have diverse thinking to come up with solutions that are sustainable and is progressive rather than destructive for future generations.
- Well-rounded solutions can come from people from different kinds of background.
- Develop system level thinking and ability to develop long term solutions to problems.

What more needs to be done at the policy level by the government/ Private sector to attract more women into STEM careers?

- We have made significant progress as a country and the opportunities that exist are amazing.
- Having said that, in my view we can do the following to further build on this in the years to come.
- To begin with, there is a need to have policies and incentives that enable foundation education for girls.
- Have attractive financial schemes to enable rural families to support girls' education.
- Remove biases against societal thinking around specific jobs "for women". This can be best done by women who are already in this field

Additionally, while workplaces have come a long way in being intentional about including women in workforce, we continue to see a lot of women drop careers under the burden of having to take lead responsibility to nurture families. They take the burden to bear and care for young children While corporates must provide support to women through these phases, concept of men taking on equal responsibilities towards families need to be encouraged. Equal paternal leaves, Flexible work arrangements for men and women to tend to family needs, sets right examples for future young women to make bold career choices.

What are some of the shortcomings in how STEM is being taught and how can we improve?

While education curriculums have improved over the years, there is a need to make education less theoretical and more practical in nature. Using real life challenges and ways to overcome needs to be a part of the curriculum. Children should be encouraged and made to feel the urge to find solutions for everyday problems. They should be encouraged to be aware of ways in which solutions are engineered, the successes and shortcomings of the same.
Lastly, we need to encourage people to learn from and accept failures. This allows them to face the corporate world better and ensure better success in the long term.

Ms. Pallavi Arora

Vice President, APJC Customer Experience Centers

Cisco Systems India Pvt Ltd

Some of my notable achievements are Wequity for Women and Technology Solidarity Idol Award and Ex-Board member of IGDTUW (Govt Women Engineering University in Delhi).

What is unique about working as a Woman in STEM compared to other fields?

The first thing you notice that the ratio of Women to Men is very small in STEM careers. Having started my career in the IT industry in 1990 – very few women pursued Engineering but most importantly a handful pursued career seriously with passion to succeed. Many of my women classmates dropped out of jobs once they had kids or even if they stayed in job, they felt the need to slow-peddle on their career vis-à-vis their family life. This was unique to STEM since unlike other careers prevalent then – Banks, teaching jobs, etc. there is no fixed work time and especially if they are in IT industry there are long work hours which can be a challenge for women in STEM.

What are your key contributions to your work area?

1. Lead product engineering teams in India and built product from scratch for India Market which was later taken to global Market.
2. Today I lead a team of 6000 technical professionals across APJC working in 4 countries – Japan, China, Australia, and India that deliver services to Global customers for Cisco.
3. Establishing Women ERG (then called Women Action Network) in Cisco in 2006 (almost first one in IT industry in India) which focused on helping women in tech pursue successful career. I was approached by many other IT companies like HP, Philips and even Nasscom women wing to consult and help them establish their own Women EROs.
4. Conducted workshop for Nasscom Women wing on how to handle various challenges as working women in IT.
5. One of the very first Advisor to Anita Borg institute that started hosting Grace Hopper conference for Women in IT and actively participated as woman speaker at their conference, committee member in selecting the various proposals from different IT companies.
6. Keynote speaker at IEEE WIE (Women in Engineering) conference.
7. Executive Sponsor for Women of Cisco for APJC region.
8. Increased diverse hiring at early in grade from 25% to 50% by taking a new path of not recruiting for traditional Ivy league universities like IITs, NITs (the diversity in these universities is very low) and seeking to nurture Women only Engineering colleges (IDTUW, Cummins college Pune and Banasthali University) and hiring from 23 states in India from Tier-2/3 cities.
9. Ran many Mentoring, sponsorship initiatives for Women to help in retention and growing of Women.
10. Nurtured and grew many Women Senior Technical professionals and Leaders.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

My cousins who themselves were Engineers, my working Mom as my role model and my fabulous father who nurtured and encouraged me to pursue Engineering and aim for a successful career and of course numerous mentors at work and outside who challenged and nurtured me to help me build the skills to get to where I am today.

What were some of the challenging experiences or obstacles you faced in your professional journey as a

woman in STEM?
Quite a few needless to say. At all times I felt people underestimated me which I converted into my strength. I had to walk out of my first marriage with a young child because my then husband wouldn't support his working wife, making it very hard for me to pursue a successful career. I was a single mom for 9 years, and I decided to take the risk of moving to the US to get a better exposure and learning which really paid for me. Through the journey I took many risks, it was a lot of struggles to manage work, find time for continuous learning and upskilling and be a mom to my kid. With the help and encouragement from mentors at work and friends, I was able to plough through. I had my share of great Managers who believed in me more than I did in myself and my equal share of Managers who felt threatened and tried to not give the right exposure/platform to grow. Of course, eventually I remarried and have a fantastic supportive husband which was very much required as one grows in leadership ladder where you need to clock late night hours, international travels etc. which I could not have done it without support from him and family.

As you try to get into leadership roles there is still a lot of apprehension about hiring women into roles. I have been asked questions which I doubt any men were asked – will you be able to travel, will you be able to take late night meetings, how will you balance work and life etc.

I figured how to work smarter than harder (since I don't have as much time as my men colleagues), knowing how to prioritize and learning how to identify what is most important. Networking has been a huge help.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

First and foremost be passionate about what you want to work on and not treat your career like a 9 to 5 job. Find the right partner and have your family and friends support you to be able to strike the right balance. Enjoy continuous learning, take a lot of risks earlier in the career, explore different roles – that is how you find the role you like the best. Understand your likes, strengths, your blind spots – Know yourself. Enroll as many mentors as possible you can get – network, be curious and experiment without fear of failure – you learn more from failures than successes.

Dr. Pooja

Principal Scientist

CSIR

I am currently working as a Principal Scientist at CSIR-Central Scientific Instruments Organisation, Chandigarh. My major job role is research and development in the domain of sensor and catalysis for energy and environment. I am working towards developing new materials, studying their fundamental properties, and addressing their techno-commercial aspects and possible integration into commercial products in the above domains. I am also a passionate science communicator and is engaged in various science outreach activities under CSIR-JIGYASA, and INYAS programs for motivating school and college students including girls for science. I was born in Birbangra, a small village in Kaithal District, Haryana and brought up in Dhandh, Kaithal. Later, my family moved to the Kurukshetra district for my education.

I have done my early school education at Tagore Public School, Dhand, Kaithal and then from Gita Niketan Awasiya Vidyalaya, Kurukshetra. I did my B. Tech in Biotechnology from the University Institute of Engineering and Technology, Kurukshetra University and M. Tech in Nanotechnology from the Indian Institute of Technology, Roorkee. I completed my PhD in Engineering (Materials) from the Academy of Scientific and Industrial Research (AcSIR), New Delhi.

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

My work is aligned to UN Sustainable Development Goals (SDGs) i.e. clean water and affordable and clean energy. I engineer materials and translate them into products for water quality testing, hydrogen production from wastewater, and indoor air purification. Our research work is recognized in terms of several awards and fellowships including CSIR-Raman Research Fellowship, NASI Young Scientist Platinum Jubilee Award (2021), IEI Young Engineer Award (2021), INAE Young Engineer Award (2020), SERB Women Excellence Award (2020), Young Associateship of Indian Academy of Science (2019-22), Haryana Yuva Vigyan Ratan Award (2019), Young Scientist Award (2019) from Indian Science Congress Association (ISCA), Young Scientist Award (2019) from International Society for Energy, Environment and Sustainability, IUSSTF Water Advanced Research and Innovation (WARI) fellowship (2017), Canadian Commonwealth Fellowship (2010), etc. I am also young associate/member of major national academies of country including INAE, IASc, and NASI. I am currently serving as core committee member of Indian Young National Academy of Science (INYAS), INSA, New Delhi. I also represented India in several international platforms including BRICS Young Scientist Conclave and Shanghai Cooperation Organisation (SCO) Young Scientist Conclave as an selected young scientist in domain of environment.

What is unique about working as a Woman in STEM compared to other fields?

Women are known for their creativity, teamwork spirit, sincerity, managerial skills, and empathy. I think women can exercise these characteristics in STEM careers, which are also very much important in STEM for achieving a bigger goal for a larger benefit to society. Besides, as a woman in STEM is also challenging especially because networking is an important key here which many women don't engage in it.

What are your key contributions to your work area?

As a trained materials scientist, I have contributed towards developing functional and catalytic materials for water pollutants detection and green hydrogen generation/air purification, respectively. Our research work has resulted in the development of field kits and portable devices for water quality monitoring, especially heavy metals, and residual chlorine. In addition, the catalyst developed by our group is shown for wastewater to hydrogen generation, photoelectrochemical water splitting as well as wearable devices development for air purification/SARS CoV-2 deactivation. We are currently focusing on 2D materials (especially MXenes) based catalyst design for green hydrogen generation as well as indoor air purification, studying their fundamental, techno-commercial and scaling

aspects for integration to the devices/systems.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

My early inspiration has been from my family i.e., my father, Sh. Shivdutt Sharma, for creating my interest in education. Being from a middle-class family, he always emphasized Education as Key to Success. While choosing STEM, I was very much influenced by TV programs (Turning Point and Nano Ki Duniya) as well as science columns by Professor Yash Pal in newspapers. My husband, Dr Praveen Kumar, has been a strong support system as he always inspired me to not give up and taught me skills of patience and perseverance, which are very much needed for Women in STEM.

I have also been guided/influenced by several faculties including Ms. Meenu (GNAV, Kurukshetra), Dr. Pranay Jain (UIET), Prof. P. Jeevanandam (IIT Roorkee), Sh. Anil Srivastava (IIT Roorkee), and Late Prof. Vijaya Aggarwala (IIT Roorkee), are a few to be named. My current director Prof. S. Anantha Ramakrishna has given me direction to have focused work for vertical growth, have a strong character, and also expand networking. Many of my friends at the Indian National Young Academy of Sciences (INYAS) have been a source of inspiration for me at several points when I felt low.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

As a working woman, I have faced a major challenge in handling my personal and professional life. At a juncture of establishing my career as well as family life, especially motherhood, I had struggled a lot to keep pace in my professional career as well as give needed time to my son. Currently, also I am going through a two-body problem, wherein my husband is working at a different institute in Kolkata, while I am working in Chandigarh. Looking after the family along with a professional career is still an ongoing tough journey. Especially travelling is important for good networking and reach of your work, which is a limitation in two-body cases, especially for women. However, the use of digital technologies during COVID times has filled this gap to some extent.

Besides, I feel judging all with the same yardstick is not appropriate, especially for young mothers. I have faced this obstacle in my professional journey as well. I tried to give my best during the tough time but was given a delayed promotion. Also, even when I performed better, I was denied merit promotion. These had been discouraging incidents but haven't deterred me to continue working hard.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

Having a good mentor, networking, and communication skills are very important early in a STEM career.

Ms. Meha Lahiri

Co-Founder, COO & CFO

Recity

I am the co-founder, COO & CFO of Recity. I live in Mumbai and was born and brought up in Allahabad. I have completed my MBA in Finance from Smt. Hiraben Nanavati Institute of Management and Research for women. I started my career as a marketing professional and in the last 21 years, I have founded 2 companies - first a creative agency, Just As Meaningful (JAM), where I crafted and executed strategies for various marquee brands and a host of start-ups, and now Recity.

Prior to my first entrepreneurial venture, I headed marketing at Jasubhai Media, where I was the custodian of large brands like AEC World Expo, 361 Degree Conference, Notions of Nation and India 2047. When I met Suraj Nandakumar, the co-founder of Recity today, my dream of building a sustainable environment soon began to translate into reality. Being the co-founder of Recity my day starts with conducting meetings with various teams to align the project requirements. I love to work closely with each member of the organization as it not only helps me understand the flow of work, but it also helps each member of the team to identify the goal more clearly. My day-to-day work not only includes strategizing with clients but also revolves around creating an organization where each member, despite their gender, is given opportunities to excel their role. I was selected and felicitated by NITI Aayog for the Women Transforming India (WTI) Awards in 2022 as a part of Azadi ka Amrit Mahotsav. This award recognized women entrepreneurs across different fields in the country - truly a very humble moment for me.

What is unique about working as a Woman in STEM compared to other fields?

It is very rare to find women in the field of STEM because of various reasons in recruitment including stereotypes. So those women who work in the field of STEM often face difficulties as their capabilities are being questioned at each point and are often paid less. Women in the field of STEM do not just bring knowledge, skill sets and important ideas to the business but also nurture empathy, inclusion and diversion.

What are your key contributions to your work area?

I am on a journey of enabling the circularity of plastic waste through digital traceability by transforming environmentally vulnerable cities with various solutions. Along with that, I tend to promote gender equality and resilient culture towards building a healthy workforce. What excites me about my role is that I have various opportunities to guide and develop leaders across various teams despite their age or gender. It is truly humbling that my work has impacted the sector beyond my internal teams - since the inception of Recity, 69% of women waste workers have been impacted through various skills-based entrepreneurial training in order to become financially resilient and have alternate sources of income.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

I started my career in the year 2002 as a Brand Manager and later started a branding agency. However, I was always aware about how urbanization has affected the appearance of the city and thus wanted to contribute to preserving the cities through sustainable development. It was just a thought, but after 2017 I met Suraj Nandakumar, the co-founder of Recity and initiated our first project in Ambala with 8 Recity champions and embarked on our journey towards circularity. As I don't come from an affluent family or a background of investors, I was a little nervous about taking on this mammoth task. But, with the support of my husband, daughter and my co-founder everything seemed possible. Hence, I chose my dream to make cities livable, and today I am doing this through circularity of plastics. I am also truly grateful to my mentors including my professor from college, my manager from my previous company, and various others who have made my professional journey enriching and meaningful.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

While historically men have been building their careers and working as providers of the family, women have often had various other motivations to work beyond family responsibilities. For me, growing the ranks to a leadership position in the last 21 years has been a boon because my daughter sees me as more than just her mom. She looks at me as a competent professional, is inspired to choose financial growth and independence for herself and is also building her worldview accordingly. But on the flip side, being always available for my colleagues has been consistently challenging in managing my personal and professional lives, much like many other women leaders in the country. Deciding when, where, and how to be accessible for work is an ongoing challenge that is strikingly hard to manage for not only me but also many others who are on their own entrepreneurial journeys.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

My advice to the next-gen women in science is to be go-getters! I would also say - go beyond your limits without having the fear of rejection because this is what will make them learn, grow, and choose the correct path for their future.

Ms. Pooja Malakar

SVP & Business Head

Xoxoday

Experienced business leader with an indelible reputation for growing & transforming businesses with over 2 decades of experience. Reputed for solving large scale complex business challenges to ensure positive impact in both revenue & margins. Passionate about building teams, developing people & problem solving. Keeping abreast of technological changes, rethinking ways of doing business and constantly improving the overall performance for the organization.

Currently working as an SVP with Xoxoday, a Tech Company with a global presence. In the past, have worked with companies like Allsec Technologies, 5 Paisa Fintech, IndiaFirst, Kotak, HDFC and Many more.

Built and managed a high-performing sales and marketing team implementing best practices and fostering a culture of continuous improvement. Established and maintained strategic partnerships with key clients and vendors, driving incremental revenue and enhancing the company's brand.

What is unique about working as a Woman in STEM compared to other fields?
There are several unique aspects of working as a woman in STEM compared to other fields: Gender disparity: One of the most significant differences is the gender disparity in STEM fields. Women are underrepresented in these fields, especially in leadership positions, which can create unique challenges for women in STEM.

Stereotyping: Women in STEM also face stereotyping, which can create a not so positive vibe. Women are often seen as less competent or less committed to their careers than men, which can lead to biases and discrimination.
Isolation: Women in STEM may also experience isolation due to being in the minority. This can make it difficult to find mentors, build professional networks, and feel a sense of belonging in their workplace.

Lack of Role Models: There is also a lack of female role models in STEM, which can make it challenging for women to see themselves in leadership positions or envision a clear career path.

Balancing Work and Family: Women in STEM may also face unique challenges in balancing work and family responsibilities. There are different challenges in every field though and despite challenges, many women find working in STEM fields to be highly rewarding and fulfilling. Women in STEM can make significant contributions to their fields and serve as role models for future generations of women in STEM. Efforts are being made to address the gender disparity and create a more welcoming and inclusive environment for women in STEM, which will hopefully lead to more women pursuing and succeeding in STEM careers in the future.

What are your key contributions to your work area?
Apart from Business growth in the organization, there are several other indirect ways that I have tried to incorporate into my behaviours like.

Promoting equal opportunities: I as a leader have always promoted equal opportunities for women by ensuring that they have access to the same career development opportunities, pay, and benefits as their male counterparts.

Providing mentorship and support: As per my capacity and bandwidth, I try to provide mentorship and support to women in the workplace, helping them navigate challenges and advance in their careers.

Fostering a culture of respect and accountability: I ensure to foster a culture of respect and accountability in the

workplace, where inappropriate behaviour and discrimination are not tolerated.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
My family, especially my parents -both dad and mom have molded me into what I am today, I would also like to give full credit to my young son Yuvan who has stood with me as a biggest pillar of support giving me the wings to fly along with my spouse and in-laws. A special shout out to my husband Vinod who at times has given more importance to my career than his, without his support it would have been meaningless and unfruitful.

My colleagues at work have been extremely supportive of my journey in the organization and they deserve a huge shout out for entrusting me to grow the biggest market for them. I have equal gratitude towards my team and other professional colleagues who have made this journey smooth and successful for me.

On a professional level I really admire Ms. Sindhu Gangadharan MD Sap Labs and Arundhati Bhattacharya CEO Salesforce, two very strong women who have shattered all glass ceilings in this space.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
Lack of Representation: Women are underrepresented in STEM fields, which can create a sense of isolation and make it challenging to find role models or mentors who can offer guidance and support. Hence, I try to extend as much support as possible and my mission will be accomplished even if I am able to inspire a few women to move up the ladder.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started)
Some of my advice are:
Build a strong network: Connect with other women in STEM and build a support network of mentors, peers, and colleagues who can offer guidance, advice, and support.

Focus on building skills: Focus on developing technical and soft skills that are relevant to your field, such as programming, data analysis, communication, and collaboration. Continuous learning and skill
Don't be afraid to ask for help: Don't be afraid to ask questions or seek help when you need it. Everyone starts somewhere and seeking guidance can help you learn and grow in your career-building is crucial for long-term success in STEM careers.

Advocate for yourself: Advocate for yourself by setting clear goals, seeking out opportunities, and asking for the resources you need to succeed in your career.

Find a work-life balance that works for you: Take care of your mental and physical health and find a work-life balance that works for you. STEM careers can be demanding, but it's essential to prioritize your well-being to sustain long-term success.

A career in STEM is a journey, and success may not come overnight. With hard work, perseverance, and a supportive network, you can achieve your goals and make significant contributions to your field.

Ms. Poornima Bethmangalkar

GM & Head Industrial and Manufacturing Business

Happiest Minds

I am the General Manager and Head of the Industrial and Manufacturing business at Happiest Minds. I have 22 years of rich industry experience and am currently focused on helping our customers in the Industrial, Manufacturing, and Automotive industries to achieve the true value of Digitization and be Future Ready. I live in Bangalore.

I hold a Bachelor's degree in Information Technology (IT) from Bangalore University. My professional journey began 22 years ago, straight out of college when I joined Wipro as a Software Engineer. In my last role at Wipro, I was responsible for Solutions, Strategy, and Presales for the Automotive/ Manufacturing group.

Throughout my career, I was fortunate to get opportunities across Delivery, Centre of excellence, building Thought Leadership, Solutions, Consulting, and Business Strategy focusing on the Manufacturing Industry, and working alongside some of the brightest minds in the industry.

What is unique about working as a Woman in STEM compared to other fields?
In my opinion, women in STEM have a world of opportunities to not just take up current jobs and roles available, but also to conceive, set new directions, and shape and create new jobs for the future.

Technology is changing rapidly, and its impact is seen across all industries – whether it be IOT, or Autonomous vehicles or smart cities or remote assistance to health care, or digitization in banks. Opportunities are immense and still evolving, we may not even be able to conceive what new roles will come up in the next 10-20 years.

Jobs of the future irrespective of the industry will require technology and anyone in STEM will have the edge. Women in the workforce already or thinking of getting in have the opportunity to make a difference.

The most recent example of ChatGPT and OpenAI, the super AI that has reached over 10 million users in just a few weeks of launch – the CTO of OpenAI is Mira Murati. And the impact that ChatGPT has made has been ground-breaking.

This is just one example, we have many more of our tribe making an impact and paving the way through their leadership and contribution to their organizations, customers, and society. I would encourage you to look around and find your interest and passion.

At individual and personal levels too, working in STEM jobs opens the path for a long career span (20-30 years) with immense growth and learning opportunities.

What are your key contributions to your work area?
Throughout my career, the focus has been contributing to customers in Industrial, Automotive and Manufacturing Industries, working alongside wonderful and immensely talented teams.

One of the charters is building offerings in the Consulting space, where we engage with customers to create value through business and technology consulting in space of Industry 4.0, new Service Model Design, and Modernization initiatives, to name a few.

We enable digital transformation by delivering seamless customer experiences and leveraging a spectrum of disruptive technologies such as artificial intelligence, blockchain, cloud, digital process automation, the internet of things, robotics/drones, security, etc.

Equally important is building the team and enabling them with skills and an arena for learning, contribution, and personal and professional growth.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
Growing up, science was one of my interest areas and it led me to choose further studies in Information Technology with immense support from my parents/family and guidance from my cousin brothers who were already in the field.

Sustaining and advancing in the career is never an individual effort - it requires significant support from family, partner, friends and mentors, and colleagues. They are the inspiration to laud you and keep you grounded.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
One of the challenges initially was overcoming my shy and quiet nature. This meant leaving my comfort zone to take opportunities that I am grateful to have got. What I have learned is that you shouldn't miss out on opportunities that come your way - support from your teams, training, and building your skills will go a long way to help your growth – both professionally and personally.

There have been times when I would be the only woman at the table/ meetings. This meant breaking stereotypes and having my voice heard. Also, there were not that many women leaders to emulate. With the focus organizations are driving, it is heartening to note we are paving the path toward an engaging, empathetic, diverse, and inclusive future.

Determination to make it to the top or lack of it due to other priorities and circumstances. Managers, teams, and organizations have a huge impact in such cases. Corporate policies, flexibility at the workplace, and a supportive work environment make a huge difference.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
There are tremendous opportunities in the STEM field for women to join, and for women who are already part of the workforce to play a larger role. Below ideas can help you to plan and advance your career.

1. Strive to have a role that you are excited about.
2. Find your path - It is ok that everything may not be clear initially. However, put conscious thought into recognizing your strengths, your ambition, and your areas of improvement and build towards that.
3. Network with people with similar interests.
4. Find a mentor who can listen and guide you.
5. Be open to changes – the organization could change, technology & work could change, your priorities and ambition could change - be flexible and realign.
6. Spend time on shaping a brand for yourself.
7. Invest in your physical and mental health - do not neglect your body and mind.
8. Constantly learn and upskill.
9. In the whole process enjoy yourself.

Building your career is not a sprint, but a marathon; you must prepare for the long run.

Ms. Pragya Shah

Investor Relations Manager

Spoctech Green Ventures Pvt. Ltd.

Present designation - Investor Relations Manager, Current job functions (Greenifit)- Building and maintaining relationships with key investors, including high-net-worth individuals and institutional investors:

- Creating and delivering presentations to potential investors, highlighting the benefits of investing in our company
- Working with internal teams, such as finance and marketing, to ensure effective communication and collaboration.
- Staying up to date with industry trends and best practices and using this knowledge to develop innovative sales strategies.
- Monitoring and analyzing sales performance data, and adjusting strategies as needed to ensure sales goals are met or exceeded and past job functions (BlackRock) –
- Ensure the accuracy of large analytical data sets and provide reporting to clients using BlackRock systems and tools.
- Analyze systems and processes to find efficiencies and improve accuracy and timeliness of reporting and reduce costs. Involves working with cross-functional teams to determine system and technical solutions. • Understand client objectives, trading strategies and market events to effectively respond to client requests by monitoring daily trading activity.
- Follow the Global markets on a daily basis to understand how macro-economic factors affect the portfolios' risk and investment decisions., residing city - Mumbai, city where you born - Prayagraj, U.P and brought up - Kanpur, U.P.

A**cademic qualifications (mention details of institutes and universities)** - PGDM- Finance, St Francis Institute of Management & Research B. Tech - CSE, Abdul Kalam Technical University

Notable achievements (awards, fellowships, memberships of scientific academic and Publications etc.) - Completed 5km marathon leaving my 13-month-old at home. That's my biggest achievement till date because in none of my endeavors before this I ever thought of giving up 5 minutes after the Compendium 2.0 CII Women in STEM Movement beginning.

What is unique about working as a Women in STEM compared to other fields?
The gender ratio has just started to improve, still in any other field, a woman is treated equal, and their opinions are acknowledged (in the least). In STEM, from personal experience, a woman feels the weight of expectations of succeeding, and excelling even before they have formed an opinion. And while expressing, they're either judged too hard or their opinions are ignored even if like a peer. It is overwhelming, but mostly it is empowering to be a part of greater development & innovation.

What are your key contributions to your work area?
Facilitating in day-to-day operations, investments, and management. Managing & maintaining relations with key stakeholder

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

My father encouraged me to take up Engineering in academics. I looked up to Priyanka Chopra, Indira Nooyi, Kiran Mazoomdar, Shama Hyder, Chanda Kochhar & Aditi Balbir (mostly women in business) in my growing years, in college & early job stage. They all inspired me to stand up for myself and that gender can be an exterior barrier for one's career growth but should never become an excuse to not grow or succeed.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

1) Not getting acknowledgement/Getting ignored for any initiatives/queries - had to raise my voice and repeat myself to get attention
2) Opinions were neglected because of Gender
3) Was offered lower salary package after Engineering as compared to male peers - got to know at a later stage and rejected the offer.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

1) Be vocal and don't hesitate to ask questions, or to make the professor repeat the answer till the time you understand the concept completely.
2) Don't lose patience or lower your expectations with self, no matter what. Keep Learning.
3) STEM or not, no subject is a gender specialized area. If you're shown/looked down upon for not getting "easier" concepts, it's not an easy concept, AND everyone has some loose ends where they're not very clear about the topics. Don't give up.

Ms. Pranati Sahoo

Senior Technical Engineer, Electronics Materials Solution Division

3M India

I hail from a city, which is not only one of the only steel cities in India, but also nurtures few of the premium technological institutes. This fueled a curious mind in me which taught me to ask more questions to unravel the beauty of science and technology. I am from a middle class and liberal family where education was given utmost importance.

I hail from a city, which is not only one of the only steel cities in India, but also nurtures few of the premium technological institutes. This fueled a curious mind in me which taught me to ask more questions to unravel the beauty of science and technology. I am from a middle class and liberal family where education was given utmost importance. My father worked in Steel Authority of India (SAIL) in the manufacturing and operation division, while my mother was the spine of our house. My siblings are also well-placed (being literature and science enthusiasts) and a constant source of support throughout my journey.

Throughout my childhood, I was quite fascinated about science and innovations. Hence my quest for learning found a way when I joined the National Institute of technology (NIT, Rourkela) to pursue my masters in inorganic & environmental Chemistry. There came an excellent opportunity to intern in Indira Gandhi Center for atomic Research (IGCAR) under a few of the prominent scientists of India. By closely working on a few cutting-edge innovations, I had the realization that research is my forte. After returning from the internship, I was a "new" person, who had a better clarity on my future and the approaches to make it happen.

Next leg of the journey: Moving to United states for higher studies

Luckily, I was able to secure a global outreach scholarship and an admit in MS (Chemistry) in one of the universities in the United States. There I started my journey for higher studies. I joined Advance Material Research Institute to pursue my specialization in nanomaterials. Then I went ahead to do my PhD and postdoctoral studies at the University of Michigan, Ann Arbor. That experience added a whole new dimension to my perspective and enhanced my capability of working in diversified areas.

Currently, I am working as Senior Technical engineer in electronics materials solution division for 3M India R&D.

Notable achievements:

- Total number of scientific publications: 22
- Total number of book chapters: 1
- Total number of scientific articles published in Tech magazines: 4.
- Nominated as best research work/thesis for graduate engineering program.

Mentorship:

- Educational Institutes: IIT Hyderabad, Vellore Institute of Technology, PES university
- Professional Programs: CII, SWE (WeLocal), SAE India PDP
- Professional Membership:
- Society of Automotive Engineers, Society of Women Engineer

What is unique about working as a Woman in STEM compared to other fields?

We are aware of the harsh reality of very few women being recognized in the fields of science, technology, engineering, or mathematics. Women bring relevance and differentiate skills to the technology and developments. But now the STEM movement has taken a great shape altogether encouraging more women to contribute to this innovation journey.

Women brings relevance, experience and differentiated skills to the field which is much needed for the diversified thought processes. A vital part of being successful in a STEM career is finding your spark and holding on to it. As rightly said, STEM subjects are challenging, the problems are daunting and many times you will not have easy answers. Having internal fortitude to keep trying new techniques and approaches is essential.

What are your key contributions to your work area?

Currently I am working in 3M India materials innovation company, as a senior technical engineer in electronics material solution. Being equipped with these experiences help me building myself from scratch with enough freedom to think and explore.

In my current role, I gather consumer insights which help us to dive into the real voice of users and the pain points and think about how we can help them through new material innovation.

Real innovation is in solving the problems, not merely having ideas. In nutshell, that's what I do.

This role gave me enough liberty to engage and communicate with all kinds of people and problems. It helped me to develop professionally and personally. Every day I face new challenges, new problem statements which double up the speed of my neurons. In my current role, I come close to solving real-world technological problems. I use my learnings and expertise to solve them or at least pave the way for more thoughts.

I also love to be part of various outreach programs to support students and career aspirants to guide them from personal experiences in science and technology.

Hence, I feel my efforts paid off.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

Nothing in my life would have happened without my parents' strife. They are the ones who build the pillar and then the rest of the family who help to make it stronger.

Then comes the Teacher, who shaped it and lastly the friends and foes who make the pillar to survive in all good or bad. So, everyone whom I came across in my life has taught me how to strive, fall and lift myself again along this journey.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

"A challenge only becomes an obstacle when you bow to it."

Sometimes overcoming a challenge is easier when we think about it in a different way. I also had a great share of challenges throughout my journey.

Fitting In: During my journey, I have switched universities and travelled to different countries for better prospects. Although it was a great learning experience, "being accepted" in different cultures was quite petrifying. I was too timid to ask for help and support.

But what helps is "to talk". Talk about common interests and build trust. But of course, you should also be vigilant about who really wants to help.

Am I good enough: Most of the time, self-doubt is one of the stumbling blocks for any kind of life curve, be it personal or professional. The question that always popped into my mind was if I am on the right track. If I am perceived well. If I am good enough to be heard.

What helped me is communication, which prevented me from being "Pigeon-Holed".

Once we have more transparency in communication and come out of our self-made shells, we can realize what we are capable of. This also builds enough self-confidence as well as trust among others.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

The issue of under representation of women in science is being seen with a great deal of concern all over the world. I would like to be a part of this movement by encouraging more women to join science and create a better world to live in.

Be strategic! It would help you to sort through the clutter and find the best way out. It is not a skill that can be taught. It is a distinct way of thinking, a special perspective on the world at large. This perspective allows you to see patterns where others simply see complexity.

Be a learner not just a knower! Sometimes the process of learning is much more productive than the result itself. Be curious and wonder about new things. It always helps to see the unseen.

Dr. Preeti Jain

Global Director, Policy, Chemicals, & Carbon Solutions

LanzaTech

I am Dr Preeti Jain, Global Director, Policy, Chemicals, & Carbon Solutions, LanzaTech. My academic qualifications are MBA (Dean's Lister) from Asian Institute of Management (AIM), Philippines and PhD (Chemistry) from University of Kurukshetra, India.

Some of my notable achievements are given below:

- Member CBEII Governing Council, USISPF Indo-US Biofuels Task Force, CII Bio-energy Sub-Committee on SAF, AMCHAM D&I & Aviation Committee, ICC NR Executive Committee etc.
- Winner Women Leaders in Oil and Gas Industry 2018
- Fulbright fellow under Indo-American environment leadership by US Government
- Distinguished Fellow Award by Desert Research Institute (DRI) Reno, US
- Washington Sycip graduate business scholarship during MBA from at AIM, Manila
- Listed in Marquis Who's Who (Science & Engineering) and Environment Experts Environment Professionals in India by MoEFCC
- Member Selection Committee for US Fulbright Award Committee 2018
- Young Scientist Awards by Indian Chemical Society

What is unique about working as a Woman in STEM compared to other fields?

I view STEM as a foundation stone for building a better equitable world for humanity at large. The scientific background and knowledge accumulated during my career served as a steppingstone to help shape policies in the country that are focused on energy transition and climate change. I had the privilege to work with prestigious National Committees including Auto Fuel Policy, National Biofuels Committee at start of my professional journey and continuing to recent association with National Task force on Sustainable Aviation Fuel as Member. STEM provided me an edge to translate complexity of science to policy makers with efficacy and shape the progressive and technology neutral policies to address energy and climate challenges.

What are your key contributions to your work area?

A scientist by training coupled with MBA; my professional pursuits with leading global players in energy industry and variety of assignments honed my business skill holistically to contribute with best of my abilities. Starting my career while working on projects on India's Clean Air Program and Auto Fuel Policy in India, I entered in space to support science-based policy. With more than 2 decades of multi-sectoral global experience across refining & petrochemicals, renewables (Biofuels), R&D, International Advisory and climate change; I worked extensively on global refining and biofuels outlooks, Industry fuel and biofuels roadmaps, design conducive policies focused on energy transition and climate change. Some of key contributions include as national task Force Member help developing a SAF Roadmap in India to decarbonize aviation (hard to abate sector). In addition, I have contributed to policy papers and recommendations on diverse subjects of technology, policy, trade, taxations, submitted to Government for chartering roadmaps and policy decisions.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

My parents have been a great force behind my professional choices. Due to lack of financial means my parents

couldn't complete college but always inspired me to pursue STEM. The seniors I met throughout my professional journey shaped my vision towards science and research. In my current role at LanzaTech, a global pioneer in innovation, we are envisioning a sustainable and climate resilient world where STEM is at the helm of affairs.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
Honestly as a student I never faced or experienced a challenge while pursuing STEM except the number of girls falls much behind boys. With the awareness and mission to encourage more girls to STEM we are likely to see this shift. In general, it's more of challenge I witnessed in Professional world, where unconscious bias does not allow provide similar career progression for women beyond a point and their transition to leadership roles.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
Take your passion in STEM to a new height with your perseverance and zeal. Collaborate with fellow women and men to add new perspective to your learnings. Be a part of every discussion on Table and be present. Craft meaningful relationships with your colleagues and peers because relationships are the currency of success. The other point I would like to highlight that failure isn't always a bad thing It helps you learn and do better and so you are always learning and on a journey.

Ms. Preeti Menon

Senior Vice President

Happiest Minds Technologies

I have been with Happiest Minds for over 11 years, heading Global Delivery for the Product Engineering and Services Business Unit. I joined Happiest Minds when we were a 40-member team. Today we have over 4600 members, 100+ M USD in revenue and have had one of the most successful IPOs of the last decade. The last 11 years have given me innumerable opportunities to refine and constantly improve the value we deliver to our clients and to our team.

I am responsible for Customer Delight and the success of the Product Engineering Services (PES) team at Happiest Minds.

I have over 27 years of experience in the technology industry, leading large teams delivering multi-million-dollar projects. My expertise lies in managing end to end delivery of Products for IDCs as well as Projects for ISVs.

Prior to joining Happiest Minds, I was Technical Director at AOL India handling their rich media products that included Winamp, Shoutcast, AOL Video amongst others. Prior, to AOL India, I was part of Symphony Services and was instrumental in setting up their Performance, Scalability and Reliability Engineering team for Seibel.

I am currently residing in the IT capital of India, Bangalore. I was born in Ernakulam, Cochin and lived the next 22 years in Bombay, before moving to the IT capital of India in 1994.

Academic qualifications (mention details of institutes and universities):
I hold a Bachelor's degree in Physics from St. Xavier's College, Bombay, GNIIT from Bombay and completed my Accelerated Management Program from Indian School of Business (ISB).

