IWSA NEWSLETTER

The Official Publication of the Indian Women Scientists' Association

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Vigyan Yatra 1: Experiments and demonstrations in Zilla Parishad schools in Poyange and Kelvane on 18-12-2025

Ganit Pratiyogita held at Tarapore (CBSE on 30-11- 2025) and Koparkhairane (SSC on 14-12-2025)

Activities in Branches: Release of book Fungiphiles at Kohlapur on 4-12-2025, Science competitions at Kalpakkam on 1-11-2025 and Workshop on "Molecular Tools in Enzyme Engineering" at Ajmer on 21-11-2025

HIGHLIGHTS

VIGYAN YATRA (VY)- IWSA reaching out to Rural Zilla Parishad Schools with Science Experiments, Models and Demonstrations:

Report of VY1 to Payonje and Kelwane in Raigad District on 18th December 2025

GANIT PRATIYOGITA- CBSE & SSC Boards
20 schools, 6 centres, more than 900 students

Article: Air Pollution and Stroke by Prof Dr Bindu Menon and Dr Rizwana Syed

Article: Nobel Prizes- 2025 (Physics, Chemistry, Physiology or Medicine)

BRANCHES

Roorkee 1979, Hyderabad 1979, Pune 1980, Nagpur 1982, Kolhapur 1982, Delhi 1987, Kalpakkam 1987, Baroda 1988, Amravati 2010, Bengaluru 2018, Nellore 2018, Ajmer 2024

BOARD OF TRUSTEES OF IWSA

EXECUTIVE COMMITTEE: 2025-27

Contents

Editorial Board (2025 – 27)

From the Editor's Desk

Dear Readers,

We are proud to bring out one more issue of the newsletter, which once again showcases the variety and originality of the ideas and hard work behind the events of IWSA, at the Head Quarters (HQ) as well as the Branches. Adhering to our mandate of taking science and its fruits to the society at large, these programs have addressed all age groups, from preschool children to postgraduate students, women, working professionals and general public.

Under the BRNS sponsored popular science talks, IWSA HQ and branches together had conducted 27 talks during this time, (14 for college students, 8 for school children and 5 for general public) with a total outreach of more than 3900. Ganit Pratiyogita, a competitive examination in mathematics initiated two years back was held this year too, and more than 900 students wrote the exam. Hyderabad and Nagpur branches also participated.

A new initiative called Vigyan Yatra was taken up by Head Quarters during this time, to reach out to rural zilla parishad schools. In this issue, you will find the details of how this idea was conceived and developed and the report of the first Vigyan Yatra, an exciting and successful experiment. You will also find how in this context IWSA made an attempt to connect the urban children with their counterparts in the rural areas, in a way that it is beneficial for both.

Apart from these programs for students, you can find that an Educator Empowerment Program as well as a Conference titled "The Thinking Class Room - Philosophers on Education and Innovation" were conducted, with the aim of moulding very effective early childhood educators. There were also several workshops aimed at equipiing participants with practical skills in various activities, which can help them to become enterpreuners.

Many branches also have conducted several innovative programs, those reaching out to rural school children, programs connecting senior post graduate students with 10^{th} standard students, urban college students with inmates of old age home, technical and nontechnical workshops, conferences on highly technical and specialized topics etc. The programs and events are too many to list out, as you can find when you scroll down.

There is an informative article on the role of air pollution on stroke, an important health issue of recent times, by Dr. Bindu Menon - a highly qualified specialist on neurology and stroke (also ex Convenor of IWSA, Nellore branch), and Dr. Rizwana Syed. The articles on 2025 Nobel Prizes summarise the highly advanced and complex topics in simple words, highlighting the essential scientific principles and how they are being applied, touching different aspects of our lives.

We lost a very accomplished IWSA member, Dr Anita M Borges, a well-known oncopathologist in September. The obituary and elegy, written by her close associates are very touching and convey her unique personality. The issue also includes an obituary for the well known conservationist Jane Goodall, a person very close to the heart of all environment and nature enthusiasts.

This was a very happening time in IWSA, resulting in more pages, but I am sure you all will enjoy reading it. We are really looking forward to feedbacks, suggestions and contributions, so that we can improve your reading experience. Please send them to **iwsa.newsletter2123@gmail.com**

--- Dr. Dhanya Suresh

(dhanya.mangala@gmail.com)

President's Message

Dear members,

Greetings to all! This has been a particularly exciting quarter at IWSA. Activities have spanned classrooms, laboratories, village schools, community centres, and conference halls. From rural science outreach and mathematics competitions to lectures on genomics and AI, we have continued to pursue a simple but ambitious objective: to make scientific thinking relevant, socially grounded, and accessible to all.

Science is often attributed to speaking in a language understood only by specialists. With these initiatives, we are striving for more democratic alternatives, one in which knowledge travels beyond institutional walls and meets people where they are - Our Science Outreach and Education Initiatives like Vigyan Yatra, Mentorship programs and many other projects are testimonials to this.

Our Workshops ranged from mushroom cultivation and flower-based food colors to advanced mobile photography and AI applications in biology, chemistry, and design. These practical sessions empowered participants with new skills and entrepreneurial ideas, especially for women and youth.

IWSA branches across India also conducted scientific symposia, outreach to schools, conferences, and community service, often in collaboration with universities and research institutes. Notable events included international conferences, workshops on sustainable agriculture, and science competitions.

This edition of newsletter also highlights the achievements of Dr. Anjana Badrinarayanan (Infosys Prize in Life Sciences), Dr. Bindu Menon (World Stroke Organisation), and other IWSA members for their contributions to science, education, and public health. Poignant obituaries honor and pay tribute to the legacies of Dr. Anita Borges (pathology) and Jane Goodall (conservation), underscoring the impact of women in science and society at large.

Events and workshops promoting recycling, sustainable agriculture, floral arts, and eco-friendly practices, encouraging innovation and environmental sustainability are also in alignment with our objectives.

Apart from the above, this edition also features excellent articles on pertinent scientific topics, ranging from the link between air pollution and stroke and many more.

We hope this edition offers a reflection of the curiosity, collaboration, and public spirit that continue to guide IWSA. When science goes beyond classrooms and reaches communities, its impact extends far beyond academia. We thank our members, collaborators, and readers for continuing to strengthen this shared journey of learning and outreach.

Dr. Nootan Bhakal

Email: nootanbhakal@gmail.com

Reports from Head Quarters

Science Awareness Programs

A. IWSA – BRNS Popular Science Lectures for Colleges

These lectures were conducted onsite at various colleges on the topics of their interest. The speakers were identified by IWSA. Students from FY BSc-to-MSc, attended the lectures along with faculty. The audience was informed about IWSA and the college for each lecture. The lectures were followed by active discussions with the speakers.

1. Genomics and its applications

Date: **12th September, 2025**

Speaker: **Dr. George Thomas**, formerly associated with SPIC Science Foundation, Chennai and Interfield Laboratories; SciGenom Research & AgriGenome Labs, Kochi

Venue: **Dept. of Biosciences, Union Christian College, Aluva, Kochi**

Outreach : 150

Abstract 1: Genomics the study of whole genomes of organisms, helps us to understand the structure, function, evolution, mapping and editing of genomes. The application of genomics covers the entire range of living organisms, but its greatest impact is in the diagnosis and treatment of human diseases, crop improvement, understanding human ancestry, forensic studies, and metagenomics. Genomic studies have thrown light on the molecular aspects of cancer, paving the way for personalised treatments. Non-invasive tests have been developed to determine the risk profile of individuals against cancer, cardiovascular diseases, and also to determine the potential effectiveness of certain drugs. The sensitivity of tests has improved so much that tests like NIPT (non-invasive prenatal tests, also known as cfDNA-cell-free DNA-screening) have been developed, which can identify genetic defects in the fetus by studying the fragments of fetal DNA that are floating in the mother's blood. While huge amounts of sequence data can be generated in a few days, even by non-experts, thanks to the technology being made easy, challenges remain in making sense of the gigabytes of information to help make use of the information obtained. All these aspects of genomics were discussed by Dr. George Thomas in this lecture.

2. Innovative Nano-biomaterials for Controlled Drug Delivery and Regenerative Engineering

Date: **17th September, 2025**

Speaker: **Dr Deepthy Menon,** Amrita School of Nano-sciences & Molecular Medicine, Amrita Vishwa Vidyapeetham, AIMS-Kochi

Venue: **Dept. of Chemistry, Sacred Heart College, Thevara, Kochi, Kerala**

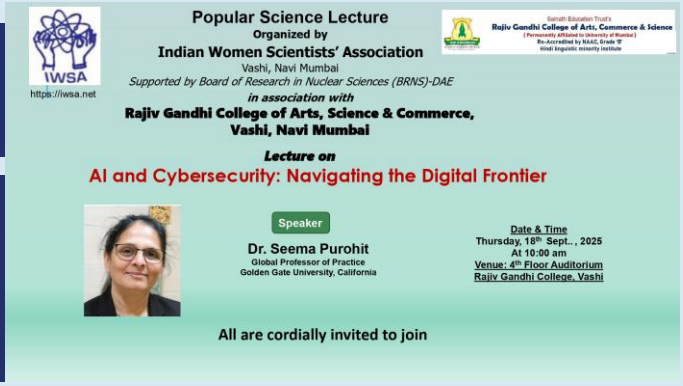
Outreach : 200

Abstract 2: Nano biomaterials have received wide acclaim as potential drug delivery agents, wherein materials at the nanoscale range help to deliver therapeutic agents (eg: chemotherapeutic agents, biological agents, immunotherapeutic agents) to target-specific sites for treating chronic human diseases. Through the judicious choice of nanomaterials, it is possible to fine tune drug release and alter the pharmacokinetic properties of the agents. Regenerative medicine on the other hand applies the principles of engineering and life sciences to deal with the regeneration or replacement of damaged or diseased tissues and organs. Regeneration of a tissue/organ is a very complex process and often requires the combination of several strategies, such as the development of

multifunctional scaffolds, the delivery of growth factors or other biochemical signals, etc. Research in tissue repair and regeneration has also benefitted remarkably through the use of nanomaterials and the prospects of this field are enormous. Thus, innovative biomaterials engineered at the nanoscale have emerged for precise and smart functions in medicine. This talk provided an overview of the characteristics and advantages of nanomaterials, with certain specific applications in medicine.

3. AI and Cyber Security: Navigating the Digital Frontier

Date: **18th September, 2025**
Speaker: **Dr Seema Purohit,** Global Professor of Practice, Global Gate University, California
Venue: **Rajiv Gandhi College,** Vashi (on line)
Outreach: 119



Abstract 3: The rapid intsaolegration of Artificial Intelligence (AI) into every sector has transformed the digital landscape, simultaneously creating new opportunities and new vulnerabilities.

Cybersecurity, once reliant solely on static rules and signatures, now leverages AI to detect, predict, and mitigate threats in real time. However, adversaries are also using AI to develop sophisticated cyberattacks, making the digital frontier both promising and perilous. In this session, Dr. Seema Purohit explored the symbiotic relationship between AI and Cybersecurity, highlighting AI-driven defence mechanisms, adversarial threats, and ethical considerations. She also discussed some real-world cases to demonstrate how AI empowers security professionals while posing new challenges in data privacy, trust, and regulation.

4. Proteomics Unveiled: Exploring the functional blueprint of cells

Date: **26th September, 2025**
Speaker: **Dr Kamalika Roy Choudhury,** Scientific Manager- Data Translation Team, ThinkBio.Ai, Kochi
Venue: **Dept. of Botany & Centre for Research, St. Teresa's College, Ernakulam. Kerala**
Outreach: 100

Abstract 4: Proteins are the functional workhorses of the cell, orchestrating nearly every biological process. Understanding their origin, structure, interactions, and regulation is central to decoding life at the molecular level. This talk began with an overview of the central dogma of molecular biology, setting the stage for how genetic information flows into functional proteins and the relationship between protein structure and function, highlighting how even subtle changes can profoundly influence biological outcomes. The fundamentals of proteomics were introduced, encompassing strategies for large-scale protein characterization and the importance of mapping protein- protein interactions to reveal molecular networks.

The core experimental approaches including protein separation techniques and mass spectrometry-based proteomic were discussed with a focus on the principles of data acquisition and computational analysis. The talk covered advanced applications such as protein microarrays, illustrating their role in high-throughput functional screening and the functional proteomics, emphasizing how dynamic protein activities and modifications shape cellular physiology. Proteo-genomics, an integrative approach that connects genomic and transcriptomic data with proteomic insights to refine biological understanding and improve disease research was also introduced. Together, these topics provided a comprehensive framework for appreciating the power of proteomics in modern biology and medicine.

5. AI and ML Algorithms: Design, Applications and Challenges

Date: **17th October, 2025**

Speaker: **Dr. Anu Gokhale, Professor & Chair, Department of Computer Information Systems, Saint Augustine's University, Raleigh, NC, USA**

Venue: **VES Institute of Technology,** Chembur, Mumbai

Outreach: 150

Abstract 5: The rapid evolution of Artificial Intelligence (AI) and Machine Learning (ML) has revolutionized industries, enabling breakthroughs in areas such as healthcare, finance, and work environment. The talk explored the dynamic landscape of AI and ML, highlighting their transformative potential. The true value of these emerging technologies lies in an analytics platform rich enough to glean key insights for business advantage as well as effective public policy. The talk addressed the design and implementation of AI and ML algorithms, discussed relevant issues and applications in both business and government, identify challenges, and reflect on their resolution.

6. Artificial Intelligence in Drug Designing and Diagnostics: Bridging Molecules, Models, and Medicine

Date: **19th November, 2025**

Speaker: **Dr. Prashant Kharkar,** Professor, Department of Pharmaceutical Sciences and Technology, Institute of Chemical Technology, Matunga, Mumbai

Venue: **Karmaveer Bhaurao Patil College, Vashi**

Outreach: 290

Abstract 6: Artificial Intelligence (AI) has emerged as a transformative force across the pharmaceutical and healthcare domains, redefining how we discover drugs, diagnose diseases, and personalize treatment. This lecture explained how computational intelligence from machine learning (ML) to deep neural networks accelerates decision-making across the drug discovery and diagnostic pipelines.

In molecular design, AI now enables virtual screening of billions of compounds, prediction of molecular properties (ADME/T), and de-novo design of drug-like molecules through generative models. Integrating algorithms like graph neural networks (GNNs), transformer-based molecular embeddings, and reinforcement learning help to optimize lead molecules and real-world case studies demonstrate the real-world impact of these technologies.

In diagnostics, AI enhances disease prediction and pattern recognition using medical imaging, multi-omics data, and clinical records. Deep-learning algorithms detect early markers of cancer, neurodegenerative disorders, and infectious diseases with accuracy rivalling expert clinicians. AI-powered tools now support precision diagnostics, digital pathology, and predictive modelling for personalized healthcare.

By bridging molecular sciences and data intelligence, this lecture equipped participants with a conceptual and practical understanding of how AI is shaping the next era of drug discovery and healthcare innovation.

https://youtu.be/pAa0s1b5qnI

7. Precision Nanomedicine for Cancer: Importance of illuminating disease biology in vivo

Date: **22nd November, 2025**
Speaker: **Dr Abhijit De,** Professor and Scientific Officer G, Molecular Functional Imaging Laboratory, KS232C, (ACTREC), Kharghar
Venue: **Caius Research Laboratory, St. Xavier's College, Mumbai**
Outreach: 61

Abstract 7: Modern biological and biomedical research work heavily relies on correct assessment of molecular functions in physiologically relevant model systems. A new field called molecular imaging (MI) has evolved, where a variety of synthetic compounds and reporter sensor technologies are utilised allowing the measurement of dynamic biological processes in a non-invasive manner. In oncology research, preclinical imaging approaches have important implications on a wide variety of research endeavours including drug discovery and molecular medicine. Today we recognize cancer as a heterogeneous, complex disease and therefore the underlying molecular functions inside tumor cells often demand individual characterization. In this backdrop, Dr. Abhijit De's group is developing new nanomedicine approach called Photothermal Therapy (PTT) for treatment of solid tumors. Simple mode of operation using triggered energy conversion principle makes it further attractive and suitable for conducting highly effective cancer treatment in a short time. Currently, in Dr. De's lab the method is being tested against a variety of palpable orthotopic and xenograft tumors located at a few millimeter tissue depths. The demonstrated procedure is very effective against many cancer types including the therapy resistant cancers. In this presentation, Dr. Abhijit De emphasized on the revolutionary potential of photothermal therapy measured using MI procedures in preclinical cancer models.

8. Career Pathways for Life Science Graduates in the Pharmaceutical Industry

Date: **5th December, 2025**
Speaker: **Dr. Sangita Sukumaran,** Professor and Head, Dept. of Pharmacology, MGM Medical College, New Panvel, MGM Campus, Kamothe, Panvel
Venue: **Dept. of Microbiology, CKT Arts, Commerce and Science College,** New Panvel
Outreach: 150

Abstract 8: The life sciences industry provides a wide range of career opportunities for graduates to contribute to healthcare and medical innovation. In Research & Development (R & D), professionals work on discovering and improving drugs, vaccines, and biologics. Clinical Research includes roles in clinical trials, safety monitoring (pharmacovigilance), and medical writing. Quality Control (QC) and Quality Assurance (QA) ensure products meet safety and regulatory standards in Production and Manufacturing, graduates help produce biologics and vaccines, following strict quality practices. Regulatory Affairs involves working with health agencies to get approvals and maintain compliance. Medical Affairs and Communication focus on sharing scientific information with doctors and patients. Those with a mix of science and business skills can explore Sales and Marketing roles. New areas like AI, Bioinformatics, and Data Science are also creating exciting opportunities. Overall, the industry offers many paths for life science graduates to build meaningful and diverse careers. https://youtu.be/ry9k77p6iDU

9. Intertwined metabolism and epigenetics unveil the way for a therapeutic intervention in gastrointestinal cancers

Date: **10th December, 2025**

Speaker: **Dr. Sanjay Gupta,** Professor-Translation Research, Principal Investigator, Cancer Research Institute, ACTREC, TMC, Kharghar, Navi Mumbai

Venue: **Dept. of Botany, Ramnarain Ruia College,** Matunga, Mumbai

Outreach: 150

Abstract 9: The complexity of the genome is regulated by epigenetic mechanisms, which act at the level of DNA, histones, nucleosomes, and chromatin. Environmental factors lead to alteration in histone modification patterns which influence chromatin structure and gene activity. These in turn enable responses for adaptation to changing environmental conditions.

Metabolism and histone modifications are deeply interconnected. Acetyl-CoA and S-adenosylmethionine (SAM) are two essential metabolic molecules that provide the carbon-based units for different biochemical reactions, such as energy metabolism and epigenetic modifications. SAM is a key methyl donor for histone methylation.

https://youtu.be/cBO8EJIZcro

10. Cell Culture and its applications

Date: **13th December, 2025**

Speaker: **Ms. Sangita Panda,** Manager, Research and Development Department, Micro Crispr pvt. Ltd., Meril Headquarters, India, Muktanand Marg, Chala, Vapi, Gujarat

Venue: **Department of Biotechnology, Research Development Cell & IQAC, Vishnu Waman Thakur Charitable Trust's Bhaskar Waman Thakur College of Science, Yashvant Keshav Patil College of Commerce, Vidhya Dayanand Patil College of Arts (VIVA College), Virar, Thane**

Outreach: 110

Abstract 10: Cell culture is a fundamental technique in modern biomedical research that allows scientists to grow, observe, and study cells outside the body under controlled laboratory conditions. This presentation provided a comprehensive introduction to basic cell culture, including its history, types of cultures, essential instruments, and core techniques required for successful cell growth.

It explained how primary, secondary, and continuous cell lines are used in research, and highlights the importance of aseptic technique, proper media preparation, subculturing, and cryopreservation. The presentation also discussed common challenges such as contamination, cell misidentification, and genetic drift, along with the principles of Good Cell Culture Practice (GCCP) to ensure safety, reproducibility, and high-quality results. Finally, it explored advanced applications such as 3D cultures, organoids, CRISPR gene editing, and personalized medicine.

Overall, this presentation helped to build a strong foundation in cell culture techniques that support scientific discovery and innovation in biotechnology and medicine.

11. Spectroscopy across the energy range: High energy X-ray & Medium energy IR; concept and utility

Date: **13th December, 2025**

Speaker: **Dr. Liladhar Kumbhare,** Scientific Officer, Chemistry Division, Bhabha Atomic Research Centre, Mumbai

Venue: **Departments of Physics and Chemistry, Research Development Cell & IQAC, Vishnu Waman Thakur Charitable Trust's Bhaskar Waman Thakur College of Science, Yashvant Keshav Patil College of Commerce, Vidhya Dayanand Patil College of Arts (VIVA College)**, Virar, Thane

Outreach: 84

Abstract 11: The lecture discussed the evolution of spectroscopies across the electromagnetic spectrum as essential tools for advanced research and technology. High energy X-ray spectroscopies are vital for environmental studies, healthcare, and industrial applications like soil-survey and petrochemicals. Medium energy IR spectroscopies are important in pharmaceuticals and material science. The presentation covered the basic principles of interaction of electromagnetic radiation with matter, theoretical aspects of X-ray and IR spectroscopies, and data interpretation, concluding with applications in modern research and development.