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.):
Few of my notable achievements are:

- Top 20 Female Cloud Leaders in 2021Top 20 Female Cloud Leaders in 2021, Issued by The Sociable · Dec 2021
- The Top 25 Women Leaders in IT Managed Services of 2021, Issued by The Consulting Report · Mar 2021
- Chairman's Award, Issued by Happiest Minds Technologies Ltd · Aug 2021

What is unique about working as a Woman in STEM compared to other fields?
Working as a Women is STEM comes with a unique set of both challenges as well as opportunities:
On the Challenges front – it can be daunting at times, as there is a general stereotyping and bias, leading to feeling of isolation and lack of confidence. I see this in my teams too and do my very best to dispel these notions.
Another important one is underrepresentation of women in the senior positions, making it tough to build supportive networks.
On the Opportunities front – you can make a huge difference by identifying other women members, grooming them and providing them support to excel in their chosen field within the organization.
You are also exposed and have the opportunity to work on the latest technologies that would make a huge difference in everyday lives – including green energy, AI/ML, driverless cars, quantum computing, etc.

What are your key contributions to your work area?

1. **Business Value Generation**: Implemented processes and mechanisms to track and improve the product delivery resulting in customer delight. This has led to significant growth and improved margins in the business.

Our Online Delivery Scorecard tracks key attributes and metrics helping us take the right action to provide quality deliverables and within the agreed timelines.

2. **Nurturing the Right talent**: Special efforts are put into nurture and empower the team in a way that we have a culture of entrepreneurship. Members are encouraged to take ownership of ensuring customer success.

   As an organization we have created an environment where technical knowledge and best practices are gathered and shared seamlessly. All initiatives are driven by a community of Happiest Minds who thrive in contributing more than their assigned tasks. We focus on building a knowledge-based organization where members are encouraged to constantly learn and be on the cutting edge of technology. Our Delivery Microsite acts as a repository of our Delivery best practices.

   A lot of focus is given towards building the leadership from within. Most of our Technical Architects, Engineering Managers and Delivery Managers are groomed from within the organization. They grow imbibing the value and culture of the organization, creating the right environment to nurture and grow further talent.

   We extensively focus on building an environment that's diverse and inclusive by identifying employees who have potential and providing them with the required training and mentorship to excel. Over the course of these past 5 years, we have a number of lady employees in the senior / technical management cadre. We have also been focusing specifically on onboarding members who are differently abled.

   We provide the necessary environment, training, and mentorship to our team members so that they develop a holistic view of the business. This has ensured in building a team which takes significant amount of pride in their ability to attract business on their own as well as successfully executing the business.

   All of this has enabled PES to score 93 in the GPTW 2021, which was a YoY increase of 10 points. This year Happiest Minds has been ranked #29 in the GPTW India's Top 50 Companies to Work for 2022.

3. **Customer Success via Governance & Consistent Delivery**: A holistic focus is on Customer Delight through Value Adds and Engineering Quality. To achieve this, we have rigorous processes, governance, and metrics in place.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
My father was the one who suggested I take up this field and urged me to join NIIT, while I had other plans of pursuing my higher education in Physics. I started my NIIT along with my final year.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
Challenges have been there, and a few have been ongoing, but this has helped make me become stronger and focus on making the environment easier for other deserving women employees. Some of the challenges over the years have been strong gender bias, stereotyping leading to lack of support. What I've realized is that you must put in double the effort to get what you deserve.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
I would want the next generation of STEM pursuant to spend time understanding what they want or would like to focus on for the next 12 months. If you need a mentor to help or support you, then reach out for one.

Take time to do more, contribute towards other activities within the organization, this will help you network and get noticed and slowly opportunities will come your way.

Be passionate, committed, and proactive in whatever you do. Focus on quality and not quantity, w.r.t what you do. Lastly, this field keeps changing, so believe in continuous learning and enjoy it. You need to strongly believe that you are as good as anybody else in this field!

Ms. Priya Kanduri

CTO & Senior Vice President

Cyber Security, Happiest Minds Technologies

Priya Kanduri, CTO & Senior Vice President, Cyber Security at Happiest Minds Technologies. With over 23 years of experience in IT Security domain, Priya's expertise spreads across Cyber Risk, Cloud security, Data Privacy and Protection, Access Governance, Risk and Compliance. She has carved her way up to become one of the women leaders representing the management council of the organization.

My work involves planning and development of Next-Gen Managed Security Platforms offering Proactive Threat Detection, Security automation, Data-Centric Security and Governance for the new age Digital Customers. My sensibility and compassionate nature have made her one of the respected and most followed leaders in the organization.
Prior to Happiest Minds Technologies, I was part of the Enterprise Security Services division of Wipro Technologies for over 12 years, delivering large Compliance and Cyber Security programs for Fortune 500 Companies across UK and Europe regions. I am is also the D&I champion for Happiest Minds and is actively involved in crafting & executing innovative approaches to promote diversity within the organization.
I am currently resides in Bangalore, India. Bork and Raised in Tirupati, Andhra Pradesh, India. I lived and worked for over 13 years in London before moving back to Bangalore in 2015.

- **Academic qualifications (mention details of institutes and universities):**
  Bachelor of Technology & Engineering from SVUCE, Tirupati, Andhra Pradesh
  https://www.linkedin.com/in/priya-kanduri/

- **Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)**
  - Recipient of **Women in Tech Leadership Award** by Analytics India Magazine @ Rising 2023 | Women in Tech Summit.
  - Winner of **"Cyber Security Executive of the Year"** award in the Cloud Security Alliance Bangalore Chapter - Annual Summit Dec 2022
  - **"Outstanding Leadership Award"** at Internet 2.0 Conference 2022 in Dubai
  - Recipient of "Women in AI" award at the Trescon World AI Show @ Dubai 2022
  - **"Women in Tech"** award at the 19th Edition of Asia Pacific HRM Congress for 2021
  - Recognized as the **"Visionary Women Leaders 2019"** by the Business APAC magazine.

- I have been a Featured Author and speaker across multiple known industry forums including Express computer, ETCISO, DataQuest, Mint, UBS Forums, CXO Junction, Think Teal, Dynamic CISO, Analytics India, NASSCOM, ETCIO, TechGig and more. More details below.
- Story featured in under women leaders in Tech in Times of India, Times Techie series (09 Dec 2022) https://timesofindia.indiatimes.com/business/startups/people/have-a-clear-vision-on-making-it-to-the-top/articleshow/96101803.cms
- Interview with express computer
- https://www.linkedin.com/feed/update/urn:li:activity:6965266816805851136
- Authored an article featured in ETCISO magazine on the topic of The Road ahead with IAM for modern workplaces (https://ciso.economictimes.indiatimes.com/news/the-road-ahead-with-iam-for-modern-workplaces/89802543)

- Authored article on DataQuest on – "what's preventing organisations from protecting themselves from cyberattacks" (https://www.dqindia.com/whats-preventing-organisations-from-protecting-themselves-from-cyberattacks/)
- Authored an article featured in Dynamic CISO magazine on the topic of Top 10 Design Priorities & Security Controls for Organizations (https://dynamicciso.com/top-10-design-priorities-security-controls-for-organizations-priya-kanduri-cto-vp-happiest-minds-technologies/)
- Authored article in Analytics India Magazine in Jan 2020. Topic: C-Level Executives Should Stay Away from These 6 Cybersecurity Myths (https://analyticsindiamag.com/c-level-executives-cybersecurity-myths-organisation-security/)
- Quoted in an article by Mint Titled, "Tech needs to be leveraged to shape the hybrid work model" on May 27, 2021 (https://www.livemint.com/industry/human-resource/tech-needs-to-be-leveraged-to-shape-the-hybrid-work-model-11622138184446.html)
- Interview with express computer (https://www.expresscomputer.in/news/ai-based-threat-defense- mechanisms-can-play-a-vital-role-in-improving-an-organizations-security-posture-priya-kanduri-cto-cyber-security-services-happiest-minds-technologies/89035/)
- Interview with analytics India Magazine (https://analyticsindiamag.com/the-mentality-that-stem-jobs-are-not-for-women-has-to- change-priya-kanduri-happiest-mind-technologies/)
- Interview with business apac (https://www.businessapac.com/priya-kanduri-securing-digital-enterprises-cybersecurity-experience/)
- Interview with the Business Reporter - UK (https://youtu.be/ENh4YbbICf0)
- Cyber Security Seminar in Oman conducted by Crowe technologies - https://www.crowe.com/om/events/cyber-security-seminar
- Panel discussion with economic times - https://economictimes.indiatimes.com/engage/et_iib_speakers.cms
- Priya Represented HappiestMinds at Red Herring Top 100 – APAC event at Bangkok. Happiest Minds was declared a winner in 2019 Red Herring Top 100 Asia post my session to the judging panel followed by a panel discussion.

What is unique about working as a Woman in STEM compared to other fields?
STEM field offers a sense of achievement compared to other fields. There's also job security, financial well-being, constant learning and growth opportunities in STEM field. There's never a dull moment in STEM.

What are your key contributions to your work area?
In my current role as CTO, Priya is responsible for rolling out next gen solutions that boost annuity revenues. Over the period of last 5 years as the CTO, Priya designed & implemented multiple SaaS and PaaS solutions for Proactive Threat Detection, Security automation, Data-Centric Security as a service and Governance for the new age Digital Customers. These creative solutions and platforms have been delivering IP revenues of 20% of overall BU revenue. These platforms have also won multiple industry awards and recognitions [Identity Solution of the year 2019 by Kamikaze @ CISO leadership summit, Overall web security solution of the year @ 2nd edition CISO leadership summit]. Key contributions and solutions offered to enterprise customers across the globe are listed below:

- IdentityVigil (https://www.happiestminds.com/solutions/identityvigil/): Happiest Minds trademarked solution Identity Vigil 2.0 is a highly scalable 360-degree IDaaS platform that provides next-gen cloud-based Identity Management (IdM) built on principles of Zero Trust.
- ThreatVigil (https://www.happiestminds.com/solutions/threatvigil/): ThreatVigil 2.0 is one of the leading threat management solutions that offers an on-demand, cloud based, penetration testing platform, developed by Happiest Minds Technologies for various enterprise segments.
- CRPP – Cyber Risk Protection Platform (https://www.happiestminds.com/solutions/next-gen-cyber-risk-protection-platform-crpp/): Cyber Risk Protection Platform (CRPP) is based on some of the best practices and essential data sources defined by Mitre att@ck, which contributes to effective detection of an attack that can engage different tactics and techniques in each attack phase.
- Ellipse (https://www.happiestminds.com/solutions/ellipse/): A modular PaaS solution with multiple tools integration, ELLIPSE is supported by a powerful analytics backend coupled with machine learning capabilities.
- I have built a team with 40% women diversity in her Cyber Security service business. She is also the D&I champion for HappiestMinds, crafted & executed innovative approaches to increase & promote diversity in HappiestMinds.

- I have Conducted multiple webinars, fireside chats and panel discussions with multiple global women leaders across industries to promote and encourage more and more women to pick leadership roles in STEM field.
- I am a Professional mentor & advisor to many aspiring women to plan a career in the field of IT & cyber security. Priya also Conducted multiple sessions going to university campuses to encourage women graduates to choose career in technology.
- All of my publications, blogs and POV's have added immense value to the cyber security industry. They have not just helped generate sales leads and benefit the image of her organization but have also helped many CXO's plan their cyber security strategies for proactive cyber-attack prevention. Priya also helped multiple customer organizations identify their cyber security maturity and risk posture by working closely with their IT, security and leadership teams and with the definition of IT and security objectives, priorities & strategy planning.
- I am the CTO, also plays a significant role in defining the service portfolios and go to market strategies for the organization, thus directly contributing to the org wide revenues.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

First and fore most inspiration was my mother who was very keen on giving me equal opportunities in my life and academics and constantly supported me throughout my life so I could stay on course with my work & career. My kids too constantly inspire me with their next generation thought process and out of the box thinking, there's so much to learn from current generation of confident young women and teenage girls. Certain adjustments my kids and my husband make in life to support my career and the way they encourage me to do more and better at work inspires me every day. I have also been fortunate to be surrounded by very supporting teams, supervisors and colleagues throughout my career. They have all been mostly men and have been a constant source of inspiration. Finally, the biggest source of inspiration for every one of us at HappiestMinds is our chairman Ashok Soota, who leads us by example. His relentless pursuit of innovation, learning and staying on top of technology trends, and experimenting with various STEM fields, always motivates me to do more and better.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

I have been in IT industry for close to 25 years and I work in cyber security segment of IT which is severely underrepresented by women. There were not many women leaders to look up to or learn from during the early stages of my career. Diversity or workplace equality were not openly discussed or debated topics back then. Though my employers offered equal opportunities for growth, it wasn't too easy working my way up, finding allies, mentors and sponsors along the way. Also being a working mother, it has always been and still is a constant struggle giving my best at work and at home.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

There has never been a better time than now for women in STEM fields. Diversity, Inclusion and equal opportunities at workplace and creating a friendly and encouraging work environment for women have become part of strategic objectives for many organizations. Women can choose from a variety of academic choices and career opportunities in STEM. To be successful and make it the top, it is important that women create a supporting eco-system in their personal and professional lives. Focus on constantly learning and challenging yourself. Do not hesitate to ask for help when needed. Also have clearly defined long term goals and short terms objectives that help you achieve those long-term goals. Allyship is very important amongst the fellow women professionals and finding the right sponsor / mentor to support and guide through career progressions and challenges.

Ms. Punnepalli Sunanda

Scientist/Technical Supervisor Grade-I

National Institute of Pharmaceutical Education and Research, Guwahati

I, Punnepalli Sunanda, was born and brought up in Eswaravaka village, located in Nellore district, Andhra Pradesh, India. I did my masters in Biochemistry at Sri Venkateswara University, Tirupati. I taught biochemistry to undergraduate and postgraduate students for 7 years (2005- 2012). Later I moved to the Indian Institute of Science (IISc), Bangalore, and started my research career. I worked as a research assistant (2013-2016) on a project funded by the Department of Science and Technology (DST).

I learned bacterial expression and purification of peptides and proteins and handled nuclear magnetic resonance (NMR) spectrometers for the structural characterization of bioactive peptides. Then I joined as a research assistant at Monash Institute of Pharmaceutical Sciences (MIPS), Monash University, Australia (2017-2018). I worked on a project involving functional and structure determination of sea anemone peptides using high-resolution NMR spectroscopy. The results of this project generated 4 peer-reviewed publications. I enrolled for the doctoral program (Ph.D.) in Biochemistry at Sri Padmavathi Mahila Visva Vidyalayam, Tirupati, India, in the year 2020.

I joined as a Scientist/Technical Supervisor Grade-I at the National Institute of Pharmaceutical Education and Research, Guwahati, India (2022-Present), and residing in Changsari, Guwahati.

Academic qualifications (mention details of institutes and universities):

- BSc (Biochemistry, Botany, and Industrial Chemistry)- D. R. W Degree College, Nellore, Andhra Pradesh, India.
- MSc in Biochemistry- Sri Venkateswara University, Tirupati, Andhra Pradesh, India.

Notable achievements (awards, fellowships, memberships of scientific academies and Publications, etc.)

Academic Achievements:

- Qualified for Andhra Pradesh State Eligibility Test (APSET) 2013 conducted by Osmania University, Hyderabad. H.T. No: 180914240
- Membership: Life Member of the National Magnetic Resonance Society (NMRS) of India

Research Publications:

1) Krishnarjuna B, Sunanda P, Seow J, Tae HS, Robinson SD, Belgi A, Robinson A, Safavi-Hemami H, Adams DJ, Norton RS (2023). Characterization of elevenin-Vc1 from the venom of Conus victoriae: a structural analogue of α-conotoxins. MDPI Mar. Drugs 2023, 21, 81.
2) Krishnarjuna B, Sunanda P*, Villegas-Moreno J, Csoti A, Morales RAV, Wai DCC, Panyi G, Prentis P, Norton RS (2021). A disulfide-stabilised helical hairpin fold in acrorhagin I: an emerging structural motif in peptide toxins. J. Struct. Biol. 213,107692. * equal contribution
3) Singh M, Kishore A, Maity D, Sunanda P, Krishnarjuna B, Vappala, S, Raghothama S, Kenyon L, Pal D and Sarma JD (2019). A proline insertion-deletion in the spike glycoprotein fusion peptide of mouse hepatitis virus strongly alters neuropathology. J. Biol. Chem. 294, 8064-8087.
4) Sunanda P, Krishnarjuna B, Peigneur S, Mitchell ML, Estrada R, Villegas Moreno J, Pennington MW, Tytgat J and Norton RS (2018). Identification, chemical synthesis, structure, and function of a new KV1 channel blocking peptide from Oulactis sp. Pep. Sci. 110, e24073 (Journal Front Cover).
5) Brahmkhatri VP, Sharma N, Sunanda P, D'Souza A, Raghothama S, Atreya HS (2018). Curcumin nanoconjugate inhibits aggregation of N-terminal region (Aβ-16) of an amyloid beta-peptide. New J. Chem. 42, 19881 19892.

6) Krishnarjuna B, MacRaild CA, Sunanda P, Morales RAV, Peigneur S, Macrander J, Yu HH, Daly M, Raghothama S, Dhawan V, Chauhan S, Tytgat J, Pennington MW, Norton RS (2017). Structure, folding and stability of a minimal homologue from Anemonia sulcata of the sea anemone potassium channel blocker ShK. Peptides 99, 169-178.
7) Reid KM, Sunanda P, Raghothama S, Krishnan VV. (2017) Ensemble characterization of an intrinsically disordered FG-Nup peptide and its F>A mutant in DMSO-d6. Pep. Sci. 108, 1-7 (Journal Cover image).

What is unique about working as a Woman in STEM compared to other fields?
My self, as a woman in STEM and especially from the structural biology research field, there is a chance to contribute significantly to the development of peptide-based therapeutics for the treatment of autoimmune diseases. STEM provides better opportunities for women to undertake independent and collaborative research and contribute their knowledge to the development of their respective fields and develop their careers as well.

What are your key contributions to your work area?
I am a biochemist and structural biophysicist. As a research assistant at IISc and Monash University, I contributed to the following research projects:

a) Characterization of an intrinsically disordered FG-Nup peptide and its F>A mutant.
b) Modulating the aggregation of the N-terminal region (Aβ-16) of an amyloid beta peptide using curcumin nanoconjugate.
c) Role of proline from spike glycoprotein fusion peptide of mouse hepatitis virus in neuropathology.
d) Characterization of minimal ShK structural homologue from the sea anemone Anemonia sulcate.
e) Identification, chemical synthesis, functional and structural characterization of a new KV1 channel blocking peptide from Oulactis sp.
f) A disulfide-stabilised helical hairpin fold in acrorhagin I: an emerging structural motif in peptide toxins
g) Characterization of elevenin-Vc1 from the venom of Conus victoriae: a structural analogue of α-conotoxins

Currently, I am looking after the establishment and maintenance of the high-field NMR magnet facility (Bruker 600 MHz and 400 MHz) at NIPER-Guwahati. I am always keen to contribute to science in various disciplines in collaborative projects. In addition, I am involved in teaching the structural characterization of small molecules using NMR spectroscopy.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
Family (Husband Dr. Bankala Krishnarjuna) and Professional mentors Dr. Srinivasarao Raghothama, Chief Research Scientist (retd.), IISc, Bangalore and Professor Raymond S Norton, Monash University, Australia.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
As a woman, balancing my personal and professional life in an organized way is challenging. especially when new parenting time, confused to choose personal or professional life. Since research is my passion and I want to continue to contribute my tiny knowledge to the broader scientific field and develop my career while facing many challenges. The main challenge that I am currently facing is leaving the 1+-year-old baby at home all day while working and living in a rural area with fewer facilities and less access to everything.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
I advise the next-generation women to be involved in counselling sessions, and scientific discussions and get awareness about their careers, be strong at their studies and be innovative in planning things in STEM field.

Prof. Ramya Sunder Raman

Professor
Earth, and Environmental Sciences & Dean Faculty Affairs
IISER Bhopal

I am currently Professor, Earth and Environmental Sciences and Dean, Faculty Affairs at IISER Bhopal. In the past, I have served the Institute as the Head, Department of Earth and Environmental Sciences; Dean-in-charge, Academic Affairs; Head, Centre for Science and Society (CS2) and Coordinator, Center for Research on Environment and Sustainable Technologies (CREST).

I grew up in Bengaluru, graduated with a Bachelor of Engineering (Chemical) degree from the R V College of Engineering, Bangalore (third in Chemical in all of Karnataka of the Visvesvaraya Technological University) and went on to earn the Master of Science (MS) and PhD degrees, both in Chemical Engineering, working with Prof. Philip K Hopke at Clarkson University, Potsdam NY, USA. Thereafter, I worked as a post-doctoral fellow at the Centre for Air Resources Engineering and Science (CARES), Clarkson University, Potsdam, NY and the Physical Research Laboratory (PRL) Ahmedabad, India before moving to a faculty position at IISER Bhopal in 2009.

My research interests are in ambient aerosol characterization, transformations, and source-specificity of its impacts. My group works at the interface of aerosol science/technology and atmospheric dynamics, with a focus on coupling air quality management with health and climate endpoints. We endeavor to build capacity and tools to provide a data-centric structure for environmental justice actions aimed at protecting the health of disadvantaged population groups. My group is currently involved in several projects aimed at understanding and managing ambient aerosol induced burden on air quality over locations in India. She is currently co-leading a work-packet in the national level multi-institute consortium project, Carbonaceous Aerosol Emissions, Source Apportionment and Climate Impacts (COALESCE).

I have been able to establish a vibrant aerosol science research group at IISER Bhopal supported by the Institute and by extramural research grants from national and international funding agencies to the tune of over 16 Crores in total. I have also been a member of the American Association for Aerosol Research. Master's students from my group have gone on to pursue PhDs in prestigious institutes across the globe while my PhD students are employed in academia, with state pollution control boards and other governmental organizations. My research in aerosol sciences is well recognized with several peer-reviewed publications in leading journals of the area and invited talks in aerosol conferences, symposia, and workshops.

What is unique about working as a Woman in STEM compared to other fields?
As a woman in academia in STEM, I believe there is broader acceptance and opportunity to carve out a niche, perhaps more so than that in industry. The opportunity to influence bright young minds, especially in mentorship roles that motivate more women to pursue STEM careers is an added advantage. Achieving societal acceptance, as a field researcher in STEM and the overt and subtle challenges that poses, is perhaps unique to women in STEM compared to some other fields.

Compared to the liberal arts and other allied domains, although we have progressed by leaps and bounds, globally and in India, and there is a lot of conscious effort at the system level to support women in STEM, most women must contend with the unintended consequences of male-dominated spaces and narratives in STEM and ensure that this does not affect their ability to succeed.

What are your key contributions to your work area?
My scientific contributions have broadly been in the key area of understanding aerosol chemical composition and source influence in the Indian region – the outcomes of the work from my group have substantially to our understanding of regional aerosols especially in central India – a previously data-poor region of the Country. My group also works on understanding anomalies in regional secondary aerosol formation and combines aerosol chemical and optical properties for assessing climate and health-end points. To this end we have built central-India relevant aerosol source profiles and have provided first estimates of potential health and radiative forcing burdens form ambient PM2.5. My group is also developing and implementing inverse and hybrid mathematical models for aerosol source apportionment and health impacts assessment. A recent key contribution has been leading the effort to build a country-wide PM2.5 sampling network and spearheading the aerosol physico-chemical characterization and receptor modeling for the COALESCE project.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
Doctoral dissertation advisor, mentor, and friend - Prof Philip K Hopke, Bayard D. Clarkson Distinguished Professor Emeritus, Clarkson University, Potsdam, NY, USA has been most influential in my pursuing a career in air pollution and atmospheric aerosols. Having said that, my mother has been my greatest inspiration to pursue a career and not just that, she continues to inspire me to pursue excellence in everything I do at work – research or administration.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
I have been extremely privileged to be brought up by parents who highly valued education, in general (and perhaps STEM areas more than others) who fully supported and contributed to my academic pursuits, intellectually and otherwise. I also studied and worked in environments that have been very collegial and supportive and there have been no challenges, that were unique to my professional journey as a 'woman' in STEM. Challenges that I have faced in my professional journey are common to what most people regardless of their gender face in building a career in academia.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
Any adversity that seems unsurmountable is only a passing cloud, persist (whether it be with family, friends, or employers) in building the career of your dreams and you will succeed. Do spend time researching the work culture before you accept your first job and do not shy away from networking. Believe in your abilities and the potential to achieve all your ambitions. Do not undersell yourself simply because you equate it with humility – women are especially susceptible to this (this is not a myth, I have observed this trait in women in STEM around me and catch myself falling prey to this tendency, as well).

Ms. Richa Chowdhary

Managing Director

Accenture India

Richa Chowdhary, Managing Director at Accenture India, is responsible for platform-based delivery for large Life sciences clients in the Europe. I have 19+ years of experience in the IT industry. She was born and brought up in Delhi. I have started her professional career in Bangalore with Accenture and then moved back to Delhi after a few years. I have master's in computer application and also holds an executive program degree with Massachusetts Institute of Technology.

I am married and blessed with 2 boys aged 15 and 10.

What is unique about working as a Woman in STEM compared to other fields?
Research says that Women make up only 28% of the workforce in science, technology, engineering, and math (STEM). Lot of women start their career in STEM and quit early owing to multiple challenges and ability to bring balance in their life. This trend has continued over years and years however, we do see the needle shifting now. The change starts with each one of us and goes on to other social and environmental changes to support the same. As a leader in this industry, I feel we all need to take the first strong step ourselves. Women have strong natural abilities to multitask and survive tough challenging environments. There are 3 key principles which make women successful in STEM:

Be confident and believe in yourself. This has to be self-driven. We always look for external validation of our being good. Women need to have self-confidence and believe in themselves which will be a key game changer in them being successful.

Stop the Guilt. It is perfectly ok to be a career woman while being a great family person. There will always be times when you take decisions on either side. This is like a weighing balance; sit will be dwindling sides but how you bring the balance is what makes you successful.

Focus on constantly upskilling yourself. STEM is an evolving field, and we need constantly stay abreast with what's latest. Being relevant helps you to sustain and excel.

What are your key contributions to your work area?
I have 19+ years of experience in the industry. Over the years, I have done many roles across client and service delivery. I have also been very passionate about driving inclusion and diversity agenda across my teams and organization. On the technical side, I have worked across multiple technologies. I started with custom technologies, moved on to digital and now platform-based delivery for our clients. Being Innovative is the core ingrain of me and I constantly strive for driving value for Accenture and for our clients. I have also led delivery excellence institutionalizing and delivery processes and ensuring standardization in the organization. I have also led the talent strategy for one of our markets driving strategizing thinking for driving growth for our organization. Additionally, I have been part of the I&D team and led the pillar for driving I&D agenda as part of our client conversations.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
I come from a family of educationalists. My father was a principal for a top college in Delhi University and my mother was a school teacher. My father is a mathematician and a great researcher with hundreds of published research papers under his name. Both my parents were extremely passionate about their profession and would always go over

and beyond their day job to do research in their fields. My passion comes from my genes. As I was growing up, IT industry was on its peak. I had lot of support from family to channelize my career here. During my long tenure with Accenture, I was blessed to have very many mentors. In each team, I found great leads and new mentors who helped me get to where I am today.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

As a woman, we are all faced with multiple instances where we found it difficult to find the right balance. I always remember that when I had my first child, I was promoted during maternity leave. I was working till the day of my delivery. I resumed work when my son was ~5 months in my new career level. Those were difficult and challenging times. I was a desktop user; my house was more than 1 hour drive away from the office. During evening meetings, my mind would start to wander, and I would start being nervous. Initially I felt lot of guilt because on one side I wanted to prove myself at the next level and the other I felt guilty as a new mother. That was the point where I sat down and thought how to better navigate this. Like in the professional world, I made an action plan for myself, which included how to better plan my critical meetings, plan for reduction of my travel time, better support system etc. I feel having a good ecosystem both at work and at home is always the key to success.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

My advice to the next-gen women will be:

- To define their purpose and work towards it wholeheartedly
- To be clear in your priorities
- To keep a balance between your work and family
- To have an open conversation with your family regarding your career goals, don't shy away from challenging situations. They only make you stronger.
- To stay agile and resilient—it always takes you a long way.

Dr. Ritu Paliwal

Veterinary Officer

NIPER, Hajipur-Bihar

I am M.V.SC. & A.H. in Pharmacology & Toxicology with over 9 years of professional experience in the fields of Laboratory Animals, scientific breeding, management of animal facility as per national and international standards. I have developed In-vivo animal models for diseases to test the efficacy of test compounds and reported analysis/Data analysis by PRISM. I have prepared over 200 Standard Operating Procedures (SOPs) for animal facility as well as for animal experimentation.

I have prepared over 200 Standard Operating Procedures (SOPs) for animal facility as well as for animal experimentation. I have Insightful knowledge of Pre-Clinical Research Processes & Practices on Laboratory Animals and Relevant Regulatory Requirements. I am experienced at managing the spectrum of activities and laboratory operations spanning testing, Method development and coordination with cross-functional departments. I am skilled at planning and designing laboratory experiments in order to produce reliable and precise data to support scientific investigations. Exposure in managing administrative functions of department thereby attaining high-quality output. Ensured compliance to quality and regulatory measures by the maintenance of appropriate documentation/records as per CPCSEA, GLP, AAALAC, OLAW and other international standards. IAEC member / member secretary IAEC. Faced and successfully defended CPCSEA, AAALAC and GLP audits. Skills in analyzing & interpreting unique problems, logical and analytical thinking to find the right solution.

Designation: Veterinary Officer

Current and Past Job Function: Development of animal models for disease, metabolism, pain and inflammation etc. Development of standard operating procedures (SOPs) related to vivarium management, giving training to scientists and students pertaining to animal care and management as per national and international regulations and standards.

Residing City: Hajipur, Bihar

City where born and raised: Sagar, Madhya Pradesh

Academic qualifications (mention details of institutes and universities):

- M.V.SC. & A.H. in Pharmacology & Toxicology from College of Veterinary Science and A.H., Madhya Pradesh Pashu Chiktsa Vigyan Vishwavidyalaya, Jabalpur in 2011 with 86.00%
- B.V.Sc. & A.H. from College of Veterinary Science & A.H., Jawaharlal Nehru Krishi Vishwavidyalaya, Jabalpur (M.P.) in 2009 with 81.2%
- 12th from M. L. B. Higher Secondary School, Sagar, M.P. Board, Bhopalin 2000 with 73.55%

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.):
Lifetime membership of:
Indian Society of Veterinary Pharmacology & Toxicology (ISVPT L-351)
Laboratory Animal Scientific Association (LASA -438)

Star Value Award: While working in GVK Bioscience in the field of laboratory animal care.
Publications: List attached in CV.

What is unique about working as a Women in STEM compared to other fields.
I hope, will get more encouragement and support here to work. I have joined NIPER recently and am looking forward to a more fruitful association. Equally will get more opportunity to grow in the field of laboratory animal science and develop my ideas.

What are your key contributions to your work area.
I have conducted Pre-Clinical Trials / (veterinary support as study veterinarian, ophthalmoscopic examination of animals, FOB, Toxicity studies as per GLP and OECD guidelines & PK studies). I also have Developed Animal Model for Metabolic Diseases, Hypothyroidism, EAE, Parkinson's disease, Asthma, COPD, Hyperlipidemia, Cholestasis etc. I have ensured compliance to quality and regulatory measures by the maintenance of appropriate documentation/records as per CPCSEA, GLP, AAALAC, OLAW and other international standards. I am a IAEC member / member secretary IAEC.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues/ Professional mentors, etc.)
My seniors during my masters encouraged me to choose this field.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM.
There are two sides. If I talk about organizations where I worked, they had given full freedom to work without any gender differentiation; however, sometimes I feel more cooperation and understanding needed from counter colleagues.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
Be bold, always open for your ideas and focus on your goal. Develop exploratory and learning habits. You are not less than anyone.

Dr. Rosy

Assistant Professor

Department of Chemistry, IIT (BHU) Varanasi

I am pleased to introduce myself as Dr. Rosy, an assistant professor in the Department of Chemistry, IIT (BHU) Varanasi. Before Joining IIT (BHU) Varanasi in 2021, I worked as a senior post-doctoral researcher at Bar-Ilan University, Israel, and gained experience in the field of electrochemical energy storage.

I was born on 4th June 1990 in Amritsar, Punjab. Since my father had a transferrable job, I grew up exploring several different cities across India. Because of this, I was privileged to learn from several excellent teachers in different Kendriya Vidyalaya.

I earned a bachelor's degree in chemistry Honors from Hindu College, University of Delhi in 2010. I pursued master's in physical chemistry from the same university and graduated in 2012. I was educated as an electrochemist/analyst at the Indian Institute of Technology Roorkee, India, from where I earned a Ph.D. Degree in 2017 under the supervision of Prof. R.N. Goyal.

Throughout my lifetime, I have received prestigious fellowships and recognitions like AI Rank 28 in the UGC-CSIR National eligibility test, Junior and Senior Research Fellowships for pursuing Ph.D. in IIT Roorkee, Most Prominent Adventurer award by Himalayan Explorer's Club IIT Roorkee, Best Oral Presentation Award by American Chemical Society. Colman Soref Excellence fellowship from Bar-Ilan University, Israel, PBC fellowship for outstanding post-doctoral researcher awarded by Planning and Budgeting Committee (PBC) of the Council for Higher Education, Israel. Sabarmati Fellowship by IIT Gandhinagar. I was also listed as Thought Leader by AzoMaterials and Hiden Analytical and have been awarded Intel 2020 Excellence award for Outstanding Female Scientist. I have published ~ 45 papers in highly reputed, high impact journals with a total impact factor of more than 500.

What is unique about working as a Woman in STEM compared to other fields?

Working as a woman in STEM is quite unique because of several reasons,

1. **Flexibility & Freedom**: If you are talented enough, you define your own problem statements and work towards them without much interference from the higher authorities. It's the same as nurturing your own child. In many cases, STEM job profiles offer the flexibility to choose your own working hours, which is not common in other fields. Because of which it's easier for females to balance the professional and personal responsibilities.

2. **Versatility & Constant Evolution**: There is no fixed pattern of growth in STEM. You evolve by learning and discovering new things every single day in contrast to the monotonous job profile of other fields.

3. **Independent Growth**: Working in STEM offers ample opportunities to be creative and develop yourself. So, in contrast to many other job profiles, your growth is not compounded by conventional promotions or something similar, it is solely in your control and depends on your achievements, findings, and publications.

What are your key contributions to your work area?

During the last 10 years of my acquaintance with research in STEM, I have opted electrochemistry as a tool to explore the area of energy storage, and, to detect drugs, neurotransmitters, and their metabolites in biological fluids.

Choose to address three main issues:

1. What are the degradation pathways that frustrate batteries performance and efficiency?
2. Development of state-of-the-art surface engineering strategy to stabilize battery performance and
3. In-operando analysis of the efficacy of surface engineering in preventing battery degradation.

I have worked towards solving the problems that limit the efficient and sustainable use of Lithium-ion and sodium ion batteries. I was dedicated to probe the interfacial electrochemistry of rationally designed next generation electrode material with highly reactive surfaces such as Li and Mn-rich NCM (LMR-NCM) and demonstrated the **dependency of battery durability and cycle life on complex interfacial interactions between the electrodes and the electrolyte solution.**

My research work has manifested that rationally designed, thin surface coating is a key strategy for extending the lifetime of batteries by forming an artificial protection layer on the electrode materials which prevents their degradation by 1) stabilizing the functional interface and addressing the deleterious reactions between the electrode and the electrolyte and 2) inhibition of transition metal ion dissolution and structural deformation. Such strategies address all the critical challenges associated with the complex electrode material and thus provide a promising research direction for choosing the relevant methodology for surface protection.

With the electrochemical and spectroscopic evidence, I have clearly demonstrated significant improvement in the battery performance with the surface treatment, which is reflected by the enhanced capacity (294 mAh/g), 41% higher discharge capacity at higher rates of 4C (commonly known as fast charging), and 60-70 mV narrow voltage hysteresis.

Using the prototype full pouch cell, I have translated the lab findings to practical applications demonstrating 50% enhanced capacity and 18% improved capacity retention in comparison to uncoated material after 200 cycles. That means the coatings will not only extend the battery life by 18% but also deliver 50% more work in comparison to a normal Li-ion battery.

In last seven years, I have reported several unconventional, low-temperature methods of surface modification that can be scaled up using any vacuum reactor with simple, facile and quick procedures. By using the materials of industrial interest, I have strived to bring the knowledge and benefits gained by laboratory experiments to industrial counterparts. Building on my research experience and expertise, I am nurturing my research group at IIT (BHU). The versatility of my acquired experience in applied electrochemistry equipped me with an unusually high degree of freedom in the choice of research field, and complete flexibility to adjust my research studies to variable electrochemical systems in terms of electrolyte medium (aqueous, organic, solid electrolyte), application (batteries, supercapacitors, catalysis, sensing etc.), and electrode material. Therefore, my group is currently branching out into electrochemical energy storage, Voltammetric Sensing, Water Splitting, and Protein Bio-electrochemistry.

Funded by MOE-IISc-STARS, SERB SRG, and Institute Seed Grant, my laboratory at IIT (BHU) is working on interfacial engineering of next-generation electrode materials to extend the battery life. My group intends to work on real life problems and will be dedicated to train the young generation to take up such problems in industry and academia. So far, I have published > 45 articles in extremely reputed high impact journals.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

I would give the foremost credit to my grandfather. He was the first one who took me out in nature and unconsciously trained me to observe and question everything. That habit was further polished by the amazing professors of the department of chemistry, Hindu College, specifically C.K. Seth sir. They were the ones who streamlined my curiosity in the right direction. After learning what to ask and how to find answers, I discovered the depth of the educational courses and laboratories. My Ph.D. Supervisor Prof. R.N. Goyal and post-doctoral mentors Dr. Malachi Noked and Dr. Doron Aurbach then gave wings to my thought process by providing a conducive working environment, discussion platforms, and laboratory exposures. I would also like to acknowledge the environment of IIT(BHU), an institute with many women faculties being treated equally in different fronts of STEM.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

The first major challenge is to convince the family. Nurturing a professional career in STEM is a time-consuming

process that sometimes challenges the orthodox patterns of society, like the right age for marriage, letting girls travel to foreign countries all by themselves, and many more. It takes a lot of effort to satisfy the apprehensions of the family and turn it into an affirmative concern. I was lucky to have a supportive and understanding family, but yes, their realistic worries were something that made me anxious from time to time.
Secondly, I found that as a woman, it takes extra effort to prove your credentials and convince people that you have an opinion and know what you are exactly doing. Somehow, it's difficult for people to believe in the ambitions of women.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
Find your spark and persistently add fuel to it. You need to be prepared for pushback and learn how to deal with it causing minimum harm to your mental and emotional stability. Look to your mentors for advice, and don't be afraid to speak up. Most importantly, don't be discouraged by other people's words, have faith in yourself and excel.

Prof. Ruchi Anand

Professor

Department of Chemistry
Indian Institute of Technology, Bombay

I am Dr. Ruchi Anand a specialist in Structural Biology / Biochemistry & Biophysics presently working as a professor at IIT Bombay. Previously worked at University of Pennsylvania, Philadelphia as Post-Doc Fellow, Sloan Kettering, New York as Post-Doc Howard Huges Fellow, Cornell University, USA as teaching assistant. I have done BSc in Chemistry Mathematics Physics, MSc in Chemistry from IIT Kanpur and Ph.D. in Biophysical Chemistry from Cornell University, Ithaca, New York, USA

Membership and awards:

- Inducted as a Member of editorial advisory board of American Chemical Society (ACS) journal, J. Phys. Chem (A/B/C) in 2023.
- Inducted as a Member into the Advisory Board of Chemical Society Reviews in 2023
- Fellow of Indian Academy of Sciences (IASc) in 2022
- Inducted into the International Advisory Board of AsianJOC in 2021
- Inducted as a Member of the Research Council of Indian Institute of Chemical Technology
- Recipient of the Wellcome Trust-DBT Alliance Senior Research Fellowship
- Recipient of B.K Bachhawat International Travel Award
- Recipient National Women Bio-scientist Award

Published Book Chapters:

1. Sahu, Subhankar, and Ruchi Anand. "Strategies for Development of Protein-Based Biosensors for Detecting Aromatic Xenobiotics in Water." The World Scientific Reference of Water Science: Volume 1 Molecular Engineering of Water Sensors. 2023. 101-136.
2. Mariam J., Anand R., Fluorescence Quenching studies of γ-butyrolactone-Binding Protein (CprB) from Streptomyces coelicolor A3(2), Quorum Sensing: Methods and Protocols, Methods in Molecular Biology 2018, 1673, 131-143.

Patents:

1. IPA No. 201821003722, Filed on 31 January 2018. Title: Biosensors for detecting organic pollutants and Process for producing the same, in the name of Indian Institute of Technology Bombay" Inventors: Shamayeeta Ray and Ruchi Anand.
2. IPA No. 201821016035, Filed on 27 April 2018. Design of Ultrasensitive Protein Biosensor Strips for Selective Detection of Aromatic Contaminants in Environmental Wastewater, in the name of Indian Institute of Technology Bombay. Inventors: Shamayeeta Ray, Tamasri Senapati, Rajdip Bandyopadhyaya and Ruchi Anand.
3. Indian Patent 431170 dated 15 October 2022. Organic Electrochemical Transistor Based Biosensor for the Detection of DNA Binding Proteins and Method for Preparation Thereof, in the name of Indian Institute of Technology Bombay. Inventors: Dipti Gupta, Ruchi Anand, Lokesh K. Gautam, Subhankar Sahu, Siddharth Kurup.

What is unique about working as a Woman in STEM compared to other fields?

In comparison to other fields, working as a woman in STEM can provide the unique perspectives, skills and contributions that are not only beneficial to that particular filed but to the society as a whole. Gender diversity in STEM have been associated with bringing different outlooks and approaches to problem-solving by providing alternative stances and novel insights leading to a more comprehensive and innovative solution. Moreover, women in STEM can play a determining role in inscribing societal needs and challenges that are often overlooked. They may

bring attention to issues that disproportionally affect women and other marginalized groups. With a diverse range of perspectives, women in STEM can advocate and address issues such as raise awareness about gender pay gap, gender biased hiring and promotion practices, underrepresentation of women in leadership positions and alternatively provide equitable opportunities and conducive environment for women. Women in STEM contribute to groundbreaking discoveries, drive innovation, and inspire future generations of women in these fields. Women in STEM can be role models for other girls and young women, showing them that they can succeed in these fields and make a difference in the world. As a woman in STEM, I have been myself involved in various social awareness programs, such as running a summer school for girls under the DST Vigan Jyoti (2018) program to encourage women in the fields of science and technology. I have also been involved in several outreach activities organized by the Royal Society of Chemistry. I am also a part of the global Gender Equality and Diversity Committee of UK, Australia, Japan and USA and involved in formulating policies that span accords countries.

What are your key contributions to your work area?

In the past decade and a half, we have made significant contributions in the field of structural biochemistry, where we have worked towards two major problems of importance to the Indian scenario: first towards understanding and devising strategies towards combating antibiotic resistance, and second in the development of biosensors for water quality monitoring. Both antibiotic resistance and sensing of pollutants in water are priority areas with huge societal benefits. We have employed enzyme systems to further research in both the above arenas. It is projected by 2050 if nothing is done to combat drug resistance more than 300 million people will suffer. The first problem pertains to understanding the molecular mechanism of antibiotic resistance, where we have solved crystal structures of antibiotic efflux pump and quorum sensing regulators of the tetracycline receptor sub-class in complex with DNA and complemented these studies with biochemical and fluorescence spectroscopy (NAR 2014, JPC (B) 2014, BBA 2015, JSB 2017, JBC 2017). Alternatively, we have been exploring nucleobase-associated pathways for discovering enzymes that are evolutionary divergent between humans and pathogens, as new targets for therapy (Biochemistry 2013, ACS Chemical Biology 2015). She recently also identified enzymes in M. Tuberculosis that confer innate resistance to aza scaffold-containing drugs (JACS 2017). Towards that goal recently by employing a combination of crystallography and biophysical techniques, how the pathogenic enzyme knows to specifically emboss the methyl mark at the correct adenine; that is the molecular basis of targeting (JACS Communication 2019) has been unearthed. Answering this question has led to the discovery of a specific RNA selection pocket and has paved the way for the development of targeted drug design. Based on this initial work, we have now been awarded the DBT-Welcome Trust Senior Fellowship to advance our efforts in understanding the mechanism of drug resistance via this route. Parallelly, we have deciphered the mechanism of specific RNA targeting by ribosomal methyltransferases through cryo-electron microscopy (ACS Chem. Biol. 2022). Our lab is also extensively involved in deciphering long distance cross talks and complex conformational allostery in large macromolecular systems (Science Advances 2020, ACS Catalysis 2022) which not only help scientists understand the importance of subtle molecular interplay but also can potentially contribute to the dimension of new lead compounds design. In parallel, we have focused our attention on NtrC transcription regulators that can be exploited for developing xenobiotic sensors for monitoring aromatic water pollutants. The class of sensors we focused on triggers catabolism of aromatic compounds like phenol, benzene etc. These pollutants enter water sources from paper, tannery and petroleum byproduct industries as well as oil spills. Most of the Indian rivers report levels of these pollutants in the high-risk zone. Accurate and effective on field detection of these pollutants have remained elusive; hence efficient detection of organic xenobiotics is an important need to be addressed. Apart from the successful elucidation of the crystal structure of the phenol sensing domain (ACS Chemical Biology 2016), it also opened doors towards intelligent design for this class of sensors via exploiting this xenobiotic sensing potential to design direct, label-free biosensors. By using a combination of structure-based design as well as mutagenesis, we could successfully create a battery of biosensors for not only phenol but other harmful aromatic pollutants like benzene, xylene, toluene etc. (ACS sensors 2017, patent filed). Currently, our group has achieved low ppb level sensitivity by employing both in-vivo (ACS sensors 2021) and in-vitro (Analytical chemistry 2018) sensors and has designed a biosensor model that can be transferred into a strip-based format (Analytical chemistry 2018, patent filed). We have also devised a protein-immobilized organic electrochemical biosensor for detecting these phenolic pollutants (patent filed 2023). Very recently, we have been granted a patent for our work on developing an organic electrochemical transistor-based biosensor for the detection of DNA binding proteins (Indian Patent 431170, 2022). For our prominent work in this field, I have been inducted into the Editorial Advisory Board of ACS Sensors since 2016. For these sensor-based proteins, we have studied allosteric mechanisms (J Bacteriol 2022), which have been found to play a pivotal role in signal transduction from the sensor domain toward the transcriptional activation region, on sensing the ligand (J. Biol Chem 2022). I have recently also received as principal investigator (5 million US dollars) from SERB, India to set up the state-of-the-art cryo-electron-microscopy

center at IIT Bombay to take the field of structural biology further. In conclusion, I would like to reiterate that our efforts to bridge basic and applied sciences are essential to tackling complicated global problems. By bringing together these two disciplines, we can accelerate the pace of innovation and develop new technologies and solutions that can help us address some of the world's most pressing issues.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

Several scientists inspired and influenced me over the course of my career I have to thank the teachers at my undergraduate college Miranda House, for instilling interest and concepts in chemistry. IIT Kanpur exposed me to the world of research that led me to pursue a Ph. D My graduate life really shaped my thinking and understanding of Science. In particular my thesis advisor Steve Ealick at Cornell University and other professor such as Barbra Baird and Braine Crane really helped me develop as researchers. Joanne Stubbe at MIT who was my collaborator had immense influence as a woman in STEM. Madam Curie two times Nobel laureate was my inspiration from my childhood days as well as Rosilin Franklin who worked on X-ray crystallography a field I trained early on in are some of my role models.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

Women in STEM often encounter stereotypes and biases that undermine their abilities and contributions. These biases can influence interaction with peers, faculty, and employers potentially impacting career growth. They are often underrepresented in many STEM disciplines and industries, resulting in fewer opportunities for networking, mentorship, and career advancement. Women may often face discrimination based on their gender such as unequal pay, limited promotion opportunities, or a lack of support for work-life balance. These disparities can contribute to a challenging work environment and hinder career progression. IIT Bombay has been working towards increasing the participation of women for several years in order to provide a more welcoming and inclusive environment.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

As next-gen women scientists embark on their careers in the STEM field, my advice to them is to pursue their passion. Following one's passion and field of interest will always be a powerful motivator to overcome challenges. It is important to build a strong foundation in the chosen STEM field and hone technical skills, understanding, and critical problem-solving abilities for their future endeavors. STEM fields are constantly evolving, so it is important to stay updated with the latest advancements by attending conferences, workshops, and seminars. Networking with professionals in the specific field within and outside the organization can lead to opportunities and productive collaborations, mentorship, and career growth. It is important to be assertive in expressing one's own ideas, ambitions and negotiating for fair treatment and recognition. Persistence and resilience are the keys to any career, particularly in STEM fields. It is thus important to embrace challenges as opportunities for growth, learn from the setbacks and stay focused and committed to one's goals. The only thing I wish I had possibly known when I started was to connect with other women in STEM, so you never feel alone. I think it is important for women in STEM to build a network.

Ms. Ruchi Pandey

General Manager Technical

3M India Limited

Ruchi Pandey (Current designation)- General Manager Technical, 3M India Limited. I am currently leading the Converter and Electronics Market Segment for the Industrial Adhesives and Tapes Division at 3M India Limited. I have over 17 years of experience in Product Development and Application Engineering in the field of Adhesives, Coatings & Polymeric materials and hold 6 patents for a variety of innovations.

I have developed and launched a variety of adhesives, tapes and coating products for the industrial and automotive market that have contributed to 3M sales of more than $100M with 36 trade secrets and 6 patents.

In my current role, I am responsible for leading new product launches for India and the Asia Region and application development for existing products for the Automotive, Appliances & Electronics, markets in the Industrial Adhesives and Tapes Division.

Prior to 3M, I worked with organizations like Haldia Petrochemical Limited and GE Research Center where I have worked mainly on materials and polymer research and development.

Born and brought up in Kanpur, U.P and currently residing in Bangalore, Karnataka

Academic qualifications (mention details of institutes and universities)
I hold a Bachelor's (B. Tech) in Chemical Engineering from H.B.T. I Kanpur and a master's in technology (M. Tech) from the Indian Institute of Technology (I.I.T Delhi) in polymer science and engineering.

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

- Member of the Adhesive Subcommittee of BIS (Bureau of Indian Standard). Member of the panel entrusted by BIS to develop new standards in the field of adhesives. I am instrumental in writing many IS standards, some of them are already published.
- Country champion for Women leadership forum (WLF) in 3M India in 2023-24
- Chair of women leadership forum Technical – 3M in 2021-22.
- Member of Indian Women Network (IWN) CII Karnataka.
- Featured in the eBook published by CII-TNTDIC on "Women achievers in STEM" in 2021.
- Professional Membership:
- Society of Automotive Engineers, Society of Women Engineer
- Adhesive and Sealant Council (ASC)

A total of 6 patents filed and out of that 4 are granted listed below:

- WO2014099448A2: Global patent granted on "Coating composition and multi-layered films for easy-to-clean surfaces"
- WO2016028499A1: Global patent granted on "Amphiphilic polymer and coating compositions"
- WO2014186316A1: Global patent filed on "Pressure sensitive adhesive assembly comprising at least a first pressure sensitive adhesive layer comprising a hollow non-porous particulate filler material, wherein the surface of the hollow non-porous particulate filler material is provided with a hydrophobic surface modification"
- IN81565IN002: patent filed on "Development of automotive grade gasoline/gasohol resistant and high-grip film with novel pressure sensitive adhesive composition for low surface energy substrates"

- Published articles in technical magazines – 3 numbers.
- Received 3M Genesis Grant, the most prestigious award for building new technology platforms from 3M Company, twice in 2013 and 2017 for "exploring rice husk for its various abrasive and shear properties when used along with coating and adhesive formulations" and for "developing a sustainable adhesive coated film product for branding applications" respectively.
- Circle of Technical Excellence team award in 2019, 2018 and 2013 – A prestigious award for the technical fraternity by 3M Company for developing and launching new products that make significant impact on the 3M business.
- Selected for the GE scholarship while pursing M. Tech. from I.I.T Delhi

What is unique about working as a Woman in STEM compared to other fields?
We have noted that the fields of Science Technology Engineering and Mathematics (STEM) have remained predominantly male with historically low participation among women. One should have a good educational background to build their career in STEM. There has been biases that women are not considered to be great in this field, but scenarios are changing and now % of girls studying science and pursuing career in science is increasing.

In my opinion, there is nothing unique in this field. Women are now presence and building their career in every field. We must create more and more role models to set the right examples Infront of new generations to encourage them to build their career in this field.

What are your key contributions to your work area?
- **Products developed and launched:**
  - Led the teams to set up world class analytical, adhesive and polymer/material lab capabilities for 3M and played pivotal role in setting up the manufacturing coating lines for making adhesive, tapes, and label product portfolio for Indian market. These capabilities overtime have given amplified opportunities to develop and launch products for Indian market, thus contributed significant growth for industrial and automotive business of 3M.
  - More than $ 5M revenue year on year with new product launches
  - Developed and commercialized adhesives (Acrylic & Polyurethane based products) for Industrial, automotive market segment.
  - Developed multiple adhesive technology platforms for 3M that generated revenue of >$100M from product launched with 36 trade secret and intellectual properties.
  - Collaborated with 3M Germany team and launched 3MTM VHBTM LSE Series tapes. Co- inventor on the adhesive technology used in this product range.
  - Commercialized tape portfolios for thin bonding applications for the Industrial market
  - Commercialized label portfolios for general purpose, identification, tracking and tire label applications for the Industrial market.
  - Commercialized new generation graphic films, paint replacement films and paint protection films for the two-wheeler and four-wheeler automotive market.
  - Commercialized branding label for oil and gas industries segment.
  - Leading the converter business for 3M India and that has contributed positively to drive considerable double-digit growth in India in last 2 years.
  - Expertise in sustainability and circular economy and driving many initiatives in collaboration with external agencies.
  - Experienced at liaising and building relationships with academic as well as industrial partners to leverage available expertise, resource, and knowledge base.

- **External Publications:**
  - Wrote articles on 3M technologies and products in technical magazines.
  - Demystifying the next generation performance labels (printweek.in)
  - 3M Innovation Driving Step Change in Transportation | (commercialvehicle.in)

Patents
- 6 patents filed and out of that 4 are granted for 3M Company (Those are listed below)
- WO2014099448A2: Global patent granted on "Coating composition and multi-layered films for easy-to-clean surfaces"

- WO2016028499A1: Global patent granted on “Amphiphilic polymer and coating compositions”
- WO2014186316A1: Global patent filed on “Pressure sensitive adhesive assembly comprising at least a first pressure sensitive adhesive layer comprising a hollow non-porous particulate filler material, wherein the surface of the hollow non-porous particulate filler material is provided with a hydrophobic surface modification”
- IN81565IN002 patent filed on “Development of automotive grade gasoline/gasohol resistant and high-grip film with novel pressure sensitive adhesive composition for low surface energy substrates.”

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
I was interested in the field of STEM from the school. STEM has always been my first choice for study and building a career because of my patent’s influence and guidance. I have witnessed my elder siblings and seniors doing well in this field, and they inspired me from the start.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
There is unconscious bias towards women in STEM. Women / girls are not as strong in STEM as men are. Many jobs require traveling and much more demanding than other comfortable jobs for women. Women having family, kids will not do justice to such jobs.

I have faced such biases from time to time during my career journey. Though such biases are eliminating since we have many role models and examples where women are leading at forefront but still, we need more.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
Today’s society is grappling with problems which could be solved by STEM solutions. In my opinion STEM is the most powerful field to make an impact in business and society. Being in the STEM field, one could be a change agent making our surroundings a better place to live.

There were many myths around taking up STEM as a career choice for girls, which are getting busted every day with more and more women are taking up roles in cutting edge technology areas. One should be confident, be visible, create a self-brand and raise hands for support. Also, continue building a strong network within STEM field.

Prof. Ruthrotha Selvi Bharathavikru

Assistant Professor, Department of Biological Sciences

Indian Institute of Science Education and Research Berhampur

I am a molecular and cell biologist with research expertise in the area of RRNA-regulated gene expression in stem cell biology with implications in disease and development. My research group, RNP Biology Laboratory investigates the role of various ribonucleoprotein complexes in health and disease using mammalian and stem cell line models, followed by validation in clinical samples.

My research experience includes my post-doctoral research work with Prof. Nick Hastie, in the area of RNA regulation in Kidney biology at the MRC Human Genetics Unit, University of Edinburgh and my PhD with Prof. Tapas Kundu, JNCASR, working on molecular characterization of chromatin modifications and post transcriptional regulation of gene expression. During my PhD, I have been associated with collaborative projects involving developing tools at the interface of chemistry and biology for drug targeting in disease conditions.

Prior to my PhD, I did my master's in biotechnology at the School of Biotechnology, Madurai Kamaraj University. However, my first ever scientific research project was at the Indian Institute of Science during my undergraduate degree stage. I was born in Chennai, and most of my education was in Mumbai. My education and research career has thus been a pan India experience.

Notable achievements:

- DBT Ramalingaswami Fellowship (2020)
- Doctoral thesis project awarded the first prize in Merck-Millipore India Innovation Award (2012).
- Ranbaxy Young scientist award (2009).
- M.Sc., gold medal for highest aggregate marks (Prof. E.R.B. Shanmugasundaram Endowment medal, Thiru. Ayyamperumal Pillai endowment medal, Dr. Subramanian Endowment medal) (2005)

What is unique about working as a Woman in STEM compared to other fields?

I think as a researcher working in the area of Biological Sciences, I have always felt (since my PhD days) that there is better gender equality. Although I have only been associated with the STEM area, it would be difficult to comment on a field that I have not been associated with.

I have been more recently associated with certain administrative responsibilities, and it is here that have noticed a paucity of role models. I have been fortunate to have been in research and academic settings where the opportunities have always been provided at an equal setting.

As a woman in STEM, there is flexibility in terms of adopting time schedules that are not as rigid as the corporate field. This is a huge advantage for achieving good work-life balance as well as providing an effective and efficient working style.

Another advantage as a STEM researcher in an HEI is the opportunity to be able to contribute directly to human resource development, technological development as well as the satisfaction of giving back to society.

What are your key contributions to your work area?

- As an independent PI, my research group has started working on identifying the regulatory networks in renal development (nephrogenesis) and the role of epitranscriptomic modifiers in Diabetic Nephropathy (Gosavi et al,, Dey et al., Harsha Sankar et al., unpublished data)

- My postdoctoral research in the Hastie lab has been focused towards understanding the role of RNA regulation by a transcription factor Wilms' tumour 1 (WT1) in the context of development and disease.

- I was involved in developing a new technique to identify and characterize the in vivo RNA binding interactome of a developmental protein, as reported in Methods Mol Biol, 1467: 197-209 (2016) and Genes Dev. 31:347-352 (2017).

- Using CRISPR-Cas9 mediated genome editing, we have created nephropathic disease model cell lines, which reveal that there are isoform specific differences towards the transcriptional and post transcriptional nodes of gene expression operational in these different disorders.

- By employing a specific small molecule inhibitor of CARM1-mediated H3R17 methylation, we found that, in human embryonic stem cell lines and in the zebrafish model system, H3R17 methylation contributes to the astroglial specific development. (Selvi BR and Swaminathan A et al., Mol Biol Cell. 2015).

- My doctoral research work was towards understanding the role of histone arginine methylation and lysine acetylation in the regulation of gene expression by employing an inhibitor based approach.We identified an Arginine methyltransferase CARM1 specific inhibitor, TBBD from pomegranate crude extract. The mechanism of enzyme inhibition was found to be unique wherein the substrate sequence determined the specificity of the inhibition (Selvi BR et al.,J Biol.Chem. 2010).

- Use of nanospheres (nanomaterial) for delivering the only known HAT activator, CTPB in vivo leading to induction of hyperacetylation in mammalian cells as well as mouse brain (Selvi BR and Dinesh J et al., Nano Lett. 2008). This work has provided a positive impetus to the field of activation of histone acetylation especially due to its therapeutic potential in the case of the neurodegenerative disorders which are characterized by histone hypoacetylation (Existing collaborative work and corresponding papers from the Kundu and Boutillier groups).

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

My decision to take up STEM research as a career option has been part influenced by situations, part by the people and part by the places where I have been. During my early childhood, my grandfather was instrumental in making me realize the importance of multitasking. My first attempt to clear the All-India Medical Entrance, did not work out. I had decided to take a year break for preparation and on my Dad's advice (to avoid a year gap) had enrolled for the Microbiology and Biochemistry BSc graduation at SIES College Mumbai. My first year at SIES changed my perspective, thanks to Prof. Anita D'souza who mentioned how she was carrying out research along with her teaching responsibilities. And fueled by this encouragement I decided to apply for the IISc Young Fellowship Programme (basically a summer research fellowship). That summer at IISc, is what triggered my interest in taking up research as a career. The joy of hypothesizing, designing, and implementing a research project and ultimately seeing the results was an exhilarating experience (which still holds true!). I have been truly fortunate to have excellent mentors all throughout my research career in Prof. Tapas Kundu and Prof. Nick Hastie, who have all imbibed qualities of practicing science. During my interviews, Prof. Veluthambi (my master's thesis supervisor) had mentioned not just looking for research-oriented positions, but stressed on the fact that those with a combined teaching and research component will help me grow as a researcher. These words keep proving themselves right semester after semester. Being within the IISER system has indeed been a holistic learning and growing experience. More recently, Prof. Chary has been a great and thoughtful mentor, a man of few words but far-reaching impact. Prof. Jyotsna Dhawan and Prof. Wendy Bickmore have been inspirational and insightful mentors and huge role models. Last but not least, all through these 17 years of research career, my family has been the biggest support system who has always helped me realize and follow my dreams.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

During my research career, as a woman, I have not really faced any gender bias, I have always been recognized on an equal footing with the male counterparts. Having come from a family of first-generation engineers and teachers, there was an expectation that I would end up in a similar profession. However, the path of biomedical research has been a hugely rewarding career, which now has changed the perception of science as a career. Thanks to my teachers, and mentors who have been a constant source of inspiration and strength.

There have been some challenging experiences, which I believe has been true for most early career researchers who started off their research careers in late 2019. We all had to face the uncertainties associated with the pandemic. However, I had the opportunity of being able to initiate the COVID testing facility at IISER Berhampur with the unwavering support of Prof. Yogendra Sharma. This was a truly enriching experience to be able to use our research expertise directly for the needs of the nation. During this phase, a few of the master's students had volunteered to work with me for some initial experiments in my research group. So, thanks to the ever-enthusiastic student support at IISER, my group's research work started off even before my PhD student was recruited. Since then, there have been several challenges in terms of logistics, but my core research team of four (3 PhD and 1 postdoctoral fellow) has always had my back.

Being part of a new institution was a conscious choice where I had already been informed that apart from the teaching and research responsibilities, there would be additional administrative roles that would be a part and parcel. However, sometimes this can be overwhelming, since a) all throughout the research career, we are trained for teaching and research not for such management roles, so there is a clear lack of experience, b) if its a new institution, there is less established structure, so sometimes there is nothing to fall back on or refer to while making important decisions. c) if it's our research that drives us, not being able to be working at the bench can be a huge challenge to personal motivation. Hence, role models and mentors who have been in such situations are needed for regular discussions to navigate these challenges. I am still trying to work through these with the help of support and advice from mentors.

What is your advice to next-gen woman in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
My advice to next gen women scientists in the initial phase of their careers in this field would be to network, reach out to mentors for advice, suggestions, and feedback. Only after my move to the UK for my postdoctoral research did I realize the need for such mentorship at different levels. It is also extremely important to have an open mind towards collaborations, suggestions and feedback received from other researchers (there is no hierarchy here). Always reach out to the peer group and mentors, science is no longer possible by confining ourselves to the four walls. Ideas and thoughts are best possible during open conversations.

We all need to have long term goals but dividing them into smaller objectives and marking each of these smaller goals is necessary to keep confidence in the research group. The research work is possible only because of the people who are part of the team. It is essential to acknowledge their individuality and their contributions in a timely manner.

The scientific ecosystem has evolved over the years and has changed since I started my research career as a student to now when my students are starting their career. There is more support available, increased awareness, technological advances, and the various career options within STEM. It is definitely the best time to be in the STEM field as a researcher.

Dr. Saba Naqvi, Ph.D.

Assistant Professor

National Institute of Pharmaceutical Education and Research - Raebareli

I was fortunate enough as I was born in my parental town Raebareli where I got raised after schooling in distinguished Kendriya Vidyalaya Raebareli and further graduated from Firoz Gandhi college Raebareli. Keeping in view of my passion to work in the field of science and technology, I got enrolled for MSc Toxicology, at Jamia Hamdard. Thereafter, I opted for doctoral studies at Jamia Hamdard with collaboration at AIIMS New Delhi.

Subsequently I got the opportunity to get the training from such mentors who were highly recognized, passionate, and knowledgeable who put me to realize my interest in science at the initial stages. I also learned the lesson from them that how to act in personal and professional life in the future to come. After obtaining Ph.D. I joined IIT Roorkee as a DST women scientist where I acquired a novel and cutting-edge technology.

Although, I have experienced numerous obstacles, but a strong drive is necessary, and it is your choice, not anybody else's that will determine whether you are successful or failed. The women need to resilient no matter what.

I joined NIPER Raebareli as an assistant professor thus providing me a chance to work in an environment where I could explore my ideas to reach at certain solutions to meet out the actual problems. Being an education and research Institute, it provides us opportunity to conduct research and teaching together where we interact and inspire to all students specially to girls who often comes from extremely remote areas to join main streams of education but are unsure of how to turn their ideas into realties. At NIPER, we as mentors gives ideas to their wings for those who are supposed for.

At present, I am Life member in several scientific societies like Society of Toxicology (STOX), Material research society of India, Indian science congress, Indian academy of Neurosciences, Society for Alternatives to animal 's experiment (SAAE), member secretary of Institutional animal ethical committee (IAEC) and awarded DST women scientist.

What is unique about working as a Woman in STEM compared to other fields?
Women are traditionally viewed as being very creative and optimistic. She has the fortitude to endure and excellent perseverance in all trying circumstances. Since most women manage their career and families so well, they tend to have good managerial and teamwork abilities. Women can explore these traits in STEM fields and use their creative concepts. She is exceptional in STEM because of her genetic traits, which also make her a successful professional woman.

What are your key contributions to your work area?
I am working in the field of nanomedicine, where I checked nanomaterials as well as environmental metals induced toxicities, their biodistribution and mechanism of action. Our group evaluated the toxicity of novel entities as well as of nano formulations using acute/sub-acute, chronic toxicity assays. Our lab is also working in nanotheranostics approach using pharmacology and molecular aspects of neurological diseases like Alzheimer's/Parkinson utilizing diverse research tools i.e., in-vitro and in-vivo animal models, and animal imaging.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
I studied in Raebareli, which is nearby to Lucknow. Lucknow is home to many excellent CSIR labs, including CDRI and IITR. One of senior scientist at IITR inspired me to pursue a master's degree in Toxicology.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
Flexible work schedules and a secure work environment, in my opinion, are essential to retaining women in STEM. Family care obligations can occasionally play a significant part in it. A strong ecology, which includes both your family and your workplace, must be present to support you when you work long hours as is often highly desirable in STEM.

One of the hardest times in my life was when I was suffering from corona virus in 2021 while under five-month pregnancy. Two months later, I gave birth to a premature baby. Under such critical situation I managed my lab during my six-month maternity leave. But I was strong enough to carry out the research work despite facing odd situations, this could not deter me from my goal.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
Getting desired results all the time is not science. In research you must be ready for negative or unexpected results, in the similar way, in life if you really want to excel in your career, you must be ready for hurdles or bottle neck, those who are not ready for that, they are not able to reach their goals. My suggestion to next gen women is to be fearless, talk with confidence, and have a clear purpose when being aggressive. Possess a self-assured demeanour, respond to criticism in a reasoned way, and always be composed and thoughtful.

There must be free crèche facility for working women, so they can balance their motherhood and work together.

The girl students are performing very well at school levels but unfortunately, they did not translate their performance into professional success this may be due to their additional responsibilities after marriage, so there are much awareness programs and schemes should be there for women to come back into their profession while a short break in career. Although DST, DBT has already implied these kind of schemes or grants that support women to come back into mainstream after a career break.

There is some motivational and educational free workshop/education loans/scholarship should be directed by gov of India to recognize their gaps to refill at all stages from school to college level. In my view women could do something extraordinary, if she is determined to perform, but their responsibilities towards family and society make it tough to reach that threshold of success.

It is important to have persistency and self-belief to acquire success despite of any kind of barriers, your desire, passion and strategies at right time and right way must be selected by yourself not by others.

Prof. Saikranthi

Visiting faculty, Department of Earth and Climate Science
Indian Institute of Science Education and Research (IISER),
Tirupati

I am Saikranthi Present designated as Visiting faculty, Department of Earth and Climate Science, Indian Institute of Science Education and Research (IISER) Tirupati, Andhra Pradesh.

Current and past job functions:

- **Visiting faculty** - Department of Earth and Climate Science, Indian Institute of Science Education and Research (IISER), Tirupati, Andhra Pradesh, India –November 2022 onwards.
- **INSPIRE Faculty** – Department of Earth and Climate Science, Indian Institute of Science Education and Research (IISER), Tirupati, Andhra Pradesh, India –November 2017 to November 2022.
- **Postdoctoral Fellow** – Divecha Centre for Climate Change (DCCC), Centre for Atmospheric and Oceanic Sciences, IISc, Bangalore, India - February 2015 to November 2017.
- **Graduate Research Trainee** – Department of Atmospheric and Oceanic Sciences, McGill University, Montreal, Canada - February 2013 to June 2013.
- **Internship** - Swedish Institute of Space Physics (Institutet for rymdfysik, IRF), Kiruna, Sweden - April 2011 to June 2011.
- **Senior Research Fellow** – National Atmospheric Research Laboratory, Department of Space, Govt. of India, Gadanki - January 2011 to June 2014.
- **Junior Research Fellow** – National Atmospheric Research Laboratory, Department of Space, Govt. of India, Gadanki – January 2009 to January 2011.

- **Residing city**: Tirupati, Andhra Pradesh, India.

- **City where you born and brought up**: Hindupur, Anantapur District, AndhraPradesh.

- **Academic qualifications (mention details of institutes and universities)**
  - Ph.D: Completed in June 2014 from National Atmospheric Research Laboratory (NARL), Gadanki, Chitoor district. (Sri venkateshwara University, Tirupati), Andhra Pradesh,
  - M.Sc: Completed in April 2008 from University of Mysore, Karnataka.
  - B.Sc: Completed in April 2006 from Sri Krishna Devaraya Unversity, Anantapur, Andhra Pradesh.

- **Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)**

- **Awards, fellowships, memberships of scientific academies:**
  - Young Scientist Award, Andhra Pradesh Akademi of Sciences 2020.
  - DST-INSPIRE Faculty Award from DST, Govt. of India (January 2017)
  - Young Scientist Award in the 2nd India Radar Meteorology Conference (IRAD) 2018.
  - Best paper award in National Space Science Symposium – 2012 held at Tirupati, India.
  - Dr. S. Pancharatnam Gold Medal in Master of Science
  - K. N. Sreenivasa Rao Gold Medal in Master of Science
  - Prof S. Chandrasekhar Gold Medal in Master of Science
  - Prof. S. B. Bondade Gold Medal in Master of Science
  - Jawaharlal Nehru Memorial Fund merit award in Master of Science

- 8th Rank in Bachelor of Science

- **Publications (IF-Impact factor):**
  - K. Saikranthi, and N. S. Chiranjeevi, 2022: Intraseasonal variation of rainfall characteristics and latent heating profiles during southwest and northeast monsoon seasons over the Arabian Sea and Bay of Bengal. Climate Dynamics, 58, 1–15. (IF: 4.901)
  - K. Saikranthi, B. Radhakrishna, T. N. Rao, and S. K. Satheesh, 2019: Variability in vertical structure of precipitation with sea surface temperature over the Arabian Sea and the Bay of Bengal as inferred by Tropical Rainfall Measuring Mission precipitation radar measurements. Atmospheric Chemistry and Physics, 19 (15), 10423-10432. (IF: 7.197)
  - K. Saikranthi, B. Radhakrishna, T. N. Rao, and S. K. Satheesh, 2019: Differences in the association of sea surface temperature - precipitating systems over the Bay of Bengal and the Arabian Sea during southwest monsoon season. International Journal of Climatology, 39, 4305 – 4312. (IF: 3.651)
  - K. Saikranthi, B. Radhakrishna, S. K. Satheesh and T. N. Rao, 2018: Spatial variation of rain systems during El Niño and La Niña periods over India and adjoining Ocean. Climate Dynamics, 50, 3671-3685. (IF: 4.901)
  - K. Saikranthi, T. N. Rao, B. Radhakrishna, and S. V. B. Rao, 2014: Morphology of the vertical structure of precipitation over India and adjoining oceans based on long-term measurements of TRMM PR. Journal of Geophysical Research: Atmospheres, 120 (17), 8987-9005. (IF: 5.22)
  - K. Saikranthi, T. N. Rao, M. Rajeevan and S.V.B. Rao, 2013: Identification of Homogeneous Rainfall Zones over Indian Region Using High-Resolution Gridded Data. Journal of Hydrometeorology, 14 (1), 304-317. (IF: 4.871)
  - K. Saikranthi, T. N. Rao, B. Radhakrishna, and S. V. B. Rao, 2013: Impact of misrepresentation of freezing-level height by the TRMM algorithm on shallow rain statistics over India and adjoining oceans. Journal of Applied Meteorology and Climatology, 52 (9), 2001-2008. (IF: 3.557)
  - B. Radhakrishna, K. Saikranthi, and T. N. Rao, 2020: Regional differences in raindrop size distribution within Indian subcontinent and adjoining seas as inferred from global precipitation measurement dual-frequency precipitation radar. Journal of the Meteorological Society of Japan, 98 (3), 573-584. (IF: 3.356)
  - Rao, T. N., K. Saikranthi, B. Radhakrishna, and S. V. B. Rao. (2016). Differences in the climatological characteristics of precipitation between active and break spells of the Indian summer monsoon. Journal of Climate, 29 (21), 7797–7814. (IF: 5.38)
  - B. Radhakrishna, T. N. Rao, and K. Saikranthi, 2019: Spatial coherence of water vapor and rainfall over Indian sub-continent during different monsoon seasons. Journal of Hydrometeorology, 20 (1), 45-58. (IF: 4.871)
  - K. Sunilkumar, T. N. Rao, K. Saikranthi, M. P. Rao, 2015: Comprehensive evaluation of multisatellite precipitation estimates over India using gridded rainfall data. Journal of Geophysical Research: Atmospheres, 119 (13), 8433-8449. (IF: 5.22)
  - V.G. Vignesh, C.D. Jain, K. Saikranthi, M. Venkataratnam, 2023: Spatial variability of trace gases (NO2, O3 and CO) over Indian region during 2020 and 2021 COVID-19 lockdowns. Environ Monit Assess, 680. (IF: 3.307)
  - Oza, H., V. Padhya, A. Ganguly, K. Saikranthi, T. N. Rao, and R. D. Deshpande, 2020: Hydrometeorological processes in semi-arid western India: insights from long term isotope record of daily precipitation. Climate Dynamics, 54, 2745–2757. (IF: 4.901)
  - B. Radhakrishna, S. K. Satheesh, T. N. Rao, K. Saikranthi, and K. Sunilkumar, 2016: Assessment of DSDs of GPM-DPR with Ground-Based Disdrometer at Seasonal Scale over Gadanki, India. Journal of Geophysical Research: Atmospheres, 121, 11,792–11,802. (IF: 5.22)

What is unique about working as a Women in STEM compared to other fields?