A sight not as sweet as it appears …

This is not ordinary grass, but a sugarcane farm.

The inflorescence or tassel of sugarcane, known as an **'Arrow'**, is a long, silky, open-branched panicle that appears at the top of the plant. Normally sugarcane flowers are not seen, because harvesting is done before flowering, so that sugar recovery is higher. This unusually high level of flowering this year is linked to frequent weather changes, unseasonal rains that continued until late November, and delays in the start of the crushing season. The early flowering can halt the vertical growth of the cane, resulting in shorter and less developed stalks and loss. Early flowering also depletes the sucrose reserves in the stalks, leading to lower sugar yields from the same weight of sugarcane, causing loss to the farmers.

This photo of sugarcane flowers was taken by **Dr. Manisha Karpe,** IWSA member (Ruia College, Mumbai) **in December 2025.**

B. IWSA – BRNS Popular Science Lectures for Schools

These lectures were conducted onsite at various schools on the topics of interest as advised by the principal. The speakers were identified by IWSA. Students from classes- 8th Std to 12th Std attended the lectures.

1. Don't let Earth heat, shrink your carbon feet!

Date: **9th September, 2025**
Speaker: **Ms. Chaitra S. Rane,** Educator & Cambridge Exam Officer, Teacher at VIBGYOR high, Goregaon (W), Mumbai
Venue: **Dr A P J Abdul Kalam Memorial High School,** Jagdusha Nagar, Ghatkopar (W), Mumbai
Outreach: 67



Abstract 1: Climate change is heating up our world, but we can cool it down together! In this session, Ms. Chaitra Rane explained how our daily actions add to our carbon footprint. Through fun facts, real examples, and simple tips, she showed how small steps can make a BIG difference.

2. Basic Information in electrical engineering / विद्युत अभियंत्रिकी ची मूलभूत माहिती (Semi English)

Date: **17th September, 2025**
Speaker: **Shri Mahendra G. Kelkar,** Former Executive Director (HR and Knowledge Management), NPCIL Mumbai India
Venue: **Adya Krantiveer Vasudeo Balwant Phadke Vidyalaya,** New Panvel
Outreach: 126


Abstract 2: व्याख्यानाचे सार, विद्युत भार, स्थिर विद्युत, धारा विद्युत, चुम्बक आणि त्याचे गुणधर्म, विजेचे चुम्बकीय प्रभाव, फ़्लेमिंग चे उजव्या आणि डाव्या हाताचे नियम, डी सी मोटर आणि जेनरेटर यांची माहिती, प्रात्यक्षिक

3. Significance of Cryogenics in Energy Storage and Industrial Applications

Date: **18th September, 2025**
Speaker: **Dr. K. V. Srinivasan,** Scientist-in-charge, Low Temperature Facility, TIFR
Venue: **St. Mary's School,** SSC, Mazgaon, Mumbai
Outreach: 112


Abstract 3: Cryogenics is an essential requirement in a variety of research areas. With the increasing demand for energy, environmental concerns and depleting fossil fuels, the focus is now on the new area called Cryogenic Energy Storage (CES) Systems. This talk focused on environmentally safe way of storing energy using cryogenic fluids such as Liquid Air, Liquid Hydrogen and Liquefied Natural Gas (LNG). The talk also showed a glimpse of various industrial applications of cryogenics in the areas of Engineering, Space, Medical etc.

4. Unlocking Biological Secrets: AI and DNA Sequencing as Game Changers

Date: **27th September, 2025**
Speaker: **Dr. Pallavi Gaikwad**, Product Researcher, International Market Support Group (IMSG), Mettler-Toledo India Pvt Ltd., Powai, Mumbai
Venue: **Sri Sri Ravishankar Vidya Mandir, Mulund**, Mumbai
Outreach: 186

Abstract 4: Artificial Intelligence (AI) is revolutionizing biotechnology by enabling rapid data processing, enhancing accuracy, and accelerating research and development. By analyzing intricate biological information such as genomic sequences, protein structures, and metabolic pathways, AI uncovers hidden patterns and insights that are challenging to identify manually. Its applications span drug discovery, personalized medicine, genomics, synthetic biology, and diagnostic innovations. AI optimizes experimental designs, predicts molecular interactions, and improves disease diagnosis accuracy, driving advancements in healthcare and agriculture.

In this talk Dr. Pallavi Gaikwad explored the dynamic intersection of next-generation sequencing (NGS) and AI in biotechnology. NGS technology allows scientists to decode DNA faster and with greater precision than ever before, revealing new biological insights. AI supports researchers in interpreting complex data, fostering the development of novel therapies, enhancing crop quality, and advancing disease detection. Together, AI and emerging technologies are reshaping science and everyday life, inspiring future generations of scientists. However, challenges such as ethical considerations, data privacy, algorithmic bias, and the necessity for robust regulatory measures must be addressed. Looking forward, AI is poised to become even more deeply integrated into biotechnology, offering opportunities for precision, sustainability, and innovation, while emphasizing the importance of responsible governance.

5. Metals and Non-metals

Date: **7th October, 2025**
Speaker: **Dr Ankush Gupta,** Associate Prof., HBCSE, Mumbai
Venue: **Deonar Municipal Colony School Complex no. 2**, M/East Ward, Govandi, Mumbai
Outreach: 160

Abstract 5: Humans have always been surrounded by rocks and soils. Perhaps in some case, when some rocks mixed with burning coal, a material different from rocks was obtained. This material could deform when beaten by a hard object. Such category of materials which could be shaped by pressing or beating and also drawn into wires by pulling, came to be known as metals. These metals when burned in the air gave powders or ashes, which did not have such properties.

Over centuries, people realized that many of these metals were pure substances (did not have any other substance in it). But what else existed in our world other than metals and their mixtures? Some people could isolate substances such as sulphur which also were pure substances, and also reacted with metals to give ash like substances. In18th century, scientists discovered that even air around us consists of many pure substances which do not contain any other substance in it and are not metals. Such pure substances which are not metals came to be known as non-metals. Dr. Ankush Gupta explained in detail about the properties of metals and non-metals that could help us understand the changes taking place in the material world around us.

6. Unveiling the Universe: India's Space Story

Date: **7th October, 2025**
Speaker: **Ms. Sampada Gaonkar,** Research coordinator, Deep Space Initiative
Venue: **Vidyaniketan English School,** TMC Buidling, Near Laxmi Park, Phase-1, Vartak Nagar, Thane West
Outreach: 90

Abstract 6: Space exploration has always inspired humanity to look beyond our world and ask questions about the universe. In this talk, the speaker explained in detail how satellites and space missions help us understand space as well as improve life on Earth. The session highlighted India's growing contributions through missions like Chandrayaan, Mangalyaan, Aditya-L1, the NISAR project and the upcoming missions. The speaker also explained how artificial satellites play a vital role in communication, weather forecasting, disaster management, and agriculture in India. Alongside this, the talk also touched upon global missions that had expanded our knowledge of stars, planets, and galaxies. The aim of the session was to inspire students to appreciate space science and to understand how India is making its mark in exploring the universe.

7. Recycling: Closing the Loop on Resources – A Global Perspective

Date: **15th October, 2025**
Speaker: **Dr Smita Kekatpure,** Scientist (Ex- NEERI), Environment Management, Sustainability & ESG expert, Visiting Professor & Speaker
Venue: **MNR School, Palaspe, Panvel**
Outreach: 150

Abstract 7: Today's world grapples with the climate emergency, biodiversity loss, and dwindling natural resources. As of October 2025, global material consumption has reached 106 billion tons annually, yet only 6.9% is cycled back into the economy—a decline for the eighth consecutive year—highlighting the urgency to recycle our resources.

Recycling is a pathway to sustainable development emphasizing on closing resource loops through regeneration, reuse, and minimal waste generation that is critically important in addressing modern society's environmental challenges.

"Closing the loop" involves rethinking production, consumption, and regeneration from waste to mimic natural cycles, reducing environmental degradation thus encouraging innovation and resilience at the global level. Dr. Smita Kekatpure gave a global perspective of the recycling methods and the students interacted enthusiastically with her.

First Woman Engineer in India

Ayyalasomayajula Lalitha (1919 – 1979) is the first woman engineer in India, who graduated in electrical engineering from Guindy Engineering College, Madras, **in 1943**. On the occasion of the **Engineer's Day (September 15th)** we remember and pay respect to this extra ordinary woman. She took up engineering and became a pioneer in spite of being widowed at the age of 18, with a small daughter. She worked at Central Standards Organisation, Shimla, and represented India in various international events and organisations.

C. IWSA– BRNS "Science and Our Life" (SAOL) Series of Webinars

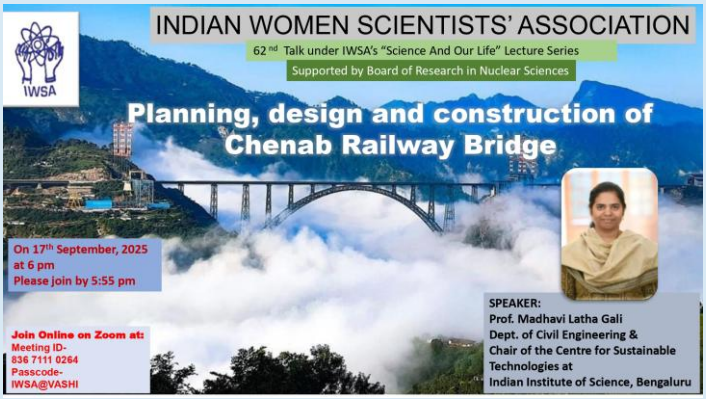
The following webinars were conducted online through Zoom platform during January to April 2025 under "Science and Our Life" (SAOL) Series.

62nd SAOL
Planning, design and construction of Chenab Railway Bridge

Date: **17th September, 2025**

Speaker: **Prof. Madhavi Latha Gali, Dept. of Civil Engineering & Chair of the Centre for Sustainable Technologies at Indian Institute of Science, Bengaluru**

Outreach: 55



Abstract 62: Constructing a railway bridge at 359m above the Chenab riverbed was one of the toughest phases in fulfilling India's 100-year dream of running a train between Jammu and Srinagar. The major challenges involved were the height and dimensions of the bridge, steepness of slopes, harshness of terrain, heterogeneity and anisotropy of the rock mass with closely spaced joints, presence of the river below the bridge, adverse climatic conditions, very high wind speeds and seismicity of the location.

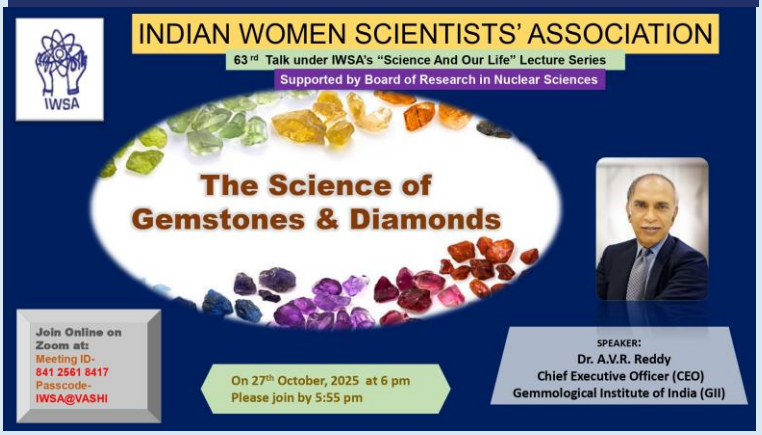
The design of such a bridge had continuously evolved, as per the rock mass conditions encountered during the excavation and the changing design parameters. The overall structure of the bridge, its type and location were probably the only constant parameters in the design and the dimensions of piers, and their locations, type and dimensions of the foundations and all other elements of the bridge were kept flexible in the design to suit the geological and geotechnical conditions of the site. In this session, Prof. Madhavi Lata shared the deeper insights gained through her 17 years of involvement in planning, design and construction of the world's highest railway bridge on the river Chenab.

63rd SAOL
The Science of Gemstones & Diamonds

Date: **27th October, 2025**

Speaker: **Dr. A.V.R. Reddy, Chief Executive Officer (CEO) Gemmological Institute of India (GII)**

Outreach: 46



Abstract 63: Colored gemstones and diamonds have always attracted humans and have been in great demand since ages. Crystals of gemstones and diamonds are formed in billions of years, deep below the earth crust in high pressure and high temperature (HPHT) conditions. The entry of other elements in the fluid before crystallization along with the stress and strain influence their color & clarity. Continuous efforts have resulted in developing some methods to enhance their color and clarity. Scientific and technological innovations since 1950s resulted in producing Lab grown Diamonds (LGDs) and Lab grown colored stones of gem quality. Since they are chemically similar to the natural ones, it has become necessary to develop various testing methods by using suitable instruments and evolving various protocols for precise characterization. Thus, globally institutes like Gemmological Institute of India (GII), Gemmological Institute of America and many more were started in the last century, which provides test certificates on the quality of gemstones and diamonds.

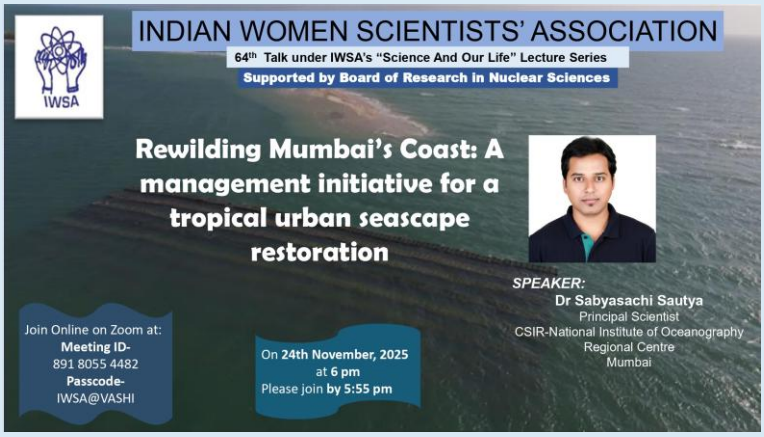
This talk gave a brief introduction to the gems and diamonds, their formation, scientific methods for their characterization and important parameters that needed to determine their quality. A few case studies on 4 C determination for diamonds and some more interesting aspects of these precious stones were covered.
https://youtu.be/AUyX2o0RuKA

64th SAOL
Rewilding Mumbai's Coast: A management initiative for a tropical urban seascape restoration

Date: **24th November, 2025**

Speaker: **Dr Sabyasachi Sautya, Principal Scientist, CSIR-National Institute of Oceanography, Regional Centre, Mumbai**

Outreach: 31



Abstract 64: Rapid coastal urbanization is leading to degraded marine habitats. Implementation of regulations and management plans, coupled with proper initiatives, are crucial for supporting marine restoration and sustainable coastal development. Many marine urban structures, such as seawalls, are smooth, featureless, and homogeneous, which reduces biodiversity. Eco-engineering, a design approach that integrates ecological principles, can help restore biodiversity and ecosystem function in urban coastal areas. This presentation will show the ecological benefits of Artificial Reefs (AR) deployed along the seawall in the intertidal region of the Mumbai coast. By quantifying the diversity, abundance, and frequency of occurrence of marine invertebrates on various AR types, investigations demonstrated the crucial role of the management framework through installations of Ars in achieving sustainable coastal development, first-of-its-kind in India. Monthly observations of the ARs were conducted for a one-year post installation to monitor changes in biodiversity. These installations, designed with water-retaining capabilities, offered hydrated shelter and cooling during exposure periods. This may have enhanced biodiversity and supported more algae and micro-invertebrates in the early stages than typical seawall rocks. This demonstrates how a well-conceived management plan, coupled with its effective implementation, can significantly contribute to the restoration of marine biodiversity within an urbanized and anthropogenically altered coastal environment.

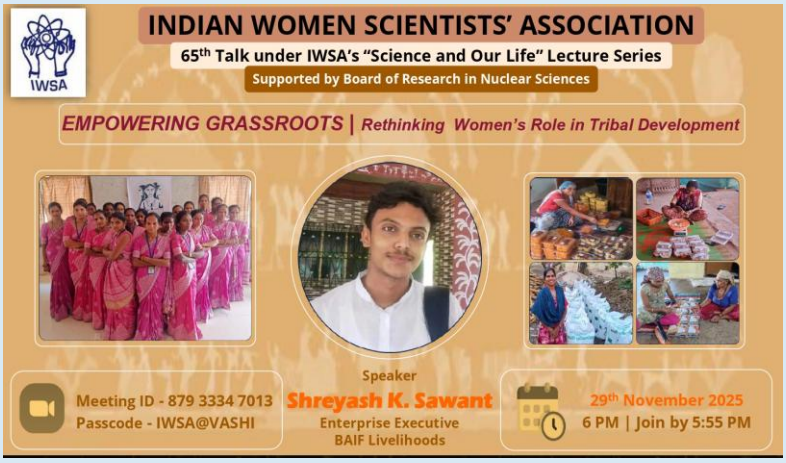
65th SAOL
Empowering Grassroots: Rethinking Women's Role in Tribal Development

Date: **29th November, 2025**

Speaker: **Shreyash K. Sawant, Enterprise Executive, BAIF Livelihoods**

Outreach: 25

https://youtu.be/MJohdaJDTYE



Abstract 65: The talk offered field insights where tribal women are not just beneficiaries but also leaders of change. This talk gave a brief overview of the Socio-cultural Landscapes alongside practical approaches towards women empowerment. Highlighting BAIF's Research & Development work, the session explored how local knowledge and community-led models were driving innovative development.

This helped the participants to reimagine development as a partnership rooted in collective action, community trust, and led by women themselves.

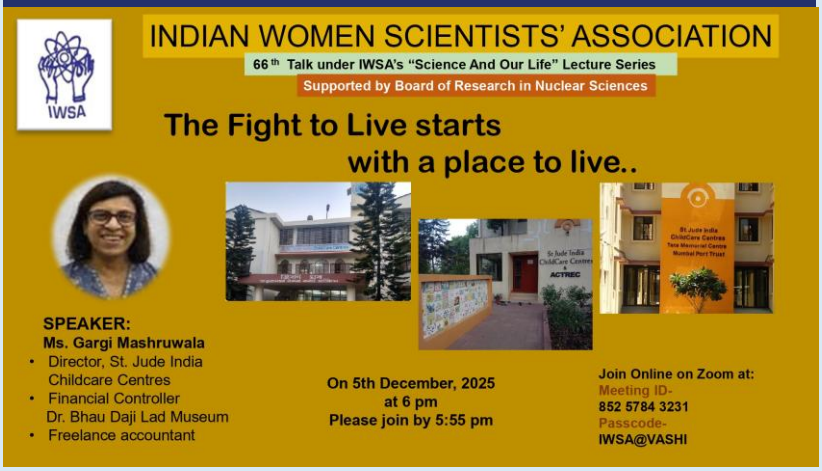
66th SAOL

The Fight to Live starts with a place to live..

Date: **29th November, 2025**

Speaker: **Ms. Gargi Mashruwala, Director, St. Jude India Childcare Centres, Financial Controller, Dr. Bhau Daji Lad Museum, Freelance accountant**

Outreach: 46



Abstract 66: St Jude India Childcare Centres was set up in 2006 by Mrs. Shyama and Mr. Nihal Kaviratne to provide cost free safe, hygienic, clean accommodation for needy families coming to the city for the treatment of their child's cancer. Starting with a Centre for 8 children in Mumbai, they now have Centres in 12 cities across India, looking after 624 children and their families each day. In the past nearly 19 years, they have provided accommodation to over 8500 children, nearly 2000 of who are survivors. The speaker shared the story of how they grew, how they managed during covid, the challenges and rewards. Some anecdotes and success stories of the achievements of their survivors were also shared.

https://youtu.be/CFyGI9UctNQ

D. Learning Garden Living Museum (LGLM)

Online Workshops in Collaboration with Inner Wheel Club District 314

1. Grow, Harvest & Enjoy Oyster Mushroom Cultivation

Date: **20th September 2025**

Resource persons: **Dr. Paramjit Anthappan and Dr. Santhini Nair**

Outreach - 124

This workshop was part of Inner Wheel District 314's *Nature & Health* webinar series. The workshop aimed to equip participants with practical skills to home-grow, harvest and prepare oyster mushrooms — unlocking culinary creativity, promoting sustainable nutrition, and encouraging low-investment, high-return cash crop.

The session opened with the initial proceedings chaired by **Dr. Shobha Ahuja, District Chairperson**. The resource persons from IWSA HQ, **Dr. Paramjit Anthappan** and **Dr. Santhini Nair** guided the participants through both theoretical insights and hands-on demonstrations.

Theoretical session: Dr. Paramjit emphasized the nutritional and environmental benefits of fibre-rich, high-protein mushrooms as a sustainable food option and shared inspiring success stories of mushroom-based entrepreneurship, particularly for women, especially with grants and subsidies available through government schemes. She briefed on substrate requirements and inspired attendees with culinary ideas — including a live demonstration of pan-fried mushrooms and one pot oyster mushroom biriyani, which the resource persons tasted and approved to the audience's delight.

Practical session: Dr. Santhini demonstrated substrate preparation, sterilisation methods and sowing of spawns. A prerecorded video presented every step of the cultivation process in the prepared substrate. She explained the incubation period and controlled conditions needed for full mycelial colonization, showed the fruiting stage, and gave practical tips on maintaining hygiene to prevent infestation.

The workshop concluded with guidance on business aspects, writing proposals to incubation centres and exploring entrepreneurial pathways. Videos of crops grown by other cultivators and recipe demonstrations were shared to inspire participants. This was followed by an interactive Q&A session.

2. 'Flower-Based Food Colours"

Date: **30th October 2025**

Resource persons: **Dr. Srirupa Mukherjee, Dr. Maitrayee Paul, Ms. Sakina Gadiwala and Dr. Seema Das**

Outreach - 124

Dr. Shobha Ahuja, Project Chairman of Inner Wheel, welcomed and introduced the team of experts from IWSA.

Dr. Srirupa Mukherjee initiated the technical session with an overview of plant-based dyes, highlighting their numerous health and environmental benefits. The workshop focused on a palette of five beautiful and edible flowers, namely, Blue Pea (*Clitoria ternatea*), Red and Cranberry Hibiscus, Red Roses, Night Jasmine (Parijat) and Yellow & Orange Marigold.

The demonstration segment began with Dr. Maitrayee Paul, who illustrated the fundamental process of preparing decoctions from the flowers. She elaborated on their versatile use in beverages like tea and sherbet, concluding with best practices for storing both the decoctions and dried flowers.

Following this, Ms. Sakina Gadiwala captivated the audience by creating an array of visually stunning desserts. Her demonstration included both single and multi-layered treats using the natural colours, alongside a refreshing preparation of rose lemonade.

Dr. Seema Das then demonstrated the application of these natural dyes in preparing flavored lassi and cold soups using marigold decoction, showcasing the surprising versatility of flower-based colours. Throughout the culinary demonstrations, Dr. Srirupa Mukherjee complemented each application with a detailed explanation of the specific health benefits associated with each flower.

An engaging question-and-answer session was followed. The seamless technical execution of the workshop was ably managed by Ms. Priya Jacob, Ms Ambika Janakiraman and Ms. Rajashree from IWSA.

3. From Trash to Art

Date: **29th November, 2025**

Resource persons: **Ar. Sonam Ambe and Ms. Priya Jacob**

Outreach - 100

The session began with Ar. Sonam Ambe outlining the vision, objectives, and intent behind the artefacts programme. This was followed by an extensive and engaging hands-on demonstration by Ms. Priya Jacob, who showcased the paper-mâché putty stork model she designed and built. Through this demo, participants gained practical insight into material handling, structural considerations, and creative possibilities. The workshop also included short demos on how artefacts can be interpreted and used to encourage inquiry within the garden environment. To support continued learning, videos and additional links were shared, offering participants further examples and resources to explore.

Overall, the workshop successfully demonstrated the educational value of garden artefacts and strengthened understanding of the Living Learning Garden as a dynamic, participatory, and multidisciplinary learning space for the community.

Giant African Snail *(Lissachatina fulica)* is ranked among the "100 Worst Alien Invasive Species". This voracious herbivore is a hermaphrodite which can lay hundreds of eggs multiple times a year and hence a major threat to important food crops and other agricultural and natural resources.

Photo by **Prof Dr Sushma Lehri**, **IWSA**

E. Mission Vigyan – A Science Quiz conducted in collaboration with Inner Wheel District 314, Thane Hills

Number of Schools: 8 (Thane Dt)
Number of Rounds: 3
Number of students participated in the 1st round (25th August 2025): 1200
Number of students participated in the 2nd round (11th September 2025): 96
Number of students participated in the 3rd round (14th September 2025): 18

This science Quiz was organized by Inner Wheel Club of Thane in collaboration with IWSA for zilla parishad and government schools in Thane taluka. The quiz was organized in three rounds. Eight schools participated in each round. Students from 7th and 8th standard from these Hindi, Marathi and English medium schools were the participants. The first round was organized on 25th August which was the elimination round, which was a written examination.

Question papers with multiple choice questions in physics, chemistry, biology, environment science and mathematics with answer keys were provided by IWSA members. Question papers were set in both English and Marathi medium. A team of IWSA members prepared a question bank in English from which questions were selected carefully for each level depending on the difficulty levels and were translated into Marathi and Hindi. Out of the 2300 registered from 8 schools located in different parts of Thane, 1200 students participated in the first round. One IWSA member and one IWC member along with school teachers conducted the test.

The second round was an oral round which was organized on 11th of September, with a total of 32 teams with 3 students per team (96 students) at Hiranandani Meadows Club House. The quiz was conducted by Mr. Rajesh and Ms. Neela Salaskar. The 6 teams with 3 students per team, who were winners in this round took part in the third and final round on 14th of September 2025. The chief guest for this final round was DC Lakshmi Singh and the quiz master was Mr. Sunil Gwalani. and the valedictory function held at Kashinath Khanekar Auditorium, Thane.

IWSA Volunteers: Drs. Lalitha Dhareshwar, Sheela Donde, Suparna Kamat, Tripta Tewari, Manashi Chakraborty, Seema Das, Ms. Vijaya Tilak, Dr. Maitreyi Paul, Dr. Srirupa Mukherjee. Dr. Nootan Bhakal, Dr. Maitreyi Paul and Dr. Smita Kekatpure from IWSA attended the final round.

The first prize winners were the team Vidya Niketan English school and the second position was taken by the BSSS school. The announcement flyer for the final round and some photographs are given below.

F. IWSA-DPS (Delhi Public School, Nerul) Mentorship Program

Number of mentees: 28
Number of mentors: 37
Duration: 20th June - 20th August 2025
Exhibition Date: 4th October 2025
Outreach: 150

This was a "first of its kind" internship program conducted by IWSA for school students, for making science models for a social cause, namely, using these models as teaching-aids for teaching scientific principles to underprivileged middle school students from remote rural schools of Maharashtra. This internship was planned as Phase I of the *Vigyan Yatra* project, an outreach activity of IWSA.

It all started when one of our members had the privilege of being invited as a judge to the Western Region CBSE Science model competition held at Delhi Public School in Nerul, Navi Mumbai, in November 2024, where 83 schools from Pune District had participated. The quality of the projects presented, the enthusiasm and the discipline of the DPS school students, and the involvement of the teachers and school management in this two-day competition was commendable. While the *modus operandi* for sourcing science models for Vigyan Yatra was being discussed, immediately the thought struck that IWSA members could mentor DPS students in making science models for Vigyan Yatra. Thoughts crystallised into action, and this Internship program was launched in June 2025. About 30 IWSA mentors volunteered to mentor students for free. With a lot of apprehension about the DPS participation, IWSA approached the school through Ms Kalpana Rathore, Head Biology Department and Post graduate teacher, also our IWSA member. With the cooperation of the DPS Principal, the coordination by Ms Kalpana Rathore, enthusiasm of the students, and full moral and financial support of the parents, as a pleasant surprise, 28 students showed interest in making models. Students were given full freedom in selecting the models of their choice. Overwhelmed by the variety of models chosen, in fields covering Physics, Chemistry, Biology, Mathematics, Environmental Science and Space Science, IWSA had to rope in a few external experts as mentors as well. Each student was asked to submit a proposal for one model, as per the detailed guidelines provided, and each student was assigned to 2-3 mentors. Each mentee-mentor group discussed and deliberated over the scientific principle and design of the model through WhatsApp video calls on a weekly/biweekly basis over two months. All these efforts culminated in 21 models being showcased for the Science Model Competition held on 4th October 2025 at IWSA HQ, Vashi.




The prize winners were selected by a very eminent panel of Judges 1) Dr. D.V. Prabhu, Adjunct Prof. of Chemistry at Wilson College; President, Association of Chemistry Teachers of India; & Chairman, Bombay Association for Science Teachers. 2) Bhagwan D. Chakradeo, credited with over 3150 stage shows due to his passionate drive to demonstrate innovative and fascinating experiments in science at various levels all over India, in schools, colleges and Universities. 3) Dr. Binoj Kutty, Assistant Prof at St. Xavier's College, Mumbai since 2008 with a keen interest in education pedagogy and research interest in Environmental Science and Microbial Quorum sensing. 4) Dr. Suresh Gangotra, former Senior Technical Advisor to Chairman, AEC and expert in Nuclear Non-Proliferation and coauthor of biography of Dr. Anil Kakodkar and Dr. R. Chidambaram. 5) Mrs. Lalitha Ramaswami, M.Sc. B.Ed., retired teacher from Atomic Energy Jr. College with more than 35 years' experience, and recipient of the Best Teacher National Award from the President of India in 2007and 6) Shri G.D. Mittal, Vice President of INS and retired from B.A.R.C. with 34 years' experience. The Chief Guest was Dr. Smt. Mansi Thakur, Director at MGM School of Biomedical Sciences, Navi Mumbai; Dean, Faculty of Allied Health Care. The guest of honour was Dr. Kapil Thakur from Department of Medicine, MGM Medical College, Navi Mumbai. Journalists, Ms. Indrani Basu for English and Mr. Manoj Jahnwala for Marathi news were present.

Nearly 150 persons, including student mentees, parents, teachers, judges, invited guests, mentors, and IWSA members participated in the event. Three prizes and two consolation prizes, as judged by the panel, were awarded to the winning students. Participation Certificates and Appreciation Prizes were awarded to each student for contributing to a noble social cause!
All the models were handed over to IWSA for use as teaching aids in the Vigyan Yatra.

1st prize: Aisi Bose for triangular blocks for frame structure; 2nd prize: B.Ramya for Mendel's law of segregation and 3rd prize: Suchana Vimal Panja for free fall Observatory model and teaching aid

Blooms in IWSA Garden

Clicked at IWSA Garden on 5th November 2025 by **Sakina Gadiwala**, Environmentalist, Amateur Nature Photographer, Hon. Gen. Secretary of National Society of Friends of The Trees and IWSA member at HQ.

Moses-in-the-cradle (*Tradescantia spathacea*), (Oyster plant or Boatlily) is an ornamental house plant, native to Central America, useful as antiseptic and anti-inflammatory for sores and wounds.

***Bromeliad / Billbergia pyramidalis*,** also known as the **Flaming Torch plant** is a clump-forming stemless plant. It is adaptable, growing well as a terrestrial or epiphytic plant, native of South America. clicked at IWSA Garden on 5th November 2025 by **Sakina Gadiwala**

Acerola cherries*, also called *Barbados cherries*/ *West Indian cherries* (*Malpighia emarginata*), clicked at IWSA Garden on 23rd September 2025 by **Tripta Tewari**, Educator and Nature Enthusiast, IWSA HQ. These are tangy, sweet-sour, and very high in Vitamin C.

Mentoring Youngsters- Rural & Urban: A Culture within IWSA
Stories of Ajayraj Jadhav and Pujita Mohta

Ajayraj Jadhav - The journey of an entrepreneur….

Ajayraj Jadhav says - “I am pursuing engineering, currently running my own startup AJ Enterprises successfully. We provide project design, workshops and technical guidance for final year diploma, degree and Ph.D. students. We create attractive logos, posters and social media video editing. My journey as a Young Innovator started from a small village near Kudal located in the Sindhudurg district of Maharashtra leading to national recognition with the constant support from IWSA”.

In 2018, while in class 11 at Ryat Shikshan Sanstha, Ajayraj Jadhav was selected for the prestigious State-level Science Exhibition held at the Karmaveer Bhaurao Patil College at Vashi. Representing his school, Ajayraj presented a unique and innovative project – an automation system for agriculture designed using recycled and waste materials.

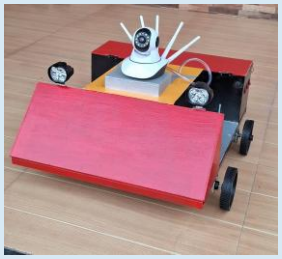
At the exhibition, his work caught the attention of some of the senior members of the Indian Women Scientists Association (IWSA). Impressed not only by the concept and sustainability of the project but also by the young innovator’s passion for invention, they recognised his immense potential. Understanding the challenges faced by students from rural backgrounds, the scientists from IWSA provided invaluable guidance and support to Ajayraj. This guidance proved to be a significant milestone in his life. Due to their recommendations and encouragement, he was selected to do research and internship at Homi Bhabha Centre for Science Education (HBCSE).

At HBCSE, Ajayraj continued his journey of innovation by developing a new science project, which was later reviewed by dignitaries such as Late Dr. H.C. Pradhan Former Director of HBCSE and the IWSA scientists. It was also much appreciated by Mr. Jagdish Chaudhari from TCS, Pune. The originality of the project and the need for large-scale real-world applications were recognized and appreciated. Subsequently, Ajayraj received a special invitation from Mr. Chaudhari to participate in a workshop and competition at COEP's Bhau Institute, Pune - another notable milestone in his journey.

Today, Ajayraj credits IWSA, especially Dr. Lalitha Dhareshwar and Dr. Sudha Rao and their IWSA team, for recognizing his talent from the beginning and guiding him through the crucial stages of his growth. Their constant guidance and encouragement have played a vital role in guiding a rural student on the path of an enthusiastic explorer.

"Their timely support not only guided me but also changed my direction. I am deeply grateful to IWSA, for believing in my ideas." This is what Ajayraj Jadhav says.



Ajayraj Jadhav and his models for rural applications- **a wind and solar based wireless charging station, an IOT Based smart agriculture robot, and a multi- axis firefighting robotic vehicle with CCTV surveillance.**

Pujita Mohta - The journey of a young researcher…

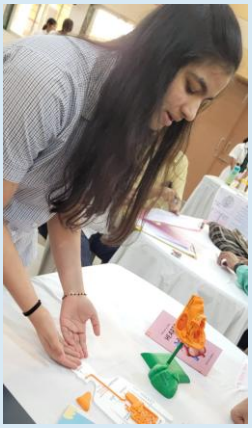
Pujita Mohta says – "I am currently pursuing the International Baccalaureate Diploma Programme at Dhirubhai Ambani International School and aspire to major in biochemistry for my undergraduate studies. Over time, my interest in biochemistry has deepened into specific areas such as genetics and forensic sciences. I have had the privilege of working closely with the Indian Women Scientists' Association (IWSA) and, through the constant encouragement and guidance of Dr. Sheela Donde, I have been able to combine my curiosity for science with creativity and practical applications.

Under the constant guidance and help of Dr. Sheela Donde, Pujita got to explore her interests in forensic sciences by writing and publishing a literature research paper in the *International Journal of Novel Research and Development (IJNRD)* titled *"How SNPs and STRs play a role in forensic science."* This mentorship not only provided her with scientific direction but also instilled the curiosity to research deeper into her interests. Through the process, she gained exposure to advanced concepts in genetics, including next-generation sequencing and Sanger sequencing, and understood how these techniques are applied in forensic DNA analysis. Learning about such methods gave her a new perspective on the role of modern biotechnology in solving real-world forensic challenges and strengthened her desire to pursue biochemistry with a focus on genetics and forensics.

Her journey with IWSA includes designing and developing 3D-printed educational models of the human heart and digestive system, which have been used to make complex biological concepts more understandable and engaging for children in rural schools. These models highlight her interest in bridging classroom learning with hands-on visualization, allowing science to be experienced rather than just studied.

Alongside her scientific contributions, Pujita also extended her efforts towards strengthening IWSA's newsletter readership and engagement. By working on communication strategies, and engaging science facts, she helped make scientific content more engaging and accessible to a wider audience — an initiative that combined her interests in both science and communication.

Today, Pujita credits IWSA for providing her with the platform and encouragement to grow as a young science enthusiast and researcher. Their recognition of her efforts has strengthened her commitment to continue exploring the intersections of science, education, and communication.

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Role of Single Nucleotide Polymorphisms (SNPs) and Short Tandem Repeats (STRs) in forensic science

Ajayraj Jadhav and Pujita Mohta with their mentors, Dr. Lalitha Dhareshwar and Dr. Sheela Donde. Both attended and presented their models on 4th October along with the DPS students.

"A mentor is someone who sees more talent and ability within you than you see in yourself, and helps bring it out of you."

- Bob Proctor, Author

G. "Vigyan Yatra," a science outreach program in rural

In keeping with the mandate of IWSA, of taking science to the masses and developing a scientific temper at all levels in the society through its various science education related programs, this project was conceptualised with the aim of extending the outreach activities of IWSA to underprivileged school students from remote Zilla Parishad schools of Raigad district in Maharashtra. The idea was to help these students understand the basic concepts and principles of science that are taught in their schools, through demonstrations / hands-on simple experiments, scientific models, and other teaching aids. This could encourage scientific literacy, curiosity, imagination, innovation, and problem-solving skills in these students for solving their local problems. Several distinguished Indian scientists like APJ Abdul Kalam, Vikram Sarabhai, Homi Bhabha, MS Swaminathan, Anil Kakodkar, to name a few, have emphasized the need to bridge the urban-rural divide and use science and technology for grassroots development and for solving day-to-day practical problems of the common man. Several Government schemes are also in place for addressing this issue.

Under the scheme of Vigyan Yatra, IWSA members, along with a few volunteers, are planning to visit at least 15-20 Zilla parishad schools within one year, carrying with them, in a van, several scientific models, charts, teaching aids, and experiments which they will explain/demonstrate to the students, and talk about their day-to-day applications.

Details of the Project:

IWSA adopted a two-pronged approach:

Obtaining all the required permissions from the State Education Department, Divisional Education Officer, Chief Education Officer of Zilla Parishad (ZP) schools of the relevant district, (a very nice recommendation letter to IWSA from Dr Anil Kakodkar was a great help in getting these permissions), identifying the Zilla Parishad schools which needed help, and coordinating the visits with the respective school Principals.

Creating age and class appropriate models for rural settings, based on school curricula, which were sturdy for transportation, preferably working models, and which could explain the underlying scientific principles in very simple and self-explanatory ways, in Marathi and English.

For achieving the second target, IWSA adopted a very novel approach. It contacted the prestigious and privileged Delhi Public School, at Nerul, Navi Mumbai, with a proposal of a free, two-month Mentorship / Internship Program for students of Classes IX and XI, to ideate, design and make models in various branches of science and mathematics that would satisfy the above criteria. Besides, the involvement of these young students from a privileged section of society would instil in them a sense of 'social responsibility' towards their under privileged counterparts in rural India.

First Vigyan Yatra VY1 to Z P Schools at Poyenje and Kelvane

Date: **18th December, 2025**

Volunteers: **6 IWSA members and 3 SYBSc (Chemistry) student volunteers from Rajiv Gandhi College, Vashi.**

Outreach: 42 students (classes 6th and 7th) and 4 teachers in Poyanje

152 students (classes 5th, 6th and 7th) and 4 teachers in Kelvane

The experiments / models / teaching aids taken by IWSA to these villages, covered the themes “Fire” and “Forces of Nature.” The evolution of fire from friction of trees, to friction of stones and matchsticks, to piezoelectric gas lighters and the latest plasma lighters were explained using simple experiments. Solar energy and its applications were demonstrated by using a small solar toy, and the principle of solar panels and solar bulbs was explained. The concepts of gravitational forces, and magnetic forces were demonstrated using experiments and models. The conservation of momentum, centripetal and centrifugal forces were explained through working models. The uses of light energy were demonstrated using lenses, mirrors, and lasers. The Chemistry experiments covered aspects of acids, bases, indicators, pH, electrolysis of water, and role of catalysts in oxidation / reduction reactions. Mathematical models were used to demonstrate principles of fractions, percentages, degrees, and decimals. Observing human red blood cells under a microscope, studying the anatomy of the human circulatory and digestive system through 3D printed models was fascinating for the students. Charts and models of animal and plant cells, and a working model of the reflex action were explained. Observing the active participation and engagement of the students and their teachers in these sessions, was a very gratifying and rewarding experience for all the IWSA members.

At the end, some books from IWSA library and the DAE publications on Sir C.V. Raman and Dr Homi Bhabha in Marathi were distributed to the students.

In conclusion, Vigyan Yatra 1 (VY- 1) to zilla parishad schools was a great learning experience. It was indeed very disheartening to see the huge urban-rural divide in education levels in our country, and this has given members of IWSA a greater impetus to continue with the Vigyan Yatra mission with full vigour!

H. IWSA Ganit Pratiyogita 2025

Date: **30th November, 2025 for CBSE and 14th December 2025 for SSC**
Number of CBSE students: **399 from 15 schools in Mumbai, Tarapur, Nagpur And Hyderabad**
Number of SSC students: **535 from 5 schools in Navi Mumbai**
Total Outreach: 934

IWSA is continuing its aim of trying to invoke an interest in Maths, especially in the students from the Maharashtra State Board. The exam was held in two phases as last year, for CBSE and Maharashtra SSC Board students of 6th, 7th and 8th standards. In the first phase, 167 students appeared at Anushaktinagar from six CBSE affiliated Atomic Energy Central Schools (AECS), 93 at Tarapur from AECS, 30 at Nagpur from Sandipani School, Somalwar School Maa Umiya Branch, NEERI, Modern School, Hadas CBSE School, Delhi Public School, MIHAN, and 109 students at Hyderabad from AECS, NFC, and Bhavan’s Sri Ramakrishna Vidyalaya, participated in the first phase. The exams were held at 4 places, namely Anushaktinagar, Tarapur, Nagpur and Hyderabad. In the second phase for students of Maharashtra State Board exams were held in Modern School & Jr. College, Sec 7, Vashi & R. F. Naik School, Koperkhairane. This was attended by 412 students from 4 schools (Fr. Agnel Multipurpose School, St. Mary’s Multipurpose School, Modern High School & Jr. College, Sacred Heart School in Vashi, Navi Mumbai and 123 students from R.F. Naik school at Koperkhairane.