Women pursuing degrees in STEM fields increase their representation, especially in scientific fields. The women in STEM possess leadership qualities and knowledge about the most vital areas of our lives. For instance, the deep space mission, Chandrayaan-1, the first lunar probe from India launched in 2008 aboard PSLV-XL from Sathish Dhawan Space Center, Sriharikota, was a big success for ISRO discovering the water and atmospheric profiling of the moon, was headed by two inspiring women – Project director M. Vanitha and mission director Ritu Karidal. Moreover, 30% of the team in this mission are women. At the outset, the Indian women are set to conquer the moon. This vividly represents women's empowerment in rocket science in India, making us believe in the power of dreams and relentlessly work towards achieving them.

What are your key contributions to your work area?

I have made significant contributions in the fields of radar meteorology and remote sensing applications, in

particular, microphysics of precipitation. I have used the most complex ground-based and space-borne radars to understand the vertical structure of different types of precipitation and their spatiotemporal variability. The active and break spells of the Indian monsoon are not coherent across the country; thus, coherent rainfall zones are identified for different seasons. The validity of the identified zones has been tested for various rain accumulations from intrapersonal to climate scale, and it found that the homogeneity of regions may vary in the future. The core monsoon region receives rainfall from the organized mesoscale convective systems in the active spells and shallow convective systems in the break spells.

I have validated space-borne radars, i.e., TRMM and GPM DPR data products, over India. I identified a problem in the TRMM (tropical rainfall measuring mission) version#5 products. TRMM underestimates the freezing level height, which has implications in the misclassification of shallow rain and is corrected subsequently in version#7 of TRMM data. I found that raindrops' evaporation is dominant in India's dry regions and low-level hydrometeor growth in the oceanic areas (Arabian Sea and Bay of Bengal). Also, one of the wettest parts of India, the Western Ghats, receives rain from shallow clouds. The occurrence of virga rain (rain that evaporates before reaching the ground) is found to be responsible for the overestimation of rainfall in the dry regions of India (like northwest India) by multi-satellite precipitation estimates of rainfall.

Further, I have shown that the monsoonal rainfall in the La Niña years is from the broad stratiform rain systems, while in the El Niño years is from weaker deep and deep-wide convective core systems. Sea surface temperature is the driving source for the precipitating systems and shows a clear link between them over the Arabian Sea but not the Bay of Bengal.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

My parents, Nagaraju and Jhansi, encouraged me to pursue a scientific career right from school. My father's persistent encouragement nurtured me to be a gold medalist in my master's degree and further to pursue Ph. D. My husband, Dr. Radhakrishna, is my best professional mentor/critic who always encouraged and supported me during my early career in all the ways of life, without him my research and academic career would have been troublesome. I got motivated by scientists and professors, especially my supervisors at NARL and Divecha Centre for Climate Change, IISc Bengaluru, during my Ph. D and postdoc. Moving to IISER Tirupati was a significant turn in my career. IISER Director, Prof. Ganesh, encouraged and supported me in establishing my lab at Yerpedu. The discussions with senior professors and colleagues at IISER certainly helped me to develop and improve my teaching skills.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

I did not face any obstacles as a woman during my professional journey; instead, every woman faces the challenge of family and work balance during their early career. I am very fortunate to have my parents and husband, who always supported me in maintaining the work-home balance with my children. Leading life is just a matter of patience; hardships or happiness will disappear.

What is your advice to next-gen women science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

Keep faith in your inner strength and working smart and presenting in a unique style led to achieving the goals. There is nothing like success and an endpoint in science; it's just the journey to acquire knowledge. Especially maternity should be a manageable obstacle to one's scientific career. One can pass the phase with patience without breaking the work taking the help of the nearest one. Women can be a certain role model to their children by having patience. The scientific network plays a crucial role in the career. It is beneficial for scientific growth during the initial phase when we are struck up. Networking always enhances the knowledge of scientific opportunities and information.

Prof. Sangeeta Santra

Assistant Professor
IIT Delhi

Residing city:

City of birth: Kolkata, West Bengal

City of brought up: Mumbai, Maharashtra

Academic qualifications (mention details of institutes and universities)

PhD: IISc, Bangalore

M.E.: IISc, Bangalore

B.Tech: NIT, Durgapur

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

	Name of Award	Awarding agency	Year
(1)	ITS-SERB award	SERB	2022
(2)	Teaching Excellence Award	Indian Institute of Technology, Delhi	2021
(3)	Best poster award	Diffusion in Solids and Liquids International Conference (DSL)	2018
(4)	Newton International Fellowship	Royal Society-SERB	2017-2019
(5)	IISc Fellowship (Research grant for submitting PhD thesis within 5 years)	Indian Institute of Science, Bangalore, India	2015-2016
(6)	CSIR, IIM-SJEF, CICS grants	To attend DIMAT International conference, Germany	2014
(7)	DAAD Fellowship for short-term research (four months)	DAAD, Germany	2013
(8)	UGC Fellowship	University Grant Commission, India	2012-2014
(9)	Merit Scholarship (Second rank holder in the department)	National Institute of Technology, Durgapur, India	2004-2008

N. Srivastava and S. Santra*	Effect of independent alloying of Zr with bronze and niobium on superconducting properties of Nb_3Sn in a Cu(Sn)/Nb system	Scripta Materialia	Under review		2023
D. Sharma, D. Kalyan, S. K. Makineni and S. Santra*	Effect of Zr on growth kinetics, microstructure and microtexture of Nb_3Sn by bronze technique	Journal of Alloys and Compounds	935	168140	2023
Z. Gao, S. Santra, S Amirkhanlao, E Eardley, C Wort, CRM Grovenor and SC Speller	Microstructures and superconducting properties of MgB_2 bulk samples processed by ultra-high pressure-assisted sintering	Journal of the European Ceramic Society	42	7481-7490	2022
Z. Gao, S. Santra, C. R. M. Grovenor, and S. C. Speller	Effect of cubic and hexagonal boron nitride additions on the microstructure and properties of bulk MgB_2 superconductors	Superconductor 35 Science and Technology	084002	2022	
G. A. B. Matthews, T. Mousavi, S. Santra, C. R. M. Grovenor, P. S. Grant and S. C. Speller	Improving the connectivity of MgB_2 bulk superconductors by a novel liquid phase sintering process	Superconductor Science and Technology	35	065005	2022
T. Mousavi, S. Santra, Z. Melhem, S. C. Speller and C. R. M. Grovenor	Superconducting joint structures for Bi-2212 wires using a powder-in-tube technique	IEEE Transactions on Applied Superconductivity	31	1-4	2021
G. A. B. Matthews, S. Santra, R. Ma, C. R. M. Grovenor, P. S. Grant and S. C. Speller	Effect of the sintering temperature on the microstructure and superconducting properties of MgB_2 bulks manufactured by the Field Assisted Sintering Technique	Superconductor Science and Technology	33	054003	2020
S. Santra, C. R. M.	Comparison of interfacial and	Journal of Alloys and Compounds	807	151665	2019

What is unique about working as a woman in STEM compared to other fields?
STEM involves both theoretical and practical modes of working. Women in STEM need to devote lot of efforts on exploring various applications and be flexible with the option of working at any point of time in a day. However, one unique point as a woman in STEM is to work on equal pace and sharing the same platform as those of men.

What are your key contributions to your work area?
My research is directed towards understanding the correlation of phase transformation-microstructure-property of interfacial reaction zones for the development of phase-modulated multilayered alloy materials. My major contributions have been in superconducting joints, titanium aluminide coats and cryogenic solders.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
Family and professional mentors.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
One of the preliminary challenges encountered by me during my early PhD days was handling of heavy equipment operating at extremely high temperatures. However, gained expertise on handling these with poise with time, and understood that it all depends on your willpower.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
Initial phase of career demands lot of time and effort to build upon for the next-gen students. Hence, giving time to family may become challenging at times. My advice is to prepare well in advance at how to manage both, and keep pursuing at professional front, and not leaving behind the career.

Ms. Santwana Mukhopadhyay

Professor
Department of Mathematical Sciences
Indian Institute of Technology (BHU), Varanasi

I have carried out research to provide a strong mathematical foundation to the thermomechanical extensions of some non-classical thermoelasticity theories.

Joydev Kenduli, Dist: Birbhum, West Bengal.
Ph.D. in Applied Mathematics

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.):

What is unique about working as a Women in STEM compared to other fields?
It can be seen globally that STEM is essentially male dominated. Due to the social mind set or psychological barrier, women or girls are discouraged to take up STEM field and to join STEM workforce. However, my experience is that the STEM provides ample opportunities to women to contribute towards generating innovative and original ideas as well as scientific knowledge and skills for technological revolution. They can do no less than the male colleagues in terms of creating a sincere, and congenial work atmosphere for better work efficiency in STEM fields. Normally the women can handle easily the multi-tasking jobs in STEM fields with much better efficiency. The proper gender ratio is essential to bring out the real changes in the society. The more women join the STEM, the next generation girls will be free from STEM related anxiety and further motivated to take up the STEM profession. The women will do equally well if not better in teaching, research and administration of STEM fields. Hence, the gender ratio should be maintained in the STEM fields in order to achieve higher efficiency, congenial environment, otherwise the growth of the society will be one-sided and incomplete.

What are your key contributions to your work area?
A. Research: The area of my research work mainly concerns with the Mathematical Modeling and Analysis on Coupled Thermodynamical Problems. The thermoelasticity theory that involves the simultaneous study of changes in the thermal and mechanical conditions in an elastic body is developed to support the general observation that deformation of an elastic solid causes some temperature changes inside the body and that the thermal changes in the solid may also cause some deformation in the elastic solid. This theory has developed a considerable interest in engineers and researchers to study and explore the vast range of its applications in various disciplines of science and technology. Thermal stress analysis is very important in a wide range of structural challenges, including high-speed plane manufacture, space vehicle, rocket, jet engine design, nuclear reactor design, and so on. Moreover, the thermoelasticity theory is increasingly being used for a range of engineering problems, including the development of material parts that can endure sudden thermal and mechanical stresses and function at high temperatures. Mathematical modelling plays very important role in this interdisciplinary topic, and it is worth carrying out research in this area. Various other branches of mechanics and physics like porothermoelasticity, viscothermoelasticity, pizothermoelasticity, magnetothermoelasticity, and many other sub-branches, which have drawn the attention of researchers, are also founded as extensions of the thermoelasticity theory.

I have carried out research to provide a strong mathematical foundation to the thermomechanical extensions of some non-classical thermoelasticity theories. Several theoretical results regarding domain of influence theorem, well-posed Ness of solutions for coupled problems, variational and reciprocity theorems have been established.

Analytical as well as numerical schemes have been developed to solve some unsolved problems. Size dependent thermoelastic vibration analysis of micro and nano-mechanical structures like beam, plate etc. have been done by considering the coupling effects of thermal, mechanical fields.

10 PhD theses have been supervised by me on coupled dynamical thermoelasticity resulting in a good number of publications (120) in reputed International Journals. Presently, another 5 research scholars are working under me in this area and two research scholars are working in the area of nonlinear dynamical systems. I am active reviewers of several reputed International Journals in the concerned area. I am also acting as an active member in the Editorial Board of Four International Journals on this area.

B. Teaching: In addition to the research work as mentioned above I have taught several courses of Mathematics and Computer Science to the B. Tech, IDD, and M. Tech students at our Institute. I have guided 27 IDD theses for students of 5-year IDD program in Math and Computing that is presently running in our department. Details can be found in my attached Biodata

C. Administration: I have also got good opportunities to discharge my sincere duties in various administrative positions of the Institute as mentioned below:

- **Details of Administrative Experience:**

Organization	Designation	Period	To	Nature of Responsibility
IIT(BHU)	Associate Dean (Academic Affairs)	2019	Continuing	To look after the administrative work related to Core courses
IIT(BHU)	Chairperson, Internal Complaint Committee	2017	Till Date	To act as Chairperson of the committee which look after the prevention and redressal of complaints of sexual harassment of women at workplace in the institute and for matters connected therewith
IIT(BHU)	Acting as Chairperson of Institute core- course monitoring committee of the institute	2018	Till Date	To monitor the smooth running of all the Institute core courses as well as conduction of examination of all the institute core courses and open elective courses.
IIT(BHU)	Administrative Warden	2015	Till Date	To look after the administrative work three IIT-Girls' Hostels
IIT(BHU)	Member of Anti-ragging Squad	2012	Till Date	Continuous vigilance/Monitoring to prevent ragging.
IT-BHU	Member of Anti-ragging Icons with outline for test print	2004-2011	2011	Vigilance to prevent ragging in IT-BHU Girls' hostel
IT-BHU/ IIT(BHU)	Member of IIT-Guest House committee,	2010	Till Date	To formulate the policies for maintenance & betterment of IIT- Guest house
IT-BHU/	Institute Purchase committee of	2005	2006	To procure the items of computer lab
IIT(BHU)	Computer Lab for Part-I students, IT-BHU/IIT(BHU)	2013	2014	of the First-Year students
IT-BHU	co-chairperson of cultural wing of Gymkhana, IT (BHU)	2006	2007	To advise and monitor the cultural programs organized by the students under Gymkhana activities
IT-BHU	Member of disciplinary committee	2010	2011	To examine the reported cases against the students and recommend the disciplinary action accordingly
IIT(BHU)	Member of Senate library committee	2012	2017	To deliberate and decide policies related to various issues of the IIT-Library
IIT(BHU)	Member of Committee of Child-care leave for faculty /non-faculty of IIT(BHU),	2012	2014	To examine various applications and recommend suitable action as per the policy of the institute

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues/ Professional mentors, etc.)?

I have chosen STEM field especially Mathematics as my favorite subject since undergraduate and postgraduate studies. After completing my Ph.D. in Applied Mathematics, I continued my further research as research associate (CSIR) and as Women Scientist (under DST program) in It-BHU, Varanasi. Presently, I am engaged in academic profession as a Professor of Mathematics in IIT(BHU), Varanasi. I am doing my teaching, research and administration in STEM fields. From my school, I got inspiration from my father (who was a high school teacher) to take science subjects and to go for higher studies. My maternal uncle was a Professor in Mathematics in a college where I took admission for bachelor studies. Hence, partly some encouragement I received from my uncle who mentored me the

initial period of my graduation. But I could not have done much in STEM without strong support of my father. Since my postgraduate and doctoral studies, I took teaching profession again because of my father's motivational suggestions. I was further inspired by my supervisor to choose Mathematical Modeling as research area for my PhD work. He was an excellent teacher in the University of Burdwan, West Bengal where I also did my M.Sc. Since then, I am continuing my research and teaching in the area of Mathematics and Mathematics related computing subjects. Last but not the least, my husband (who is also working as a Professor in IIT(BHU)) is my main inspiration and support in continuing my work as women in STEM field.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

Staring from school life to my present position, I had to face several challenges in addition to other issues of ups and downs during my career path. It was a Herculean task to complete my graduation as I had to travel to my college (situated 40 km away from home) by bus which was not at all regular at that time. After joining for Ph.D. I got married and at that time I had difficulty to manage both professional and family life. Also, it was a challenge for me during the last stage of my PhD work when I had to take care of my newly born baby. However, from that time onwards, I have learnt how to tackle my professional and family life in a much more balanced way, and I brought up my daughter with all care till she graduated from an IIT again in STEM fields. I realize all women will face same type of problems in balancing professional and family life. In my professional life, I also faced the behavioral problems from a few of my colleagues, which I could overcome with help of my well-wishers and other senior colleagues in the Institute. Again, this kind of issue will not be uncommon to women while pursuing their career in STEM fields.

What is your advice to next-gen women in science for initial phase of their career in the STEM field?

My suggestion will be to have clear plan for studies and career goal. At the same time, one should be free from the negative mind-set that normally discourages women to take STEM field of study. They should have confidence that they are no less capable or talented than the male counterpart. They can do also equally well given an opportunity. Hence, the long-term planning and vision is essential to be stable in this profession while entering to family life. Right decision in the turning point of life is very critical which I have realized from my life-experiences and also from the examples of my friends. Otherwise, the journey of career path will not be smooth and enjoyable. Life is full of surprises and challenges, and one should be alert how to tackle the challenges (whatever it may be) and overcome those with courage, self-confidence and determination in order to fulfil her aims and ambition. We should keep in mind that it is also our moral duty to maintain a proper gender balance of the workforce in STEM field to contribute meaningfully to the society.

Prof. Sarika Jalan

Professor

Indian Institute of Technology, Indore

I am Dr. Sarika Jalan working as an Professor at Indian Institute of Technology Indore previously worked as Editor-in-Chief, Journal of Computational Science (January 2021), Visiting Professor, TU Berlin (November-December 2022), Guest Scientists, MPIPKS Dresden Germany (June-July 2022), Visiting Professor (February 2020 – January 2021), IBS center for Theriacal physics, Daejeon South Korea, Professor (December 2017 -), Indian Institute of Technology Indore,

I am Residing in Indore and born and brought up in Robertsganj (Sonebhadra Dist.) UP.

Academic qualifications (mention details of institutes and universities):

- Ph.D. (Physics, Specialization: non-linear dynamics) Physical Research Laboratory, Ahmedabad. Dissertation: "Different Mechanisms of Synchronization in Coupled"
- MSc. (Physics) Banaras Hindu University, Varanasi
- B.Sc. (Physics Hons) Banaras Hindu University, Varanasi

Notable achievements (awards, fellowships, memberships of scientific academies and publications, etc.)
Awards and recognition:

- Serb Power Fellow 2022-2025
- India Top cited Paper Award by IOP Publishing (2022)
- Editor-in-Chief: Journal of Computational Science (Elsevier)
- Elected executive committee member for complex systems society (until 2023)
- Invited Member: Bernoulli Society (2022 -)

Editorial board member:

- Chaos, Solitons and Fractals (2017 - 2020)
- Nature Scientific Reports (2017 -)

Editorial advisory board:

- Chaos: An interdisciplinary journal of nonlinear science (2018-2021)
- Chaos: An interdisciplinary journal of nonlinear science (2022-2025)

Publications:

1. The structure and dynamics of networks with higher order interactions S. Boccaletti, P. De. Lellis, CI del Genio, K Alfaro-Bittner, R Criado, S. Jalan, M. Romance Physics Reports 1018, 1-64 (2023).
2. Eigenvector localization in hypergraphs: Pairwise versus higher-order links, A. Mishra, S. Jalan, Physical Review E 107 (3), 034311 (2023)
3. Oscillations quenching in coupled Stuart-Landau oscillators via dissimilar repulsive coupling. S. Dutta, O. Alamoudi, Y. S. Vakilna, S. Pati and S. Jalan*, Phys. Rev. Res. 5, 013074 (2023).
4. Estimation of Correlation Matrices from Limited time series Data using Machine Learning
5. N. Easaw, W Soek, PS Lohiya, S. Jalan, P Pradhan, Journal of Computational Science (2023).

6. Spacing ratio statistics of multiplex directed networks, T. Raghav, S. Jalan*, New J. Phys. 25 053012 (2023).
7. Multiple first-order transitions in simplicial complexes on multilayer systems, S. Jalan* and Ayushi Suman, Physical Review E 106 (4), 044304 (2022)
8. First-order route to antiphase clustering in adaptive simplicial complexes, A D Kachhvah, S. Jalan*, Phys. Rev. E (Letter) 105, L062203 (2022)
9. Eigenvalue ratio statistics of complex networks: Disorder versus randomness, Ankit Mishra, Tanu Raghav, and Sarika Jalan*, Phys. Rev. E 105, 064307 (2022)
10. Hebbian plasticity rules abrupt desynchronization in pure simplicial complexes. A. D. Kachhvah, and S. Jalan*, New Journal of Physics (Fast Track) 24, 052002 (2022)
11. Random matrix analysis of multiplex networks, Tanu Raghav, S Jalan*. Physica A: Statistical Mechanics and its Applications 586, 126457 (2022).

What is unique about working as a woman in STEM compared to other fields?
The freedom which STEM research provides than other fields is very helpful in achieving family-work balance for women, and automatically allows us in proceeding relatively freely towards realizing our ambitions as there exists less guilt of ignoring family.

Second, the creativity which working in a STEM field provides, and challenges innovations while working in new areas of research, in general irrespective of men women, is very fulfilling.

What are your key contributions to your work area?
A large range of complex systems around us can be modelled using coupled nonlinear oscillators on graphs. The challenge lies in deciphering origin of dynamical patterns depicted by such large-scale complex systems. We have provided the mechanisms behind occurrence of emerging cluster synchronization patterns using coupled oscillators on networks model. Particularly, we have solved analytical challenges arising due to incorporation of multilayer and higher-order interactions in predicting critical coupling for synchronization transition.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
Getting an opportunity to peruse doctoral studies at Physical Research Laboratory (PRL) played a major role in shaping all aspects of my life. Seniors and colleagues at PRL were hardworking, humble, intelligent, ambitious, leading in their respective research areas and most importantly fun-loving enjoying their work and life. Since my childhood, I knew I had to "do something, go to a creative field, see the world.... and so many aspirations", but this career I think was inspired by my days at PRL, and support which I received there.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
Off course less women in the field: this is the biggest challenge, in India and everywhere.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
In case sometimes you feel isolated, that's okay. Sometimes you may feel outsiders, not fitting in social norms set for girls, that's also okay. Girl, you have guts to choose STEM as your career option. So, enjoy everything.

Prof. Sasmita Mohapatra

Professor
Department of Chemistry
National Institute of Technology Rourkela, Odisha

I am Dr. Sasmita Mohapatra, and my research focuses on the development of multifunctional nanoparticle based theragnostic drug for early diagnosis and therapy of cancer and my interdisciplinary approach in designing theragnostic nanodrug integrates research in materials science, chemistry, and biology.

I was born and brought up in Puri district of Odisha, and studied in J. B. R. Govt High Nimapara, Puri. I did my graduation from Raveshaw College and master's from Utkal University Bhubaneswar. I was greatly inspired by our master's teachers and my parents to pursue higher study in Chemistry.

Academic Profile
B.Sc. Ravenshaw College
M. Sc. Utkal University, Bhubaneswar
Ph.D. in Nanomaterials from IIT Kharagpur

Awards and Fellowships

- Young Scientist Award, State Science Academy, Odisha 2014
- R. C. Tripathy Young Scientist Award, OCS 2013
- CSIR-NET JRF, 2001
- Elected Life Fellow, Indian Chemical Society no 8570
- Indian Society of Nanomedicine, Life Member ISNM-LF-117
- Odisha Chemical Society, Life Member LM/915/12

What is unique about working as woman in STEM compared to other fields?
Women are born multitaskers. They can nurture a baby by proper education and training, integrate all individuals into a family and keep a perfect equilibrium between professional and personal life. However, since the old days and also now the girls and women are held back in higher studies by biases, social norms which greatly influence the quality of the education they receive and the subjects they study. A social consciousness is the need of the hour to motivate girls in research in STEM. In order to attract more girls towards STEM an awareness drive must be initiated at individual level by organizing lectures or seminars in nearby higher secondary school/undergraduate post graduate colleges. A professional circle among women scientists may be created at the Institute level in order to boost up such awareness activities.

What are your key contributions to your work area?
Advances in nanoparticle synthesis and surface engineering have made it possible to produce nanoscale agents affording both therapeutic and diagnostic functions. We have shown different strategies to develop multifunctional nanoparticle drug which can be used for the diagnosis as well as treatment of cancer. Our research outcome may have further applications in real time monitoring of therapeutic response during the treatment of cancer. After gathering years of experience in synthesis of photonic quantum dots with tunable optical properties our group has developed different bioanalytical techniques for naked eye detection of a numbers of disease markers. Our work has been published in reputed international journals. 6 students have been trained and awarded Ph.D. degree in this research area and are now doing well in their respective professional fields.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

After qualifying CSIR-NET Junior Research Fellowship, I joined IIT Kharagpur in the Department of Chemistry under the mentorship of Prof. P. Pramanik. I was truly nurtured academically as well as inspired by nanotechnologist Prof. P. Pramanik who had unlimited courage to solve several research problems through interdisciplinary solving approach. In course of doing my doctoral research at IITKgp I came to know the tunable properties of nanomaterials and realised that it is possible to develop a customized multifunctional drug nanoparticle by integrating different functional diagnostic nanoparticles as well as drugs in a single platform. After completing Ph.D, I joined as an Asst. Professor in National Institute of Technology Rourkela. My keen interest in "theranostic nanodrug" synthesis stirred me to write research grants and submit to different funding agencies. I received research grants from various funding agencies like DST, BRNS, DBT to set up my laboratory at NIT Rourkela at very early age. My research was improved up at various stages by support from the Institute and external funding agencies which truly accelerated my professional growth.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

Though it has been a challenging task to keep a balance between family, guiding Ph.D. students, executing research work, teaching UG/PG students and being a mother, with huge mental support from my husband Prof. N. Panda I could easily pass through many tough situations in my personal life. A high level of professionalism and mental maturity is required if both partners are in same workplace and aim to excel at both professional and personal fronts. In my opinion if both are in same profession and qualifying all eligibility criteria they must be given a chance to serve at same workplace.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

Women truly need lots of support when they speak their own problems in a professional platform which differ from men although in they are same position. A proper forum/centre must be set up in all Institutes/companies where women employees can exchange their opinions or feelings. For aspiring women researchers my advice would be to stretch themselves in their early careers. They must be exposed to the opportunities available to take forward their professional career. Especially for women researchers support from family is essential as experimental work requires long dedicated work hours. Now a days, girls may take up other career opportunities in STEM such as work in industries, building own digital teaching platforms, patent laws, job in industries etc.

Prof. Shabina Khanam

Associate Professor

Department of Chemical Engineering
Indian Institute of Technology, Roorkee

Present designation: Associate Professor
Current and past job functions: Teaching and Research
Residing city: Roorkee
City where you born and brought up: Born in Pipari (Dist Sonebhadra), UP.
Brought up: Different cities of UP like, Obra (Dist Sonebhadra), Rampur, Bijnor

Academic qualifications (mention details of institutes and universities)

- 2002 – 2007: Ph.D., Chemical Engineering, Indian Institute of Technology Roorkee.
- 2002: Master of Technology, Chemical Engineering, Indian Institute of Technology Roorkee CGPA: 8.73 out of 10
- 1996 – 2000: Bachelor of Technology, Chemical Engineering, Aligarh Muslim University, Aligarh CGPA: 8.03 out of 10
- 1995 : Intermediate: RBD Inter College (UP Board), Bijnor,
- 76%, Distinctions: Physics, Chemistry, Mathematics
- 1993 : Higher Secondary: KG Inter college (UP Board), Rampur,
- 70.7%, Distinctions: Mathematics.

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

Fellowships

- M. Tech. Assistantship funded by MHRD during Post Graduate studies (July, 2000 to February, 2002)
- Senior Research Fellowship of CSIR (Council of Scientific and Industrial Research), New Delhi, for pursuing Ph.D. Program (August 2002 to September 2006)

Awards

- Received Outstanding Teacher Award in UG category in the year 2022.
- Secured Third Position in Poetry Competition in Staff Category under GATI in the year 2022.
- Was amongst the top 15 faculties in IIT Roorkee during screening for Outstanding Teacher Award in UG category in the year 2019.
- Received Best Research Paper Award for the paper: S.S. Chauhan and S. Khanam, "Flue gas waste energy integration system in steam cycle of thermal power plant", International Conference on Recent Advances in Engineering & Science (ICRAES-2020), AMU Aligarh, India, Jan 11-12, 2020.

What is unique about working as a woman in STEM compared to other fields?
I believe that working in STEM I am able to project myself in better way. Wherever, I go my visibility increases probably because of less in number compared to men.

What are your key contributions to your work area?
Contribution of the work done in Engineering in terms of the followings:

a) 7 Ph.D. thesis completed and 4 are in progress

b) 27 M. Tech thesis completed and 1 is in progress

c) 38 research papers in refereed journals with average impact factor of 5.932

d) 33 research papers in national and international conferences

e) 4 new and 14 re-run NPTEL MOOCs courses

f) 2 short term courses

g) Sponsored research and consultancy projects worth of Rs. 152.92 lakhs as PI and Rs 1316 lakhs as Co-PI.

h) Delivered my duties at different administration levels of the Department/Institute.

i) Conducted research to solve industrial problems of following Process Plants: Eco Green Solution Systems (P) Ltd., Bangalore; Bihar Sponge Iron Ltd., Jharkhand; Shri Mahavir Ferro Alloys Pvt. Ltd., Rourkela; Chhabra Thermal Power Plant, Rajasthan; Piparwar Washery, Ranchi; Kedla Washery, Ranchi.

j) Presently, research studies are being conducted with industries like SMC Power Generation Ltd., Jharsuguda, Odisha; JSPL, Angul, Odisha; Tata Steel Plant, Meramandali, Odisha.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

- My class teacher at high school (ms. Saroj saxena)
- My supervisor at iit roorkee (prof. Bikash mohanty)

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

Many a times I heard from male faculty colleagues that it is easy for me (being a women) to grow in professional journey because of women empowerment. Sometimes facing those stereotypes were challenging, apart from that I have received the support I need to grow in the field.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

- Keep on doing the work with your full effort and don't give much attention to other's comments.
- Take as much challenges as possible.

Prof. Shailly Tomar

Professor
Department of Biosciences and Bioengineering
IIT, Roorkee

I am Shailly Tomar working as professor in the Department of Biosciences and bioengineering at IIT Roorkee. I belong to Village Gurana, Distt Baghpat U.P. I was born in a hospital in Meerut. Primary education was in a town Baraut. Further education 4th class to 12th class I was in a boarding school Motilal Nehru School of Sports, Rai Haryana.

Current and past job functions:
December 2019 - Present, Professor of Molecular Virology, IIT Roorkee
April 2014 - December 2019, Associate Professor of Molecular Virology, IIT Roorkee
January 2010 - April 2014, Assistant Professor of Molecular Virology, IIT Roorkee
February 2007 - January 2010, Lecturer of Molecular Virology, IIT Roorkee

Residing city: Roorkee, Uttarakhand

Academic qualifications (mention details of institutes and universities)
- Graduation B.Sc. (Hons) from Delhi University, Delhi, INDIA-year 1999
- M.Sc. in Biophysics from All India institute of Medical Sciences, (AIIMS, New Delhi)- year 2001
- Ph.D. in Virology from Purdue University, IN, USA- year 2006

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)
Awards:
1. Visiting Scientist, OVDF DST SERB, Purdue University, USA (2019)
2. Visiting Scientist, Karolinska Institute, Sweden Research Council (SRC) Grant, Karolinska Institute, Stockholm, Sweden (2019)
3. Institute Research Fellowship as Outstanding Young Faculty, IIT Roorkee (2018)
4. DST Fast track young scientist, DST Govt. of India (2006)

Research publications: 70 research publications and 7 books authored
Patents granted:
1. Tomar S., Kumar P. and Kaur R.; "A method for screening NSP1 capping enzyme inhibitors of Chikungunya" Indian patent application no.: 201711039736 (8th Nov 2017)

Patent granted (Patent No. 429557)
1. Tomar S., Kumar P., Kaur R., Chaudhary N., Singh VA., an antiviral composition of tamarind chi-like lectin and uses thereof. Indian patent, Application no. 201811019298 on May 23rd 2018.

Patent granted (Patent No. 413264)
Patents filed:
1. Tomar S. Kumar P. Singh VA., Nehul S.K., Sharma G. Alphavirus virus-like particles (VLP) containing immunogenic proteins of pathogens and its uses thereof. (Indian Patent Application No. 202311004737, January 24th, 2023)
2. Tomar S., Kumar P., Singh V.A., Nanoluciferse reporter tagged virus-like particles, a method for producing the same, and applications thereof (Indian patent application, 202211066289., 18th November 2022)
3. Tomar S., Khoba Prafful., Bhutkar M., A portable ultraviolet sterilization and disinfection device. Indian Patent,

Provisional Application no. 202111046071 dated. 09/10/2021
4. Tomar,S., Kumar, P., Sircar, D., Kumar, R., Singh, V.A. A prophylactic and therapeutic antiviral composition and method thereof. Indian Patent, Application no. 202011023131, Dated 2nd June 2020.
5. Tomar S. Mudgal R and Dubey A., An antiviral composition against alphaviruses. Indian Patent Application no 201911049130, Dated 29th Nov 2019
6. Tomar S. Kumar P. Neetu, Singh VA. and Choudhary S. Chikungunya virus titration and detection kit. Indian patent application no. 201911035044 on 30th Aug 2019
7. Tomar S., Kumar P., Singh H., Mudgal R. Chikungunya virus protease inhibitors and uses thereof. Indian patent, Application no. 201811022065 on June 13th, 2018.
8. Tomar S., Kumar P. and Kaur R.; "A highly sensitive nsp1 enzyme assay and kit for determining inhibitors of alphavirus/chikungunya virus." PCT application no. PCT/IB2018/051760 (16th March 2018).

What is unique about working as a woman in STEM compared to other fields?
Science is very fascinating. Each day our mind ends up thinking about some new idea and innovation. The more a problem is analysed, the more curiosity is built up to break it. If the problem is challenging, then we end up learning more and once we crack it, it gives a boost to our confidence. Sometimes the results are not as expected. We as women are multitasking and I take failure as an opportunity to learn, to re-evaluate and come back stronger with better reasoning. Failures in research are the experiences that make leads to our growth. Satisfaction that comes from the hard work and our sincerity towards a given task keeps me strong to fight odds. The new discoveries and findings of a scientific problem are creditable and benefits mankind directly or indirectly. This is the motivation that to impact and directs me to work extensively and exclusively in this field of drug discovery against pathogenic viruses.

What are your key contributions to your work area?
My molecular virology lab is working extensively towards antiviral drug discovery and bio-therapeutics from natural sources against emerging pathogenic viruses with the focus on enveloped plus-strand RNA viruses including Chikungunya virus (CHIKV), Dengue virus, and SARS-CoV-2. My research group has been actively involved in virology research for more than 15 years, continually working and achieving milestones discovering antiviral against CHIKV and other enveloped +ss RNA viruses, as is evident from the research publications and patents of our research team. My research group uses interdisciplinary approaches to target virus specific replication enzymes, proteins and molecular contacts of virus and host using computational tools for in silico identification that are validated using biochemically assays, biophysically binding affinity assays and the antiviral efficacy is evaluated by preforming cell-culture based in vitro and in vivo animal model studies. Research members of my laboratory have expertise in biophysical and biochemical techniques such as Circular dichroism spectroscopy (CD), Dynamic light scattering (DLS), Isothermal Titration Calorimetry (ITC), Surface Plasmon resonance (SPR), FRET and capillary electrophoresis techniques. They also use cell culture techniques such as qRT-PCR, plaque reduction assay, immunofluorescence assays etc.