The registrations for the CBSE students were done offline; forms distributed in the schools and collected at the Indian Nuclear Society office on dates informed at the various AECS at Anushaktinagar. The registration forms for the SSC board schools were given to the respective schools. The question papers were set by four IWSA members from HQ; and sent to Mumbai, Hyderabad and Nagpur centres. IWSA members of HQ, Hyderabad and Nagpur came forward to volunteer to make and distribute admit cards, oversee the seating and other examination arrangements, ensure smooth conduction of the exam and finally evaluate the answer sheets. The Mumbai centre will hold valedictory functions for the prize winners independently in January 2026. The Hyderabad centre decided to felicitate their prize winners (1st and 2nd Prizes only) at the AECS Annual School function. The Nagpur centre sent the certificates to the prize winners directly.

IWSA Volunteers at HQ and Tarapur- Dr. Sheela Donde, Dr. Lalitha Dhareshwar, Dr. Yojana Singh, Dr. Suparna Kamath, Ms. Manashi Chakraborty, Ms. Tripta Tewari, Ms. Vijayalakshmi Tilak, Dr. Seema Das, Dr Nootan Bhakal, Dr Paramjit Anthappan, Dr Mangala Ghorpade, Dr. Dhanya Suresh, Ms. Vidyutaa Kashyap, Dr. Maitrayee Paul, Ms. Bhuvaneshwari, Dr. Srirupa Mukherjee, Ms. Priya Jacob, Dr. Smita Kekatpure, Ms. Malathi Rao, Ms. Sukhvinder Sandhu & Ms. Sunu Nainan.

I. IWSA – Student Internship Program

Title: **Volunteering Technical Assistance to Publication Subcommittee for IWSA's Learning Garden and Living Museum Project**

Duration: **17th to 29th November 2025**

Affiliation: **ITM Centre for Social Initiatives, ITM Skills University, Kharghar**

Number of Students: **5 MBA Program students currently pursuing Specialisation in Finance, Marketing and DMMM (Digital Media and Marketing Management)**

IWSA Mentors and Expert invitees: **Dr. Rita Mukhopadhyaya, Dr. Paramjit Anthappan, Ms. Vijaya Chakravarty, Ms. Priya Jacob, Ms. Sukhvinder Sandhu, Ms. Malathi Rao and Dr. Sweedle Shivkar**

ITM Mentor: **Prof. Shrilaja Palur**

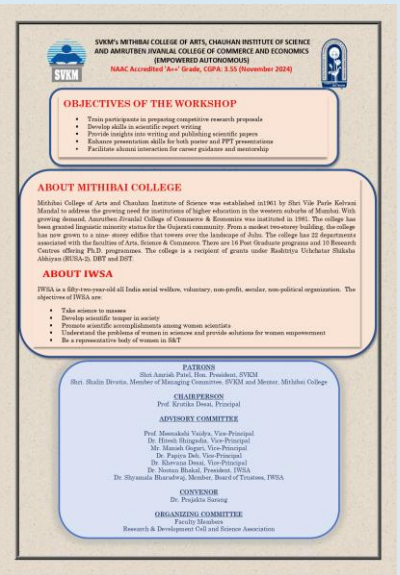
The internship project was aimed at mentoring interns towards enhancement of a forthcoming project of a book on Biodiversity and creation of promotional content post book launch event to encourage and attract readers across all ages. Besides, the group was allocated the task of making suggestions for attraction of more visitors to our website with improved navigation. The internship combined fieldwork, literature search, and digital learning. The learning outcomes expressed by interns included knowledge enrichment and skill empowerment for scientific and cultural plant documentation and basics of creative promotional video production. Improved adaptability by working both online and offline depending on the situational requirements, confidence built up in teamwork and overall networking to combine science, culture, and technology in projects for societal outreach.

J. Workshop on "Research Unlocked -Write it Right, Present it Bright"

Date: **17th September 2025;**

Outreach: 71

This one-day workshop was organized as a part of the existing **MOU between Mithibai College and IWSA, Research & Development Cell and Science Association of Mithibai College** in association with IWSA. Four of IWSA resource persons namely, **Dr. Paramjit Anthappan, Dr. Seema Das, Dr. Yojana Singh and Dr. Radha Srinivasan** gave insights on the respective topics-Drafting Research Proposals, Research Paper Writing, Scientific Report Writing, and Designing and Delivering Impactful Poster and PPTs. The workshop was appreciated for its structured approach provided by IWSA experts. 56 students and 15 professors participated in the workshop. **Dr. Prajakta Sarang of Mithibai College** and **Dr. Shyamala Bharadwaj, Immediate Past President of IWSA** were the coordinators of this workshop.



Community Programs

A. Indirabai Padhye Nursery School and Education Committee

1. Educator Empowerment program (registration free)

A 3-day program on **2nd, 3rd and 4th September** from 3 pm to 4.30 pm

2nd - Importance of Drama in Preschool by **Vidhi Oswal,** trainer at Trinity Speech and Drama

3rd- Dance- an essential tool for holistic Development in Preschool by **Swara Patel,** cofounder of Rhythms Feet Dance Academy

4th- Mindfulness in Teachers by **Dr. Sujata Udeshi,** expert in diet and lifestyle management

Number of Attendees - 22 – 27 / day

2. Teacher's Day on 5th September

The team of ECCE Trainees, teachers, IWSA members and stakeholders took the " EDUCATORS OATH" - A Promise to oneself to be honest and committed to the Profession of Teaching.

Number of Attendees: 30

3. Celebrations:

(i) **Hindi Diwas on 7th October:** Trainees displayed teaching aids, games and presented poetry in Hindi. Mrs. Arati Passi, head of the Hindi Dept. of Lodha World School, Thane, an educationist with more than 28 years of experience in various capacities with several awards and achievement to her credit, was the chief guest. She judged the presentations and prizes were awarded to the trainees.

(ii) Diwali on 17th October: The trainees prepared creative and colourful stalls for the nursery and day care children, explaining all details of the Diwali celebrations through handmade models.

(iii) Christmas on 23rd December Nursery children celebrated with Santa Clause and gifts Trainees organized a Christmas Potluck party on the same day in the evening

4. Pratham story telling challenge:

Trainees presented two stories for big group of kids in many schools.

I am not a cat –

Name of the School	Date	Number of Children
Anjuman A A K School, Vashi	1st October	230
St. Mary's School, Koparkhairane	10th October	400
Sacred Heart School, Vashi	17th October	500
IWSA Nursey & Daycare	17th October	30

Sukri & Tukri –

Kids Little Feet Preschool, Ghansoli	9th October	50
Anjuman A A K School, Vashi	1st October	230
St. Mary's School, Koparkhairane	13th October	100
Sacred Heart School, Vashi	17th October	500
Poddar Preschool, Vashi	16th October	25

Outreach: 1285

5. Visits and Attending special events

ECCE trainees - **Godrej School** on **3rd October 2025,** Nursery kids **- Fire Station** on **5th December 2025, Post Office on 16th December, Bakery on 19th December.**

Trainees attended **Ram Joshi memorial lecture** by **Mr. Nilesh Nimkar**, Founder Trustee and Director of Quality Education Support Trust (QUEST) on **1st October, 2025.**

The teachers and trainees attended a **RUSA sponsored One day Conference/ Workshop at BMN College**, Matunga on Friday, 19th December 2025, with two sessions, 1- **Story telling by Dr Sarita Kadaralkar**, 2- **Brain Gym by Ms Geeta Dalal**.

Students attended an online session, "**story telling with Doodles**" by **Ms Sheila Lewis**, Pioneer, Doodle4education on Sunday, 21st Dec.

6. Conference on "The Thinking Class Room -Philosophers on Education and Innovation" (on Early Childhood Education)

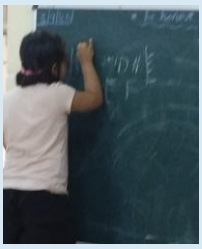
Date: 12th December 2025
Sponsored by: RUSA (Rashtriya Uchchatar Shiksha Abhiyan)
Collaborators: Dr BMN College of Home Science
Venue: IWSA HQ, Vashi
Outreach: 50

Six sessions were conducted by eminent speakers. **Dr Shobha Bharat**, Co-ordinator for Master's program in Early Childhood Education was the Key note speaker, and she talked on "Philosophers on Education'. Other speakers were **Ms. Mitali Thatte**, Joint Director Research, QUEST ('Foundational Numeracy; Literacy in Early Years'), **Ms. Preeti Misra**, Founder, Rainbow Bridge ('Rhymes; Stories the Waldrof Way'), **Mr. Madan Pisharody**, Founder, Swar Laya Music Production ('Less Screen More Swar), and **Ms. Sheila Lewis**, Educator and Pioneer, Doodles4 Education ('Doodles for Education) and **Mr. Mrunal Shah**, Founder, Sunday Bricks (Building Blocks).The sessions were very lively and interactive with very good student participation.

B. IWSA's Day Care and JMM Working Women's Hostel

Celebrations

1. **Teacher's day** was celebrated in daycare on **5th September**, with the kids acting as teachers. Learnt solar system from "young" physics teacher.
2. **Diwali** was celebrated with diya making and safety instructions and **Navratri** with Dandiya.
3. **Bal Diwas** was celebrated on **14th November, 2025**. Children made rose flowers, and participated in dance, songs, quiz etc. on this occasion.



Sports Day – 13th December 2025

Day Care Sports Day and Hostel Sports Day were celebrated on 13th December, 2025 from 4.00 to 6.00 pm and 7.00 to 9.00 pm respectively

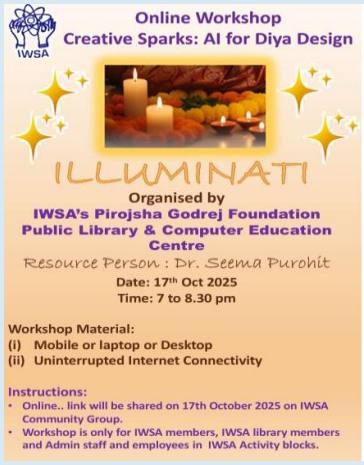
C. IWSA's Satish Haware Computer Education Centre

1. Workshop on Advanced Mobile Photography

Date: **14th – 16th October 2025 (offline)** and **28th to 29th October (online)**
Resource person: **Dr. Sushma Lehri**
Venue: IWSA
Participants: 44

This workshop introduced all the features of mobile cameras, manual controls, colour selection and techniques for impactful framing, exposure timing etc. Dr. Lehri's engaging style sparked lively discussions and hands-on curiosity. Post-processing, video creation — editing workflows, Instagram reels, time-lapse, and hyperlapse formats were all covered. Practical demos enriched the learning experience. A participant's birthday celebration added warmth and camaraderie. Certificates were distributed by senior members and trustees. Encouraged by enthusiastic feedback and public demand, the same workshop was held online on 28th – 29th October, 2025.

2. Online Workshop on AI for Diya Designs



Date: **17th October 2025**
Resource person:
Dr. Seema Purohit
Participants: 22

This inspiring online workshop showed how Artificial Intelligence can be used in traditional Diwali Diya-Making, to craft eco-friendly and personalized festive designs using digital tools. Nano Banana, a Google-based image editing platform tailored for non-designers, was introduced and its capabilities to generate handwritten text, to create festive visual elements and to edit and enhance photograph were demonstrated. Dr. Purohit shared tips to add more creativity and also discussed the platform's current limitations as well as its evolving potential. The workshop inspired participants to adopt sustainable and innovative approaches to Diwali decoration.

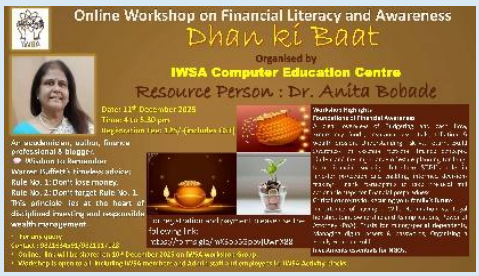
3. Online Workshop on "AI for Biology and Chemistry"

Title: **Nano PLM - Bio & Chem AI Program** ***(PLM – Protein Language Model / Polymer Language Model)***
Date: **17th November – 1st December 2025** (online)
Resource persons: **Mr. Sudhir Gupta,** Technology Evangelist
Outreach: 32

Specially designed for **college students and professionals** in chemistry, biology and IT. The course fee was Rs. 100/-Digital certificates were awarded to those who successfully submitted their projects.
Program Highlights: Practical examples of how AI accelerates discovery of new polymers and proteins. Hands-on learning with **Python, Google Colab, and Hugging Face**. The workshop trained them with a base AI model for applications in chemistry and biology.

4. Online Workshop "Dhan Ki Baat"

Date: **24th December 2025**
Speaker: **Dr. Anita Bobade,** Global Professor of Practice, for the DBA Dissertation Programme of Golden Gate University, California, USA
Outreach: 20



The talk covered disciplined investing and responsible wealth management, various investment options, financial literacy, and gender differences in financial management, SEBI's role etc. Dr. Anita provided detailed explanations on value investing, diversification and different types of shares. Critical concepts for securing your family's future: Importance of having a Will, Nomination vs. Legal heirship, Joint ownership and its implications, Power of Attorney (PoA) and many other aspects of wealth management were discussed. The session concluded with plans for future discussions on mutual funds and estate planning, while also touching on topics like tax planning and the management of financial liabilities post-retirement.

D. IWSA's Pirojsha Godrej Foundation Library

1.Teacher's Day Celebration

Date: **5th September 2025**

Outreach: 30

As a gesture of paying respect to teachers, four children from Day Care Centre had acted as teachers of Science, Maths, English etc., the most noble and challenging profession, and all others assembled in the library. Snehalata Bhavsar addressed the children and library members about the significance of library books. She presented her poem with messages of Dr. S. Radhakrishnan's birthday celebration and connection with Teacher's Day in a manner that all could easily understand.

A brief animated video, highlighting the importance of "Attitude of Gratitude" towards our teachers was showcased in our Computer Education Centre cum Digital Library. The significance of being innovative and creative in a team (exemplified by the students compiling and gifting a booklet of appreciation for their teachers) was the take home message for the children. Also, a small quiz on the video was conducted by Ms Sukhvinder Sandhu wherein the kids happily participated. Drs Seema Das and Param Anthappan also shared some useful messages relevant to Teachers Day. Ms Sucheta encouraged the children to visit the library to read books and was felicitated by the library members.

All those present, including our Little Teachers of the day were given a rose flower each, as a token of appreciation.

2.Christmas Celebration

Date: **30th December 2025**

Collaborators: **Day Care Centre, IWSA**

Outreach: 30

The IWSA library came alive in a burst of colour and festivity—radiant ambience and creative decorations for this celebration. Our cheerful Santa from the library staff, and countless happy smiles filled the space with pure joy and masti. A special highlight was the storytelling session for our tiny tot members, their adorable caps adding charm and delight to the occasion.

This jubilant gathering was not just about festivity—it was a celebration of gratitude for all that 2025 brought us, and a hopeful welcome to 2026 with renewed faith, joy, and aspirations.

E: Onam Celebration

A 10-minute Onam dance celebration was organized on 27th September, during the lunch break of the EC09 meeting, by EC members and a few Trustee members to honour Mother Nature's bounty. A Thiruvathira dance was presented, symbolizing the collective strength and grace of women. The mini event was aimed at holistic team building and appreciation of Indian cultural diversity. A short prelude was presented to explain the meaning of the selected song, enhancing the cultural experience for all. The committee acknowledges the cooperation of all present, including the staff and children of the Day Care Centre, whose participation added warmth and joy to the celebration.

Reports from Branches

Ajmer

1. Awareness session on suicide prevention

Date: **10th September 2025**

Speaker: **Dr Tulsi Giri Goswami,** Medical Physicist & Asst. Prof. of SMS Medical College, Jaipur & Radiation Officer, Rajasthan

Venue: **Central University of Rajasthan, Ajmer**

Outreach: 93

2. International Conference on Biotechnology and Nanotechnology (ICBN-2025) (Hybrid mode)

Date: **30th October – 1st November, 2025**

Venue: **Department of Microbiology and Biotechnology, IIS, Jaipur**

Outreach: 60

Ajmer branch co-hosted this International Conference, which featured eight technical sessions, one keynote lecture, 15 invited talks and two presentation segments oral and poster with participants from across India and abroad. Dr. Nidhi Gupta was the faculty coordinator. Over the course of three days, researchers shared more than sixty original studies, spanning biotechnology, nanotechnology, genetics, environmental science, and applied microbiology. The hybrid mode enabled global participation, fostering international academic exchange.

Technical Session I featured the keynote lecture by Dr. Amulya K. Panda, Associate Director of Panacea Biotec, New Delhi, and former Director of the National Institute of Immunology, who discussed the transformative potential of biotechnology in developing cost-effective vaccines and therapeutics. Session II was themed “New Era Medicine” and in Session III, Dr. Prashant Singh from the University of Delhi discussed ZnO based nanomaterials for detecting volatile organic compounds in early lung cancer diagnosis. Session IV was themed “Genes and Proteins” and session V “Environmental Sustainability”. Session VI was on Tuberculosis, Session VII on Innovations and Discoveries Session VIII on “Nanotechnology”. The deliberations ended with the valedictory session. All sessions were well attended, and the question-and-answer interactions were both lively and intellectually engaging.

3. One day Scientific Symposium to commemorate International Day of Medical Physics

Date: **7th November, 2025**

Venue: **Department of Radiological Physics, SMS Medical College & Hospital, Jaipur, Rajasthan**

Outreach: 145

This One-Day Scientific Symposium was conducted under the banner of the Association of Medical Physicists of India (AMPI) and the AMPI–Northern Chapter, and was endorsed by the International Organization for Medical Physics (IOMP), the Asia-Oceania Federation of Organizations for Medical Physics (AFOMP), and the Indian Women Scientists’ Association (IWSA), Ajmer Branch.

The IOMP theme for IDMP 2025, "Medical Physics and Emerging Technologies: Shaping the Next Decade," served as the guiding concept of the day. The symposium highlighted the vital contributions of medical physicists in advancing patient care through innovation, research, and adoption of emerging technologies in healthcare.

The Chief Guest of the event was Prof. (Dr.) Deepak Maheshwari, Principal & Controller, SMS Medical College & Hospital, Jaipur. The Special Guest of Honour was Dr. Mrinal Joshi, Medical Superintendent, SMS Hospital, Jaipur, and the Guest of Honour was Dr. V. Subramani, Vice President of AMPI and Professor of Medical Physics, AIIMS New Delhi. The function was presided over by Prof. (Dr.) Arun Chougule, Organizing Chairman, IDMP 2025 Jaipur & Ex-Head, Department of Radiological Physics and the dignitaries and participants were welcomed by Dr. Rajni Verma, Organizing Secretary, IDMP 2025 Jaipur.

In the scientific program, Prof. Arun Chougule spoke on "Inter-Professional Collaboration for Innovation and Research in Medical Physics," underscoring teamwork and innovation. Prof. Devesh Gupta delivered a session on "Emerging Technologies in Medical Physics Radiotherapy," focusing on technological advancements in radiation oncology. Dr. V. Subramani presented a talk on "Shaping the Future of Cancer Care: Role of Medical Physics and Technology," highlighting how innovation and technology are driving improvements in cancer management and care.

A Panel Discussion on "The Role of Artificial Intelligence in Medical Physics" explored the applications of AI in treatment planning, imaging, and patient safety, sparking lively engagement among the participants. Dr. Rajni Verma delivered a special talk titled "Why, Where, and When to Find a Medical Physicist — Celebrating the Invisible Hands of Modern Medicine." The presentation paid tribute to the often-unseen but critical contributions of medical physicists in ensuring the precision, quality, and safety of medical technologies.

Participants comprised of medical physicists, oncologists, academicians, and students from various institutions. The celebration was well covered by the local press, further enhancing public awareness about the contributions of medical physicists to healthcare and scientific advancement.

4. Outreach Program- Post Graduate students Reaching out to School Children

Date: **15th November, 2025**

Venue: **Department of Geology, University of Rajasthan, Jaipur and Government Higher Secondary School, Watika, Jaipur**

Outreach: 61

IWSA, Ajmer branch, organised a special outreach activity on 15th November 2025, where students of M.Sc.I Semester, Department of Geology, University of Rajasthan, Jaipur interacted with the students of Class X, in the Government Higher Secondary School, Watika. This was carried out under the guidance of Dr. Asha Saxena, with the objective of sharing knowledge and enhancing awareness on various topics related to daily life and general science.

The session was conducted in an engaging and interactive manner. Bhumika and Nagendra explained the origin of the Earth and the Universe, helping students understand basic concepts of cosmology. Topics covered were 1) Various landforms on Earth and their formation, 2) The diversity of species on Earth and their evolution, 3) Different gemstones and minerals, highlighting their importance and uses, 4) Fundamental duties, emphasizing their significance in responsible citizenship and how individuals can follow them in their daily lives.

The activity proved to be highly beneficial for both the M.Sc. students and the school students. It provided a platform for the postgraduate students to share their knowledge and improve their communication skills, while the school students were motivated to learn new concepts and broaden their understanding.

Overall, the session was fruitful and inspiring, fostering curiosity and awareness among the participants.

5. One-day Training-cum-Workshop

Theme: **"Molecular Tools in Enzyme Engineering"**

Date: **21st November, 2025**

Host: **Department of Microbiology, School of Life Sciences, Central University of Rajasthan**

Number of Participants: 77

IWSA co-hosted this workshop, which drew an enthusiastic crowd comprising of postgraduate students, research scholars, and faculty members from various life science disciplines. Upon arrival, attendees received specially prepared kits at the registration desk, ensuring engagement in the sessions that followed and care. Dr. Nidhi Pareek, the faculty coordinator outlined the events, Prof. Sanjib Kumar Panda, Dean of the School of Life Sciences, and Dr. Akhil Agrawal, the Head of the Department of Microbiology highlighted the growing significance of enzyme engineering in advancing research and innovation across the biological sciences.

The first technical session, Introduction to Enzyme Engineering and Computational Tools conducted by Dr. Suman Tapryal, Associate Professor, Dept. of Biophysics, University of Delhi, provided an in-depth and engaging exploration of the foundational principles underlying enzyme engineering. The second technical session, Molecular Tools for Enzyme Engineering: Recombinant Generation, Expression Systems & High-Throughput Screening, offered a detailed and immersive exploration of the molecular biology techniques that serve as the backbone of enzyme engineering. The session provided attendees with a holistic understanding of how molecular biology techniques directly support enzyme engineering research, bridging theoretical knowledge with practical laboratory applications and real-world problem-solving.

In the practical module, participants engaged in an intensive hands-on training session centered on the computational analysis of protein structures using PyMOL, a widely utilized and powerful molecular visualization platform. The instructor demonstrated a range of foundational and advanced features, including importing protein structure files, manipulating molecular orientations, customizing visual representations, and highlighting key structural elements. Overall, the workshop offered a comprehensive and well-structured foundation in both the theoretical principles and practical applications of enzyme engineering.

6. Two-day Training-cum-Workshop

Theme: **"Smart and Sustainable Strategies for Transforming Agriculture Under Extreme Climate"**

Date: **4th – 5th December, 2025**

Host: **Department of Environmental Science, Central University of Rajasthan**

Outreach: 100

This workshop, part of an Anusandhan National Research Foundation (ANRF) sponsored project, was organized in association with IWSA, Ajmer branch. The programme served as a dynamic platform for collaboration and knowledge exchange, drawing participation from young faculty members, research scholars, progressive farmers, and multiple stakeholders from neighbouring regions. Faculty Coordinator was Dr. Garima Kaushik (Life member-IWSA & convenor of IWSA Ajmer Branch). The program aligned with the vision of the Hon'ble Vice Chancellor, Prof. Anand Bhlerao, upholding the Sustainable Development Goals (SDGs) to maximise societal and environmental impact, particularly through initiatives that involve farmers, women, and community groups in capacity-building and entrepreneurship.

Prof. N. K. Gupta (Director PM&E, Sri Karan Narendra Agriculture University, Jobner, Rajasthan) and Prof. Zahoor Ahmad Baba (Head, Division of Basic Science and Humanities, Sher-e-Kashmir University of Agricultural Sciences and Technology, Sopore, Kashmir) were the keynote speakers.

Prof. N. K. Gupta underlined the importance of smart farming solutions such as precision agriculture, climate-resilient cropping systems, hydroponics, aeroponics, aquaponics, Internet of Things (IoT) in agriculture, and regenerative agricultural practices to enhance productivity while conserving natural resources. Prof. Zahoor Ahmad Baba, serving as Co-PI of the project, delivered a session titled “Biofertilizers for Sustainable Farming: Concept and On-Farm Application.” He interacted extensively with participants and shared valuable insights on how innovative microbial-based technologies can transform agriculture under climate stress.

Dr. Akhil Agrawal (Associate Professor, Department of Microbiology, School of Life Sciences, CURAJ) presented his work on “Desert Solification,” a sustainable technology aimed at converting sand into soil-like material to benefit agricultural practices in arid and desert regions. Dr. Mohd. Ashraf Dar (Post-Doctoral Fellow, Yildiz Technical University, Istanbul, Türkiye) discussed the harmful effects of excessive pesticide use on soil quality, human health, and environmental balance. His talk, “Sustainable Agriculture Through Microbial Intervention: Linking Nutrient Solubilization and Pesticide Biodegradation,” offered an innovative perspective on utilising microbes to both reduce soil pollution and enhance crop nutrition. Prof. Praveen Mathur (Former Head, Department of Environmental Science, Maharshi Dayanand Saraswati University, Ajmer) spoke on “Vulnerability to Resilience: Smart Approaches for Climate-Safe Agriculture,” and highlighted the need for climate-adaptive agricultural systems. He focused on advanced tools, including IoT-based farming, remote sensing, and satellite advisory systems, as well as climate-resilient crop planning and integrated farming models. Dr. Nidhi Pareek (Assistant Professor, Department of Microbiology, School of Life Sciences, CURAJ) discussed “Exploiting Microbial Enzymes to Strengthen Environmentally Sustainable Crop Protection Strategies,” elaborating on the use of thermostable enzymes to manage white-rot fungal disease in chickpea and their potential role in sustainable crop protection. Dr. Dipak Gayen (Assistant Professor, Department of Biochemistry, School of Life Sciences, CURAJ) presented his session on “Genetic Engineering for Sustainable Agriculture,” highlighting cutting-edge approaches to enhance crop yield through targeted genetic modification. The workshop concluded with a valedictory session.

Amravati

1.Visit to Old Age Home

Date: **11th October, 2025**

Number of Beneficiaries: 30

Participants: 91

IWSA members accompanied by 81 students (Chemistry post graduate students and NCC cadets) and 10 staff members of Sant Gadge Baba Amravati University (SGBAU) visited an old age home at Badnera, (Shree Gadge Maharaj Vruddhashram, Balgaon Taluka, Dist. Amravati), distributed some items of daily use and fruits and also organised a cleanliness campaign there. The students were divided into small groups and had a close interaction session with the senior citizens, listening to their stories and experience and sharing light hearted anecdotes. The NCC cadets with their disciplined yet compassionate approach, assisted the elderly with their mobility and ensured that everyone was comfortable. A spontaneous cultural program by the students further enlivened the atmosphere, bringing a festive joy to the faces of the residents. The simple act of sitting with the elderly, holding their hands and listening to them created a vibrant space of intergenerational connection and warmth. The students were deeply moved by the experience, and the visit led to reflective discussions among them. The event provided a practical lesson in compassion that transcends academic learning. This was a reminder of the importance of community engagement and the role of educational institutions in shaping not just skilled professionals, but conscientious and empathetic citizens.

2.IWSA–BRNS Popular Science Lecture for Colleges

Topic: **The Unseen Chemistry Behind Everyday Products**

Date: **26th September, 2025**

Speaker: **Dr Sunil G. Warhadpande,** Asst. Prof. (Retd), Nabira Mahavidyalaya, Katol, Maharashtra

Venue: **Vidya Bharati Mahavidyalaya, Amravati**

Outreach: 156

Abstract: Chemistry, as a foundational science, underpins all daily products. The molecular interactions of surfactants, for instance, are meticulously engineered to lift dirt. Similarly, stereochemistry- three-dimensional arrangement of atoms- is the key to a fragrance's unique sensory profile or a food's flavour. In pharmaceutical research, the principle of ligand-receptor binding guides the design of drugs, ensuring a molecule can precisely target a biological site for a therapeutic effect. The talk described these unseen chemical principles behind plastics and textiles to medicines, and emphasized the profound impact of scientific innovation on our lives, making chemistry an indispensable field for both fundamental and applied research.

Bengaluru

1.IWSA–BRNS Popular Science Lecture for Colleges

Topic: **The 3 Cs of Crafting Your Career**

Date: **7th October, 2025**

Speaker **Dr. Smita Jain,** Former Director, Partnerships (India) at Cactus Communications

Collaborators: **Department of Biotechnology, Faculty of Life and Allied Health Sciences,** M. S. **Ramaiah University of Applied Sciences (RUAS),** Bangalore

Venue: FMC Building, RUAS

Outreach: 105

Abstract: This interactive session by Dr Smita Jain focussed on the 3Cs - Clarity, Commitment, and Confidence- that shape a successful scientific and professional journey. Additionally, she discussed other set of 3 Cs like Consistency, Curiosity, and Courage, which are also vital for achieving success. The talk provided valuable insights for students and early career researchers on how to make informed career choices, build essential skills, and navigate the evolving landscape of science and research careers.

2.Popular Science Lecture

Topic: **Plastic: Boon or Bane**

Date: **2nd December 2025**

Speaker: **Dr. Kavyashree Manjunath,** Founder of Apratima Biosolutions

Venue: **Department of Life Science, Bangalore University**

Outreach: 80

The lecture was hosted by Dr. Sree Latha, faculty member at the department of Life Science. Apratima Biosolutions is a Bangalore based deeptech startup working in the area of protein engineering to degrade plastic through Biotechnological methods. The speaker has 9+ years of post-doctoral research experience in the area of drug discovery, molecular dynamics, protein engineering and developing tools to analyse Next Generation Sequencing data.

In her lecture, Dr. Kavyashree talked about the history of plastic, necessity for its invention several years ago, it's large-scale usage in every aspect of life, it's impact on every creature that exists on Earth, the manifested repercussions to human beings and finally, she educated the audience to reduce plastic use and the immense possibilities in the field of Biotechnology to eliminate plastic.

Delhi

IWSA Delhi Branch started a new initiative of arranging weekly/ fortnightly interactive Science Dissemination lectures by IWSA Delhi Branch Members to school students and teachers online in association with **Knowledge and Awareness Mapping Platform (KAMP)**. This was the first lecture of the series for students of classes 8-12. The lecture was livestreamed on Facebook page of KAMP portal as well.

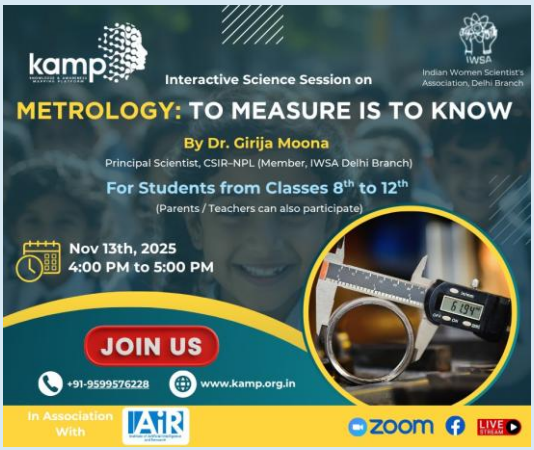
1. Weekly/fortnightly interactive Science Dissemination lectures (online via KAMP)

Topic: **Metrology: To Measure Is To Know**

Date: **13th November, 2025**

Speaker: **Dr. Girija Monna,** Principal Scientist at CSIR-NPL

Outreach: 150



2. Weekly/fortnightly interactive Science Dissemination lectures (online via KAMP)

Topic: **Carbon: Nature's solution to Energy Materials**

Date: **20th November, 2025**

Speaker: **Dr. Priyanka Heda Maheshwari,** Sr. Pr. Scientist (CSIR NPL)

Outreach: 75

3. Weekly/fortnightly interactive Science Dissemination lectures (online via KAMP)

Topic: **Understanding our Environment and Air Pollution'**

Date: **27th November, 2025**

Speaker: **Dr. Monika J. Kulshreshtha,** Chief Scientist, CSIR-NPL and Professor (AcSIR)

Outreach: 100

4. Weekly/ fortnightly interactive Science Dissemination lectures (online via KAMP)

Topic: **Metrology: Importance, Types and Applications**

Date: **12th December, 2025**

Speaker: **Dr Nidhi Singh,** Chief Scientist, CSIR-NPL

Outreach: 60

Hyderabad

1.IWSA–BRNS Popular Science Lecture for Colleges

Topic: **Women's Health in Reproductive years**

Date: **28th October, 2025**

Speaker: **Dr. Sasikala Kola,** Consultant Obstetrician and Gynaecologist, Rainbow Hospital, Hyderabad

Venue: Women Study Centre & Office of Director Hostels, VCIWU, Hyderabad

Outreach: 200

Abstract: Right from adolescence through reproductive years until menopause, women face multiple health issues not only pertaining to their fertility but also the rest of the body. The general health both physical and mental of a person has great bearing in the reproductive health of a woman. Tremendous changes in food and eating habits, life style changes and increased environmental pollution has catastrophic effects on reproductive health of both men and women. This talk focussed on various factors that affect the health of a woman from adolescence to menopause.

2.Guest Lecture on Food Safety

Topic: **Ensuring Protection of Farming Community and Safety of Foods - Innovative Methods**

Date: **29th October 2025**

Speakers: **Dr. J. Padmaja,** Scientist F and Group Leader (Retd.), Food Safety Division, ICMR–National Institute of Nutrition (NIN), Hyderabad

Venue: **Post Graduate and Research Centre, Professor Jayashankar Telangana Agricultural University (PJTSAU) Rajendranagar, Hyderabad**

Outreach: 50

This program, organized by The Department of Food and Nutrition, in collaboration with NSS Units (I and II) and the Indian Women Scientists' Association (IWSA), Hyderabad Branch, aimed to raise awareness about the interlinkages between agricultural practices, farmer well-being and food safety through the application of modern and sustainable innovations.

Dr. Padmaja, with her expertise and experience in leading several nationally funded projects supported by the Department of Science and Technology (DST), Department of Health Research (DHR), and the Food Safety and Standards Authority of India (FSSAI) in the field of food toxicology research provided valuable insights into the lecture's central theme. She explained the concept of "My Plate for the Day," elaborated on the pesticide registration process in India and the importance of adhering to regulations aligned with the Codex Alimentarius Commission. She provided a comprehensive view connecting scientific evidence, farmer's safety, and consumer health, encouraging the audience to adopt innovative, sustainable and evidence-based solutions in agricultural and food safety systems.

Dr. Vijaya Khader, a distinguished academician and former Dean of Acharya N. G. Ranga Agricultural University, with more than four decades of active engagement in nutrition research, teaching, and capacity-building programs, and Convener of IWSA, Hyderabad Branch, explained the formation and objectives of IWSA.

Dr. M. Satyavani, retired Principal Technical Officer from the ICMR–National Institute of Nutrition (NIN), Joint Secretary of IWSA, Hyderabad Branch, with over 35 years of distinguished service in laboratory animal sciences, biosafety management, and preclinical toxicological research, discussed development and processing of novel functional foods derived from plant-based bioactive compounds. She illustrated the integration of functional foods such as prebiotics and probiotics into daily diets to improve metabolic health. She also touched upon the use of genetically modified organisms (GMOs) in food and feed studies, emphasizing the importance of safety evaluation under controlled research conditions. Also briefly mentioned ongoing collaborations with the ICMR–National Institute of Virology (NIV), Pune, which support food safety and biosafety evaluation frameworks.

3. IWSA Ganit Pratiyogita

Date: **30th November 2025**

Venue: **AECS, NFC, and Bhavan's Sri Ramakrishna Vidyalaya**

Number of Participants: 109

Hyderabad branch conducted IWSA Ganit Pratiyogita 2025 for CBSE schools along with IWSA HQ. Students from Atomic Energy Central School, Nuclear Fuel Complex, Hyderabad and from Bhavan's Sri Ramakrishna Vidyalaya participated in the competitive examination. Dr. Gita Sharma, Dr. J. Padmaja Rambabu, Dr. Kalpana Sastry, Dr. M. Satyavani and Dr. Vijaya Khader were the volunteers from IWSA. The prize winners were felicitated at the annual function of AECS.

Kalpakkam

1.Technical Talk

Topic: **Township Security-Challenges and constraints**

Date: **28th October 2025**

Speaker: **Mrs. Vanaja Nagaraju**, Associate Director, Safety and Resource Management Group, Engineering Service Group, General Service organization (GSO), Kalpakkam.

Venue: **Auditorium of the Nondestructive Evaluation Division, IGCAR**

Outreach: 30

In her talk Mrs. Vanaja Nagaraju elaborated on the crucial role played by GSO in managing common facilities in the Atomic Energy Townships at Kalpakkam and Anupuram. These facilities include housing, medical services, transportation, water supply, civil, electrical, mechanical, telecommunications and computer services. Mrs. Vanaja Nagaraju highlighted the various activities of GSO carried out by various divisions depending on the functional requirement and expertise. She also discussed the challenges faced in ensuring security of the township and its amenities, emphasizing the importance of coordination with the district administration on these issues efficiently. In the interactive session followed by the lecture, the members actively participated and discussed various aspects of township security.

Mrs. Vanaja Nagaraju, who is superannuating in the month of October 2025 was felicitated in the function. Many members of IWSA remembered and cherished the moments, memories and contribution to the organization and her involvement in IWSA activities over the years. In a heartfelt gesture, members wished her a peaceful and fulfilling retired life and presented her with a gift and a memento as token of love and appreciation.

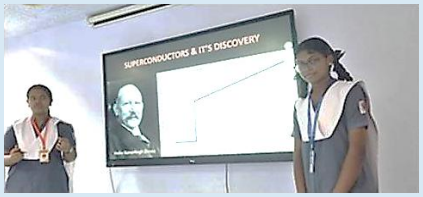
2. Science competitions for students from DAE Township schools.

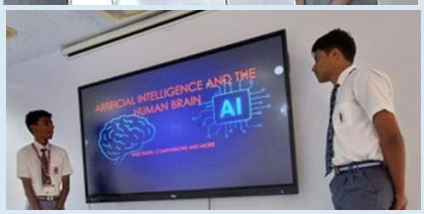
Mindcraft in the format of collage for 6th –8th & Tech-talk in the format of PowerPoint presentation for 9th – 12th standards

Date: **1st November 2025**

Schools: **AECS-I, II, III, KV-1 and KV-2 schools**

Outreach: 300





These competitions were held as a part of the National Science Day 2026, and the topics were thoughtfully chosen to inculcate curiosity and innovation among students.

For students in 6th-8th standards, the collage topics included the following: Energy Conservation in Homes and Schools, Save Our Earth – One Step at a Time, Innovations that Changed the World, Communication Revolution, Future Cities – Smart and Green, and Life on Other Planets.

For students in the 9th - 12th standards, PowerPoint presentation included the following topics: Pandemics and Vaccines – The science of immunity and prevention, Plastic Pollution and Biodegradable Alternatives, Artificial Intelligence and the Human Brain, The Chemistry of Batteries – Powering the Future, Forensic Science: Solving Crimes with DNA and Chemistry and Superconductors and Super materials: Changing technology.

The event witnessed enthusiastic participation from a total of 300 students across AECS-I, II, III, KV-1 and KV-2 schools. The students presented their work with great zeal and creativity, demonstrating a strong understanding on the topics at hand. The competitions were conducted by a dedicated panel of 30 IWSA members, who thoroughly evaluated the students' submissions. In each category for each school, three prizes will be awarded during the National Science Day program, which will be organised at AECS-3 school. The participation of students and showcasing their talent made the event a resounding success.

3. Visit to Biotech Park

Date: **5th November 2025**

Number of IWSA Members: 22

IWSA members undertook a technical visit to the **Golden Jubilee Biotech Park for Women Society**, located in Siruseri near Chennai. The session began with an informative address by Dr. S. Shriram Raghavan, Business Advisor to the Biotech Park. He provided a comprehensive overview of the history and objectives of the park, the role of the incubation centre, and the various schemes offered by the government to support start-ups. He highlighted that the primary focus of the park is to empower women entrepreneurs in the fields of biotechnology and life sciences by providing a platform for self-employment and career development. The Biotech Park, supported by the Department of Biotechnology, offers a conducive ecosystem for startups by providing infrastructure at affordable costs and facilitates activities ranging from research and development to manufacturing under one roof, with modular units and land for large-scale production. The centre also provides incubation support, technology demonstration, and pilot plant studies with assistance from agencies such as BIRAC. Two emerging entrepreneurs: Dr. Rachna Dave, Founder of MicroGO LLP, and Dr. Menaga Magendran, Founder of Bioneemtec also gave inspiring talks about their journeys, challenges, and experiences in establishing their ventures. Participants were shown all the major facilities and common equipment available. It was an enriching experience and served as an eye-opener into the opportunities available in the biotech startup.