Previously published literature of our research group has reported a therapeutic protein from seeds of Tamarind, commonly known as Imli, to inhibit CHIKV and Sindbis virus with great efficacy. Not only this, recently a patent from my group was granted for the efficacy of this antiviral composition of a combination of therapeutic from Tamarind seeds, caffeine, and theophylline. In addition to it, piperine, an alkaloid from black pepper, was identified by our team to inhibit the replication cycle of CHIKV with great efficacy. Using a combination of high-throughput computational tools and wet lab experiments, our team identifies molecules targeting different steps of viral life cycle such as the entry step, replication cycle, budding step of viruses to hinder their cycle or the host pathways to upregulate immune responses of host. Two new molecules have been newly identified by us, Herbacetin (from flax seeds) and Caffeic acid phenethyl ester (from honeybee hive), that are observed to display potent inhibition of CHIKV and dengue virus at low micromolar range. With the emergence of the global emergency situation of COVID-19 pandemic, our team focused on identification and drug repurposing against SARS-CoV-2. For quick identification of drugs, a combination of high-throughput computational tools and cell culture techniques enabled us to identify molecules that were observed to display good antiviral efficacy against SARS-CoV-2.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
The curiosity towards what is happening? why it is happening? and the suffering of humans, animals and plants due to various diseases is what inspires me. Scientists who work day and night in labs, scientist who neglect their own

health and at times their own family motivate me and inspire me. My husband, Prof. Pravindra (who himself is a scientist), his expectations and support is my strength. I have seen my teachers Prof. T. P. Singh and Prof. Richard J. Kuhn working for hrs with dedication and focus in their offices is what has always inspired me. Positivity in people around me and their smiles give me energy to work. My parents being in village always believed in me and that inspired me. In my village I saw other parents did not send their daughters to school but my parents put me in boarding school for education. So, I told myself that I will not let their sacrifice go down the drain.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

Management of work-family balance was the first and foremost challenge that number of times affected my professional journey. Lack of workplace flexibility and the hustle culture of organization to measure "productivity" by hours worked was sometimes disturbing. Managing family, kids, home and a big research lab with PhD scholars, post docs, masters, B.Tech students and interns is very challenging. Keeping track of everyone's task and giving them time is challenging. But these challenges are actual strength that has come slowly with experience. In India, the various resources that have been developed by various labs using government funds and support are not openly available to researchers. Scientists in India somewhere feel insecure about sharing and collaborating. Most challenging was to establish myself as virologist and my virology lab with very less support. However, when I see many of my students are now working as virologist in various institutes and companies in the world is what gives me immense satisfaction.

What is your advice to next-gen women science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

Even though Indian women still have to overcome various hurdles in their homes and have to convince families and societies to pursue their careers in innovation and become entrepreneurs, educating women about how they can receive funds to start their business or research, different start-up schemes, government scholarship schemes, idea incubation centres can not only shorten the knowledge gaps for participation but will also help to attract more women in industries and research. As innovation often begins during education and training in a technical field, understanding the mechanisms for pursuing careers in science, engineering and technology and the scholarships that can be availed to gain education can help to make the path clearer. At times, either we don't have enough financial support to receive quality education or we are not aware of the government/private schemes that can support the research work. This can be achieved by conducting free seminars in schools, colleges, workplaces, offices etc. Moreover, sessions can be conducted where success stories of women role models can be showcased to everyone to build-up their self-confidence and boost up their interest in science and innovation. A big hurdle which is faced by most of the women entrepreneurs is funds to start their career or research. Although various scholarship/funding schemes are already started by government or industries, but seminars or workshops can be conducted to make girls or women aware about these and to shorten this knowledge gap between academia and industries. Hands-on trainings of software's and computational programs that will be frequently required in a particular field can be conducted to create awareness and boost confidence to overcome minor hurdles.

Ms. Shaily Srivastava

Managing Director
Accenture

Some of my notable achievements are outstanding record of innovation, including 12 granted US Patents, 3 pending US Patent Applications and 16 published European Patent applications.

What is unique about working as a woman in STEM compared to other fields?
Women in STEM often are under-represented in senior positions as compared to other fields and hence ensuring a seat at the table for our opinion to be heard becomes that much more important.

What are your key contributions to your work area?
I have designed technology solutions for complex, multi tower, digital transformation deals in the areas of Industry 4.0 (Engineering and Manufacturing), e-commerce, content etc.

Outstanding record of innovation, including 12 granted US Patents, 3 pending US Patent Applications and 16 published European Patent applications. I have made significant contributions to 3GPP SA2 for WLAN-UMTS interworking architecture issues.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
I think I was inspired to take up engineering as I come from a family of engineers – my grandfather, father, brothers, uncles...all were engineers. Thanks to my parents' confidence and support, I grew up with a lot of self-belief and was quite self-motivated and excelled at school. NTSE, IIT and then MS from US (with full scholarship) followed. I was lucky to have amazing mentors at work who helped me stride forward and excel at work.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
The first challenge was when I realized that I was one of 5 girls in our batch at IIT in an overall batch of 400 students. Simple things like girls' toilets were missing in the departments.

In some ways it prepared me for the journey ahead as I understood the importance of speaking up to make the journey for the STEM women after me, a little better.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
My advice to the next-gen women in science would be to dream big, be intentional about your career, be a lifelong learner and to take calculated risks; know your worth and take your seat at the table.

Ms. Shefali Aggarwal

Managing Director
Advanced Technology Centres India, Accenture, ATCI Europe Innovation Lead

My notable achievements are multiple Accenture awards and recognitions for driving Innovation with clients including 3 granted patents.

What is unique about working as a woman in STEM compared to other fields?
A career in STEM requires a complex set of technical skills and capabilities to solve problems of the world. Working in this space gives me a sense of achievement as I can solve problems of large Organizations through technology.

What are your key contributions to your work area?
I played an instrumental role in driving business growth for our clients and managing large accounts globally. Led the transformation and operations of one of the largest global eCommerce platforms.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
Inspiration came from my father who has been a self-made Professional in this industry. He has been a role model and the rest is history.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
Gender bias was one of the big challenges when I started my career in this industry especially since there were not many women in Leadership roles. There was low sensitivity to women needs. Career in STEMS was assumed to be a demanding one and hence not conducive for women.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
Women need to take charge of their career and take risk. Do not let anyone and anything stop you from following your dreams.

Dr. Shreetoma Kundu

Research Assistant

NIPER, Kolkata

I am working as a Research Assistant at National Institute of Pharmaceutical Education and Research Kolkata (NIPER-K). In the past I have been fortunate enough to be associated with certain esteemed institutions of the country like National Institute of Biomedical Genomics (NIBMG) and Indian Institute of Science Education and Research Kolkata (IISER-K). I am basically from Bengaluru. But was born in Kalyani, West Bengal. I have been brought up in quite a few different places.

I have spent my early childhood days in Bangalore, Japan and New York city, United States of America. Since the age of 4, I have been brought up in Bangalore. But I currently stay in Kolkata, West Bengal.

Academic qualifications (mention details of institutes and universities)

Education always begins at school. College and universities come much later in life. My early schooling was in Bright Horizone, New York city, USA. After returning to India, I got admitted in Kensri School Academy of Excellence where I completed my school.

Further, I pursued my B.Sc in Microbiology Hons. from Lady Brabourne College, Calcutta University. I completed my masters (M.Sc.) in Biotechnology from Visva Bharati, Shantiniketan.

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

With a score of 86.5% in my 12th exams I was a topper in my School. Further on, I qualified the All India JNU CEEB (Jawaharlal Nehru Combined Entrance Examination) in 2016 and got admission in M.Sc

Biotechnology. I have also qualified the Graduate Aptitude Test in Engineering (GATE) in 2018 with an AIR 1644 and score 396. During my M.Sc I worked for my Master Degree Thesis on Leishmania donovani growth and cell cycle, under the guidance of Dr.Samiran Saha, Dept. of Biotechnology, Visva Bharati. I am also a part of the publication from this work in the journal of Parasite Immunology with the title "Chlorogenic acid acts upon Leishmania donovani arresting cell cycle and modulating cytokines and nitric oxide in vitro"

What is unique about working as a woman in STEM compared to other fields?
There is a better opportunity for innovation. As there are a few women in our country, in STEM, even if some can do little, that will encourage many.

What are your key contributions to your work area?
After MSc from a renowned central University, I am grateful to the authority of NIPER K, for giving the responsibility in one of the most important areas of Biomedical Research, which is imaging. I am contributing to many upcoming interesting projects at my institute by performing confocal microscopy. I am also trying to build up my own research interest in Autophagy.

Who all inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
Firstly, my parents, Prof. Tapas Kumar Kundu and Mrs. Soma Kundu. They have been the pillar of strength in my life. All my teachers at my school in Kensri, in my college at Lady Brabourne and all my teachers and M.Sc. thesis mentor

Dr. Samiran Saha, at Visva Bharati have shaped my future. My mentor Dr. Ravichandrian, Director NIPER-K has immensely supported me and guided me through out. It has been a blessing to be under his guidance.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

In STEM, I am an experimental Biologist. During my final year of I could not complete my thesis work (as I was pregnant), and although I scored the highest marks in the courses, I had to wait one more year to submit my thesis and get the final MSc degree. With a small child it was difficult for me to take the next step after my MSc. However, after a year of MSc I got this opportunity to contribute to science and take my carrier forward. I am grateful to NIPER K, for this opportunity and providing such a wonderful working environment.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

I am a beginner as in STEM professional. I would say, so far, I have realized that self-confidence is of paramount importance. Apart from this, proper training with respect to the specific area of interest is very important. Only then can the technology be well learnt and applied in research. In addition to this the training sessions must be feasible for women with respect to timing and distance from their abodes to the venue of training sessions. In this way it will be more convenient for women to balance their duties related to both their professional and personal areas of life.

Dr. Shrilakshmi Desiraju

Co-founder and CEO

AA Probiotics

I am Dr. Shrilakshmi Desiraju is a tech entrepreneur with a background in biotech, specifically in the field of Probiotic technology commercialization. I firmly believe that purpose is greater than any one individual, a value that is deeply ingrained. The biotech and deep tech industries are high-risk, requiring substantial capital to even conceptualize a product. I have persevered through numerous challenges, including licensing, setup and infrastructure costs, capex expenditure, high working capital, and regulatory hurdles.

My tenacity, strength, and mental fortitude have made me a woman of grit. My journey with Triphase Pharmaceuticals is a story of an individual who defied the odds to become a techno-preneur of a company with a US, Canadian, and European Patent for eliminating the cold chain in the Probiotics Industry - a groundbreaking feat that offers significant cost savings for the probiotic industry. This start-up is driven by a passion to create impactful products in a country primarily known for services or generic products.

Experienced in capital raising and in developing investor readiness - Successfully raised debt funding under CGTSME 1 Cr. collateral free funding in 2011, Angel funding and Raised Series A venture capital funding in nutraceutical / pharmaceutical high-risk industry and exited her first venture at ROI very successfully.

My unwavering pursuit of new goals is my greatest asset. My new venture AA Probics is focused on contributing the science of probiotics to both human and animal nutrition, specifically aquaculture. This new initiative recognizes the importance of ONE HEALTH, ensuring that the co-existence of plants, animals, and humans are equally balanced. I take great pleasure in crafting compelling narratives and advocating for them. I am a visionary leader who has made a significant impact in the biotech industry. In addition to my impressive achievements as a tech entrepreneur, I am also an accomplished mentor for startups. I have been been instrumental in guiding and supporting numerous entrepreneurs, helping them navigate the challenges and complexities of the industry.

My impact in the industry extends far beyond my individual accomplishments, making me a respected leader and mentor in the biotech community. Specializing in establishing technology-based businesses as entrepreneurial start-up, I steered the organization in the capacity of CEO, and Director, I enjoy both mentoring, building ventures and championing causes. I have excellent project management ability skills in a collaborative team setting. A Strong publication record, both in scientific and business journals. I am an Independent Director certified by the Institute of Directors (IOD) and is currently serving on the boards of three companies.

I look forward to being a motivator for women empowerment cohorts / Influencer / Subject advisor (mid-level tech companies) / Management Consultant to leverage my knowledge.

- **Some of my notable achievements are:**
  1. FKCCI - Women Achiever Award - March 2019
  2. BIO EXECELLANCE award as Emerging company 2018 from Govt of Karnataka. November 30th, 2018
  3. 1st US Patent Awarded in August 2018
  4. NON-GMO certification August 2018
  5. NPN no for Triphase Products June 2018
  6. Featured in Bio spectrum as women entrepreneur in Dec 2017.
  7. Featured in Times of India as Women entrepreneur several times.
  8. Nominated for INDIA 5000 best MSME award November 2017

9. Winner of Economic Times-Power of Ideas 2016
10. Innovation excellence award from federation of Karnataka chambers of Commerce, 2015
11. Businesswomen of the year awarded by EMerg, 2014
12. India's Small Giant award for the most promising small and medium size company, 2014
13. NAEJA Five-year service award for the excellence and dedication, 2001-2006
14. MBA Entrance Award, University of Alberta 2006
15. Pfizer Award of Recognition, 2005
16. NSERC Fellowship (awarded for postdoctoral work), Ottawa, ON, not availed, 2001.
17. DBT (R.A.) Fellowship, Indian Institute of Sciences, (Prof. P. Balaram) Bangalore, India, 1999 – 2001.
18. Project Assistant Fellowship: National Chemical Laboratories, (Prof. K.N. Ganesh) Pune, India, 1997 – 1999.
19. MPCST (Madhya Pradesh Council of Science & Technology Award), Young Scientist Certificate of Merit, 1997

- **Patent publications**

"Thermostable strains, products & methods there of "us patent no 10,058,577 b2, inventors: desiraju aditya, desiraju shrilakshmi, sharieff irfan, prakash abhilash us, european patent, and canadian patent awarded, 28th august 2018

- **Research papers**

  18 research papers, recent one as below:

- "viral infections, the microbiome, and probiotics "front. Cell. Infect microbiol;12, 2021.

  Ashton harper, vineetha vijayakumar, arthurc.ouwehand, jessica, ter haar, jordi espadaler, sylviebinda, shrilakshmi desiraju and richard day

What is unique about working as a woman in STEM compared to other fields?

- The uniqueness of working in STEM compared to other fields is use of technology to creatively solve a market problem.
- Promotes more innovation.
- This helps with the scaling up with ease and most important is the large group of people getting benefited.
- It enhances chances of socio-economic role models and Socio-economic scenarios in India.
- Strong STEM education creates critical thinkers, problem-solvers, and next-generation innovators.
- These leads to better and impactful career

What are your key contributions to your work area?

My domain has been biotech, especially in the areas of Probiotics, I have felt the use of STEM has come handy in solving a market pain in areas of probiotics and has created a niche in the market. Using the principles of Technology – Commercialization, my team and I have been able to convert natural gut bacteria which is stable only in 2-8 deg C to more than 150 deg C stable. It has potential of eliminating the cold chain from the probiotic industry. This innovation leads to unprecedented benefits such as cold chain is eliminated a huge cost saving to the industry, shelf life is increased, multiple applications, genetically preserved, can be shipped in the normal containers, label claims can be maintained.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

Been born in the family of academicians, parents were the first source of inspiration. I was from Tier -2 city (UJJAIN -M.P.) hence the probability of not getting many opportunities was the biggest source of self-motivation. As an entrepreneur I had multiple mentors from early on and hence they were a source of inspiration as they would surely tell you what not to do than what to do.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

Less gender diversity always made me work in the men dominated areas. It brought in good and challenging experiences. I realized Entrepreneurship or jobs in STEM were gender neutral. The challenges of raising funds, market access and taking critical decisions while doing innovations leading to Intellectual property if successful requires

tremendous focus but were same for both genders.

When it comes to pursuing a career in science, society's established patriarchy pushes women down. Women are regarded to bear the combined responsibility of home and work by default, and if a professional gap is taken for family reasons, it becomes extremely difficult for women to return to professions in science. They are not considered seriously and are not paid remuneration as per the skills that they bring to the table. I have not faced them myself but been witness to numerous.

Though this has been negated by many women in the bygone era and continues to hold true today where women are marching ahead across sectors, occupying key leadership positions, and making immense contribution to science, innovation, technology and society in the present era

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

- Perseverance and Passion for sciences is the only way forward.
- Get Mentors early on in your career.
- Believe in yourself, there is no Knight coming to save you.

Prof. Shubhini A Saraf

Director

NIPER, Raebareli

I was born in Indore and when I was a toddler, my parents moved to Jabalpur. I finished my schooling in Jabalpur and went on to pursue a career in Pharmaceutical Sciences- B. Pharm, M. Pharm and PhD degrees from Dr. Harisingh Gour Vishwavidyalaya, Sagar. This is, where I began to feel that there is an extreme skewness in the girls: boy 's ratio, as we were only 5 girls in a class of 28 during my B. Pharm days.

Three girls were day scholars and only two of us were from other cities. This put me in a disadvantaged position as I was very easily singled out for ragging (in those days there were no anti-ragging laws). Traveling during my student days taught me how to tackle unruly elements. In our institution, we had very few female teachers, but we were given a very level academic field, with absolutely no biases. We were one of the first few batches, to appear for GATE (Graduate Aptitude Test in Engineering), where two of us girls and one boy qualified from my batch. My M. Pharm and PhD mentors were very inclusive, and I never ever felt any gender bias. I went on to qualify the MP Public Service Commission exam and joined a job as a lecturer in a Government College in Bhopal. Moving on professionally, I joined as Head of Department and subsequently as Director of a College affiliated to a Technical University.

Papers published

1. Singh, Priya; Alka; Maurya, Priyanka; Nisha, Raquibun; Singh, Neelu; Parashar, Poonam; Mishra, Nidhi; Pal, Ravi Raj; Saraf, Shubhini A; QbD Assisted Development of Lipidic Nanocapsules for Antiestrogenic Activity of Exemestane in Breast Cancer, Journal of Liposome Research,112763, 2022, IF 3.648
2. Singh, Priya; Singh, Neelu; Mishra, Nidhi; Nisha, Raquibun; Maurya, Priyanka; Pal, Ravi Raj; Singh, Samipta; Saraf, Shubhini A; Functionalized Bosutinib Liposomes for Target Specific Delivery in management of, Estrogen-Positive Cancer, Colloids and Surfaces B: Biointerfaces,2022, IF 5.268
3. Effective Uptake of Folate functionalised Ethionamide Loaded Hybrid System: Targeting Alveolar Macrophages, Nanomedicine. IF: 6.096
4. Pal, Ravi Raj; Rajpal, Vasundhara; Singh, Neelu; Singh, Sukhveer; Mishra, Nidhi; Singh, Priya; Maurya, Priyanka; Saraf, Shubhini A; Downregulation of pro-inflammatory markers IL-6 and TNF- in rheumatoid arthritis using nano-lipidic carriers of a quinone-based phenolic: an in vitro and in vivo study, Drug Delivery and Translational Research,12 (7), 1640-1658 IF 5.671
5. Raquibun Nisha, Pranesh Kumar, Umesh Kumar, Nidhi Mishra, Priyanka Maurya, Samipta Singh, Priya Singh, Heena Tabassum, Alka, Anupam Guleria, Shubhini A Saraf, Assessment of hyaluronic acid-modified imatinib mesylate cubosomes through CD44 targeted drug delivery in NDEA-induced hepatic carcinoma, International Journal of Pharmaceutics,2022, IF 6.51

Patents filed:

1. AK Singh, S Saha, AK Kesari, SA Saraf, D Kumar, A Prakash; Indolo Fused Pyrido-oxazepine and its derivatives for the Treatment of Hepatocellular Carcinoma" Indian Patent Application (2016), Number: 201611016493 Awarded
2. Kshama Srivastava, Priyanka Maurya, Poonam Parashar, & Shubhini A. Saraf, Patent No. 202011011874 (Preparation of herbal nutraceutical to treat malnutrition/undernutrition in tuberculosis patients using moringa oleifera granules) FER submitted

Mentorship awards

- Gyanendra singh –g.y.t.i. Award as mentor, 2013
- Samipta singh a.w.s.a.r. Story writing award, 2019
- Mahendra singh –shortlisted in top 5 thesis for pharmaceutics pharmainnova award, 2019
- Malti-second prize in north zone finals of anveshan, a.i.u. For research project, 2019
- Best research paper award in the journal pharmaceutics, 2019

Life memberships

1. Indian pharmaceutical association (i.p.a.)
2. Indian pharmaceutical graduate association (i.p.g.a.)
3. Association of pharmacy teachers of india (a.p.t.i.)
4. Society of pharmacovigilance (india) (isp)
5. L.a.s.a.i.

What is unique about working as a woman in STEM compared to other fields?
In a meeting, once, I found myself the only female Center Superintendent among 200 others. This was a startling revelation to me and underlined the fact that there are very few females in leadership positions in STEM. The glass ceiling in this case is not a myth!

What are your key contributions to your work area?
I became the Head & Dean of the Pharmaceutical Sciences Department/School at BBAU and worked on various fronts like setting up the department and Labs, setting up the programs, publishing extensively in Novel Drug Delivery and Lipid Nanotechnology, managing various administrative roles, and actively participating in governance through various Committees as Member/Chairperson. I was the Director (Research and Development) at BBAU (Central University) before I joined as Director, NIPER, Raebareli.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
My father was an Engineer, and he was extremely innovative. Having two younger brothers, the atmosphere in my house was always very gender neutral. Seeing my father create a working model of a vehicle, solar heating for hot water (in the early seventies), and so on, STEM was an obvious choice for me. The inspiration to choose Pharmacy as a career came through my uncle who was a professor of History and an extremely knowledgeable person regarding career options, the benefits of reading, and so many other things.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
It is very often that I got to hear from a selection committee member or departmental Head that they would prefer male candidates because they are capable of more work, they don't take Maternity Leave and other such stereotypes. It has always been my endeavor to ensure that merit should prevail and there should be no gender biases. Having realized that I was in a position to make a difference, I began to support as many females as possible during their early careers who were mostly juggling multiple roles. In fact, I yet live by the mantra, Real Queens Help Fix each other's Crowns!
Things are rapidly changing, and some STEM organizations have become sensitive to taking on more women realizing their professional prowess and minding the gender gap!
Because I am an educator, I have seen so many young girls being accompanied by anxious parents, each time they come to drop their wards. I request them each time to let them learn to travel, to decide things, and many of these girls from small cities have now become confident, dynamic professionals, having traveled. multiple parts of the world! The skewed ratio of genders' is also improving for women in STEM, which automatically takes care of unique challenges like washrooms, places to relax etc., but we must keep up the high alert and constantly work towards giving equal opportunities for an equal world in STEM.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
My advice to the younger next-gen women in STEM is to take on all the new work that comes their way as they are accomplished multi-taskers. This enhances their confidence, and they are able to prove a point to the people with biases, paving the way for the next generations, as a role model! Data shows that women have all the right attributes including empathy, change catalyst and inspirational leadership but sometimes self-doubt makes them hesitant in applying for better jobs. I would say it's better to have tried and not succeeded than never to have tried at all! My advice also is that they should not burden themselves with more than what they can happily handle. They should take help, wherever required, on the home front, so that they can do full justice to their job, with a smile and not a frown.

Ms. Shukla Chowdhury

Technical Assistant

L&T Construction & Mining Machinery, Durgapur

My name is Shukla Chowdhury, and I am currently working as a Technical Assistant with L&T Construction & Mining Machinery, Durgapur. It is a predominantly male-dominated workplace, and I have been posted at Noamundi Iron Ore Mines of M/s Tata Steel Limited. Here, I am responsible for the maintenance and repair activities of Heavy Earth Moving Machineries (HEMM) required for mining operations.

I was born and raised in Sainthia, Birbhum District, West Bengal. I completed my ITI diploma in the Machinist trade from an ITI at Suri. After finishing my ITI course, I completed an apprenticeship as a Machinist at South Eastern Coalfields Limited in Chhattisgarh. In 2020, when L&T began their journey of including women in their Product Support Department at Durgapur, I was selected by Larsen & Toubro Limited to work as an associate. After joining, we received both theoretical and on-job training at Durgapur Service Centre to work independently.

During my tenure at L&T, as a part of the first women's team in mining sites, I am proud to have received the following awards:

- An appreciation award for "Women Empowerment" from M/s. Tata Steel Limited just after joining the mines site.
- "Women Building India - Special Initiative Award" from CII (The Confederation of Indian Industry).

I am also happy and proud to have been a part of the Exhibitor team at EXCON - Bangalore held in March 2022.

What is unique about working as a woman in STEM compared to other fields?

I am proud to say that my work as a Technical Assistant for large earthmoving machines was once considered a complicated job for a woman, but things have changed in the last 3-4 years. Nowadays, women are being recognised in the HEMM industry due to initiatives taken by companies like L&T. Even though the work requires physical and mental skills, we have successfully taken on the challenge and ensured 100% safety.

Recently, Tata Steel Limited announced that they would introduce a one-shift mining operation at their Noamundi project, consisting only of a woman team, including operators, contractors, site managers, and service providers. This is a significant motivator for us and has boosted our confidence levels.

What are your key contributions to your work area?

I have ensured to plan and guide the customer on scheduled maintenance for each machine on time, resulting in zero lapses in maintenance and enabling the customer to carry out production without any hindrances. Additionally, I have conducted troubleshooting activities for Dump Trucks and Wheel Loaders and ensured that the fleet's availability has been as per our guarantee. As a result, the customer is satisfied with our services.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

During my schooling days, when I was in the 7th grade, I lost my beloved father. We belonged to a needy family, and my mother had to work hard day and night to take care of my siblings and me. Despite our circumstances, I had a strong determination to stand by her and decided to pursue ITI to get an opportunity in the engineering field. My mother was my inspiration, and her dream and my willingness have turned into a self-passion to work in the engineering/technical domain. I am thrilled to have the opportunity to work at L&T, India's largest engineering company.

What were some challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

The machines we maintain are taller than a one-storey building, and every time we need to access the operator's cabin or any compartment, we must climb a steep ladder. Initially, this was one of the most challenging experiences for me as a woman. However, I have learned to overcome this obstacle through practice and by following the safe operating procedure.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly, you wished you had known when you first started).

I have one thing to say: Stay strong. Remember, the world may seem big, but you can accomplish anything you set your mind to as long as you remain determined.

Ms. Sweta Jehangirdar

General Manager

Engineering Research Centre
Tata Motors Ltd. (TML)

I am working as General Manager, Engineering Research Centre, Tata Motors Ltd. (TML) – Heading the Electronics design for the various Electronics aggregates in the vehicle. Involved in design of the components to manufacturing, service all areas support.

a. Joined Tata Motors in year 1995 as Graduate Engineering. Trainee (GET) and continued career in TML right from Shopfloor like foundry, press shop and now working as Head – Electronics Design.
b. Based out of Pune, completed my graduation from Cummins College of Engineering – Pune

What is unique about working as a woman in STEM compared to other fields?

a. Today we find nearly 25 to 30% of women in the field Science and Technology. This is always an emerging field and would gain more focused in terms of personalized mentorship, Emotional intelligence where we find women leaders playing substantial role.
b. There is a need for diverse perspectives in this field, so that a very focused, technology centric approach can be institutionalized.
c. There is a strong need to remove the myths and bias of women being stronger only in the field of home science, childcare, Banking or Doctors.

What are your key contributions to your work area?

a. Pioneered Diagnostics and Telematics in Tata Motors where Telematics is today the leading edge for the TML leadership attributes.
b. Worked on 13 Foundry Commissioning Machines within a very short span.
c. Worked on the Indica Weld shop line setup.
d. Part of the Regulatory support in TML is to ensure Govt regulation implementation and standardization.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

a. My father. He is my role model and inspired me to work in the technical field right from my childhood.
b. My professional mentors and my managers were always part of my career build up.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

a. Male dominant work domain did give me a bit of setback while taking tough decision.
b. A woman always expects an A+ in all the fields wherever she is. It's stressful to get that A+ everywhere and this stress is the actual impediment.
c. Factories act – night working
d. Family pressure and balancing work life balance
e. Maternity and sabbatical breaks
f. Children education, Quality time for the child.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

a. Focus on deliverable not the Gender. Give the best of your knowledge to the field you are working in. Forget the majority workforce and focus only on the work.
b. Maintaining Work life balance, enjoy Woman hood as well as focus on good and Quality career growth in your life.

Dr. Sindhu R. S.

Associate Professor & Head of The Department

Department Of Surgical Gastroenterology Govt. Medical College, Kottayam, Kerala.

Department Of Surgical Gastroenterology, Head of The Department, Team Leader Liver Transplantation Projects, MBBS, MS (General Surgery), Mch (Surgical Gastroenterology), FMAS, FIAGES, Department of Surgical Gastroenterology, Govt. Medical College, Kottayam, Kerala

Present Designation: Associate Professor & Head of The Department

Team Leader Liver Transplantation Project

Department Of Surgical Gastroenterology Head, Dept. of Surgical Gastroenterology, Govt. Medical College, Kottayam, Kerala.

Current and past job functions

1. Associate Professor & Head, Dept. of Surgical Gastroenterology, Govt. Medical College, Kottayam, Kerala from 2021
2. Associate Professor in Surgical Gastroenterology, Govt. Medical College, Trivandrum, Kerala from 2015 to 2021
3. Assistant Professor in Dept. of Surgical Gastroenterology, Govt. Medical College, Trivandrum, Kerala from 2009 to 2015
4. Lecturer in Dept. of Surgical Gastroenterology, Govt. Medical College, Trivandrum, Kerala from 2002 to 2009
5. Assistant Surgeon, Health Services Department, Kerala from 1999 to 2002

Residing City: Kottayam, Kerala

The city where you were born and brought up: Trivandrum, Kerala

Academic qualifications:

1. Mbbs (university of kerala) 1995
2. M.s. General surgery (university of kerala) 2009
3. M.ch surgical gastroenterology (kerala university of health sciences) 2013
4. Fmas (fellowship from amasi)
5. Fiages (fellowship from iages)

Experience:

- 21 years of clinical experience in surgical gastroenterology
- Done more than 1000 major gastro surgery procedures
- Team leader for liver transplantation program
- Conducting open and advanced laparoscopic surgeries
- Published more than 20 research papers in the specialty
- Doing ph.d. In surgical gastroenterology
- Faculty for the specialty for more than 14 years

Noble achievements:

1. First lady to attain M. Ch Surgical Gastroenterology super specialty medical PG degree from Kerala
2. Team leader for the first successful Liver Transplantation in the Government sector in Kerala state
3. Team leader for the first Living Donor Liver Transplantation in the Government sector in Kerala state
4. Team leader for the first successful Deceased Donor Liver Transplantation in the Government sector in Kerala state
5. Best Research Paper award in the National conference of Indian Association of Surgical Gastroenterologist (IASG) in 2012.
6. Vanitha Rethnam 2022 Award by the Govt. of Kerala
7. Vanitha "Woman of the Year" 2014
8. More than 20 research publications in national and international journals

Challenges:

1. Post-Polio paralysis in both legs from the age of 3 years
2. Lady surgeon in a highly male-dominated specialty of Gastro surgery and Liver Transplantation

What is unique about working as a woman in STEM compared to other fields?

Women rarely accept surgery as their profession, because of the difficulties in balancing the personal and professional life. Surgery is a highly demanding job in terms of high-end patient care and long working hours, and women find it difficult to adjust that to their family time. In Kerala, women's literacy is high, and, in many fields, women have been doing professional work at par with their male colleagues. However, surgery is a male-dominated specialty and we have only very few ladies in the specialty of Gastric surgery and Liver Transplantation. To me, as a lady, it is exciting to work as a surgeon especially Gastrosurgeon and Liver Transplantation surgeon providing optimal patient care and training the students coming to this specialty. With the huge support from my husband and son, I can do the job of a full-time Gastrosurgeon and a teacher in my specialty. It is of great pleasure to see young ladies getting motivated to take up this specialty as their choice.

What are your key contributions to your work area?

1. Could successfully establish laparoscopic cancer surgeries in the dept. Of surgical gastroenterology, govt. Medical college, trivandrum, kerala.

2. Could successfully take up the most neglected project - liver transplantation in government medical colleges of kerala state

3. Could become the team leader for the first successful liver transplantation in the government sector in kerala state, the first living donor liver transplantation in the government sector in kerala state, and the first successful deceased donor liver transplantation in the government sector in kerala state during the year 2022-2023.

4. Could take part in active clinical research in the specialty; presented more than 30 research presentations at various clinical conferences and published more than 20 research papers in various clinical journals in the specialty.

5. Being a polio victim, could deliver many motivational talks to the student community and the women empowerment platforms.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

1. My mother Smt. A. Radha was a working woman in the health service department, successful in raring their 3 children one as a doctor, one as a lawyer, and one as an engineer. She never gave us an opportunity to complain that she is not spending enough time with us.

2. My Father Sri. TK Sadasivan Nair was a self-made person, socially active to help the neediest in the community. His words and attitude have molded my mind to serve the people by remaining in the government hospital of my state.

3. My Teacher, Dr. Y.M. Fazil Marickar is my professional mentor and was a strong supporter in my decision to

become a surgeon, overriding my persistent doubts about the same, being a lady and a physically disabled person at the same time.

4. My family, friends, and colleagues are my constant inspiration to maintain my efforts to lead my life as a successful lady surgeon and a homemaker.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

1. Being a lone lady in the male crowd was a big challenge in my initial days, but later I got acceptance and space in that crowd with my consistent progress and its results.

2. My physical disability in the form of post-polio paralysis of both legs, requiring external support as calipers and crutches for movements forms a big obstacle in my outdoor activities. However, in-hospital facilities minimize the difficulties, and I am hugely encouraged by my colleagues for achieving my professional goals.

3. My progress in the profession in spite of my disability had invited some bigger struggles and I preferred to move to another Govt. Medical College in the state with a mission from the Government of Kerala to start a new department of surgical gastroenterology and to take up the Liver Transplantation project. It was a huge task to build a new Gastrosurgery Department from the base, but my team became successful in getting the liver transplantation license in 5 months - time and we could successfully do our first Living Donor Liver Transplantation in just 10 months after starting the new department. We were hugely appreciated by the administrators and the public and I was awarded the **Vanitha Rethnam 2022** Award by the Govt. of Kerala.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

1. It is best to have an interactive relationship with the other ladies in your field to discuss and find solutions for the difficulties in your professional and personal life.

2. It is very important to stay updated regarding the developments in the specialty and profession. It is important to talk and discuss one's viewpoints and opinions in the meetings and conferences, by which your voice and valid opinions will be heard and assessed. It forms the scientific attitude to come forward and give voice to your opinion rather than waiting for others to judge you by opinions from others. Progress is an active process; it never happens as a passive process.

Ms. Sindhu Srinivas

Development Manager and Engineering Leader

Driving product innovations at SAP

I have extensive experience in setting up teams for success in product development. I am a skilled people manager with a passion for empowering team members to operate autonomously. Have led multiple teams to deliver product innovations in the cloud native stack.

Technical know-how of the development stack along with people skills with a track record of engineering excellence in delivery of successful products.

Development architect
Worked on various technologies in both the on-premises and cloud stack. Have expertise in delivering outcomes for customers as a solution architect – from gathering customer requirements to proposing and designing a solution, to implementing the software with good quality and delivering outcomes to customer in the agreed timelines.

Worked with customers across industries and geographies - AOL, Samsung electronics, BHP Billiton, Cargill, Phillip Morris Inc, Israel Chemicals to name a few.

Residing city- Bangalore
Born and brought up – Bangalore

Education
Bachelor of Engineering (Telecommunication)
PESIT, Visvesvaraya Technological University, Bangalore

Awards:
SAP Social Sabbatical Award - Was awarded a place amongst 96 extraordinary performing employees at a global level within SAP to participate in a month-long Social Sabbatical 2015 in Manila and worked with social enterprise called Messy Bessy. SAP Social Sabbatical program strives to solve business challenges, specifically for the education and entrepreneurial sectors in emerging markets, while strengthening the participants' leadership competencies, cross industry sector know-how, and intercultural sensitivity. I worked with 2 other team members at Messy Bessy to provide inputs on their supply chain and inventory processes and suggest recommendations to improve their operational efficiency. In the words of the founder of Messy Bessy "Messy Bessy experienced a 44% growth in revenue and 100% growth in the number of beneficiaries after SAP Social Sabbatical, and this resulted in more opportunity for our employees in terms of education, work training, and capacity building. They were also exposed to a more technical and professional approach to supply chain, resulting in a more robust work experience for each scholar in the program" – Krie Lopez. Due to high impact of our stint there I also got invited to mentor the next batch of 12 Social Sabbatical participants in the Philippines in 2016 with the 4 organizations they worked with so as to set them up for success.