4. Science Demonstration and Science Quiz

Date: **21st November 2025**

Venue: **Government higher secondary school, Vengambakkam, Chengalpet (Dt)**

Outreach: 75

IWSA Kalpakkam branch in association with the Society for Advancement in Chemical Sciences and Education (SACSE), arranged science demonstration followed by science quiz for students of class 9th to 12th in the nearby village school. The theme of the program was “Exciting Chemistry Demonstration Experiments,” which was followed by a Quiz Competition for the students. Science books in Tamil were distributed as prizes for quiz winners and runner ups. ~75 students were present during the demonstration.

5. FemTech-2025

A National Event on Women in Technological Advances and Social Upliftment

Date: **16th December, 2025**

Speakers: **Dr. B. Amudha,** Director, Regional Meteorological Centre, Chennai and **Dr. S. Rajeswari, MBBS, DNB (OG),** Preventive Oncologist & Colposcopy Specialist, Iswarya Hospital, Chennai

Collaborators: **Indian Society of Heating, Refrigerating and Air Conditioning Engineers (ISHRAE)**

Venue: **Sarabhai auditorium, IGCAR**

Outreach: 300

This event was presided by Shri. C.G. Karhadkar, Distinguished Scientist, Director, IGCAR. Smt. Rajeswari, Convener, FemTech, welcomed and highlighted the objectives of FemTech. Smt. N. Jayanthi, National Women Chair, ISHRAE 2024-2025 briefed about FemTech. In his address Shri. Karhadkar appreciated the activities of IWSA, Kalpakkam and ISHRAE and highlighted the role of women in science.

In the technical session, **Dr. B. Amudha** talked on **"Aspects of Weather Forecasting",** providing valuable insights into the various aspects of weather forecasting observatories, automatic weather stations and monitoring systems. In-depth details were shared by the speaker on the role of weather forecasting in aviation industry, wind mapping and cyclone detection and warning systems. **Dr. S. Rajeswari talked on "Know Your Risk Cancer Awareness",** covering the various aspects and types of cancer, factors contributing to cancer, symptoms and therapies, and creating awareness amongst the audience. Both the speakers were felicitated by Shri Karhadkar. The well received technical sessions ended with a vote of thanks, national anthem and high tea.

6.Superannuation and felicitation events

As a traditional practice, IWSA, Kalpakkam branch organized the felicitation of its life members in the month of December for their exemplary service to the department and to IWSA, Kalpakkam branch. Life members, Dr. Sangeetha, Pediatrician, GSO Hospital (VRS) and Mrs K. Shyamala Devi, EAD, SQRMG (superannuation) were felicitated by the EC members of IWSA, Kalpakkam branch at their respective residence with a traditional shawl and a memento for their significant contribution to IWSA.

Volunteer speaks…

Ms. Sunu Nainan from HQ

I joined IWSA in 2025 and as an IWSA member, I got an opportunity to be a judge for the E/F South Ward Science Exhibition 2025–2026, held at St. Mary's High School (SSC), Nesbit Road, Mazagaon, Mumbai on 27th November 2025. With my 32 year experience of teaching Science and Maths to high school students, I was all excited and curious to go once again to a school event. It turned out to be a big event where 50 schools had participated and almost 700 people were at the venue. Three of us from IWSA were judges. I am really indebted to IWSA for giving me this opportunity to be part of this exhibition, bursting with all positives required in education- innovation, creativity, youthful energy, and so much originality mixed with confidence in children enthusiastic to learn. The work and contributions of judges were well appreciated and specially mentioned. It was indeed a memorable and enriching experience. It was so heartening to feel what my India is growing to and felt proud how IWSA was catalysing that growth and how I was also part of it ...

Kolhapur

1. Release of "Fungiphiles": A Pictorial Booklet on Fungal Diversity Across Maharashtra

Date: **4th December 2025**

Venue &collaborators: **Rajaram College, Kolhapur**

Outreach: 230

Though small in size, fungi play a vital role in global ecosystems and human life—yet they remain shrouded in misconceptions. Mycology teams from across Maharashtra, led by Dr. Anjali Patil and Dr. Dhanashree Patil, united to document common fungi in their surroundings. Their tireless efforts produced Fungiphiles, a pictorial pocket guide featuring habitats, identification tips, and safety information.

The booklet was jointly published by the Department of Botany, Rajaram College, Kolhapur, and IWSA Kolhapur Chapter with its printing supported by the IWSA Kolhapur Chapter. The booklet was released at the inaugural function of the international conference "Exploring Fungal Frontiers: A Multidisciplinary Approach to Advancing Fungal Biology" on 4th December 2025.

Chief guests included Prof. Dr. D.T. Shirke, Vice-Chancellor, Warana State Public University, Warna Nagar, Kolhapur, Prof. Dr. Priyani Paranagama, Senior Professor and Chair of Chemistry, University of Kelaniya, Sri Lanka, Prof. Dr. S.K. Deshmukh, President, Association of Fungal Biologists, Prof. Dr. A.J. Bodake, Convenor and Principal, Rajaram College, Dr. Manjiri Desai, President, IWSA Kolhapur Chapter, Dr. Dhanashree Patil, Editor, Fungiphiles, and Prof. Dr. A.R. Patil, Organizing Secretary of the conference. The conference organized from 4–6 December 2025 by the Department of Botany, Rajaram College, Kolhapur, was sponsored by Anusandhan National Research Foundation (ANRF), Department of Science and Technology, Government of India, and Shivaji University, Kolhapur.

2. Floral Fest: Blending Creativity, Science, and Sustainability

Date: **6th – 7th December 2025**

Collaborators: **Gardens Club, Kolhapur**

Venue: **Mahaveer Garden, Kolhapur**

Outreach: 75

Aim of the event was to explore floral arts through a creative and scientific lens, promoting sustainability. The objectives were to provide scientific ideas for startups via the floral fest, to introduce floral drinks for a healthier future. This also tried to engage youth in learning floral arts like Ikebana and eco-flowers as plastic alternatives and to develop techniques for extracting fragrances and flavors. Along with IWSA, members of the Inner Wheel and Rotary Club joined the inauguration and extended their support.

Greenhouse floral farmer Mrs. Sunita Patil was felicitated as the Best Lady Farmer for her 29 years of consistent innovation. She has successfully grown top-selling varieties like Gerbera, Sunflowers, and Chrysanthemums, and introduced Eustoma (Liatris) to Maharashtra for the first time. Pallavi Kulkarni, President of Gardens Club Kolhapur, honored the workshop demonstrators from the Ohara School, Bombay.

Session 1- Ikebana Demonstrations: Archana Vaidya, Harinakshi Mestry, Ragini Kakkar, and Seema Salgaonkar showcased basic Moribana-style Ikebana (Japanese flower arrangements), along with advanced Rimpa and Landscape styles.

Session 2- Floral Drinks Workshop: Deepali Taywade Patil, former IWSA Kolhapur Convener, led a demonstration on floral drinks. She shared the healthy chemistry behind vibrant floral colors, teaching participants to create tasty Mojitos and Sorbets that transform magically with a squeeze of lemon.

Using a PowerPoint presentation, Deepali explained the biochemistry and health benefits. Mrs. Manisha Bhoperao Kadam, Puja, and Smita assisted in preparing and serving the drinks to all participants resident of Gardens Club Kolhapur, honored the workshop demonstrators from the Ohara School, Bombay.

Session 3- Floral Fragrances and Flavors: Dr. Manjushree Deodhar (Retd. Prof. Vaze Kelkar College, Mulund) and V.N. Sharma from Mumbai presented on aroma extraction. They set up a live distillation unit to demonstrate the process, tying into an upcoming national conference on natural fragrances and future projects.

Session 4- Hands-On Paper Flower Training: Participants received 65 kits for making paper flowers— a sustainable substitute for plastic decorations. Krupesh Hiremath and Gardens Club members guided everyone through the hands-on activity.

Nagpur

1.Teacher's Day

Date: **20th September 2025**

Venue: **Abhyankar Smarak Trust Hall**

Outreach: 30

Participants included teachers, head masters, principals of schools and colleges. Participants selected chits with different topics written on them, which led them to talk about their personal journeys in teaching, their successes, memorable and transformative moments with students, and the ways they extended support beyond traditional classroom instruction. Some shared experience of what difficulties are faced by students of weak financial background. Shortage of resources is a challenging situation for teachers. Participants also shared experiences on how they had inculcated discipline among students. Some expressed happy moments with students and how even beyond their school or college days students have been remembering their teachers. Overall, it was an excellent opportunity to ponder upon the realities, challenges and happiness in teaching journey of the educators. All participants were given gifts.

2. World Food Day 2025

Date: **1st November 2025**

Collaborators: **Nutrition Society of India and Ashadeep**

Venue: :**Kalakunj, Civil Lines, Nagpur**

Outreach: 50

This was an opportunity to share and learn knowhow and experiences of all participants engaged in Food for self, family and community at large. Six groups discussed the theme “Hand in Hand for Better Foods and Better Future”, covering myths and facts about food, reducing food waste, food adulteration, promoting traditional foods, and importance of festival foods. Teams were named after delicacies such Puranpoli, Ladoo, Kaanji, Chakli, Shrikhand and Sheera. Members of all three organizations participated with equal enthusiasm.

Key takeaways included - Debunking common food myths, - Strategies to reduce food waste at various levels, - Prevalent food adulterations in the market, - Ways to promote traditional foods, - Significance of traditional festival foods, - Special foods for specific age groups.

The discussion highlighted the importance of sustainable food systems, nutrition, and cultural heritage. Event was topped with small happy hampers for participating teams.

3. Children's Day Celebration- Science Exhibition by Children

Date: **21st November 2025**

Venue and Collaborator: **Shanti Vidya Bhawan Digdoh, Nagpur**

Number of Participants: 250

The exhibition featured a wide range of models and demonstrations, including the hydrological cycle, DNA structure, Carbon dioxide absorption, Photosynthesis, Chandrayaan take-off model, Volcano eruption, Windmills, and many more. Some students presented innovative, real-life solutions such as Safety shoes for women, Water dispensers, Safety barricades, Mechanical lifts, Solar-powered irrigation systems, Working ATM models, Microscopes, and Solar system replicas. The exhibition was inaugurated By Dr. Anuradha Gadkari, founder member IWSA and evaluated by a panel of judges: Dr. Seema Somalwar, Dr. Rita Israni, Dr. Saroj Desai, and Dr. Punita Tiwari. IWSA members Dr. Dipti Andhare and Dr. Sushama Soni were also present on the occasion. Children also presented a skit depicting misuse of social media and its ill effects in general. The initiative taken by Dr. Sushma Pankule, trustee of the school, support from the Teaching staff and the effort, creativity, and scientific thinking demonstrated by the students were highly appreciated by all visitors.

4. IWSA Ganit Pratiyogita

Date: **30th November 2025**

Venue: **Modern School, NEERI, Nagpur**

Number of Participants: 30

Nagpur branch conducted IWSA Ganit Pratiyogita 2025 for CBSE schools along with IWSA HQ. Students from Sandipani School, Somalwar School Maa Umiya Branch, NEERI Modern School, Hadas CBSE School, Delhi Public School, MIHAN, Nagpur participated in the competitive examination. Dr. Anuradha Gadkari, Dr. Seema Somalwar, Dr. Rita Israni, Dr. Lalita Sangolkar, Mrs. Prachi Lakhe, Dr. Bharati Ganu, Mrs. Asmitha Duragkar, Mrs. Mamata Karikar and Mrs. Mamta Chopade were the volunteers from IWSA.

Nellore

1. Talk on Latest Technologies in Genetics

Topic: **Next Generation Sequencing, Gene Editing, and Microarray Data Analysis**

Date: **8th and 9th October 2025**

Speaker: **Dr Neelima Raj,** Cancer researcher (self-employed)

Venue: **BSc Nursing department, Akshara Institute of Management and Technology,** Renigunta road, Tirupati, Andhra Pradesh

Outreach: 137

The two day-event focused on providing students with a deeper understanding of these cutting-edge technologies and their applications in nursing healthcare. The session on NGS covered the basics of NGS technologies, data analysis, and their applications in genomics mainly and discussed about the Omics. The gene editing session focused on the CRISPR-Cas9 system and its applications in precision medicine. Students gained insights into the potential of gene editing in treating genetic disorders. The Micro array session was very brief which covered only the principles of microarray technology, data analysis, and interpretation. Students learned about the applications of microarray analysis in understanding gene expression and identifying biomarkers.

The event enhanced the nursing students' knowledge and skills in bioinformatics and genomics, preparing them for potential career opportunities and pursue courses in genomics in these fields. 60 students of 3rd and 4th year students attended on the first day and 77 students of 1st and 2nd year on the second day.

Roorkee

1. IWSA- Teachers' Day Workshop

Topic: **Holistic Approach to Well Being through Art**

Date: **5th September 2025**

Resource person: **Mrs. Rashim Bhargava,** Certified Practitioner of the Zentangle Method

Venue: **ESPEE Global International School, Roorkee**

Outreach: 46

This two and a half hours workshop on the unique, meditative, mindful and relaxing Zentangle Art was received with great interest and enthusiasm by all the participants as it allowed them to relax, de-stress, focus and create at the same time. People who had never done any artwork were so happy to have been able to create beautiful pieces with clear instructions and easy step-outs. Enthusiastic teachers at the school were so thrilled that they are planning to take it further into their lives.

2. IWSA–BRNS Popular Science Lecture for Schools

Topic: **"Number Ninjas (Skill Mathematics)"**

Date: **29th September 2025**

Speaker: **Dr Rama Mehta**, Rt. Scientist National Institute of Hydrology, Brain Energizer & Memory Trainer

Venue: **Maa Saraswati Public Sr Sec School, Haridwar**

Outreach: 810

In this session, speaker tried to upgrade students' skills in certain arithmetic operations. It helped the participant students to identify and fill gaps in their understanding, ensuring they had a solid foundation before moving to higher-level mathematics. This session provided a chance to practice and solidify understanding, and increased the student's confidence in dealing with mathematical terms and problems. The topics covered were Magic with Numbers, Quick Multiplication & Division with skill Tech, Fast multiplication in one line, multiplication with series of one, multiplication with series of nine, squares of numbers ending with 5, squares of numbers ending with 25, square the numbers using Yavadunam Tech, squaring the repeated series of numbers, square of natural numbers, square roots within seconds & riddles. The Q & A session and practice sheet were designed to make each participant as quick and deft with numbers as a Ninja!

Article

Air Pollution and Stroke

Prof Dr Bindu Menon and Dr Rizwana Syed

1. Introduction: A Silent Threat in the Air

Air pollution is often evident in smoke-filled skies, acrid exhaust fumes, and thick urban smog that shrouds city landscapes. However, the subtler and more insidious impacts of air pollution linger silently, particularly its profound effects on brain health. While it is frequently associated with respiratory ailments such as asthma and bronchitis, the reality is that air pollution plays a significant role in triggering strokes, a condition that is a leading cause of death and disability worldwide. Over the last twenty years, extensive research has spotlighted air pollution as a modifiable environmental risk factor that can be addressed. As global urbanization accelerates and larger populations are exposed to toxic air, understanding this connection and implementing effective strategies to mitigate it becomes imperative for improving global health outcomes.

2. Air Pollution

Air pollution is defined as the contamination of indoor or outdoor air by harmful biological, chemical, and physical agents that pose serious health risks. It comprises a complex mixture of solid particles and gases, some so minuscule that they can penetrate deep into the lungs and even infiltrate the bloodstream. The primary pollutants contributing to this perilous environment include:

Particulate Matter (PM2.5 and PM10):

Tiny, microscopic solids or liquid droplets suspended in the air, which arise from various sources. PM is a composite of numerous chemicals, with larger particles (PM10, measuring less than 10 micrometers) primarily resulting from industrial emissions, while the more dangerous PM2.5 particles (less than 2.5 micrometers in diameter) originate mainly from vehicle traffic. These ultrafine particles are particularly hazardous, as they can reach deep lung tissues, enter the bloodstream, and affect organs throughout the body.

Nitrogen Dioxide (NO_2): A harmful gas released from vehicles, power plants, and other combustion processes. NO_2 is notorious for contributing to respiratory inflammation and oxidative stress, aggravating pre-existing conditions.

Sulfur Dioxide (SO_2): This pungent gas is generated by the combustion of fossil fuels containing sulfur, like coal and oil, and can significantly impair respiratory health.

Carbon Monoxide (CO): An invisible, odorless gas produced by the incomplete burning of carbon-containing fuels, posing a severe risk to health, particularly in enclosed spaces.

Ground-Level Ozone (O_3): A secondary pollutant formed when sunlight interacts with nitrogen oxides and volatile organic compounds. Ground-level ozone is particularly harmful as it can impair lung function and increase susceptibility to respiratory infections.

These pollutants vary by geographical location and seasonal conditions but are commonly found in heavily trafficked urban areas and regions with industrial activity.

3. Understanding Stroke: A Neurological Emergency

A stroke is a critical medical emergency that occurs when blood flow to a specific area of the brain is either interrupted or drastically reduced, leading to a deprivation of oxygen and vital nutrients that brain cells require. In mere minutes, this can result in irreversible cell damage and death. There are two principal types of strokes:

Ischemic Stroke (accounting for 80% of cases): Caused by a blockage in the arteries supplying blood to the brain, typically resulting from a clot that has developed either from the vessel walls or due to blood clots formed elsewhere in the body.

Hemorrhagic Stroke: This type occurs when a blood vessel within or surrounding the brain ruptures, leading to bleeding that exerts pressure on brain tissues and can cause extensive damage.

Both types of strokes carry the risk of permanent neurological damage and can lead to death. Traditional risk factors, including high blood pressure, high cholesterol, diabetes, tobacco use, sedentary lifestyle, and poor dietary choices, have long been recognized, but emerging research increasingly highlights air pollution as a significant environmental trigger.

4. Air Pollution Contributes to Stroke

An expanding body of epidemiological research demonstrates a robust correlation between air pollution and heightened stroke incidence, particularly among older adults and those with preexisting cardiovascular conditions.

Short-Term Exposure: Daily fluctuations in air pollution levels, especially those of PM2.5, have been linked to an increase in hospital admissions for stroke. These fine particulate pollutants can destabilize atherosclerotic plaques—fatty deposits that narrow arteries—and can also elevate blood coagulability and provoke cardiac arrhythmias, all contributing to ischemic events.

Long-Term Exposure: Residing in areas plagued by chronic air pollution can lead to sustained oxidative stress and systemic inflammation, promoting the progression of atherosclerosis and hypertension, both of which are critical risk factors for stroke. Notably, a landmark meta-analysis conducted by Shah et al. in 2015 revealed that even slight increases in PM2.5 levels were associated with a significant rise in stroke-related hospitalizations.

5. Biological Mechanisms Behind the Link

The complex connection between air pollution and stroke involves multiple biological pathways that illuminate how these pollutants affect health:

Systemic Inflammation: Inhaled pollutants trigger an inflammatory response not just localized in the lungs, but throughout the body, impacting blood vessel function.

Endothelial Dysfunction: Pollutants can damage the endothelium—the delicate inner lining of blood vessels—compromising its ability to regulate blood flow and clotting effectively.

Oxidative Stress: Air pollutants produce free radicals that inflict cellular damage, hastening vascular aging and contributing to disease.

Increased Coagulability: Exposure to pollutants can alter platelet functionality and increase blood viscosity, raising the likelihood of clot formation.

Hypertension: Chronic exposure to polluted air can elevate blood pressure by interfering with the autonomic nervous system and affecting renal function, further exacerbating stroke risk.

6. Global Burden of Stroke Attributed to Air Pollution

The findings from the Global Burden of Disease (GBD) Study in 2019 identified air pollution as one of the foremost risk factors for premature death on a global scale, with stroke as a significant contributor to this toll. It's estimated that over 3 million stroke-related deaths each year can be connected to both ambient and household air pollution. Developing nations bear the brunt of this crisis, where rapid industrialization, lax regulations, and high population density converge to create alarmingly poor air quality. According to the World Health Organization (WHO), an astounding nine out of ten people around the globe breathe air that exceeds safe health thresholds.

7. Rural Women and Household Air Pollution: A Hidden Stroke Risk

In many rural communities, biomass fuels like firewood, dung, and crop residue are still commonly used for cooking. Women, who typically cook in poorly ventilated spaces, face chronic exposure to high levels of indoor air pollution.

Health Risk: Daily exposure to smoke increases stroke risk due to systemic inflammation, oxidative stress and high BP.

Gender Disparity: Women are disproportionately affected due to longer exposure times and limited access to clean cooking alternatives.

Global Impact: Household air pollution contributes to nearly 25% of global stroke deaths in women linked to air pollution (WHO, 2021).

A study published in *Environmental Health Perspectives (2023)* confirmed that women exposed to biomass smoke daily for more than five years exhibited higher systemic inflammation and arterial stiffness, both of which are precursors to stroke.

Reducing indoor air pollution through clean energy access and public health outreach is critical to protecting women's health and lowering stroke rates in rural populations.

8. At Risk:

Specific populations are particularly vulnerable to the detrimental effects of air pollution:

Elderly individuals with compromised cardiovascular systems face an elevated risk.

Children and infants are also at heightened risk due to their developing lungs and immature immune systems.

People with pre-existing health conditions such as hypertension, heart disease, or diabetes are more adversely affected.