What is unique about working as a woman in STEM compared to other fields?
It is extremely rewarding to be a woman in Technology especially in a company with a good work culture. I love the "Eureka" moment when a problem you are grappling with – be it technical or interpersonal suddenly seems solvable when you think of different approaches to attack the issue. It's also very challenging with the changing trends

technologically and requires constant upskilling and reskilling. The number of women who leave technical roles is also high as balancing the demands of the job and a family is very difficult without a good support system.

What are your key contributions to your work area?
Head of Engineering for Sustainability Solutions in India - Steered engineering teams to deliver SAP s vision of building intelligent sustainable enterprises with focus on the Greenline in Sustainability on an emerging technical stack in 5 months for a beta and 10 months for General availability. I have set up a team from scratch and am driving project execution across multiple locations. This is an achievement to be able to deliver to market early - while adhering to all the standards required to enable such a release with ever changing market demands when domain is new, team is new, and the technology is emerging.

Product and thought leadership in sustainability domain – Instrumental in driving engineering of product innovations in the Sustainability domain enabling enterprises to cut down their scope 3 (Corporate Value chain) Green House Gas emissions via the product SAP Product Footprint Management. This product provides the capability to manage 20% of global GHG emissions per annum in the world. I have been exposed to the domain from 2015 as the leader for the product on sustainability reporting and now represents Labs India as a Product leader in Sustainability to senior government officials including the German Chancellor Mr Olaf Scholz, senior executives, customers and partners to present the sustainability charter and look for co-innovation opportunities in the ecosystem. I have groomed around 40 team members and encouraged filing of 6 patents within the team in this topic.

Pioneer for daily delivery and bi-weekly feature releases to production: Set up front runner teams that run as a true SaaS organization with daily delivery and biweekly feature releases when many team members come from varied backgrounds with limited experience with this. This required a mindset shift in a large company used to delivering enterprise software with big release cycles. It required creating a start-up-like culture to fail fast and to learn. My team is a front runner in SAP and continues to meet DORA (Devops Research and Assessment) metrics for elite software delivery performance.

History of successful product delivery at SAP - It has been my constant endeavor in the last 7 years to drive our cloud product story in SAP. I have successfully led engineering teams to deliver cloud native product innovations – SAP Sustainability Footprint Management, SAP Project Intelligence Network, SAP Cloud for projects – Resource Management from inception till successful go live and customer adoptions. These cloud products have as many as 100 customers subscribing to these solutions and adopting them for their businesses.

People manager and mentoring - Have evangelized and managed multiple global remote teams for all aspects of the software/program, including directly supervising onsite and remote employees, hiring, career development and performance management. I also provide technical guidance to the team in helping them overcome hurdles in execution.

Technical expertise: Cloud engineering architecture with know-how of microservices and cloud native applications on SAP Business Technology Platform, know-how of SAP HANA, Cloud application programming model, Fiori UIs. Was the architect of SAP Project Intelligence Network for Construction which connects clients, contractors, sub-contractors, and suppliers in a cloud based collaborative platform to jointly work on design and business processes. Prior to this, worked as a development architect on ABAP in the areas of SAP SD, MM, FI, Global Trade Management.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
The desire for a challenge is what inspired my foray into engineering. Once I started college, I quickly realized my major wasn't what interested me and I chose all optional courses in computer science and found that I was rather good at that. Even as I started out in technology, I didn't expect to stay this long if not for professional mentors and the thrill of mastering a new skill every few years.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
Early on in my career, I visited a customer in Argentina and was the architect from SAP tasked with understanding their business needs and then customizing a solution for them. I travelled with a male colleague to this customer. We

were in the workshop and every time I asked a question or suggested a follow up, I was dismissed and all responses from this customer were only directed at my male team member. We collected the requirements and then went back to brainstorm and come up with proposals.

When we came back with the proposal, I decided to present it and handle any questions that came up. I was bombarded with a lot of questions and the tone wasn't very friendly too. I managed to hold my ground and stick to the content of the proposal by answering politely – but I felt dismissed and unheard. I continued the work and eventually got praise from the senior leadership of this customer for the work.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
I believe in "Lean In" philosophy of Sheryl Sandberg quite a bit and find the advice that "If you are offered a set in a rocket ship, don't ask which seat" to be really useful. As a women in tech I often am my harshest critic. I would advise young women starting out to have the confidence to take on opportunities that come your way. There should be more awareness of the limiting beliefs that we carry of "not being good enough", "not fitting 100% of job requirements" and a conscious choice to get out of that narrative in our heads and seize new opportunities. Women should prepare for opportunities and when offered a chance – be ready.

Ms. Snehal B Metri

Marketing Executive & MIS (Management Information System) Coordinator

L&T Construction & Mining

The fields of mining and machinery are predominantly male dominated. However, women in STEM possess two exceptional traits: good listeners and patience. In addition, women tend to have a higher level of endurance than men, which enables them to scrutinize and analyze their assigned work more meticulously. This ultimately results in a more comprehensive understanding of the given subject matter.

Current functions:

- Analyzing and consolidating order inflow & sales for Kansbahal Business
- End-to-end support for the sales team, from releasing purchase orders to execution of projects
- Planning and organising digital marketing campaigns and promotional activities to create awareness about Kansbahal products. These are manufactured sand plants, surface miners and crushers, apron feeders and spares.

Past job functions: project coordinator & technical assistant to ic head

- Monitoring project progress at different project sites for the minerals & metals (m&m) business unit with respect to targets given by the management.
- The task involves identifying why certain goals or targets have not been met and monitoring the requirements of a site to provide the needed assistance.
- Job cost analysis of ongoing m&m projects.

Notable achievements:

- Top Performer for four consecutive years in L&T
- Member of the Delhi Chapter of The Indian Society of Heating, Refrigerating and Air Conditioning Engineers (ISHRAE)

What is unique about working as a woman in STEM compared to other fields?

The fields of mining and machinery are predominantly male dominated. However, women in STEM possess two exceptional traits: good listeners and patience. In addition, women tend to have a higher level of endurance than men, which enables them to scrutinize and analyze their assigned work more meticulously. This ultimately results in a more comprehensive understanding of the given subject matter.

What are your key contributions to your work area?

In my previous job, I was responsible for monitoring projects and workforce productivity at multiple levels, from site engineers to project managers, across various locations. To simplify the process, I created a dashboard that allowed for easy day-to-day monitoring of different project segments, such as civil, excavation, mechanical, piping, and electrical, as well as task force productivity.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

My father has been a tremendous source of inspiration for me. He has consistently provided unwavering support and motivation, encouraging me to strive for greater achievements in my professional pursuits.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

There may not be formal barriers for women in STEM, but they face emotional barriers. Women's lack of recognition and respect in a male-dominated field is the most common challenge. Women are often stereotyped as less intelligent and less competent, which leads to their being assigned administrative roles rather than technical ones. Additionally, women may feel a lesser sense of belonging, as men on the team typically make critical decisions.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly, you wished you had known when you first started).

In the long run, the most effective approach is expressing yourself without defensiveness and fully engaging with your thoughts, knowledge, and understanding. By doing so, you can help define the organization's cultural norms. Therefore, speaking up, asking for what you want, acting confidently, and using your voice is essential.

Ms. Snigdha Thakur

Associate Professor

IISER, Bhopal

I am Snigdha Thakur working as Associate professor at IISER Bhopal my research topic are Active Matter, Rigid active particles in viscoelastic medium, Chemo-mechanically propelled vesicles, Nanomotors in active medium, Coarse grained simulation of living polymers, Phase separation in a binary mixture and Self propulsion of nematic droplets.

Experience:

Indian Institute of Science Education and Research, Bhopal

- Associate Professor, September 2017 – Till date
- Assistant Professor, May 2011-August 2017

University of Toronto, Toronto, Canada

Postdoctoral research – Mentor: Professor Raymond Kapral

Academic Qualification:

- **Ph. D. Physics- Indian Institute of Technology Madras, Chennai, India**

  Thesis titled: Investigations on the dynamical properties of liquid crystals and living polymer, Adviser: Professor P. B. Sunil Kumar
- **M. Sc. Physics- Banaras Hindu University, Varanasi, India**

  Specialization - Electronics (Merit list – 70.8%, Gold medalist).
- **B. Sc. Physics- Banaras Hindu University, Varanasi, India**
  Honours - Physics (Merit list – 71.3%, First Rank).

Publications:

- Particle-based mesoscopic model for phase separation in a binary fluid mixture; Surabhi Jaiswal, Soudamini Sahoo, and Snigdha Thakur, PRE, 107, 055303 (2023)
- Activity induced non-monotonic aggregation in a mixture of chemically active and passive particles; Manisha Jhajhria, Soudamini Sahoo, Tanmay Biswas and Snigdha Thakur, Accepted for publication in Soft Materials (2023)
- Collapse dynamics of chemically active flexible polymer; Namita Jain and Snigdha Thakur, Macromolecules, 55, 2375 (2022)
- Cargo transportation using an active polymer; Namita Jain and Snigdha Thakur, AIP Advances, 12, 115211 (2022)
- Self-propelled motors in complex fluids and as constituents of active materials; Snigdha Thakur, Liyan Qiao, Raymond Kapral, Europhys. Lett., 138, 37001 (2022)
- Active particles in explicit solvent: Dynamics of clustering for alignment interaction; Arabinda Bera, Soudamini Sahoo, Snigdha Thakur, Subir K Das, Phys. Rev. E, 105, 014606 (2022)

- Effect of Poiseuille flow on the dynamics of active vesicle; Prabha Chuphal, Soudamini Sahoo and Snigdha Thakur, Soft Materials, 19, 359 (2021)
- Role of viscoelasticity on the dynamics and aggregation of chemically active sphere dimers; Soudamini Sahoo, Sunil Pratap Singh, Snigdha Thakur, Physics of Fluids, 33, 017120 (2021)
- Formation of self-propelling clusters starting from randomly dispersed Brownian particles; Prabha Chuphal, Ishwar Venugopal, Snigdha Thakur; Bulletin of Material Science, 43, 183 (2020)

Awards and fellowships:

- Ramanujan fellowship, science and engineering research board, india, 2011-2016
- Senior research fellowship, council of scientific and industrial research (csir),new delhi, india, 2007-2009
- Daad fellowship, 2006
- Prof. Motilal rustagi memorial scholarship for securing first rank in m.sc., 2002

What is unique about working as a woman in STEM compared to other fields?
STEM was generally considered to be masculine. Breaking that barrier and pursuing career here is very satisfying for me.

What are your key contributions to your work area?
In our group we have established a new area of research in soft condensed matter Physics in IISER Bhopal. Our specific interest lies in the soft and biological materials that are driven out of equilibrium either by interactivity or by an external field. Such active material exhibits very interesting emergent behaviour. We employ theoretical and computational tools to investigate the rich dynamics exhibited by such systems.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
One of my friends during my undergraduate studies told me about the options available in research and how it is suitable for an inquisitive person like me.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
I was lucky to have excellent mentors (all males) who helped me in building confidence in myself to be able to pursue my career in STEM, even though this is an area which is not preferred by many women. Some of the challenging aspects that women in any field experience was experienced by me as well. Difficulty in chasing my career goals during pregnancy was the major one. However, I was able to cope with that due to the excellent support provided by my employer, family and friends.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
Having confidence in one-self, while setting up a new lab or research field or work-life balance is very important. My general observation is that many women are low in confidence during our initial career. Therefore, I would suggest all my women colleague to believe in themselves in their initial phase of career.

Dr. Soumi Sukla

Veterinarian

NIPER, Kolkata

I am a veterinarian working at NIPER -Kolkata and perform experiments in the Animal Facility (CPCSEA trained). My research work is focused on Study of dengue virus pathogenesis, diagnosis and development of antivirals, Cross-reactivity between SARS-CoV-2 and dengue, Role of virus in Indian Leishmaniasis, Animal disease models. I am associated with different intra and inter-institutional collaborative projects.

Academic qualifications (mention details of institutes and universities):

Degree	Subject	Institute/University/ Board	Marks/ OGPA	Division
Ph.D. (2006)	Animal Genetics & Breeding	Indian Veterinary Research Institute, Bareilly, UP	8.49 / 10.00	First class
M.V.Sc (2003)	Animal Genetics & Breeding	National Dairy Research Institute, Karnal, Haryana	7.8 / 10.00	First class
B.V.Sc. & A.H. (2001)	All the subjects of Veterinary sciences and animal husbandry	West Bengal University of Animal and Fishery Sciences, Kolkata	69.1%	First class

Residing city: Kolkata, WB

City where you born and brought up: I am born and brought up in a remote village called Mankar in the district East Bardhaman in West Bengal

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

A. Visiting Research Associate- University of Cambridge (2007)
B. Senior Research Fellowship - Indian Veterinary Research Institute, Bareilly, UP (2003-2006)
C. Junior Research Fellowship - National Dairy Research Institute, Karnal, Haryana (2001-2003)
D. National Merit Scholarship (1996-2001)

Membership of professional bodies

1. West bengal vVeterinary council, india (Permanent Member)
2. Indian virological society (life member)
3. Indian science congress association (life member)
4. Organization for women in science in the developing world (full member)
5. Indian association of animal production (life member)
6. CCSEA-nominee - institutional animal ethical committee, IISER-Kolkata
7. CCSEA-nominee - institutional animal ethical committee, CSTM-Kolkata
8. CCSEA-nominee - institutional animal ethical committee, CARI-Kolkata
9. CCSEA-nominee - institutional animal ethical committee, IACS-Kolkata

10. CCSEA-nominee - institutional animal ethical committee, TABB Biostudy Services-Kolkata
11. Member – institutional biosafety committee, NIPER-Kolkata
12. Member – Institutional human ethical committee, NIPER-Kolkata
13. Member – institutional animal ethical committee, NIPER-Kolkata

Publications: Research articles:

1. Roy KK*, Jyothi D, Paul U, Sukla S* (2023). Identification and validation of novel non-nucleoside class of molecules inhibiting the dengue virus replication. Journal of Biomolecular Structure and Dynamics. https://doi.org/10.1080/07391102.2023.2192796 (Impact factor: 5.235)
2. Kumar S, Singh R, Dutta D, Chandel S, Bhattacharya A, Ravichandiran V, Sukla S*. (2022). In vitro anticancer activity of methanolic extract of Justicia adhatoda leaves with special emphasis on human breast cancer cell line. Molecules. 27(23):8222. https://doi.org/10.3390/molecules27238222 (Impact factor: 4.927)
3. Sukla S*, Nath H, Kamran M, Ejazi SA, Ali N, Das P, Ravichandiran V, Roy S, Biswas S* (2022). Detection of Leptomonas seymouri narna-like virus in serum samples of visceral leishmaniasis patients and its possible role in disease pathogenesis. Nature Scientific Reports, 12(1):14436. https://www.nature.com/articles/s41598-022-18526-9. (Impact factor: 4.996)
4. Singh R, Chandel S, Ghosh A, Matta T, Gautam A, Bhattacharya A, Babu SS, Sukla S, Nag D, Ravichandiran V, Roy S, Ghosh D. (2022) Glucogallin Attenuates the LPS-Induced Signaling in Macrophages and Protects Mice against Sepsis. International Journal of Molecular Sciences. 23(19):11254. doi: 10.3390/ijms231911254. PMID: 36232563; PMCID: PMC9569803. (Impact factor: 6.208)
5. Nath H, Mallick A, Roy S, Kayal T, Ranjan S, Sengupta S, Sukla S, Biswas S (2022). COVID-19 serum can be cross-reactive and neutralizing against the dengue virus, as observed by the dengue virus neutralization test. International Journal of Infectious Diseases, 122:576-584. doi: 10.1016/j.ijid.2022.07.013 (Impact Factor: 12.7)

Research Highlight: "SARS-CoV-2 infection protects against dengue" published in Nature India on 23rd September 2022

Patent:

- **Title of Patent**: An easy-to-use diagnostic system for rapid dengue virus detection using fluorescence-based molecular probes
- **Authors**: S Biswas, S Ghosh, S Sukla and P Mondal
- **Application Number**: TEMP/E1/16889/2020-DEL Dated: 05.05.2021

  This technology had been e-filed for patent in India, Brazil, Kenya and South Africa and recently granted patent in South Africa (April, 2023).

What is unique about working as a woman in STEM compared to other fields?

It is well-accepted fact that the women are underrepresented and there is a strong gender-biasedness in STEM career. The absence of adequate support networks specifically tailored to women in STEM is a challenge. Like in many other fields, achieving a work-life balance is a challenge for women in STEM. Despite these challenges, being a woman in STEM can also be incredibly rewarding. It offers opportunities to make a significant impact, contribute to scientific advancements, and shape the future of technology. These inspire me to continue my career in STEM despite all obstacles I face.

What are your key contributions to your work area?

I have been working in the field of virology and have published more than twenty peer-reviewed research articles. Some of the major contributions are summarized below:

i. Development of new techniques of screening for pre-existing drug-resistant variants in the laboratory strains and clinical isolates of HSV-1 and deciphering the mechanism of action of different helicase-primase inhibitors (HPI) from the mode of resistance development to various HPIs. One such HPI is currently in use in Japan called Amenamevir and the other one, Pritelivir (AiCuris GmbH & Co.KG, Germany) is in Phase III clinical trial.
ii. Demonstrated that gamma-herpesviruses (EBV & KSHV) exploit dendritic cells to infect B cells using murine herpesvirus as a model.

iii. The observation that majority of the Visceral Leishmaniasis/kala-azar samples from India revealed the presence of not only the primary causative protozoan parasite, i.e. Leishmania donovani (LD) but also co-infection with another protozoan member called Leptomonas seymouri (LS), which further contained an RNA virus (Lepsey NLV1) i.e. a "triple pathogen" phenomenon. Thereafter it was further reported that the protozoan virus could be detected directly in serum samples of kala-azar patients and preliminary evidence suggests that the virus reduces IL-18 level which, otherwise, increases during LD infection and takes part in parasite clearance. These discoveries have opened up a new horizon of research towards revisiting the disease pathogenesis and management of kala-azar and its complications, such as PKDL.

iv. Development of an easy-to-use diagnostic system (without RNA extraction or RT-PCR amplification steps) for rapid dengue virus detection using fluorescence-based molecular probes and this technology has been e-filed for patent in India, Brazil, Kenya and South Africa and recently granted patent in South Africa (April 2023).

v. Dengue-COVID cross-reactivity: an observation around April 2020 that global severity maps of SARS-CoV-2 and dengue don't generally overlap led to the discovery of dengue and SARS-CoV-2 cross-reactivity. The archived (2017) dengue serum samples (predating the pandemic) cross-reacted in SARS-CoV-2 rapid antibody tests. This was supported by computational modelling studies and later validated by further studies from Israel and Brazil. This work has been cited in National Guidelines for Dengue Case Management during COVID 19-Pandemic, 2020, NCVBDC Guidelines, Govt. of India and also in COVID-19 Scientific and Public Health Policy Update (2nd February 2021), Africa CDC. COVID-19 serum samples, tested with dengue antibody test kits, have a high false-positive rate and most importantly, serological tests will be inconclusive (for both viruses) where both the viruses are now co-endemic.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

I enjoyed solving mathematical problems as a primary and secondary level student and eventually started liking science subjects. When I joined National Diary Research Institute as a post-graduate student, I started visiting the labs with my seniors whenever I had some off time from my course work. I liked being there and enthusiastically performed all the odd jobs asked by the seniors in the labs. Since then, I decided to take up research as my career. The joy of knowing and doing new things is what always inspires me to be a researcher. Viruses, the intermediates between living and non-living beings never failed to keep me mesmerized, inspired and motivated.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

I faced the first challenge when I decided to take science for my higher secondary education. At that time there were very few girls in our village who used to study science and most of them couldn't do well later. Therefore, I have been advised by my well-wishers not to take science subjects. I again faced severe criticism from my relatives when I decided to study veterinary sciences as the field was dominated by male peers. But these were much less challenging than what I am facing now. I have a kid and I want to be with my family therefore it is not feasible for me to explore any suitable job outside Kolkata. Since my return to India (with six post-doctoral experiences from University of Cambridge, UK) I have been working on fellowship or contractual jobs. I joined NIPER-Kolkata in 2019 with where my tenure gets extended every six months. As a researcher, particularly one working in the field of virology, it is a severe challenge for me since it is astoundingly difficult to concentrate on any significant project when I know my tenure might not get extended, so I end up working on projects which I can complete in short period, but good research work needs time, definitely not a six-months tenure. This is the major challenge faced by women in STEM and forced many to leave the profession.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

My advice to the next-gen women in STEM would be- never ever let your passion change or die, no matter what you face! Challenges will be directly proportional to your good work but work self-motivated and never allow challenges to overpower you. Another point of caution would be, if you are studying or working abroad, return to India only when you have a job offering that suits you well. I wish somebody told me that.

Prof. Sreedevi Upadhyayula

Professor
Chemical Engineering
IIT, Delhi

Dr. Sreedevi Upadhyayula worked as a Senior Design Engineer for five years in both Public sector (BHPV Ltd., Visakhapatnam, subsidiary of BYNL group) and Private sector (APL, Chennai, subsidiary of PTE, Singapore) after completing her M. Tech in Chemical Engineering (Petroleum Refinery and Petrochemical Technology specialization) from IIT Kharagpur in 1993.

I returned to academics in 1998 joining the Catalysis Division of National Chemical Laboratory, Pune as a CSIR Senior Research Fellow. I completed my PhD in 2001 jointly from NCL, Pune and Indian Institute of Technology Kharagpur. I then worked as a Post-doctoral Research Fellow in the Department of Chemical Engineering at University of Notre Dame, IN, USA, before joining the Department of Chemical Engineering at IIT Kharagpur as an Assistant Professor in January 2004. In April 2006, I joined the Department of Chemical Engineering, Indian Institute of Technology Delhi and currently working as CLASS of 66 Chair Professor. My research interests include environmentally benign heterogeneous catalysis involving ionic liquids, zeotype materials in Petrochemical and Refinery catalytic processes, biomass conversion to biofuels: Catalyst design, Parametric study, Kinetics and Modeling of heterogeneous reactions.

Academic qualifications:

- **B.Tech** in chemical engineering (1990), college of engineering, andhra university, visakhapatnam- 530 003.
- **M.Tech.** In chemical engineering with petroleum refinery engineering and petrochemical technology as specialization (1993), indian institute of technology kharagpur- 721 302.
- **Ph.D.** In chemical engineering (2003), ncl (csir), pune- indian institute of technology kharagpur - 721 302

Professional experience:

- August 2020 onwards class of 66 chair professor, department of chemical engineering, IITD
- August 2018 onwards Professor, Department of Chemical Engineering, IIT Delhi
- April 2011- Aug 2018 Associate Professor, Department of Chemical Engineering, IIT Delhi
- April 2006 - April 2011 Assistant Professor, Department of Chemical Engineering, IIT Delhi
- Jan' 2004 - April 2006 Assistant Professor, Department of Chemical Engineering, IIT Kharagpur-721 302, West Bengal
- Nov' 2001 - March 2003 Post-Doctoral Research Fellow in the Department of Chemical Engineering, University of Notre Dame, Indiana, USA

Research project:

- Analysis of Oxidative Stabilization Reaction in the Mesophase Pitch Matrix of Carbon-Carbon composites; Project funded by 21st Century Indiana Research Fund. Advisor&Project PI: Prof. William C. Strieder
- June 1999 – July 2001 CSIR Senior Research Fellow in National Chemical Laboratory, Pune, India. Area of research: Alkylation of aromatics with alcohols over large pore molecular sieves. Supervisor: Dr. B.S.Rao, Scientist F (Retd.), Catalysis
- Division, also worked with Dr. S.S.Tambe, Theoretical Sciences group, NCL, Pune.
- Feb' 1998 - June 1999 Senior Research Fellow in the Department of Chemical Engg., IIT-Kharagpur under the supervision Prof. B.K.B. Rao and Dr. N.C. Pradhan
- Aug' 1995 - Feb' 1998 Worked as Sr. Process Engineer in M/s Asian Peroxides Ltd. (subsidiary of PTE, Singapore) Lilavathi Building, Armenian Street, Chennai, India.
- Feb' 1993 - Aug' 1995 Worked as Process Engineer in Refinery Systems group of a Public sector firm, Bharat Heavy Plate and Vessels Ltd. (BYNL group), Visakhapatnam, Andhra Pradesh, India.

Research interests: Heterogeneous catalysis for fuels from fossil and renewable sources, renewable energy, greenhouse gases conversions to fuels and chemicals, waste biomass conversion to alternate fuels and

value-added chemicals, and process development using benign solvents and catalysts, wastewater remediation using catalytic processes including resource recovery, Analysis and modeling of heterogeneous reactions.

Honors and awards

- Applied Research Award 2021-2022 (Prof. K.L. Chopra Faculty Research Award), IIT Delhi
- Featured in the list of Top 75 Women in STEAM on the occasion of 75yrs of India's Independence and Women's Day, 8th March 2022, jointly by the Principal Scientific Adviser Prof. K. Vijay Raghavan and His Excellency, The British High Commissioner Mr Alex Ellis and to be featured in the 2nd Ed., of "She Is" by Red Dot Foundation.
- Member of the Committee (Ministry's Order date 03.1.2021) for "Adoption of Hydrogen Technologies in Upstream Sector" constituted by MoPNG, India.
- Subbarao Research Excellence Award in Chemical Engineering - 2021 in the Dept. of Chemical Engineering, IIT Delhi for the supervised PhD thesis titled "Experimental and theoretical investigations into valorization of biomass-derived phenols by C-C coupling with light oxygenate" (PhD Student name: Gul Afreen)
- Research Council Member, CECRI, Karaikudi CSIR Laboratory, 2022-2024.
- Golden Peacock Innovative Product Service Award 2021, BPCL Corporate for K-Model.
- Editorial Advisory Board Member for ACS Engineering Au, 2021 till date.
- Member Program Management Review Committee (PMRC) of SERB-GE India FIRE Program to select and monitor the identified "Industry Relevant R&D (IRRD)" 2021-2022.
- Technical Advisor to CDRI, Delhi, 2020-2021.
- Member of PAC committee for CRG-Chemical and Environmental Engg., DST-SERB 2020-2022.
- Member of PAC committee for POWER grant of DST-SERB 2020-2022.
- Member of PAC committee for GE-FIRE grant of DST-SERB 2020-2022.
- Member of Proposal Review committee for CSIR-Fundamental & Innovative Research in Science of Tomorrow [CSIR-FIRST] Scheme 2021-22.
- Research Council Member, IIP, Dehradun CSIR-Laboratory, 2020-2022.
- "Innovation Award under the category "Best Innovation in R&D Institute" 2019-2020" for "K-Model: Quick and Accurate Prediction of Crude Oil Blend Compatibility and Blend Optimization of N-Number of Crude Oils" from Centre for High Technology, Ministry of Petroleum & Natural Gas, Government of India, India.
- Member of Expert Committee to suggest the suitable legislative framework for development of Chemicals and Petrochemicals by Ministry of Chemicals and Petrochemicals 2020-21.
- Class of 66 Chair Professorship 1st Aug 2020 – 1st Aug 2023.

What is unique about working as a woman in STEM compared to other fields?

This enables me to be fully functional human being, teaching and coaching young &bright engineering and scientific minds. Also, logical thinking, planning & decision- making in the scientific & technological research world (like any Man in the field) in the professional place and at the same time being a loving, caring daughter, wife, mother on the home front! The other fields may not allow a woman's logical & scientific spirit to reach extreme heights and may only be complimentary to her emotional & feminine roles at home!

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

My Parents, Paternal side aunt, Math teachers of Primary & Secondary school,

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

- Balancing work & home life which needed two completely different (extremes) skill-sets.
- Engineering Process Plant commissioning task was not given to lady engineers in the 1990s, ladies were restricted to design and Piping and Instrumentation (P&I) diagram vetting in the office.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

Next-gen women need develop focused, disciplined, devoted and indiscriminating mind-sets to whatever chores/tasks/careers they take-up very early in life (right from childhood) which will help them tremendously in their adult lives and shape them into beautiful human beings (who seem to become rare these days) useful to society (not restricted to family unit) & the world at large.

Ms. Sruthi Kannan

Techno-business leader

Cisco Systems, Bangalore

I am a techno-business leader at Cisco Systems Bangalore, where I head Cisco for Startups and business development for Digital Native Enterprises. I orchestrate meaningful outcomes for startups in their scale up journey by co-creating end-to-end digital solutions, fine-tuning business strategies, opening joint go-to-market opportunities as well as instrumenting follow on funding. Awarded as the best startup ecosystem enabler by Startup India this Jan 2023, I have been recognized as one of the top 10 innovators in India in 2021.

As an invited member of the CII National Startup Council, CII National Mission for Technology, Innovation and Research, Executive Advisory Committee Member on Startup India Seed Fund Scheme as well as a TIE Charter Member, I am a strong advocate for startups that play a critical role in accelerating and amplifying the goodness of digital transformation.

I hold B.E in Computer Science and Engineering from the College of Engineering, Guindy (Asia's oldest tech institution founded in 1794) and I have been awarded the Distinguished Alumnus Award for 2022 at this prestigious institution in recognition of my contribution to the engineering fraternity and society at large. In addition to master's in psychology from University of Madras, I hold specializations in Digital Transformation and Entrepreneurial Leadership from UC Berkeley and Stanford University respectively.

What is unique about working as a woman in STEM compared to other fields?
Being a woman in STEM provides a golden opportunity to use technology as a powerful enabler to transform the world around us. The superpowers endowed by technology aids not just in community emancipation, but also individuals' and inspires the coming generations to follow suit.

What are your key contributions to your work area?
As the Head of Cisco for start-ups, I have been at the fore of the entrepreneurial ecosystem as a vocal advocate for technology-based start-ups. I have actively mentored CEOs, CTOs and CXOs in areas of business strategy, tech architectures and global expansion. With an unflinching track record of over 90% follow on funding to the tune of $230 M, I have instrumented tangible outcomes for start up founders through my vast network of venture capitalists and investors. I have also accelerated the journey of technology start-ups by onboarding them onto corporates partner networks, thereby creating a multi-million-dollar joint pipeline resulting in a strong win-win for corporates and start-ups alike.

I have been creating an indelible mark in the start up ecosystem and advise the central and state governments on policy decisions as an invited member of the CII National Mission for Technology, Innovation and Research and the CII National Start-up Council. As the Chair of the Women in STEM pillar, I along with my team undertook a detailed study of the landscape of women in STEM in India and tabled strong proposals for implementation for the benefit of women in different stages of their career. As the co-chair of the Incubators and Accelerators group, I deep dived into the academic incubator framework and provided recommendations at the national level based on research-based study. My resilient work cutting across the startup ecosystem drew the attention of the Govt. of India's Department for Promotion of Industry and Internal Trade (DPIIT), and I was invited as the only industry member of the prestigious Experts Advisory Committee of the Startup India Seed Fund Scheme with a contour of 945 crores. I am also an invited member of the Executive Committee of the Department of Science and Technology's NIDHI initiative that aims to empower accelerators across the country.

I not only inspire startup founders, but C-suite executives as well, providing them a validated pathway towards effective engagement with startups. I work closely with industry leaders under the visionary chairmanship of Sri. S. Gopalakrishnan (Co-founder - Infosys) as a honorary faculty at the CII Centre of Excellence for Innovation, Entrepreneurship and Startups (CIES). I also actively advise the acceleration teams and mentor the start-ups of organizations including Action for India, Cisco Thinqbator, NASSCOM Foundation. As a NASSCOM Deep Tech Club partner, I act as an anchor for start-ups to productize disruptive technology in areas of quantum technology, confidential compute, LiFi and Meta.

My contribution in the field of innovation and technology through entrepreneurship continues to address United Nation's sustainability development goals including sustainable cities and communities, reduced inequalities, quality education, good health and well-being.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
The power of technology attracted me towards computing as a career option. I was quite fortunate to have the right guidance from my teachers at school, university, friends, and family at every milestone. In particular, my grandparents have had a huge influence on my steep and constant learning curve. Having battled several odds, they strove to rise throughout their career and continued to contribute to the society in very impactful ways. A favourite saying that my grandmother often quotes is etched in my memory – 'heights by great men reached and kept, were not by a sudden flight. But they, while their companions slept, were toiling upwards through the night'.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
It often gets lonelier in the ascending professional journey. Finding the right people to network and building genuine relationships has been a challenge. As a woman, I have had to strive doubly harder to demonstrate my capabilities and let the outcomes speak for themselves.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
Advancing into leadership roles often requires one to be at the right place and at the right time. Having a broad outlook, establishing one's niche in their area of expertise, acquiring newer skillsets, and building a strong network stand women in good stead as they work their way into leadership roles. It is imperative to look beyond one's desk[top] and observe the real big world live and at closer quarters, to discover opportunities, dream big and dare to succeed.

Prof. Sulakshana P. Mukherjee

Associate Professor

Department of Chemical Sciences, IISER, Berhampur

I am Sulakshana P. Mukherjee working as a Associate Professor at Department of Chemical Sciences IISER Berhampur I have born in Rasayani, District-Raigad, Maharashtra and spent Childhood at Panvel, District- Raigad, Maharashtra, India.

Research experience and employment:

1) **Assistant Professor**
   Department of Biosciences and Bioengineering
   Indian Institute of Technology, Roorkee
   Roorkee, Uttarakand-247667, India

2) **Research Associate**
   Department of Integrative Structural and Computational Biology
   The Scripps Research Institute
   La Jolla, CA-92037

3) **Assistant Research Scientist**
   Department of Chemistry and Biochemistry
   University of California, San Diego
   La Jolla, CA-92093

4) **Post-doctoral Fellow**
   Department of Chemistry and Biochemistry
   University of California, San Diego
   La Jolla, CA-92093

Academic qualifications:

1) PhD, Chemical Sciences, Tata Institute of Fundamental Research, Mumbai, India
2) MSc, Inorganic Chemistry, Mumbai University, Mumbai, India
3) BSc, Chemistry: Mumbai University, Mumbai, India

Honours and awards:

1) 2021, Invited speaker at ISMAR-APNMR-NMRSJ-SEST 2021
2) 2020-2023, General Secretary of National Magnetic Resonance Society (NMRS) India
3) 2009-2012, Irvington Institute Postdoctoral Fellowship of Cancer Research Institute 2009-2012
4) 2007, TAA-Zita Lobo Memorial Award for the best thesis of the year 2006-2007
5) 2005, Sarojini Damodaran International Fellowship, TIFR Mumbai

What is unique about working as a woman in STEM compared to other fields?

Throughout my entire professional journey as a woman in STEM field, I have been fortunate enough not to encounter any instances of discrimination. However, I have often found myself in a unique position as one of the few women in various committees that are predominantly represented by men. It is during these meetings that I have become acutely aware of the gender imbalance within the STEM field.

What are your key contributions to your work area?
Overall research goal: Delineate the NF-kappaB interactome

Cellular processes including immune response are highly dependent on gene transcription. Although major advances have been made in the field of transcription for the past few decades, we are still far from complete understanding of this process. This is apparent from our inadequate knowledge about cancers and autoimmune diseases whose origin lies in our very own cells through deregulated gene expression.
Transcription factor (TF) proteins are one of the basic components, which regulate transcription by binding to their cognate site/s on the promoter/enhancer regions of their target genes. TFs can be constitutive or inducible – the latter form requires a stimulating agent for its onset. To ensure proper regulation of target gene expression the TFs interact with various other components in the nucleus in addition to DNA. These components comprise of co-factors, co-activator proteins, nucleic acids (like non-coding RNAs) and other transcription factors. The primary focus of my research is to understand how TF interacts with multiple components in the nucleus to regulate and control gene transcription. My lab focuses on the NF-kappaB family of transcription factor and study its interaction with various other proteins that control the gene expression of its target genes.

My research has provided insights into the dynamic behavior of the NF-kB dimers not only in its free form but also in complex with the DNA. In the process, my lab has unraveled NF-kB dimers that were not previously established.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
Like a typical middle-class household in the suburbs of a cosmopolitan city like Mumbai, my family laid great emphasis on formal education. From my childhood days, I was more interested in science and mathematics. I always wondered why I was being taught subjects other than STEM, the importance of which I realized much later in life.
A major part of my secondary and high school education was done in Kendriya Vidyalaya, with my mother playing a crucial role in my pursuit for higher education. She tried her best to create a comfortable environment around me for study.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
While I never encountered any gender bias that hindered my professional journey, I did face safety concerns as a woman. During my college years I spent 4-5 hours daily commuting from my home in suburban Mumbai to the main city. Safety became a concern during early morning journeys to attend 7:00 am classes, and in unanticipated situations when the public transportation halted unexpectedly due to weather conditions or instances of unrest in Mumbai.