Low-income and marginalized communities often reside closer to pollution sources and have limited access to healthcare resources, compounding their risk.

Urban dwellers, especially those in industrial cities or near major roadways, find themselves in environments where air quality is critically poor.

Rural women, especially those who cook with biomass fuels like firewood in poorly ventilated kitchens, experience chronic indoor air pollution exposure, significantly increasing their risk for stroke and other cardiovascular diseases.

These groups face disproportionately greater risks of stroke due to the dual challenges of environmental exposure and socio-economic barriers affecting their access to prevention and treatment options.

9. Prevention Techniques and Public Health Measures Addressing air quality to reduce the risk of stroke requires a multi-faceted, collaborative approach:

Government Intervention:

Enforce stricter pollution regulations for industries and automobiles to curb emissions.

Enhance public transit systems and promote eco-friendly transportation options, such as cycling and walking.

Invest in renewable energy technologies like wind and solar to diminish dependence on fossil fuels and reduce harmful emissions.

Regularly monitor air quality indices and ensure that this information is readily available to the public.

Establish green spaces in urban planning to improve air quality and encourage physical activity among residents.

Limit heavy truck traffic in residential neighbourhoods and create low-emission zones to protect vulnerable populations.

Wear N95 mask for additional protection

Incorporate air-filtering solutions in urban architecture, like green roofs and roadside vegetation, to improve air quality.

Initiatives like LPG distribution (e.g., India's PMUY) and clean stove programs show promise but face challenges in affordability, adoption, and sustained use.

Innovations like solar-powered cookstoves, bio-digesters, and improved ventilation designs are being piloted in Africa and South Asia.

Individual-Level Measures:

Stay indoors during days of high pollution, particularly during rush hours when traffic is heaviest.

Use High Efficiency Particulate Arresting (HEPA) air purifiers at home to filter out harmful particles.

When outdoor exposure is unavoidable, wearing N95 masks can provide additional protection.

Adopt a heart-healthy lifestyle through balanced nutrition and regular exercise to mitigate environmental health risks.

10. Conclusion: Breathing Cleaner for Brain Health

The connection between air pollution and stroke is no longer theorized; it is a well-established, alarming reality that demands urgent attention. However, it also presents a modifiable risk factor upon which public health initiatives can act decisively. By acknowledging air pollution as a significant contributor to stroke, we unlock critical opportunities to enhance health outcomes. Cleaner air translates to healthier hearts, brains, and lives. By reducing exposure to air pollution, we can prevent thousands of strokes annually. Through informed policymaking, technological advancements, and community engagement, we can pave the way towards a healthier, more breathable future.

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Images courtesy: Ms. Priya Jacob, IWSA

About the Authors

Prof. Dr Bindu Menon (M.D. (Med.), D.M. (Neuro), DNB. (Neuro), PGDCN (Neuro),(London) FRCP (Edinburgh), FRCP (London), MNAMS. FICP, FIAN, FWSO, FAAN, FAMS

Prof. Bindu Menon is the Head of the Department at Apollo Hospitals Nellore, India and founder of Dr Bindu Menon Foundation. She has a teaching experience of 23 years, over 100 publications, editor of five books and has 23 chapters to her credit.

She holds various positions; Board member SSO/ Research committee Co-Chair/ Genesis member World Stroke Organization; Secretary General of the Indian Epilepsy Association, Adjunct faculty at National Institute of Epidemiology/Indian Council of Medical Research, Asia Oceanic Association of Neurology representative of the EAN Scientific Panel on Epilepsy; SG Neuroepidemiology WFN; Associate Editor, Neurology section, Annals of Medicine, Chair Outreach subsection IAN, OneNeurology Ambassador, WICCI State Vice President, Delhi External Affairs Council.

She is a recipient of 62 International and national awards, the ILAE Asian and Oceanian outstanding epilepsy award, World Stroke Award from the WSO, the Mridha Spirit of Neurology Humanitarian Award, the A.B. Baker Teacher Award, Advocate and Advisor at Palatucci Leadership Award from the AAN, Best doctor award from National IMA and Lions International to name a few.)

She has 9 fellowships to her credit and has delivered 10 oration lectures.

She founded the Dr Bindu Menon Foundation which has been instrumental in starting several novel projects for the first time in the country, “Neurology on Wheels”, Tele awareness Programme, Apps “Stroke Help” “Epilepsy Help” “NeuroCare” and “Stroke Connect”. A passionate advocate, she leads community outreach programs and continues to champion awareness and bridge the treatment gap in neurological care across India.

She is the Founder of the start-up “Artificial Intelligence in Neurology” www.AtINeu.org

www.drbindumenon.com

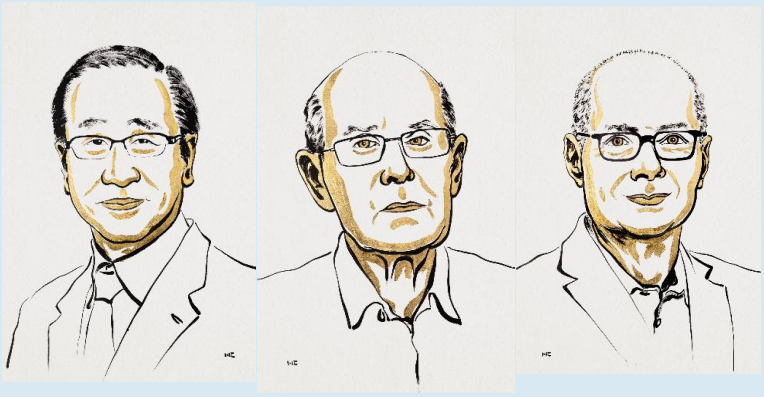
Dr. Rizwana Syed is an MBBS graduate and ECFMG-certified physician aspiring to pursue Neurology residency. She has completed neurology clinical rotations in the U.S., gaining exposure to diverse healthcare systems. She is currently working as a Medical Officer at Apollo Specialty Hospitals, Nellore. Her interests include neurological research, medical education, and academic writing.

Nobel Prizes - 2025

1. Chemistry

By Dr. Shyamala Bharadwaj

The 2025 Nobel Prize in Chemistry has been awarded to **Susumu Kitagawa, Richard Robson and Omar M. Yaghi** "for the development of metal–organic frameworks." Metal–organic frameworks (MOFs) are porous materials comprised of metal ion or cluster nodes coordinated to organic linkers. The seemingly endless combinations of nodes and linkers enable the design of MOFs with an extraordinarily diverse range of structures and properties. Their large surface area, adjustable pore size, structural flexibility, and ability for functionalisation at either the metal nodes or organic linkers have shown potential in applications such as gas storage and separation, chemical sensors, water harvesting and purification, heterogeneous catalysis, energy storage, and drug delivery. The modular nature of MOFs has also stimulated extensive fundamental studies on synthetic methodologies, thermal expansion behaviour, magnetic structures, and structural disorder.



Susumu Kitagawa was born in July 1951 at Kyoto, Japan. Ph.D in 1979 from Kyoto University, Japan. His affiliation at the time of the award: Professor, Kyoto University, Kyoto, Japan.

Richard Robson was born on 4th June 1937 at Glusburn, UK. Ph.D in 1962 from University of Oxford, UK. His affiliation at the time of the award: Professor, University of Melbourne, Australia.

Omar Yaghi was born on 9th February 1965 at Amman, Jordan. Ph.D in 1990 from University of Illnois Urbans-Champaign, USA. His affiliation at the time of the award: Professor, University of California, Berkeley, USA.

The story of this year's Nobel Prize for Chemistry is quite interesting from the fact that the three Nobel laurates have worked from laboratories located at three different continents of the world and their birthdays span between 1937 to 1965. Yet, they have worked on the same topic of development of a new type of molecular architecture called metal-organic frameworks (MOFs).

It all started in 1989, when Richard Robson tested utilising the inherent properties of atoms in a new way. Robinson's inspiration came when he was preparing for a classic chemistry lesson for the students of Melbourne University, in which the students were asked to build molecules with wooden balls as atoms and wooden rods as chemical bonds.

He combined positively charged copper ions with a four-armed molecule; this had a chemical group that was attracted to copper ions at the end of each arm. When they were combined, they bonded to form a well-ordered, spacious crystal. It was like a diamond filled with innumerable cavities. (Fig. 1)

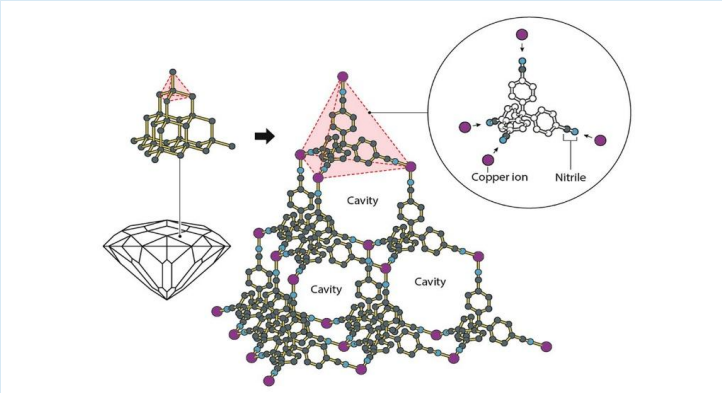


Fig. 1 The copper ions are combined with a molecule that has four arms and at the end of each arm has a chemical group, nitrile, that is attracted to the positively charged copper ions, resulting in an ordered spacious crystal. (©Johan Jarnestad/The Royal Swedish Academy of Sciences)

Robson immediately recognised the potential of his molecular construction, but it was unstable and collapsed easily. However, Susumu Kitagawa and Omar Yaghi provided this building method with a firm foundation; between 1992 and 2003 they made, separately, a series of revolutionary discoveries. Kitagawa showed that gases can flow in and out of the constructions and predicted that MOFs could be made flexible. Yaghi created a very stable MOF and showed that it can be modified using rational design, giving it new and desirable properties.

As a young student, Kitagawa was influenced by a book written by the Nobel Laureate Hideki Yukawa where the author had quoted an ancient Chinese phisosopher, Zhuangzi, “even if something does not bring immediate benefit, it may still turn out to be valuable”

Research funders were not impressed by Kitagawa’s three dimentional metal organic frameworks (MOFs) which were stable and could absorb and release methane, nitrogen and oxygen without changing shape. One of the reasons was that chemists already had zeolites, stable and porous materials that could be built from silicon dioxide. Zeolites can do the same function of absorbing gases like MOFs synthesized by Kitagawa.

In 1998, Kitagawa presented several advantages with MOFs, like they can be created from different types of molecules, with enormous potential for integrating different functions. He also showed that MOFs can form soft materials, unlike zeolites, which are hard matrials. Thus, Kitagawa showed that MOFs contain flexible molecular building blocks (Fig. 2) that can create a pliant material.

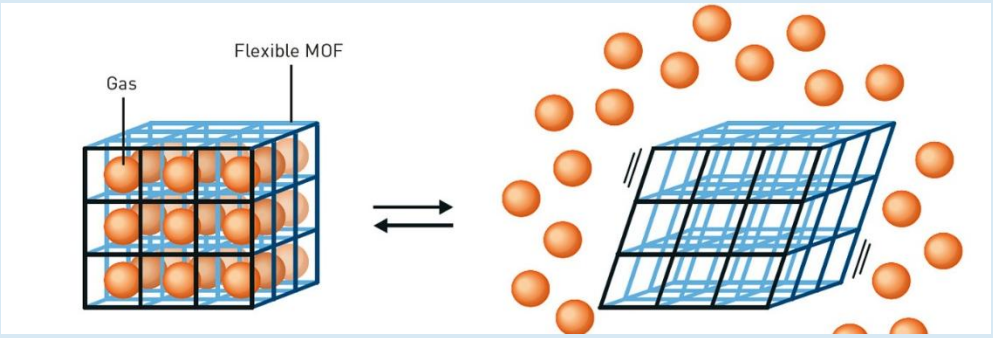


Fig. 2 In 1998, Kitagawa proposed that MOFs could be made flexible. There are now numerous flexible MOFs which can change shape, for example, when they are filled or emptied of various substances. (©Johan Jarnestad/The Royal Swedish Academy of Sciences)

The story of Omar Yaghi is more interesting, considering his childhood days in Amman, Jordan, where he and his many siblings were raised in a single room with no electricity or running water. At the age of 15, Yaghi moved to the US to study. He was attracted by chemistry and the art of designing new materials. In 1992, Yaghi started his first position as research leader at Arizona state University where he succeeded in combiniing metal ions with organic molecules to create large crystals that could host guest molecules in its spaces. These materials were so stable that they could be heated to 350°C without collapsing. Yaghi described this material in an article in Nature (in 1995) where he coined the term “metal-organic framework”. This term is now used to describe extended and ordered molecular structures that contain cavities and are built from metals and organic (carbon-based) molecules.

Yaghi presented MOF – 5 to the world in 1999 and this material became a classic in the field. A couple of grams of MOF – 5 could hold an area as big as a football pitch, which means it can absorb much more gas than a zeolite could (Fig.3).

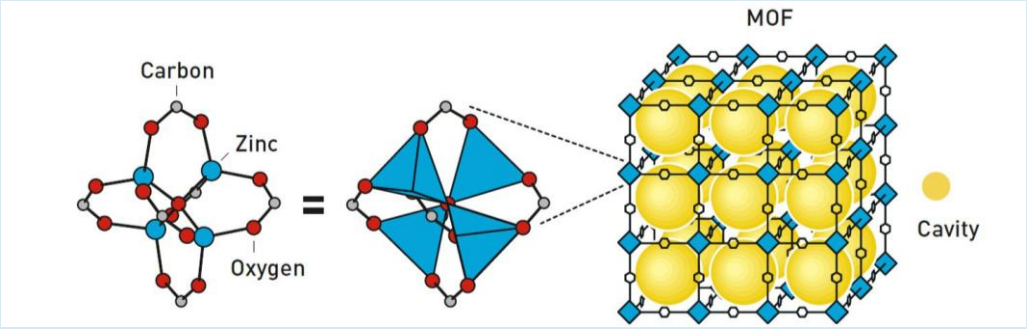


Fig. 3 In 1999, Yaghi constructed a very stable material, MOF – 5, which has cubic spaces. Just a couple of grams can hold an area as big as a football pitch. (©Johan Jarnestad/The Royal Swedish Academy of Sciences)

It is believed by some researchers that metal organic frameworks (MOFs) have such huge potential that they will be the material of the 21st century. Through the development of MOFs Richard Robson, Susumu Kitagawa and Omar Yaghi have provided chemists with new opportunities for solving the challenges we face. Following the laureates' groundbreaking discoveries, chemists have built tens of thousands of different MOFs. Some of these may contribute to solving some of humankind's greatest challenges, with applications that include separating PFAS (perfluoroalkyl and polyfluoroalkyl substances) from water, breaking down traces of pharmaceuticals in the environment, capturing carbon dioxide or harvesting water from desert air.

Reference: https://www.nobelprize.org/prizes/chemistry/2024/

2. Physiology and Medicine

By Dr. Seema Das

The 2025 Nobel Prize in Physiology or Medicine was awarded to **Mary E. Brunkow**, **Fred Ramsdell**, and **Shimon Sakaguchi** for their discoveries concerning *peripheral immune tolerance*, the subtle mechanisms that stop our immune system from attacking the body it is meant to protect. Their work unites decades of research into one clear answer, a special class of cells called **regulatory T cells** or **Tregs**, that act as the body's immune brakes, governed by the gene **FOXP3**.

1. **Mary E. Brunkow (USA):** Mary E. Brunkow, an American geneticist, identified the FOXP3 gene mutation responsible for immune system imbalance in both humans and mice. Her work showed how a defective FOXP3 gene leads to loss of immune control, causing severe autoimmune disorders such as Type 1 diabetes and IPEX syndrome. This discovery revealed the genetic foundation of immune self-tolerance and opened new directions in molecular immunology.

2. **Fred Ramsdell (USA):** Fred Ramsdell, an American immunologist, confirmed the functional importance of the FOXP3 gene and its connection to regulatory T cells (Tregs). He demonstrated that FOXP3 acts as a "master control gene" guiding Treg formation. Ramsdell's contribution bridged genetics and immunology, showing how gene expression regulates immune stability. His findings have helped in developing targeted therapies for autoimmune and inflammatory diseases.

Fig 1: Winners of the 2025 Nobel Prize in Physiology or Medicine

3. **Shimon Sakaguchi (Japan):** Shimon Sakaguchi, a Japanese scientist, first discovered regulatory T cells (Tregs) in the early 1990s. His research proved that these cells act as "immune guardians," preventing harmful attacks on the body's own tissues. Sakaguchi's work clarified how the immune system balances defense and tolerance, a key to understanding autoimmune diseases. His pioneering studies formed the foundation that later linked with Brunkow's and Ramsdell's findings. Together, these scientists uncovered the complete mechanism of immune self-control, linking a genetic key (FOXP3) to its cellular regulators (Tregs). **Prize amount,** 11 million Swedish kronor, is to be shared equally between the laureates.

The discovery of **regulatory T cells (Tregs)** transformed modern immunology by explaining how the immune system avoids attacking healthy tissues and why autoimmune diseases such as **type 1 diabetes and lupus** occur when this control fails. It also opened new therapeutic possibilities—either calming harmful immune responses or enhancing them against cancer.

For much of the twentieth century, scientists believed immune tolerance was achieved mainly in the **thymus**, where self-reactive immune cells are eliminated during early development—a process known as **central tolerance**. However, this theory could not explain why autoimmune diseases sometimes appear later in life. Researchers suspected an additional mechanism that regulates immune activity after immune cells mature and circulate in the body.

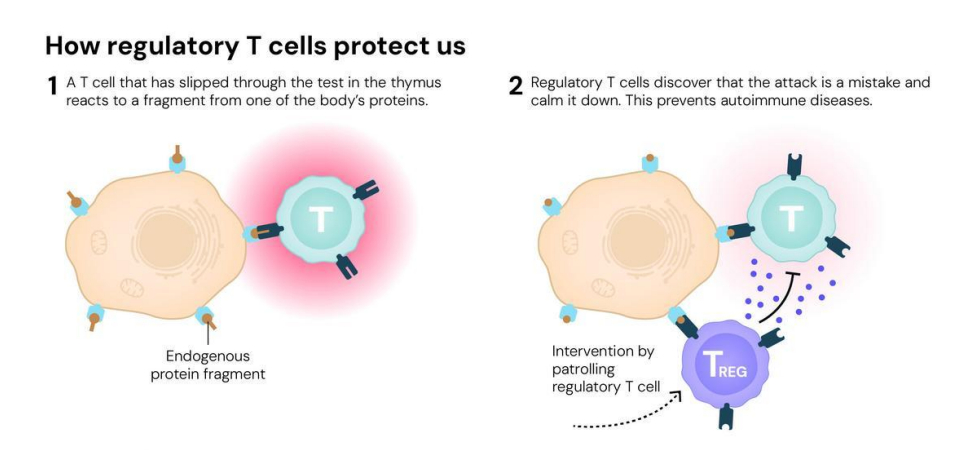


Figure 2: Protection by Treg cells

In **1995**, **Shimon Sakaguchi** and colleagues discovered that a small subset of T cells could suppress autoimmune reactions in mice. Removing these cells triggered disease, while restoring them prevented it— revealing the existence of **regulatory T cells**. In **2001**, **Mary Brunkow and Fred Ramsdell** identified a mutation in a gene called **FOXP3**, which prevented the formation of these regulatory cells and caused fatal autoimmune disease in mice. Mutations in human FOXP3 were later linked to **IPEX syndrome**, confirming its critical role.

By **2003**, Sakaguchi's team showed that **FOXP3 acts as the master regulator of the Treg lineage**, establishing a unified understanding of immune self-regulation. These discoveries clarified the delicate balance between immune attack and tolerance and laid the groundwork for new therapies. Today, scientists are exploring **Treg-based treatments** for autoimmune diseases and organ transplantation, while reducing Treg activity may enhance cancer immunotherapy. Over **200 clinical trials worldwide** now investigate these approaches.

Yet therapeutic manipulation requires caution: too much immune suppression can increase infection risk, while too little may trigger autoimmunity. The future lies in **precise immune modulation**, maintaining balance rather than complete suppression.

This work highlights a central principle of medicine—that health depends on equilibrium—echoing the goals of **Sustainable Development Goal 3: Good Health and Well-being**.

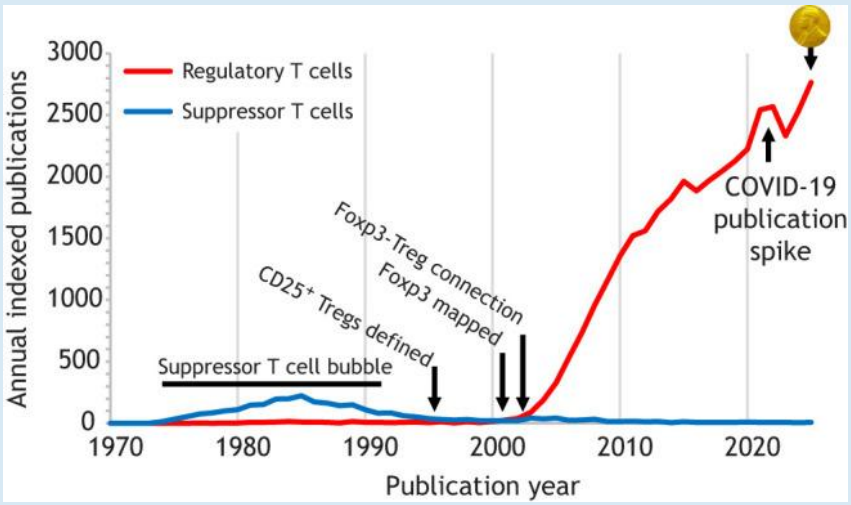


Fig. 3: Publication timeline for work on regulatory T cells.