In my professional life, I often feel overwhelmed by the responsibility of being a member of multiple committees where I represent women faculty. This overwhelming feeling stems from the unfortunate reality of the underrepresentation of women in STEM fields.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
At this stage of my career, I wish during my college years I had more interaction with my teachers, as their guidance could have helped me to take up subjects based on my talent. My advice to the next generation of women would be to actively engage with their teachers and seek their guidance to strengthen their pursuit of higher education in STEM. It is crucial for young women in STEM to explore various areas within STEM to ascertain their true interests and determine the specific path they wish to pursue in their future endeavours.

Dr. Sushma Singh

Associate Professor
National Institute of Pharmaceutical,
Education & Research (NIPER) - MOHALI

I was born and brought up in Kolkata though with my roots in Uttar Pradesh. I graduated in Zoology (Hons.) from Presidency College, Kolkata for which I had to travel by local train daily as it was far off from my home. But studying in Presidency was my dream. My parents supported me a lot. My father who was in administrative job was also behind me motivating and being supportive in the area which I chose for further studies.

My elder brother was pursuing MBBS from AIIMS and he was constantly motivating me for pursuing MBBS. He guided me also but somehow.

I wanted to pursue research. I had a different calling. I completed my post-graduation from Razabazar Science College, University of Calcutta, Kolkata with specialization in Molecular Biology and Biophysics. One of my teachers Prof. CK Das Gupta, though other teachers should not go unacknowledged, was my motivation for going ahead in this field. My batchmates were also the most supporting lot. My mother throughout my journey has given unstinting support and kept me out of kitchen which she said would occupy large share of my time which I could devote to my studies. I pursued PhD from School of Life Sciences, Jawaharlal Nehru University, New Delhi. I worked as CSIR JRF and then SRF during my tenure. I had as my guide Prof Rentala Madhulaba, a very strong and motivating person whom I idolize being women in science. She made me realize that even women can make a mark in science nationally as well as globally. During my final year of thesis completion, I got married. I had a very supportive husband and in-laws. I was offered post-doc position in NIH, USA which I did not take up instead I joined in National Centre for Cell Science, Pune as Research Scientist and worked on project on Leishmaniasis and Cancer. I had my first baby and decisions on career became tough. I understood life was not going to be that easy. I accepted the challenge. I applied in Seattle Biomedical Research Institute and in various Institutes in India. NIPER, Mohali gave me the opportunity to work as Assistant Professor. I had wonderful colleagues with whom I executed several collaborative projects. We have published our findings in journals of international repute. My students have presented their work in several national and international forums and have won best poster prizes in several platforms. Mentoring young minds have brought me great pleasure. I am a member of Punjab Science Congress, Society of Biological Chemists, Biotech Research Society of India, International Society of Infectious Diseases and Global Outreach Member of the American Society for Microbiology

Past Job
Research Scientist in National Centre for Cell Science (NCCS)

Residing city: Mohali

City where you born and brought up: Kolkata

What is unique about working as a woman in STEM compared to other fields?
Women in STEM need to dedicate a greater number of hours to their work but can have flexible working hours. Working in STEM gives the opportunity to interact with young minds, train them in various skill development programs for their brighter future. This helps in roping in the best of minds, nurture entrepreneurs and future women candidates for startups. Women in STEM are strengthening the scientific innovation and healthcare of the

Academic qualifications (mention details of institutes and universities)

Sl No.	Institution Place	Degree Awarded	Year	Field of Study
1.	Presidency College, Kolkata	B.Sc	2000	Zoology (Hons.)
2.	Calcutta University (Razabazar Science College)	M.Sc	2002	Molecular Biology and Biophysics
3.	Jawaharlal Nehru University (JNU), New Delhi	Ph.D	2008	Life Sciences

country at each step for example, improving the point of care testing and contribute towards diagnostics.

What are your key contributions to your work area?
My major area of research is target specific drug discovery for treatment of Visceral Leishmaniasis. We have identified several metabolic and non-metabolic proteins with immense relevance to the parasite as drug targets. Several enzymes belonging to pentose phosphate pathway and sterol biosynthetic pathway were identified. Their role in parasite infectivity and growth was elucidated by gene knockout studies. Besides, therapeutic switching was considered for use of existing drugs with new indications. Two antidepressants, ketanserin and mianserin were highlighted to be potential antileishmanial candidates in the in vitro studies with no host cell cytotoxicity paving the path for exploring this strategy for identifying available drugs for resistant cases as well. We have also worked on membrane proteins in this protozoan pathogen which is a highly unexplored area. Funding was received from ICMR, CSIR, SERB, Department of Pharmaceuticals to execute these projects.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues/ Professional mentors, etc.)?
My parents, my husband, in-laws and friends were major inspiration. One of my teachers Prof. CK Das Gupta, though other teachers should not go unacknowledged, was my motivation for going ahead in this field. I had as my guide Prof Rentala Madhulaba, a very strong and motivating person whom I idolize being women in science. She made me realize that even women can make a mark in science nationally as well as globally.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
Women in STEM may require different working hours. This is where developing the skill of work life balance becomes crucial. Developing a support system at home and at workplace facilitates the growth process even more. In our society at times, it becomes difficult to explain everyone why you cannot be there for every family event. This is where we are sometimes branded as 'selfish' and 'too career oriented' no matter how much effort is put in making both ends meet. More focus on self-criticism and self-judgment is required than focusing on criticism and judgment by others. This can be really demoralizing at times. As the saying goes 'slow and steady wins the race' one should learn to prioritize things as not everybody gets to make a career for which they are passionate for. We should also learn to prioritize out health. When body and mind is healthy the thinking process is faster and positive.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
STEM is the driving force which drives innovation, fuels economy, and moves the civilization forward. It instils critical and logical thinking, problem-solving skills, analytical skills, teamwork, and creativity in the young generation. It helps bring solutions to real world problems. In STEM, women are highly underrepresented. More women in STEM will bring gender diversity which will push more innovation and bring more solutions. Increase of women in STEM will also bring economic security by closing the wage gap. This will lead to a better and improved work force which will lead us into a better society More women mean more role models, mentors. They will have better working conditions in terms of less gender-based discrimination and harassment in workplaces. It is also important that women hold more leadership positions, as opposed to traditional subordinate spots. STEM field have been conventionally male dominated. Younger women in this field often are in dearth of role models when they are in training or when they join the workforce. Women face several obstacles and as result of underrepresentation in STEM are held to unrealistic standards in society as well in workplaces. They are often required to prove their worth repeatedly to be considered at par with their male colleagues. Also, the women and young girls feel oppressed and pressured in to fulfilling their assigned 'gender-role'.

Prof. Susmita Das

Professor
Department of Electrical Engineering
National Institute of Technology Rourkela, Odisha

I am Dr. Susmita Das, currently working as an Professor in the Department of Electrical Engineering, National Institute of Technology Rourkela and has teaching and research experience of more than 32 years at NIT, Rourkela. I am born in Cuttack, brought up in Bhubaneswar and currently residing at Rourkela of state of Odisha.

I have done B.Sc. Engineering with Honors from College of Engineering and Technology, Bhubaneswar and got the M. Tech and Ph.D. degrees in the field of Electronics Systems and Communication from Department of Electrical Engineering, NIT Rourkela.

I am a Senior Member of IEEE USA, Fellow IETE, Fellow of IEI, Life member of ISTE, and member of many Editorial Boards.

I have published more than 120 SCI, SCIE, Scopus indexed Journals and IEEE sponsored Conference papers. My research interests are Advanced Wireless Communication (5G & 6G technologies), AI & Machine learning applications. I have supervised 7 PhD students till date and presently guiding 7 research scholars. I have undertaken major administrative responsibilities at NIT, Rourkela such as Dean (Faculty Welfare) & HOD of Electrical Engineering and also the Nodal Officer for ISRO's Space Technology Incubation Center for Eastern Region at NIT Rourkela.

What is unique about working as a woman in STEM compared to other fields?
It gives me a unique opportunity to pursue research in extreme engineering applications like developing key enabling technologies for 5G & 6G communication for betterment of society in addition to my teaching responsibility. It also gives me ample scope for research collaboration in interdisciplinary areas in STEM domain and this enriches my knowledge basket. As a faculty in STEM I always try to motivate girl students specifically, to aim for higher studies in STEM, so also to take up challenging careers in diversified corporate sectors. Due to my engineering background, I am often asked to share my ideas and technological skills in various forums of the society. Being amongst few women in this field, I feel privileged and truly blessed.

What are your key contributions to your work area?
As a researcher and an academician, I always try to multitask and to be more adaptable, and creative in my domain. I have mainly contributed to the society through my teaching & research work. Additionally, I have shouldered some major administrative responsibilities time to time at NIT Rourkela as listed below:

- Former Dean (Faculty Welfare)
- Former Head of the Department, Dept. of Electrical Engineering
- Chairman, Internal Quality Assurance Cell (IQAC)
- Chairman Institute Curriculum Committee
- Member, APEX Committee for NEP implementation
- Former Chairman, NEP Implementation Committee
- Former Chairman, Internal Complaints Committee

- Chairman, DAPOC, DRC & DAC, EE Dept.
- Former Chairman, Institute's Summer Internship Program,
- Chairman, Technical Evaluation Committee Smart Classroom Development
- Nodal Officer, Space Technology Incubation Center (STIC), ISRO

Who inspired you to take up this field as a career option (mention Family/Friend /Colleagues / Professional mentors, etc.)?

My inspiration from my childhood is my father who was a prominent Electrical Engineer of our state. He truly judged my potential and inspired me to choose a career in STEM field. During my high school, our science and mathematics teachers became my role models. Their teaching style, fundamental concepts and problem-solving skills inspired me further to pursue my studies in Science domain. During my Engineering education, the then reputed Professors in our Institute helped me to go for higher studies. Further, my Ph.D. supervisor was my professional mentor and motivated me to grow up in my professional career. Fortunately, I got full support of my family, friends and colleagues in this long professional journey.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

In initial phase of my professional journey, my biggest challenge was to manage my career, family and children, all together. Always I had an internal feeling that I was not giving the best but balancing them prioritizing my schedules. In profession, the challenge was always to meet the requirements for career growth. Sometimes I had to sacrifice my leisure hours and worked with tremendous mental pressure. Later stage in my career, I succeeded to rise up and get noticed by authority to shoulder many administrative assignments. I have faced many challenging situations. Sometimes when a woman leads a team, her voice and decision are difficult to be agreed in a working community. But, when she is firm and dedicated only, she succeeds in all endeavors. I feel more women should be included in administration and higher level committees to rationalize all decisions and policies of any organization. In spite of obstacles in my professional journey I feel satisfied and grateful to Almighty for everything.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

My advice for next-gen women who want to enter the STEM field would be to get prepared as there will be challenging situations in profession as well societal demands. Various factors like marriage, and family might lead our career pathways to unexpected turns. But, every women should remember that "it's never too late" to start our careers at any phase of life. They can either avail the facility for a temporary career break or work from home at ease in this digital era. But they should always remember that they can only sustain and get rewarded by coming out of their comfort zone. We should all nurture our unique perspectives, hard earned knowledge and ambitious goals to succeed in our professions. Every professional woman should not hesitate to approach their peers/seniors, interact and get involved in groups and projects. They should not be indecisive to participate and share ideas in discussions/meetings at work place earn recognition for their worth.

Finally every woman in STEM field should sincerely plan for their professional career from initial phase to be successful.

Ms. Swati Tendulkar

General Manager

Advance Technology, Engineering Research Centre
TATA Motors Ltd (TML)

I am responsible for the design and development of Traction motors and High Voltage Harnesses for Commercial Electric Vehicles. Prior to this, I was involved in design and development of Low voltage harnesses, PLC logics, PCB Design, and instrumentation.

What is unique about working as a woman in STEM compared to other fields?
Globally, STEM has always been a male dominated area. Increasing number of women in STEM has changed the business outlook with a female perspective, thereby making it more balanced.

Working as a woman in STEM has its own demands of business priorities and deadlines. Also, managing her own career aspirations in a male dominated area, necessitates a woman to work doubly hard to stand out. All this, while balancing the priorities and responsibilities at home is impossible without meticulous time planning, multi-tasking, a tremendous desire to succeed professionally and most importantly, the support & encouragement from family.

What are your key contributions to your work area?
I consider that my key contribution to my work area is keeping my team continually charged up and taking up new technical challenges & deliver. This has helped build team capability and kept them actively engaged. Also, I have tried to ensure that the women in my team are given equal opportunities to prove themselves and deliver shoulder to shoulder with their male counterparts.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
My parents – both doctors, always encouraged me to take up the career of my choice. Later, my husband and his family equally encouraged me to continue and pursue my career and my aspirations.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
I have been fortunate not to face many obstacles as a woman in STEM. However, some of the initial obstacles were the differentiation in work allotment - consideration to give me easier tasks, being a girl.

I had to take extra efforts to prove that I could be equal or in some cases better in any work allotted to me and that I could very well handle the work classified to be allocated to male colleagues only.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
The next-gen women in science must start their careers with confidence and on the note that they are equally capable if not more than their male counterparts.

They should have a clear goal set for their career right in the beginning, and be ready for a lot of hard work, stay focused and most importantly, enjoy working.

Ms. Tara Kannan

Senior Distinguished Scientist

CavinKare Private Limited

I am heading the hair colours division at CavinKare Research Center (3 direct reports)- 8/1/2006-present-17yrs 4 months.

- Key driver for Innovation in retail and professional hair colours
- Expertise in product development, scale up and problem solving for above categories
- Developed NPD pipeline in with products readiness after Consumer study & Stability.
- Lead Driver for launch of over 50 variants across varied hair colouring product formats
- Collaborated with internal and external teams to ensure successful launch of products.
- Key driver for selection, commissioning of hair colour manufacturing setup; Experienced operator
- Experienced in International/Indian hair colours regulation, & w/ authorities for product approval
- Experienced in identification and execution of proprietary rights via new ingredients, technology, product composition, process.
- Experienced in recruitment, retention & talent management

Patents granted:

1. A Herbal hair wash formulation/Composition in powder form - IN363855B
2. Hair colouring composition using Plant dyes - IN309293B
3. Novel Hair colouring Composition - IN303499B
4. Faster Hair colouring composition in Solid form with up to 10% moisture content - IN295026B
5. Hair colouring composition- IN292145B

Patents filed and to be granted:

1. Solid particulate carrier system for stable dispersion and spreadability of solid particulates
2. Synergistically co-acting coupler combination system and dye formulation/kit involving the same for Instant colouring of keratinous fibres and the like
3. An efficient coloring composition for keratinous fibres
4. A synergistic composition for colouring keratinous fibres
5. A muti -component hair colour composition

Awards

Won the super achiever award in 2009-10 and have also won 9 other awards for Product Innovation, process, and business impact over the period 2009-2021.

Recognition:

Have been promoted in 2003,2004,2008,2011,2014 & 2021

What is unique about working as a woman in STEM compared to other fields?

Research does not give immediate results. There is a need for very high perseverance. STEM is more challenging since differentiated ideas need to be generated by interacting with consumers & reading allied and parallel fields,

converted into concepts and tested out amongst consumers for acceptance and then converted into a product to meet consumers unsaid &unmet needs. The ultimate challenge is in developing a differentiated product which creates sizable revenue for the organization and has a proprietary advantage-patented product so that you can win over competition.

What are your key contributions to your work area?

- FMCG domain expert, IP expert, innovation driver, out-of- box thinker, result oriented, pilot & manufacturing line expert, hair colour safety and regulatory knowledge, quality management domain expert, quick Learner, problem solver, collaborator, project management competent, effective communicator, analytical, team player, motivator, mentor.
- 15+years of experience in design, delivery and technology development of hair colour formulations and products. Thinking differently, continuously challenging the status quo and breaking conventions are my fortes.
- 5 granted patents and 5 patents pending in the field of hair colours and hair wash,
- Leading teams through platform shift projects with emphasis on innovation and translation of research into successful products in the market.
- Played a vital part in nurturing the hair colour brand from 17 crores in 2006 to 277 crores in March 2023.
- Successfully come out with a breakthrough technology of delivering hair colour in 10 minutes through extensive reading in allied and parallel fields and consumer interactions.
- Understood consumer convenience, tapped their unsaid and unmet needs, and successfully developed 'Easy Shampoo' based 10 minutes hair colours.
- Significantly contributed to the bottom line by Genius of AND thereby establishing the hair colour brand as one of the highest gross margin drivers for the organisation.
- Managing the Indian business as well as IB of hair colours across Srilanka, Nepal and Bangladesh.
- Successfully established and gained expertise in scaling up of hair colour manufacturing processes across factories at multiple locations and have also brought about significant process improvisations, thereby improving bottom line.
- Collaborated with ingredient suppliers and Academia for breakthrough products.
- Part of various leadership training programmes like LARAS and 7 habits.
- Have grown from a senior associate scientist to a senior distinguished scientist over a span of 2 decades.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

My father and my Husband motivated me to take this up as a career option. Dr. Meenakshi Narayanan, R&D Head and Dr. Mukhopadhyay, Ex R&D Head, Cavinkare inspired and motivated me continuously to take up this field.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

Hair colours are one of the most complicated fields in FMCG industry where even size and shape of a container affects product stability. Work life balance is a great challenge. I was a novice when I entered the hair colours formulation development in 2006.

Some of my challenging experiences are:

- Understanding the impact of humidity maintenance in powder dye manufacturing as a key process parameter
- Travelled to Pondicherry factory twice a week during initial stages of crème colour manufacturing -2010-2011 which was later standardized in 2013 in Haridwar factory.
- Understanding the need for passivation of hydrogen peroxide manufacturing vessel by visiting RM manufacturing facility in TADA, impact of shape, size, headspace &vent release in Hydrogen peroxide packaging containers-Bottles
- Understanding the impact of uniformity in lacquer coating in Aluminium tubes used to pack colorant containing dyes-Due to lacquer issues, had to visit factory on a Sunday before the day of my daughter's SSC final exams. So, work life balance is always a challenge.

- Have travelled to factories in Haridwar &Assam and have even worked late night to standardize the manufacturing process.
- To convince my cross functional team members at times about the differentiation in the products we developed is always a great challenge.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

- IIY-Invest in yourself-Plan specific time for reading and thinking for your overall development.
- Passion for research
- Continuous learning
- Be fully alert to convert whatever we see/learn around us to implementable products which meets consumers unmet/unsaid needs.
- Market visits
- Challenge senior leadership on product launches.

Dr. Taranjit Kaur

Research Associate (RA)

Department of Electrical Engineering (EE), IIT Delhi

I, Dr. Taranjit Kaur, hails from a small rural village named Chagran in the district Hoshiarpur, Punjab. The sub mountainous village share its boundaries with Una district of Himachal Pradesh. Currently, I am working as a Research Associate (RA) in a MeiTY funded project "Neurocomputing and Cognitive Intelligence" in Department of Electrical Engineering (EE) under the mentorship of Prof. Tapan K. Gandhi. Prior to joining as RA, I was an Institute postdoctoral fellow in EE Deptt. IIT Delhi from year 2018-2021.

Presently I am residing in IRD Girls hostel, Block A-4, IIT Delhi campus. My current and past research work involve the understanding of the various aspects of natural intelligence by studying the normal, developing, and diseased brain with the help of brain imaging techniques. The finding from the fundamental studies have been extrapolated to understand various neuro-developmental disorders and at the same time it has helped me in developing intelligent system inspired from neural functioning for various engineering applications. My research work revolves around the domains of Blindness, Epilepsy, and Disorder of Consciousness.

Also, during my postdoctoral and the RA tenure at IIT Delhi, I had been teaching selective topics from a course on Computational Neuroscience, (ELL890), Computer Architecture (ELL305), and Embedded system (ELL365/ELL787). In ELL890, which is a PG level course taken by a mix of postgraduate, and doctoral students, I specifically address the domains of Magnetic Resonance Imaging (MRI) basics, and MR Spectroscopy. For the UG level courses, i.e., ELL305 and ELL365/ELL787, I mostly undertake the topics relating to architectural issues in RISC and CISC processors. I had also been mentoring course projects, performing exam invigilation duties, correcting answer scripts, and helping in writing of the research grants.

Academic qualifications (mention details of institutes and universities)

I completed my Ph.D. as a full-time candidate with MHRD fellowship in the area of Multispectral MR Image Processing (Year 2012-2017) from Dr B R Ambedkar National Institute of Technology, Jalandhar, Punjab. My thesis title was "Brain Tumor Characterization using MR Imaging and Spectroscopy". Prior to this I did my M. Tech in the field of Electronics and Communication Engineering (ECE) from Guru Nanak Dev Engineering College (GNDEC), Ludhiana, Punjab with distinction and Gold Medal (Year 2010-2012). My M. Tech dissertation was focused on the design of FIR Digital Filter using PSO and its Variants. Previously, I completed my B. Tech in ECE from GNDEC with 1st class and distinction (Year 2006-2010). GNDEC Ludhiana, an autonomous institute, is one of the oldest and minority institute of Northern India established in 1956 with a commitment by Nankana Sahib Education Trust to uplift the vast weaker section of Indian polity comprising Rural India by admitting 70% students every year from Rural Areas.

Notable achievements (awards, fellowships, memberships of scientific academies and publications etc.)

Awards and fellowships:

2012	Gold medal in studies during M. Tech
2012-2017	Awarded fellowship by ministry of human resource development (MHRD), government of india for pursuing Ph.D. In electronics and communication engineering at dr. B. R. Ambedkar national institute of technology jalandhar, punjab, india
2014	Awarded best paper at the 3rd international conference on biomedical engineering and assistive technologies (beats-2014), UIET chandigarh, feb 14-15

2018-2020	Awarded post-doctoral fellowship by computer science engineering department, IIT roorkee, india
2018 -2021	Awarded post-doctoral fellowship by electrical engineering department, IITdelhi, india
2020	Awarded 3rd prize during poster presentation at international workshop on science of intelligence, IIT jodhpur
2020	Awarded best paper at the 5th iapr international conference on computer vision and image processing CVIP 2020, IIITallahabad, dec 4-5

Publications:

I have contributed 25 research articles in refereed International Journals, Conferences proceedings, and book chapters. Moreover, 3 journal articles are in process and two are under preparation. The complete list of articles is attached herewith.

Journal Publications (Published)

1. Kaur, Taranjit, and Tapan Kumar Gandhi. "Classifier Fusion for Detection of COVID-19 from CT Scans." Circuits, Systems, and Signal Processing (2022): 1-18. Impact Factor: 2.311
2. Kaur, Taranjit, Tapan Kumar Gandhi, and Bijaya K. Panigrahi. "Automated diagnosis of COVID-19 using deep features and parameter free BAT optimization." IEEE Journal of Translational Engineering in Health and Medicine 9 (2021): 1-9. Impact Factor: 3.316
3. Kaur, Taranjit, et al. "Artificial Intelligence in Epilepsy." Neurology India 69.3 (2021): 560. Impact Factor: 2.117
4. Azimi, Shiva, Taranjit Kaur, and Tapan Kumar Gandhi. "A deep learning approach to measure stress level in plants due to nitrogen deficiency." Measurement 173 (2021): 108650. Impact Factor: 5.131
5. Kaur, Taranjit, and Tapan Kumar Gandhi. "Deep convolutional neural networks with transfer learning for automated brain image classification." Machine Vision and Applications 31.3 (2020): 1-16. Impact Factor:2.983
6. Kaur, Taranjit, et al. "Prevalence of foot problems and its related associations in Intellectually Disable (Special Olympic) Indian population." The Foot 42 (2020): 101650. Impact Factor:1.8
7. Kaur, Taranjit, Barjinder Singh Saini, and Savita Gupta. "An adaptive fuzzy K-nearest neighbor approach for MR brain tumor image classification using parameter free bat optimization algorithm." Multimedia Tools and Applications 78.15 (2019): 21853-21890. Impact Factor:2.757
2. Kaur, Taranjit, Barjinder Singh Saini, and Savita Gupta. "A novel fully automatic multilevel thresholding technique based on optimized intuitionistic fuzzy sets and tsallis entropy for MR brain tumor image segmentation." Australasian physical & engineering sciences in medicine 41.1 (2018): 41-58. Impact Factor: 7.126
3. Kaur, Taranjit, Barjinder Singh Saini, and Savita Gupta. "An optimal spectroscopic feature fusion strategy for MR brain tumor classification using Fisher Criteria and Parameter-Free BAT optimization algorithm." Biocybernetics and Biomedical Engineering 38.2 (2018): 409-424. Impact Factor: 4.314
4. Verma, Atul Kumar, Barjinder Singh Saini, and Taranjit Kaur. "Image denoising using Alexander fractional hybrid filter." International Journal of Image and Graphics 18.01 (2018): 1850003. Impact Factor: 1.469
5. Kaur, Taranjit, Barjinder Singh Saini, and Savita Gupta. "Quantitative metric for MR brain tumour grade classification using sample space density measure of analytic intrinsic mode function representation." IET Image Processing 11.8 (2017): 620-632. Impact Factor: 2.373
6. Kaur, Taranjit, Barjinder Singh Saini, and Savita Gupta. "A novel feature selection method for brain tumor MR image classification based on the Fisher criterion and parameter-free Bat optimization." Neural Computing and Applications 29.8 (2018): 193-206. Impact Factor: 5.606
7. Kaur, Taranjit, Barjinder Singh Saini, and Savita Gupta. "A joint intensity and edge magnitude-based multilevel thresholding algorithm for the automatic segmentation of pathological MR brain images." Neural Computing and Applications 30.4 (2018): 1317-1340. Impact Factor: 5.606

Journal Publications (Under Process)

14. Kaur, Taranjit, Anirudra Diwakar, Manjari Tripathi, P. Sarat Chandra, and Tapan Kumar Gandhi. “Deep Learning Based EEG Seizure Detection and Attention Based Model Interpretation on an Imbalanced Dataset with Noise Artefacts.” IEEE Transactions on Neural Systems and Rehabilitation Engineering (2022): (Under Review)
15. Kaur, Taranjit, Avaneep Gupta, Sumeet Khandelwal, and Tapan Kumar Gandhi. “Assisting Visually Impaired in Crowded Environment: A Computer Vision based Paradigm.” IEEE Transactions on Automation Science and Engineering (2023): (Under Review)
16. Kaur, Taranjit, Rohan Wadhwan and Tapan Kumar Gandhi. “Facial Expression Recognition from Dynamic Video

Sequences: A Landmark-Aware & Part-based Ensemble Paradigm". IEEE Transactions on Artificial Intelligence (2022): (Submitted)

Book chapters

1. Kaur, Taranjit, Barjinder Singh Saini, and Savita Gupta. "Optimized multi threshold brain tumor image segmentation using two-dimensional minimum cross entropy based on co-occurrence matrix." Medical imaging in clinical applications. Springer, Cham, 2016. 461-486.
2. Kaur, Taranjit, Barjinder Singh Saini, and Savita Gupta. "Optimization techniques for the multilevel thresholding of the medical images." Medical Data Security for Bioengineers. IGI Global, 2019. 166-184.
3. Kaur, Taranjit, and Balwinder Singh Dhaliwal. "Design of Linear Phase FIR Low Pass Filter Using Mutation-Based Particle Swarm Optimization Technique." Applications of Artificial Intelligence in Electrical Engineering. IGI Global, 2020. 344-358.

What is unique about working as a woman in STEM compared to other fields?

While working as a woman in STEM, I feel empowered and passionate about using my developed skills and knowledge to innovate, solve real-world problems, and contribute to the society. It is really satisfying when I see that the technology, we developed is eventually improving the lives of the people. It is also gratifying when you receive recognition for the designed technological advancements in the form of awards and appreciations.

What are your key contributions to your work area?

My overarching research goal is to simultaneously contribute to the advancement of basic science as well as the betterment of the human condition. The work that I have undertaken in the past 9.5 years thus far has adopted a cross-disciplinary approach to merge these two objectives.

My research contribution has spanned multiple medical domains including Brain tumors, Epilepsy, Blindness, Disorders of consciousness, and other allied health areas (Mental Health, Liver Health (Fatty Liver, Fibrosis, and Cirrhosis), and Diabetic Foot Ulcers).

Some of the specific works which I wish to highlight are:

1. Understanding the limit of plasticity in adult brain using Magnetic Resonance Spectroscopy (MRS).
2. Improving our ability to intervene in cases of epilepsy via the design of automated detection and localization tools.
3. Identifying the prominent regions contributing to consciousness in Coma patients through fMRI analysis.
4. Assessing the effectiveness of transcranial direct current stimulation (tDCS) in the management of the mental disorders
5. Designing of AI based models for still birth prediction in Indian population

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

I draw my inspiration from my family especially my father (S. Amarjit Singh) who has always been a strong support to my decisions (both personal and professional), my post-doctoral mentor (Prof. Tapan Kumar Gandhi) who has always motivated me to do good quality fundamental research and in same time think about, how sour science can be translated to the development of technology which in turn help serving our Nation and Humanity at Large. He has always encouraged his team to work towards helping others and growing together. I am also grateful to my doctoral mentors (Prof. Barjinder Singh Saini, and Prof. Savita Gupta) who introduced me to the so-called field of bio-medical research, and of course a big inspiration from my own failures and distressing times that stimulated my struggle for the best with conviction in mind that "If I am privileged then I have the duty to serve this society".

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

Academically, I had a continuous journey in STEM without any gap in my academic career. But yes, I did have challenging experiences professionally especially after my Ph.D. when I decided to pursue my career in research. Coming from a reserved Punjabi family to a place which I felt was quite far away from family, I initially felt little isolated and scared. Also, I was judged to be less smart than my fellow colleagues who hailed from urban areas. Subsequently, it led to narrowing of the advancement opportunities and the motivation.

But then one thing always came to my mind that my competition is not with the outside world but with myself. If I have to pursue my dream, then I have to learn more & more and be strong in difficult times. Consequently, I started looking at the failures/my fears as the chances to improve myself and tried to figure out some possible ways. Truly, it has opened at least not all the doors but yes few doors for some exciting possibilities.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

My advice to the next-gen women science would be firstly happy and satisfied with your career choice, if you are not then this was not the place you wished for. Secondly while choosing an academic career in STEM field, look for the places that are renowned in the area and then take a decision, don't hastily jump to any opportunity, always think what the future scope will be. Thirdly, whether it is academic or professional career keep yourself motivated towards the goals. There will be times when you will feel low, try to discuss, or share your problems with your peers and senior members of the group. Fourthly, be vocal about your needs, if you will not communicate there is no chance of improvement, if you will communicate at least things might improve. Finally, you have the capability to achieve everything stay focused and things will fall in place.

Prof. Trapti Jain

Professor Department of Electrical Engineering

Indian Institute of Technology, Indore

I am Dr. Trapti Jain is born and brought up in Ujjain, Madhya Pradesh. I have received the B.E. degree in Electrical Engineering from Government Engineering College Ujjain in 1997 and has obtained the Ph.D. degree in Electrical Engineering from IIT Kanpur in 2008. I am currently a Professor in the Department of Electrical Engineering at IIT Indore.

Before joining IIT Indore in June 2012, I have served as an Assistant Professor in School of Computing and Electrical Engineering at IIT Mandi from December 2010 to 8th June 2012. I have also served in Electrical Engineering Department at Madhav Institute of technology and Science (MITS), Gwalior from May 1999 to November 2010. My research interests include synchrophasor applications in power systems, grid integration of renewable energy systems, artificial intelligence applications to power systems and data analytics in smart grid.

Notable achievements

- Received **excellence in research award** for the paper titled "real-time event detection based on weibull distribution using synchrophasor measurements for enhanced situational awareness" at IIT Indore in 2023
- Received IETE technomedia award 2018 for young women in engineering.
- Received **best paper award** for the paper titled "tunable-q wavelet transform and dual multiclass SVM for online automatic detection of power quality disturbances" at IIT indore in 2017.
- Our paper titled "Impacts of G2V and V2G power on electricity demand profile" received the **best paper award** at the 2014 IEEE international electric vehicle conference (IEEE ICVE 2014) held at florence, italy.
- Fellow of the institution of engineers (india)
- Fellow of the institution of electronics and telecommunication engineers (IETE)
- Senior member of IEEE (USA), member of IEEE women in engineering (WIE),
- Head of the electrical engineering department at IIT indore from august 2016 to august 2019
- Founder chair of the executive committee of IEEE PES chapter of IEEE MP section for 2022, 2023.
- Vice-chair of the executive committee of IEEE PES/IAS Joint chapter of IEEE bombay section for 2021.
- Appointed as an independent director of indore smart city development limited from december 2021.
- Served as an independent director of M.P. Paschim kshetra vidyut vitran company Ltd. (MPPKVVCL) for two tenures from may 2015 to may 2021.
- Serving as an associate dean, research and development at IIT indore from april 1, 2023
- Technology advisor of a start-up company named syncphasorai pvt. Ltd incubated at IIT kanpur
- Published one book on "available transfer capability in electricity market"
- Published six book chapters, around 75 research papers in international journals of repute and various international and national conferences.

What is unique about working as a woman in STEM compared to other fields?

It is well known that STEM is a male dominated area in comparison to other fields and we are able to prove our

competency in this male dominated field.

What are your key contributions to your work area?

- Teaching undergraduate and postgraduate students
- Supervising phD students, masters students in carrying out research
- Development of research lab on smart grid
- Fetching research project grants from various funding agencies
- Head of the department for a period of three years
- Associate dean, research and development
- Chairperson, internal complaint committee for a period of three years from july 2016
- Independent director of indore smart city development limited from december 2021
- Served as an independent director of m.p. Paschim kshetra vidyut vitran company ltd. For a period of six years

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

I chose this field not because of inspiration from someone but I was more inclined towards Physics and Mathematics during my school days itself. Those days, with PCM, only option was to do either bachelor's in engineering or bachelor's in science. With my mother's support, I could decide to go in Engineering as my father is also an Engineer.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

A major challenge is to maintain balance between professional and personal life as you go on higher positions demanding more time to stay at workplace. Another challenge is to compete with men and prove yourself to be at par with them while fulfilling the responsibility of running households, paying attention to the study of children, and other domestic responsibilities. All this equally well in comparison with housewives. These societal norms put extra pressure on us. Due to this, sometimes we prefer to take a back step in career.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

I would like to suggest the next-gen women in STEM that:

- They should work on their time management skills to develop an appropriate balance between professional and personal life.
- Usually, women ignore their health in fulfilling their responsibilities toward home and work. Due to this, in later stage, they suffer various health problems. Hence, they should also keep their health to be a priority so that they can manage work and home well during the later stage of their career.

Ms. Umachandi Mantena

Technical Manager

Department of Research and Development
ELICO Ltd.

Hello, I am Umachandi Mantena, a professional with a strong background in engineering physics and photonics. I was born in Vijayawada, Andhra Pradesh, India in August 1980.

I completed my Bachelor of Science degree from Acharya Nagarjuna University, Guntur, AP in 2000. After that, I pursued a Master of Science (Technology) degree in Engineering Physics (Photonics) from the National Institute of Technology (NIT)-Warangal, Kakatiya University, Telangana, India, which I successfully completed in 2004. I am currently pursuing a Ph.D. degree at the same institution.

I have been working as a Technical Manager with the Department of Research and Development at ELICO Ltd., Hyderabad, Telangana. During my tenure, I have been instrumental in driving research and development initiatives and contributed significantly to the growth of the company.

My research interests primarily focus on the fundamental investigation and application of spectrometers, with specific expertise in the optical design of imaging and non-imaging optical systems. I am passionate about my work and have made notable contributions in this field. Several of my research papers have been published in prestigious journals.

I possess strong analytical and problem-solving skills, which have helped me excel in my professional career. Additionally, I am an excellent team player and believe in collaborating with others to achieve common goals.

In summary, I am a highly accomplished professional with a proven track record of success in the field of engineering physics and photonics. With my academic qualifications, professional experience, and expertise, I am confident that I can add value to any organization.

International Journal Publications:

1. Mantena, u., Roy, s. And datla, r., 2021. Diffuse reflectance illumination module improvements in near-infrared spectrometer for heterogeneous sample analysis. IEEE access, 9, pp.153508-153517. Doi:10.1109/access.2021.3126393.
2. Umachandi mantena, sourabh roy, ramesh datla, evaluation of a digital micro-mirror device based near-infrared spectrometer for rapid and accurate prediction of quality attributes in poultry feed, nfs journal, volume 29, 2022, pages 51-59, issn 2352-3646. Https://doi.org/10.1016/j.nfs.2022.11.002.

International Conference:

1. M. Umachandi, Ramesh Datla, D. Haranath, Sourabh Roy, "Analysis of Protein Content in Food Samples by Near IR Spectrometer ", 11th International Conference on "Advances In Metrology" AdMet - 2022 And Pre-AdMet Workshops.

Patent Filed:

1. "Apparatus and Method for Multipoint Analysis of Standoff Distant Analyte using Near Infrared Spectrometer" Indian Patent Application No. 202141008449, Mar. 01,2021.

What is unique about working as a woman in STEM compared to other fields?
Working as a woman in STEM (Science, Technology, Engineering, and Mathematics) can be unique compared to other fields in several ways:

Underrepresentation: Women are historically underrepresented in STEM fields, which can lead to feelings of isolation and a lack of support from colleagues. This underrepresentation can also lead to unconscious biases and discrimination, such as assumptions that women are not as competent or committed to their work as their male counterparts.

Stereotypes: There are still pervasive stereotypes about women's abilities in STEM fields. These stereotypes can be damaging and can make it difficult for women to gain recognition and respect for their work.

Work-Life Balance: The nature of STEM work, which often involves long hours and a heavy workload, can make it challenging for women to balance work and family responsibilities. This can be particularly true in fields that require extensive fieldwork or travel, which can limit opportunities for women who are primary caregivers.

Networking: Networking is critical for success in STEM fields, but it can be challenging for women, especially those who are in male-dominated fields. Women may feel excluded from networking events and may find it difficult to connect with colleagues and mentors.

Advocacy: Women in STEM often need to advocate for themselves and their work. This advocacy can take many forms, including negotiating for promotions and equal pay, speaking up about workplace inequities, and mentoring other women in the field.

Despite these challenges, many women find working in STEM fields to be incredibly rewarding. By breaking down barriers and advocating for change, women in STEM are helping to create a more diverse and inclusive workplace for future generations.

What are your key contributions to your work area?
At ELICO, I have made significant contributions to several projects. These include:

Project-1: Diode Array based UV-Vis Spectrometer: My primary focus was to address existing issues related to stray light, measurement errors, and poor accuracy and reproducibility. Through my efforts, I developed and implemented an effective methodology for optimizing optics design. This involved careful selection of slit dimensions, designing a proper baffle for the spectrograph, aligning optics precisely, and reducing jitter noise in the power supply output.

Project-2: EDXRF based Gold Analyzer: I was responsible for designing and developing an efficient and compact X-ray optical geometry module that included an X-ray tube, Si-PIN detector, sample XY stage, primary beam filter and pinhole collimator wheel module, and camera module. This module was used for a low-cost jewelry analyzer to analyze precious metal concentrations of Au, Ag, and Cu.

Project-3: Flame Spectroscopy: I led the design and development of both filter-based and diode array-based Flame Spectrometers. These were used to detect different elements or compounds of interest found in chemical agents and toxic industrial chemicals, and to detect these materials simultaneously and at very low concentration. We developed this product under Research and Development for one of DRDO labs.

Project-4: Colori and Turbidity Meter: My contribution to this project was the design of a unique optical lens system for various optical path-lengths in a two-channel setup. It is used to measure the absorbance and transmittance to determine colored compounds in the test analyte sample, as well as measure turbidity in terms of NTU by detecting scatter light. This product is primarily used for water quality checking and participated in field trials for Jal-Jeevan. Our product design and features have been patented.

In addition to my project contributions, I have also been involved in leading product development, collaborating with team members, improving processes, implementing quality tests. As an expert in optics technical aspects, I have

brought significant value to the industry, role, and responsibilities that I have held.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues/ Professional mentors, etc.)?

- Mrs. Malathi, my science teacher during primary and secondary education, inspired me to pursue science in higher studies through her excellent teaching skills.
- My brother, Prasad Raju, motivated me to pursue higher education and his inspiring thoughts instilled in me the drive to succeed.
- During my post-graduation, I was the only girl in my class, and while it was a challenging experience that made me feel lonely at times, it also helped me to develop resilience and broad thinking skills that are valuable in any work environment.
- Dr. A.S. Murthy's knowledge sharing in optics design domain ignited my interest in the field and inspired me to begin a career in optics.
- Dr. Ramesh Datla played a crucial role in my career by providing me with sponsorship and opportunity to pursue a PhD at NITW. His ethical standards and open-mindedness served as an inspiration to me, teaching me how to navigate the professional field.
- My parents, mother-in-law, husband, and children have been unwavering in their support throughout my professional journey, providing the necessary support and encouragement to enable me to achieve my goals.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

Gender bias, lack of representation, work-life balance issues, pay and promotion.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

My advice to next-gen women scientists starting their career in the STEM field would be to build a strong network, seek out mentorship, pursue opportunities for growth, advocate for yourself, and be strong. Remember that setbacks and failures are part of the journey, but staying positive, curious, and committed to your vision can help you succeed.

Ms. V. Umamaheswari

Executive

CMB-IT Department
L&T Construction & Mining

I am V. Umamaheswari, Executive in CMB-IT Department at L&T Construction & Mining I am associated with the IT department of L&T Construction & Mining Machinery since 2016. I am completely involved in the development of the Dealer Management system (DeManS), a portal for Construction Equipment Business Dealers for the entire country for all their machine sales, parts, and service transactions.

I was a part of South1 – Spare parts team handling order placement, invoicing, and procurement of parts.

Academic qualifications (mention details of institutes and universities)-

- Completed MBA in 2009 from Alagappa University
- Completed BA Corporate Secretaryship in 1993.

What is unique about working as a woman in STEM compared to other fields?

- Was able to enhance my people network by interacting with dealer principals and employees of 30 dealers with 85 dealer locations.
- Was able to drive the consultants' team to provide optimum solutions to meet the business requirement.

What are your key contributions to your work area?

- Single point contact for all dealers for all system issues.
- Implemented Field Service Management (FSM) in the SAP Cloud for Construction Equipment Business's Service operations.
- Understanding business requirements and providing appropriate solutions on time.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

- Senior management, Colleagues and Family

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

- Initially, balancing work-life and family was a challenge. However, with support from family and colleagues, I overcame the same.
- Prioritizing the requirements and managing multiple issues faced by the users at a time was a challenge.

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly, you wished you had known when you first started).

- Try to fit in. Figure out how to be part of the new work culture.
- It may take time to gain the trust of coworkers to get them on board. Handling the situations patiently will help in fitting in the organization.

Ms. Varsha Singh

Associate Professor

Indian Institute of Technology (IIT)

I teach and carry out research in the field of cognitive psychology, it allows me to explore interesting questions related to mind/brain-body and the way we process information, and how psychophysiology contributes to thought processes. Seeking answers to such difficult questions requires an interdisciplinary approach.

For instance, in collaboration with clinicians I seek to understand how brain pathology, psychiatric, specifically cognitive disorders help us understand how we experience emotions and carry out cognitive tasks such as decision making. I utilize available expertise from engineering discipline to improve the methodology/ways in which brain and behavior could be explored (computer science, mechanical engineering, electrical engineering), to address cognitive deficits encountered in clinical domain (neurology, physiology, psychiatry), and with collaborations with social sciences allow me to understand how socioeconomic context might impact cognitive functions (economics, sociology). I am an Associate Professor at Humanities and Social Sciences at IIT Delhi, also affiliated with the Educational Technology Service Center. In the past, I worked as an Assistant Professor at Indian Institute of Management, and served as a Research Scientist at IISc, Bangalore. I was born and bought up in Pune, Maharashtra, did my undergraduate and master's education at University of Pune, followed by a PhD from IIT Bombay.

Academic qualifications (mention details of institutes and universities)

- Indian Institute of Technology (IIT), Bombay (2005-2011)
- Indian Institute of Technology (IIT), Bombay (2005-2011)
- PhD, Psychology (CGPA: 9.45/10), University of Pune, Pune (1998-2000)
- Master's in arts (MA), Clinical Psychology (Grade: First class), Symbiosis Institute of Management Studies, Pune (1998-1999)
- Post-graduate Diploma in Personnel Management (Grade: Outstanding), Fergusson College, University of Pune (1995-1998)
- Bachelor of Arts (BA), Psychology (Grade: First class with distinction)

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

- Selected as one of the 75 women scientists in STEAM and featured in 'She is' - 75 women in STEAM (Science, Technology, Engineering, Arts and Mathematics)
- Serve as an editorial board as an action/conflict editor for Journal of Experimental Psychology: Applied, a journal of American Psychological Association (APA)
- Member of American Psychological Association (APA), and member of Women in Cognitive Sciences (WiCS).

What is unique about working as a woman in STEM compared to other fields?

I can share my experience as a woman in STEAM (psychology in India is considered a part of Arts rather than Science stream). Although Psychology specialization draws majority of women, the sub-specialization of Cognitive Science/Cognitive Psychology has severe under-representation of women across the world. I enjoy the ability to study how the mind works, to examine how brain areas are implicated in cognitive functions, however, this field relies on experimental methods, and requires fair share of quantitative skills, especially statistics and research design. The thrill of comparing experimental/treatment and control group, the nightmare of outliers, missing data, and the choice of sound statistical treatment that could provide robust insights is the most exciting part of this field. Brain imaging (functional near infrared spectroscopy, structural magnetic resonance imaging) provides a glimpse of what

the mind/brain's activity might indicate in terms of thought, experience, however, neuroscientific investigations are dependent on access to expensive imaging equipment. Because fewer women get funded, or probably even apply for funding, inaccessible funding and reliance on expensive equipment for studying brain-behaviour link leads to exclusion of women from cognitive sciences. I enjoy carrying out experiments, plotting the first set of results that tells us stimuli-response characteristics is amazing. Sharing this excitement of discovery, and data-driven theory building with students and collaborators is extremely fulfilling. What is unique about this field is that it is truly interdisciplinary in nature, with equal scope for theory and application in real world.

What are your key contributions to your work area?

- Recently examined a hypothesis that might explain how epilepsy surgery might alter cognitive function of decision making, and theory of mind perspective.
- Documented via a supervised PhD thesis, how autonomic nervous system response (Hear Rate Variability) in people with spinal cord injury could be predictive of depression.
- Also demonstrated sex-specific risk of affective disorders and identified risk factors such as interaction of stress and sex hormone.
- The key contribution is to demonstrate biological and physiological factors could be associated with cognitive sex-differences, especially how interaction of stress and sex hormones (cortisol and testosterone) might influence male risky decision making.
- The work on neurological disorders demonstrated that disruption to the central nervous system (brain and spinal cord injury) might disrupt psychophysiology and be detrimental to cognitive function.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?

I was lucky to grow up in Pune, a small town, and found the schoolteachers, and college professors inspired and nudged students towards exploring ideas. My mother completed her studies after marriage and having children, it served as a role model to continue education to gain knowledge, learn about the world. I also grew up spending a lot of time in the British Library, and the Fergusson college library, reading about general topics but also about researchers such as Brenda Milner who studied epilepsy and memory, Joseph LeDoux's work on fear memory, classic theorists such as William James, or animal studies on cognition. The undergraduate laboratory in Fergusson college particularly had a strong emphasis on experimental psychology, inspired by the tradition of Biological Psychology. Spending countless hours in another amazing laboratory during master's in clinical psychology at University of Pune offered training that was inspired by the departments roots in Experimental Psychology.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?

Cognitive Psychology/Science in India and elsewhere has women under representation, detrimental to developing networking, receiving mentoring, forging collaborations, slowing down professional growth. It also impacts in subtle ways for instance the stereotype of successful researcher in Cognitive Psychology/Sciences is expected to be a male, it surprises, disappoints students that a principal investigator/supervisor could be a female, and she could be a hard task master.

Another challenge is the total lack of support received by women faculty in this field, senior women faculty in Cognitive Psychology/Science do not prefer to network with the same gender because it carries no career advantage to network/work with someone with similar or lesser power, authority, resources, further creating a social and professional isolation.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).

My advice to next-gen women scientists will be to take risks, try different/new options, aim higher-dream bigger but not without delivering the output, lastly, to not hesitate to ask for help when needed. Just like it takes a whole village to raise a child, similarly, it takes a whole professional community to nurture a researcher/scientist, and facilitate growth of the researcher and of the field

Ms. Vasudharani

Associate Professor

IISER, Tirupati

I was born in Chennai in a middle-class orthodox family. My schooling was, and my bachelor's and masters were in Chennai. I studied in an all-girls school from Class 5 to Class 12. After Chennai, I moved to Bangalore for my summer project at Astra Zeneca, where I continued to work. I spent two years in Bangalore and moved to Hamburg, Germany, for my PhD program.

This took me five years to complete, and after that, I moved to Duesseldorf as a postdoctoral scientist. At the end of 2008, my lab moved to Tuebingen, so I moved along. My husband's lab moved to Wurzburg, and therefore we became two-bodied. Since then, we shuttled between Tuebingen and Wurzburg until we moved to India in 2012. Before joining IISER Tirupati in India, I lived in Ahmedabad, Baroda, Mumbai, and Bangalore.

The present designation, current and past job functions, residing city, and the city where you were born and raised.

- Associate Professor and Associate Dean (Students) – July 2021- present
- Assistant Professor-IISER, Tirupati (Aug 2015 to present).
- Teaching faculty-Dr Vikram Sarabhai Institute for Cell and molecular biology at M.S University, Baroda, India (Jan 2015-Aug 2015).
- Visiting faculty - IMSc, Chennai (Sep 2013-April 2019)-Maternity break-Part time teaching faculty.
- Scientific consultant (writing) – Evolva Biotech, Chennai (Nov 2013-Mar 2014).
- Senior scientist - University Hospital Tübingen, Germany (Jan 2011-Jun 2012).
- Postdoctoral work – Institute for Biochemistry and Molecular Biology, University Hospital Düsseldorf and Institute for Pharmacology and toxicology, Tuebingen, Germany (Apr 2008 – Dec 2010).
- Asst Research Scientist - AstraZeneca India Pvt. Ltd. Bangalore (July 2001 to Apr 2003).
- Summer fellow - AstraZeneca India Pvt. Ltd. Bangalore (May 2001 to June 2001).
- M.Sc. thesis at the Department of Bacteriology, National Institute of Tuberculosis Research, ICMR, Chennai (Sep 2000-Jan 2001).

Academic qualifications (mention details of institutes and universities)

- Ph.D. in Biology – Summa cum Laude (for defense talk), University Hospital Eppendorf, Hamburg, April 2008. (Prion protein interaction in brain).
- M.Sc. - Microbiology, University of Madras, India (Distinction), April 2001.
- B.Sc.- Microbiology, University of Madras, India (Distinction), April 1999.

Notable achievements (awards, fellowships, memberships of scientific academies and Publications, etc.)

- IISER Tirupati faculty recognition award on 4th foundation day for Best Faculty at IISER Tirupati (2019).
- Nominated DAAD Research Ambassador (2018-2022).
- Ph.D. fellowship from the Hamburg Medical School (Eppendorf), University of Hamburg, Germany 2004 - 2008).
- Astra Zeneca team award for HIT evaluation in the anti-mycobacterial project (2003).
- Recipient of international summer fellow scholarship awarded by Astra Zeneca research education foundation, UK, for ten selected global recipients (2001).
- Infosys Foundation scholarship for postgraduate studies (1999-2001).
- Tamil Nādu Educational trusts scholarship for postgraduate studies (1999- 2001).
- Member: Indian Academy of Neuroscience (India) and Society for Neuroscience (USA)

Editorial member:

- Review Editor in Frontiers in Cellular Neuroscience (Cellular Neuropathology)

What is unique about working as a woman in STEM compared to other fields?
STEM field allows us to think logically and apply this in every walk of life. The scientific way of life becomes our natural lifestyle. I started adopting to simple living – high thinking concept and made that my slogan. It also provides leadership at a small scale, being the head of the laboratory. It is very gratifying when we make discoveries that impact society directly. The scientific rigor and training received during the Doctor of Philosophy make you believe in perfection!

What are your critical contributions to your work area?
I started with my Institute on 10th August 2015 and have significantly contributed to my work area's growth. This, in turn, has made me successful and brought me to where I am today. Being the first faculty, I had the opportunity to design and develop new courses and the curriculum for our department. This was further fine-tuned as per the requirement of the department. I also established our first UG labs, Classrooms, and Daycare. I have been a part of several committees contributing to the committees endlessly. My organizational seniors, the Director, and the department chair, gave me a free hand to do whatever was suitable for the institute. Besides several scientific committees, I was also part of the student activity committee; here, I got the excellent opportunity to build student life on campus. I also actively established the mental health platform on campus via online forums. As a DAAD (Indo-German academic exchange organization) Research Ambassador, I established the DAAD fellowships – fellowships for undergraduate students and Ph.D. students on campus.

We established a platform called Veekshana in IISER Tirupati to promote women in STEM. Of the several activities, STARS of IISER Tirupati is interesting; our UG students share their success stories. This is inspirational and positively inspires other students.

I am currently part of the Institutional Biosafety Committee member (IBSC), Academic senate, and Associate Dean of student activities.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
My family members- always encouraged me to study, even during the hard days when my family had financial instability! Even when my parents gave up sometimes, my brother supported my interest in the STEM field. My husband who co-operates for my profession even now!

My Friend Saroj Kiran, who came to Chennai from Vizag and started doing B.Sc in the same college. He knew he wanted to study at Cambridge, and he did that. He always motivated me to take up Ph.D. and go for higher studies.
Dr. Vanaja Kumar, a retired scientist from – National Institute for Research in Tuberculosis, was my master's thesis mentor, and it was inspiring to see how she managed her family and research.

My team leader at Astra Zeneca, Dr Meenakshi Balganesh endlessly inspired me to pursue research as a career and never give up.

Lastly, my best friend's family supported me financially to complete my M.Sc course. They are my motivators! My son who inspires me every day!

What were some challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
After Ph.D., I had specific locations and institutes where I wanted to pursue my post doctoral research. But as soon as I got married, I had to compromise and stay in Germany in the same city as my husband.

My maternity was a challenge for me. Since I had medical complications, I was not permitted medically to be in the lab. Hence I had to go on bed rest, followed by this pre-term child. This made me firmly decide I would not be in a job/lab until the child was medically fit.

Overall, my career took a 3-year break. If not for this, I could have been a professor already and may not have missed out on deadlines for several prestigious fellowships and awards. But at the end of the day, I do not regret taking that break because that time will not return.

Still, in the Indian setup, women must take care of the family, whatever they may be at work. They are still the family leader when it comes to running the household. This is a significant setback. Very few families have equal partnerships.

After starting my current role, we became two-bodied again, and raising our child alone was a massive challenge for me. When I started at IISER Tirupati, my son was only 2.5 years old, and Tirupati had one school with a Daycare 15 km away from my workplace. In a small town, I traveled each day 60 km dropping and picking up my son.

Thanks to my family and a few colleagues who stayed by me and gave me the courage to continue. Thanks to my senior members and mentors who accommodated all these!

I set high standards for myself and could not use "being a mother" as an excuse for not being there in the institute for several things. I could never compromise on the goals set by my institute; hence, I would stretch out to succeed and always felt the responsibility of "not being a bad example for a woman with a child." I always wanted to be a positive role model, and no employer should hesitate to hire women with children. Hence I pushed my limits a lot.

One big challenge that many of us face in STEM is the inability or lack of opportunities for couples who are in STEM. This leads to two body issues. At our institute: Of 57 faculty, we have 16 women, and 11 are married. Of this, six are two-bodied! As usual, the trend is that the maximum number of women faculty is in Biology, and the minimum is in Physics and mathematics.

Professionally, in the beginning, it seemed like no obstacle was gender-associated. Still, as we grow in the profession, sometimes one can notice that there are indeed "male-dominated cultures' in the STEM areas. While there are male colleagues who are empathetic, there are still few who think that "all success comes naturally because someone is a woman." Despite contributing equally (sometimes more than some men), it gives a very stinky feeling that highly educated male colleagues attribute their female colleague's success to gender and not to talent! This is discouraging and an obstacle. Not all women take it stronger; some of them succumb and quit! Gladly, I did not have to go through this, but aware that such things do happen!

What is your advice to next-gen women in science for the initial phase of their career in the STEM field? (Possibly, you wished you had known when you first started).
Find out all the information about awards, fellowships, and grants, as some have age limits. You can design your career very well when you have this data. I wish someone had told this to me.

If you aspire to be a leader in STEM fields, do not hesitate to take up administrative tasks, these give you the strength and courage to lead. They also shape you as a decision-maker.

Please do not compromise your personal life for your professional life. Both are equally important. Refrain from overstretching more than required; people will always form impressions. Don't work for others' expectations; aspire only for what you can do and do it the best.
Be inclusive, and don't feel vulnerable. Avoid gender-associated reasons for absence from work or leading any activity/administrative role.

Plan your maternity break well so that the time can be utilized well.

If you want to have a family life, start it early. I became a mother very late and coping with professional goals and raising a child are two whole things that require complete dedication, and you cannot compromise one over the other. But if your child is at least in high school when you are at the peak of your career, it is better as the child is more independent and can handle it better! A teenager in high school can be left alone in the home but not a toddler.

Dr. Vasundhra Bhandari

Assistant Professor
Department of pharmacoinformatic
NIPER, Hyderabad

I am currently working as an Assistant Professor at Department of pharmacoinformatic at NIPER-Hyderabad. Before, there I was working as a DST INSPIRE Faculty at National Institute of Animal Biotechnology-DBT, Hyderabad. I moved from Delhi to Hyderabad in 2013 after submitting my PhD thesis. I was brought up in Delhi and did my complete schooling and graduation in Delhi.

Academic qualifications (mention details of institutes and universities):
I did my Phd from National Institute of Pathology-ICMR New Delhi in 2014. Master in Biochemistry from Jiwaji University, Gwalior 2007, Bachelor of Science from Gargi College, Delhi University in 2005,

Notable achievements (awards, fellowships, memberships of scientific academies and publications etc.)

1. Received Travel Award by European Commission to attend International Symposia in Infectious Disease held at Pasteur Institute, Paris in 2011.
2. Received Sri Ramachari Young Scientist Award by NIP-ICMR in 2012.
3. Received DST Fast Track Young Scientist Award to conduct my research.
4. Holder of India most prestigious DST INSPIRE Faculty Award.

What is unique about working as a woman in STEM compared to other fields?
Working as a woman in STEM (Science, Technology, Engineering, and Mathematics) brings with it a unique set of experiences and challenges compared to other fields. One aspect that sets women in STEM apart is the underrepresentation they face. Historically, women have been underrepresented in these fields, which can create a sense of isolation and the need to break through gender biases and stereotypes. However, this also presents an opportunity for women to be trailblazers and role models, inspiring future generations of girls to pursue STEM careers.

Another unique aspect is the persistent gender gap in opportunities and advancement. Women in STEM often face barriers when it comes to career progression, mentorship, and access to resources. They may need to navigate biases, discrimination, and unconscious stereotypes that hinder their professional growth. Addressing these issues is crucial for achieving gender parity and creating inclusive work environments. Moreover, being a woman in STEM allows for diverse perspectives and contributions. Women bring unique insights and approaches to problem-solving, fostering innovation and enriching the field with their perspectives.

What are your key contributions to your work area?
I work in the field of Infectious Diseases majorly focusing on antimicrobial resistance which is a global threat. During my PhD, I have deciphered the resistance mechanism of drug resistant Protozoan parasite, Leishmania donovani which causes kala azar and further the work have been taken up for discovering of biomarkers in my lab. I started my independent career as a Principal Investigator and begun my journey working on ESKAPE group of pathogens. Our group was the first to report a new phenotype of Methicllin Resistant Staphylococcus aureus, OS-MRSA from India and working on its mechanism of resistant. Our lab has identified various important drug and vaccine targets to fight these deadly pathogens and are working on it using integrated approaches.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
Choosing a career option was my decision, but for becoming an independent woman I was inspired by my mother.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
There are few challenging experiences such as Women are often underrepresented in STEM fields, leading to feelings of isolation and a lack of role models. We sometimes face limited access to mentors and support networks that can hinder professional growth and career development. Another issue is balancing work and personal responsibilities which can be particularly challenging in STEM fields that often demand long hours and dedication, especially for me as I have very young kid.

What is your advice to next-gen women in science the or initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
The first piece of advice is to have a good support system at home and office. If you had a good mentor who can guide you well in advance that will be very helpful.

Ms. Veena P

Technology Manager - Electrical & Electronics
GE Research Bangalore

I am currently working as a Technology Manager for the Electrical & Electronics team in GE Research Bangalore. I have been with the GE Research team for ~11 years in various roles, starting from an EEDP to the most recent role of Senior Engineer. I grew up in Hyderabad and have a master's in technology in Electrical Power Systems Engineering from IIT Delhi. I have ~20 patents.

What is unique about working as a woman in STEM compared to other fields?
Although women may be outnumbered in STEM fields, working in STEM for women is filled with exciting opportunities that have an ability to change the world for the better.

What are your key contributions to your work area?
Some of my contributions include building a first of a kind multi-layer control test bench which enabled design and validation of performance of wind turbines and batteries to offer enhanced grid services like frequency response and inertia for large multi-turbine wind farms and hardware set-up, control and heat run of full scale 225 kW solar photovoltaics integrated to 2.5 MW GE wind turbine converter.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
I owe it to my family and teachers for encouraging my curiosity in engineering and to my colleagues, mentors and friends for their continuous support that keeps me going.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
I feel blessed to have a largely positive experience in my professional journey. A few minor setbacks during the initial years would be the lack of access to reliable information which was overcome by participating in different events to gain a deeper understanding of the industry and make meaningful use of networking with professionals.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
View career challenges as opportunities – If one overcomes a challenge, one will have found a way forward. Otherwise, one would have learnt a lesson. Either way, some growth happens which makes one a better individual.

Dr. Yama Dixit

Assistant Professor
Centre for Atmospheric Sciences
Indian Institute of Technology, Delhi

I am presently working as an Assistant Professor at the Centre for Atmospheric Sciences, IIT Delhi, New Delhi. My research focusses on past-climate dynamics, reconstruction of changes in hydrology, abrupt climate change and impacts of climate change on ancient societies. I am currently supervising 3 PhD students and 1 MTech student. I am also involved in teaching an undergraduate course Global Climate Change and Indian Summer Monsoon variability.

Prior to joining IIT Delhi, I have postdoctoral experiences as Research Fellow at the Earth Observatory of Singapore (2018-2021) and was a Marie Curie Prestige fellow and LabexMER fellow at IFREMER France (2015-2017).

I was born in Meerut and raised in Lucknow, Uttar Pradesh.

Academic qualifications (mention details of institutes and universities)

2009-2013	PhD (Earth Sciences)
	St. John's College, University of Cambridge, UK
2008-2009	MPhil Environmental Sciences – Distinction
	Jawaharlal Nehru University, New Delhi, India
2006-2008	MSc Environmental Sciences – Distinction
	Jawaharlal Nehru University, New Delhi, India
2003-2006	BSc (Hons) Chemistry – Distinction
	Hansraj College, Delhi University, India

Notable achievements (awards, fellowships, memberships of scientific academies and Publications etc.)

2023	Elected in the Editorial Advisory board of the journal The Holocene
2022	Elected in the Editorial board of Nature profile journal: Communications Earth and Environment
2022	Selected in 75 leading Women in STEM by the Office of Principal Science Advisor (GoI) and British High Commission
2015	Marie Curie PRESTIGE Incoming Fellowship
2015	LabexMER International Postdoctoral Fellowship in Marine Sciences
2015	European Research Council Travel grant XIX INQUA 2015, Nagoya, Japan.
2014	Institute Postdoctoral Fellowship at IIT Kanpur, India
2012	International Association of Sedimentologists (IAS) Travel Award: EGU General Assembly, Vienna, Austria
2011	IAS Travel Award: AGU Chapman Conference on Climates, Past Landscapes, and Civilizations in Santa Fe, New Mexico, USA
2011	Graduate Student Award at Congrès des doctorants 2011, IPGP, Paris, France
2010	St. John's College Travel and Research grant: EASAA Vienna, Austria
2009	Gates Cambridge Scholarship (First ever Indian recipient in Earth Sciences) for study towards PhD at University of Cambridge
	PhD offer from University of Oxford (Declined)

2009 Deutsche Forschungsgemeinschaft (DFG) Fellowship for Lindau Nobel Laureates meeting in Chemistry, Germany

PUBLICATIONS (only selected journal articles):

1. Dixit Y., Biswas S., 2022 Human-environment interactions during the mid-late Holocene and the Anthropocene-lessons from NW Indian plains and Bengal Delta. Geological Society, London, Special Publications, 515, https://doi.org/10.1144/SP515-2020-122
2. Dixit Y., Toucanne S., Tripati A., Lora J., Fontanier C., Bonnin, L., Jouet G, 2020 Enhanced western Mediterranean rainfall during past interglacials driven by North Atlantic pressure changes. Quaternary International, v. 553, p. 1-13. Doi: https://doi.org/10.1016/j.quaint.2020.08.017
3. Dixit Y., 2020 Regional Character of the "Global Monsoon": Paleoclimate Insights from Northwest Indian Lacustrine Sediments Oceanography, Special Issue on Paleoceanography: Lessons for a Changing World. June 2020 Issue.
4. Pasquier V., Toucanne S., Sansjofre P., Dixit Y., Revillon S., Mokeddem Z., Rabineau M., 2019 Organic matter isotopes reveals enhanced rainfall activity in North-Western Mediterranean borderland during warm substages of the last 200 kyr. Quaternary Science Reviews, v. 205, p. 182-192.
5. Dixit, Y., Hodell, D.A., A. Giesche, Tandon, S.K., Gasquez, F., Curtis, J., Petrie, C.A., Saini, H.S., Mujtaba, S.A.I., Singh, R.N., Petrie, C.A., 2018 Intensified summer monsoon and the urbanization of Indus Civilization in northwest India. Scientific Reports, v. 8(1), 4225.
6. Special highlight: "From the lab: How adequate rainfall helped Indus Valley Civilisation flourish" – The Indian Express
7. RN Singh, CA Petrie, A Alam, J. Bates, Alessandro Ceccarelli, S Chakraborty, S Chakradhari, A Chowdhary, Yama Dixit, Charles Andrew Ivey French, A Gieshe, Adam S Green, LM Green, Penny J Jones, A Suryanarayan, MC Ustunkaya, JR Walker., 2018 Living in the Hinterland I: Survey and Excavations at Lohari Ragho 2015–2017. Puratattva, v. 48, p. 130-141.
8. Petrie, C.A., Singh, R.N., Bates, J., Dixit, Y., French, C.A.I., Hodell, D.A., Jones, P.J., Lancelotti, C., Lynam, F., Neogi, S., Pandey, A.K., Parikh, D., Pawar, V., Redhouse, D.I., Singh, D.P., 2017 Adaptation to variable environments, resilience to climate change: investigating Land, Water and Settlement in Indus northwest India. Current Anthropology, v.58, p. 1-30.
9. Dixit, Y., Tandon, S.K., 2016, Hydroclimatic variability on the Indian subcontinent in the past millennium: Review and assessment, Earth-Science Reviews, v.161, p.1-15.
10. Dixit, Y., Hodell, D.A., Sinha, R., Petrie, C.A., 2015, Oxygen isotope analysis of single ostracod valves record seasonal lake water variability in paleolake Riwasa (India), Journal of Paleolimnology, v.53, p.35–45.
11. Dixit, Y., Hodell, D.A., Petrie, C.A., 2014, Abrupt weakening of the summer monsoon in northwest India ~4100 yr ago. Geology, v. 42, p. 339-342.
12. Special media highlights in: Nature, University of Cambridge research news, The Independent, New Scientist, The Times of India, Science Daily, Eurekalert!-Science news (AAAS), Business Standard.
13. Dixit, Y., Hodell, D.A., Sinha, R., Petrie, C.A., 2014, Abrupt weakening of the Indian summer monsoon at 8.2 kyr B.P. Earth and Planetary Science Letters, v. 391, p. 16-23.
14. Dixit, Y., Hodell, D.A., and Petrie, C.A., 2011, A climatic record from Paleolake Riwasa, Haryana, India. Manviki, v. 1(2), p. 35-43.

What is unique about working as a woman in STEM compared to other fields?

Women in STEM have the advantage of using their imagination and critical thinking to solve practical problems with scientific analytical tools. Being in this field one can always be more quantitative in their approach towards tackling a problem and more often using numbers such that a more definitive solution can be obtained.

What are your key contributions to your work area?

My key contribution in my research area so far have been:

1. My research using isotopes of lake sediments to reconstruct past climate record identified a 200-year long drought in India which coincided with the collapse of the ancient Indus Valley Civilization. This was the first climate record reconstructed which addressed the long-debated hypothesis of climate related collapse of the Indus Valley Civilization.

2. The isotopic records that I analyzed from lakes in NW India also identified links between glacier melting in the

North Atlantic region and its connection with weakening of Indian monsoon rainfall at around 8200 years back. This has serious implications for future global warming-linked melting of glaciers that will impact the monsoon rainfall on the Indian subcontinent and in turn will impact the socio-economic wellbeing of the populations of the Indian subcontinent.

Who inspired you to take up this field as a career option (mention Family / Friends / Colleagues / Professional mentors, etc.)?
Personally, my mother has been my greatest inspiration. My mother came from a small village where girls do not get the same opportunity for education as boys, she studied through distance education throughout her life and got a Master's degree (First Class) in Hindi and subsequently a PhD in Sanskrit, after having four children. My mother's resilience, perseverance and love for education that she displayed until her retirement as a principal of a government girls high school, inspired me to come back to India after 10 years abroad, to take up an Assistant Professor post at IIT Delhi and to serve the country.

My interest in Chemistry and its application in the environment was instilled during my undergraduate days at Hansraj College (Delhi University) by my environmental chemistry teacher Dr. Ranjana Rastogi. She encouraged me to apply for a master's in environmental sciences course at Jawaharlal Nehru University, New Delhi. My interest in Environmental geochemistry deepened further with Prof V. Rajamani's (JNU) lectures on climate and chemistry of natural materials and I decided to pursue a PhD degree in this field. He mentored me throughout my professional career and showed me the way forward in this field.

What were some of the challenging experiences or obstacles you faced in your professional journey as a woman in STEM?
My most challenging experience was taking up Environmental Sciences after being a topper in undergraduate Chemistry (Hons) degree. My family and relatives were against this field of study as it involved a lot of fieldwork and long hours in the laboratory, which they thought is not suitable for a young woman like me. I was also discouraged as they were critical of future prospects of a field like climate science, which would never be the top priority to get jobs in a developing country like India.

The other experience which had a huge impact on me was when I was laid off from work as a postdoctoral researcher in Singapore just after having my first daughter on grounds of not being as productive as compared to my male colleagues. It was a very difficult phase and it took a serious toll on my mental health and I realized the importance of being resilient in a world where gender disparity is a reality. And so I want to train the younger generation, especially women, make them curious about the world around, guide them on choosing careers in STEM and mentor them through their professional life.

What is your advice to next-gen women in science for initial phase of their career in the STEM field? (Possibly you wished you had known when you first started).
My main advice would be to just follow your dreams and seek help/advice from those, who you think are capable. Perseverance and resilience is the key to be in STEM disciplines.

Confederation of Indian Industry

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering Industry, Government and civil society, through advisory and consultative processes.

CII is a non-government, not-for-profit, industry-led and industry-managed organization, with around 9,000 members from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 300,000 enterprises from 286 national and regional sectoral industry bodies.

For more than 125 years, CII has been engaged in shaping India's development journey and works proactively on transforming Indian Industry's engagement in national development. CII charts change by working closely with Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness and business opportunities for industry through a range of specialized services and strategic global linkages. It also provides a platform for consensus-building and networking on key issues.

Extending its agenda beyond business, CII assists industry to identify and execute corporate citizenship programmes. Partnerships with civil society organizations carry forward corporate initiatives for integrated and inclusive development across diverse domains including affirmative action, livelihoods, diversity management, skill development, empowerment of women, and sustainable development, to name a few.

As India strategizes for the next 25 years to India@100, Indian industry must scale the competitiveness ladder to drive growth. It must also internalize the tenets of sustainability and climate action and accelerate its globalisation journey for leadership in a changing world. The role played by Indian industry will be central to the country's progress and success as a nation. CII, with the Theme for 2023-24 as 'Towards a Competitive and Sustainable India@100: Growth, Inclusiveness, Globalisation, Building Trust' has prioritized 6 action themes that will catalyze the journey of the country towards the vision of India@100.

With 65 offices, including 10 Centres of Excellence, in India, and 8 overseas offices in Australia, Egypt, Germany, Indonesia, Singapore, UAE, UK, and USA, as well as institutional partnerships with 350 counterpart organizations in 133 countries, CII serves as a reference point for Indian industry and the international business community.

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Notes