Annual publications based on PubMed indexation. Regulatory T cell publications include mentions of either 'regulatory T cell' or 'Treg'. 2025 data are extrapolated from publication data in January to October. Key dates are indicated on the graph.

Key publications: Sakaguchi S, Sakaguchi N, Asano M, Itoh M, Toda M. Immunologic self-tolerance maintained by activated T cells expressing IL-2 receptor a-chains (CD25). Breakdown of a single mechanism of self-tolerance causes various autoimmune diseases. J Immunol. 1995:155:1151-1164.

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3. Physics

By Dr. Dhanya Suresh

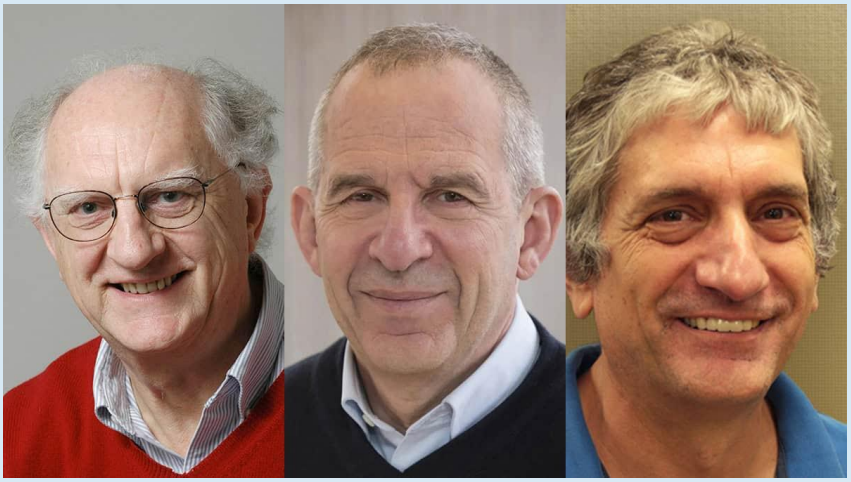

Fig 1: Winners of the 2025 Nobel Prize in Physics

This year's Physics Nobel Prize was awarded to three professors from USA, Prof. **John Clarke,** Prof. **Michel H. Devoret,** and Prof. **John M. Martinis** *"for the discovery of macroscopic quantum mechanical tunnelling and energy quantisation in an electric circuit".* **John Clarke**, born 1942 in Cambridge, UK, completed his PhD in1968 from University of Cambridge, UK., and joined as a Professor at University of California, Berkeley. **Michel H. Devoret**, born in 1953 in Paris, France, completed his PhD in 1982 from Université Paris-Saclay, France, and joined University of California, Berkeley. At present he is professor at both Yale University, New Haven, CT and University of California, Santa Barbara and he is also Chief Scientist for Quantum Hardware at Google Quantum AI, Santa Barbara, CA. **John M. Martinis**, born in 1958 did his PhD in 1987 from University of California, Berkeley, and at present he is professor at the University of California, Santa Barbara, and also Chief Technology Officer at Qolab, Los Angeles, CA.

Quantum mechanics allows a particle to move straight through a barrier, using a process called tunnelling. As soon as large numbers of particles are involved, quantum mechanical effects usually become insignificant. The laureates' experiments using superconducting materials demonstrated that quantum mechanical properties can be made concrete on a macroscopic scale.

In ordinary conductive materials current flows because of the flow of free electrons whereas in superconductors the individual electrons may become organised, forming a synchronised flow without any resistance. The electrons are joined together as pairs known as Cooper pairs, which can be described as one quantum mechanical system. In 1962, a British physicist, Brian Josephson, did quantum mechanical calculations and

predicted the mathematical relationships for the current and voltage across the weak link when two such superconductors are placed in proximity, with some restriction between them in 1962. This restriction can be a barrier of a thin insulator. This device is known as Josephson junction and the effect which produces a current without any applied voltage is known as **Josephson effect.** It is an example of a macroscopic quantum phenomenon, where the effects of quantum mechanics are observable at ordinary, rather than atomic, scale. Josephson was awarded Nobel Prize for this theory in 1973.

John Clarke completed his doctoral degree at the University of Cambridge, UK, in 1968 under the academic guidance of Brian Pippard, who was the advisor of Josephson also. After joining Berkeley, University of California, he built up his research group and specialized in exploring a range of phenomena using superconductors and the Josephson junction. By the mid-1980s, Michel Devoret had joined John Clarke's research group as a postdoc, after receiving his doctorate in Paris. This group also included the doctoral student, John Martinis. Together, they took on the challenge of demonstrating macroscopic quantum tunnelling. To measure the quantum phenomena, they fed a weak current into the Josephson junction and measured the voltage, which is related to the electrical resistance in the circuit. The voltage over the Josephson junction was initially zero, as expected. This is because the wave function for the system is enclosed in a state that does not allow a voltage to arise. Then they studied how long it took for the system to tunnel out of this state, causing a voltage. Because quantum mechanics entails an element of chance, they took numerous measurements and plotted their results as graphs, from which they could read the duration of the zero-voltage state. This is similar to how measurements of the half-lives of atomic nuclei are based on statistics of numerous instances of decay. The laureates introduced microwaves of varying wavelengths into the zero-voltage state. Some of these were absorbed, and the system then moved to a higher energy level. This experiment showed that the zero-voltage state had a shorter duration when the system contained more energy – which is exactly what quantum mechanics predicts.

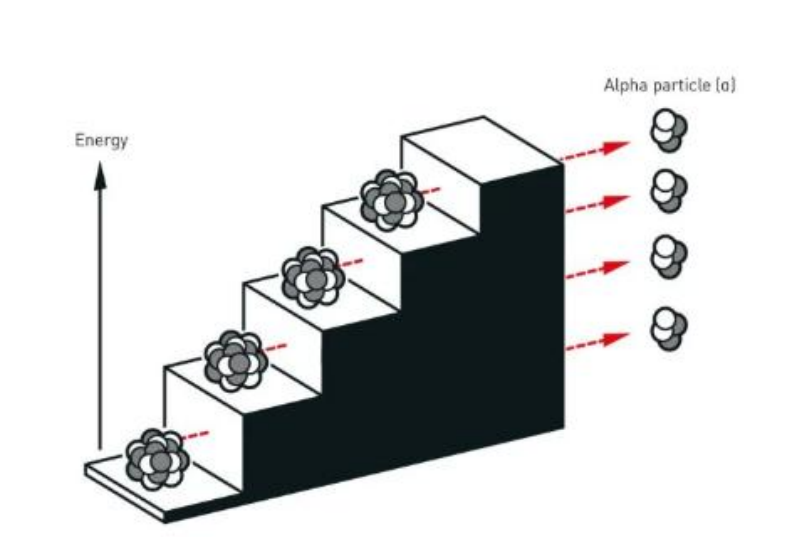

Fig 2: A quantum mechanical system behind a barrier can have varying amounts of energy, but it can only absorb or emit specific amounts of this energy. The system is quantised. Tunnelling occurs more easily at a higher energy level than at a lower one so, statistically, a system with more energy is held captive for less time than one with less energy.

This type of macroscopic quantum state offers new potential for experiments using the phenomena that govern the microscopic world of particles. It can be regarded as a form of artificial atom on a large scale – an atom with cables and sockets that can be connected into new test set-ups or utilised in new quantum technology. Another example is the quantum computer experiment subsequently performed by Martinis, in which he utilised exactly the energy quantisation that he and the other two laureates had demonstrated. He used a circuit with quantised states as information-bearing units – a quantum bit. The lowest energy state and the first step upward functioned as zero and one, respectively. Superconducting circuits are one of the techniques being explored in attempts to construct a future quantum computer. This year's laureates have thus contributed to practical benefits as well as to theoretical understanding of our physical world.

This year's Nobel prize has provided opportunities for developing the next generation of quantum technology, including quantum cryptography, quantum computers, and quantum sensors. One of the strong but completely theoretical foundation of quantum mechanics, laid down almost 100 years back (Erwin Schrödinger's equation which predicted tunneling / probability of existence in classically forbidden regions was published in 1926 and awarded with a Nobel Prize in 1933) is made practical now, using another 60-year-old (Josephson's effect was predicted in 1962 and Nobel Prize was awarded in 1973) theoretical calculations! This demonstrates the sturdy

foundations of the field and how combined, persistent efforts through generations lead to progress, sometime slow and steady, sometime in quantum leaps and sometimes through tunneling…

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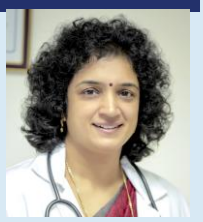
https://www.nobelprize.org/uploads/2025/12/popular-physicsprize2025-4.pdf

IWSA Members: Honors, Achievements and Invitations



1. **Dr Bindu Menon, Ex Convenor, Nellore branch**, has been elected as the Co-Chair of the Research Committee, World Stroke Organisation.

2. **Dr. Vijaya Khader**, **Convenor, Hyderabad Branch** delivered a lecture on "Feeding Smart Right from Start," at Nutri Ignite 2025, on 12th September,2025 organized by the Department of Botany and Food & Nutrition of RBVRR Women's college. She was

invited as a distinguished speaker at the 10th Asian PGPR Society India Chapter National Conference at Jammu from 15th to 17th September, 2025. She spoke on how to improve the economic status of farm women through application of Science & Technology. Dr. Vijaya Khader also chaired a Session on Gender and climate change: Navigating the impacts on fisheries and aquaculture on 1st & 2nd October 2025. She was invited to speak on the health benefits of Palm Oil at Bhopal: Palm Oil Conclave 2025, (Reshaping Perception through Palm Oil Dialogues - Health, Marketing, Climate) on 6th December, 2025 at Hotel Courtyard Marriott, Bhopal, M.P. She was part of the technical session wherein there were three other speakers. This Conclave was attended by more than 200 people.

3. **Dr. Gita Sharma (Hyderabad Branch),** faculty of the Department of Microbiology, University College of Science, Osmania University was felicitated during the International Conference, commemorating Golden Jubilee Celebrations of the Department. Prof. Gita Sharma, one of the founding faculty members, made landmark contributions to vaccine development, playing a key role in developing Sanvac B at Shantha Biotech and Academia-Industry collaborations at Department.

4. **Dr. P. Cheena Chawla** from Delhi branch was honored by Union Health Minister, Govt. of India, Shri J. P. Nadda on 27th November 2025 for her achievements in cancer prevention through Awareness cum Community Screening camps on cervical, breast, oral and prostrate cancers. She had also made innovative efforts in providing research-based geriatric care facilities to communities with focus on integrative healthcare. Her efforts on expanding community healthcare includes creating awareness on HPV vaccination, introduction of Life Course Vaccination and Reducing Zero Dose children across South East Asia region, starting with India. This program was arranged by Sarva Rithu Seva Foundation and Sarva Kalyankari Trust.

5. **Ms. Rekha Pradhan** was invited as judge and chief guest for G.H. Ananthanarayan English Oratorical Contest on 13th September 2025, held at SIES (Dr.Abdul Kalam) Memorial High School, Ghatkopar and was felicitated.

6. **Dr. Shyamala Bharadwaj, Dr. Seema Das, Dr. Dhanya Suresh, Dr. Paramjith Anthappan** and **Dr. Suparna Kamath** were invited as judges in the All india inter AECS / JC Rashtriya Bal Vaigyanic Pradarshani (RBVP) and Teaching Aid Exhibition 2025, held in Atomic Energy Central School 6, Anushaktinagar on 6th December 2025. STEM for Vikasit and Atmanirbhar Bharat was the theme of the exhibition, with seven subthemes, Sustainable agriculture, Waste management and alternatives to plastics, Green energy, Emerging technologies, Recreational mathematical modelling, Health and hygiene and Water conservation and management. 30 schools from all over India participated, with 7 teams each.




7. **Ms.Tripta Tewari,** IWSA HQ, was invited as a judge at Rajiv Gandhi College of Arts, Commerce and Science, Vashi for an intercollegiate competition, '**Best out of Waste**" on 9th December 2025. In the same college, **Dr. Smita Kekatpure** was invited as a judge for **intercollegiate cooking competition** on 10th December 2025. These competitions were part of 5 days mega festival, Prarambh, with 50 + events.

8. **Dr. Mangala Ghorpade, Ar. Sonam Ambe** and **Ms. Sunu Nainan** from IWSA HQ were invited as judges for the E & F South Ward level interschool Science Exhibition, held at St. Mary's School, Mazgaon on 27th November 2025. 50 schools participated in this exhibition and more than 700 people attended.

9. **Dr. Lalitha Dhareshwar, Trustee, IWSA** was invited as Guest of Honor and was felicitated in the same event. She was introduced by a robot designed and made by her mentee, Mr. Ajayraj Jadhav. Dr. Lalitha was also invited as one of the judges at an event of SHAKTI, an NGO run by Vimla Nandakumar, where 16 underprivileged girls enacted the roles of 16 women scientists and presented some of their work.

10. **Dr. Yojana Singh** and **Ms. Bhakti Belapurkar** from HQ were invited as judges for a science quiz for children of 6th – 8th standard, Vigyan Prashn Manjusha-2025, held at the NMMC headquarters in Nerul on 17th November 2025.

11. **Dr. Paramjit Anthappan** and **Dr. Santhini Nair,** IWSA HQ**,** were invited as resource persons to conduct a session on "Mushroom Cultivation for Women Empowerment" by WISE SNDT Women's University Incubation Centre on 12th September 2025. **Ms. Vijaya Chakravarty,** Member, IWSA HQ, was the host for the session.

Women Achievers

by Dr. Shyamala Bharadhwaj

Dr. Anjana Badrinarayanan- Infosys Prize 2025 in Life Sciences

The Infosys Prize 2025 in Life Sciences is awarded to Dr. Anjana Badrinarayanan for pioneering contributions to understanding mechanisms of genome maintenance and repair. Through innovative live-cell imaging combined with genetic and cell biological approaches, her work has revealed fundamental principles of how DNA damage is repaired, demonstrated mutagenesis in non-dividing cells, and identified novel pathways of mitochondrial DNA damage responses, illuminating principles central to life and evolution.

Anjana Badrinarayanan's discoveries demonstrating mutagenesis in non-dividing cells have overturned classical paradigms that link mutation solely to replication, providing mechanistic insight into how dormant bacterial populations evolve and acquire antibiotic resistance. Her studies have also revealed novel regulatory mechanisms of bacterial DNA damage responses and illuminated how mitochondrial DNA is repaired and cleared following damage. Together, these advances have reshaped understanding of genome maintenance across both prokaryotic and eukaryotic systems.

Anjana Badrinarayanan's work exemplifies scientific creativity, precision, and depth, bridging molecular mechanisms with cellular physiology. By uncovering universal strategies that cells use to safeguard their genomes, she has profoundly advanced the fields of genome and microbial biology, establishing new directions for research into genome stability and cellular resilience.

Anjana Badrinarayanan is currently Associate Professor at the National Centre for Biological Sciences, Bangalore. She received her Ph.D. in 2011 from Oxford, where she received an Overseas Research Award and a Clarendon Fellowship for Ph.D. research. Dr. Badrinarayanan subsequently did postdoctoral research at MIT, for which she received a Human Frontiers Program long-term fellowship. She joined NCBS as Assistant Professor in 2016 and was promoted to Associate Professor in 2023.

https://www.infosysprize.org/laureates/2025/anjana-badrinarayanan.html#read-more

Obituary: Celebrating the Life of Dr Anita M Borges

(19th November 1947- 18th September 2025)

By **Dr Sangeeta Desai,**

Former Professor and Head, Department of Pathology, Tata Memorial Centre

Dr Anita Maria Borges was a "thinking" surgical pathologist, pan cancer oncopathologist, generous teacher par excellence, erudite orator and widely referred to as the "Queen of Histopathology".

She was born in Mumbai in 1947, after spending her formative years (1966-1975) in Medical School at the Topiwala National Medical College and B.Y.L. Nair Charitable Hospital, Mumbai, India, post MBBS and MD Pathology, she trained and worked at the Royal Marsden Hospital, London, UK and at the Memorial Sloan Kettering Cancer Centre, New York, USA. She was a Fellow of the Royal College of Pathologists (FRCPath), London, United Kingdom. After her return to India, she worked at Indian premier tertiary cancer Institute, Tata Memorial Hospital, for 23 years (1981-2004) where she was an officer in charge of Surgical Pathology. Until September 18, 2025, she was Director of the Center for Oncopathology, Mumbai and also

the Head of the Histopathology Department at S. L. Raheja Hospital, Mumbai.

Dr Borges always exhorted postgraduates in Pathology to work as a pathologist but think like a clinician. Her great charisma and wisdom imbued the fellow pathologists and students with tremendous confidence to anchor themselves in complex diagnostic scenarios and look clinicians in the eye. In this way, she not only herself played the “first fiddle” but also inspired her mentees also to be the “first fiddle” and not play “second fiddle” in multidisciplinary cancer management.

Dr Borges was a vast ocean of knowledge and voracious reader. When she appeared for her MD Pathology exam, the examiners said “who are we to question you, you seem to know it all.” Her knowledge transcended boundaries and she sailed effortlessly through diverse, myriad arenas of Pathology and non-pathology alike viz. art, culture, music, philosophy etc.

Her passion for teaching was evident from the fact that she left us for heavenly abode on September 18, 2025, when she was visiting Gorakhpur, UP, for an academic meeting. I feel fortunate to have had her as a teacher who was a guiding light for me during my formative years.

Her legacy will live on through numerous mentees and students inspired by her. Wherever she’s, she must be passionately teaching and her authoritative voice must be echoing through the corridors of heaven…….

A vision beyond sight …. For a legacy

It was the year of 1947
A distinguished couple were parents again
To a daughter who would be distinct
Accomplished in knowledge and instinct
Who, with her keen ways of thought
Would later rule the world of Pathology with no doubt
Is it benign or malignant
And how to the surgeon it was important
How best to give the best to the patient
No hair splitting yet make the report relevant
She had an aura, a charm
A warmth, a truth, and like none, a dedication
She saw with eyes that went beyond morphology
To see in toto the patient beyond just diagnosis and etiology
She told us, don't just train your students, but educate
At a loss is the world now, the young ones who to her will never relate
At a loss to each one that was connected to her
In the recent past, in the later past that we cannot ever decipher
There were depths, there were facets and they were multiple
Of personality her's that cannot be described, by any disciple
There comes just once, an individual
Whose impact on others several is monumental
That goes beyond words
And can be only perceived in interactions that are the real rewards
For the best of the best has left us for ever
Now only in memories, anecdotes, in our minds to revere
To remember her ways, her words, her principles
And with dedication carry the torch sacrosanct and unassailable
As written valiantly by her one deep followers.....
The Queen has passed away,
Taking the light away....

By **Dr Meenakshi Balasubramanian**
Professor and Head, Department of Pathology,
TNMC and BYL Nair Ch Hospital, Mumbai

Obituary: Jane Goodall – Ethologist and Conservationist

(3rd April 1934 – 1st October 2025)

By **Dr Shyamala Bharadhwaj**

British ethologist and conservationist **Jane Goodall** redefined what it means to be human and set the standard for how behavioral studies are conducted through her work with wild chimpanzees in Gombe Stream National Park, Tanzania.

Dr. Valerie Jane Morris-Goodall, best known simply as Jane Goodall, was born in Bournemouth, England, on April 3, 1934. As a child, she had a natural love for the outdoors and animals. She had a much-loved dog, Rusty, a pony and a tortoise, to name a few of their family pets. When Jane was about eight, she read the Tarzan and Dr. Dolittle series and, in love with Africa, dreamed of traveling to work with the animals featured in her favorite books.

Jane Goodall with a chimpanzee at the Chimpounga Chimpanzee Rehabilitation Centre, Congo (Brazzaville).

Jane was unable to afford college after graduation and instead elected to attend secretarial school in South Kensington, where she perfected her typing, shorthand, and bookkeeping skills. She retained her dream of going to Africa to live among and learn from wild animals, and so she took on a few jobs including waitressing and working for a documentary film company, saving every penny she earned for her goal. At age 23, she left for Africa to visit a friend, whose family lived on a farm outside Nairobi, Kenya.

In March 1957 Jane boarded a ship called the Kenya Castle to visit her friend and her family. There, Jane met famed paleoanthropologist Dr. Louis Seymour Bazett Leakey, who offered her a job at the local natural history museum. She worked there for a time before Leakey decided to send her to the Gombe Stream Game Reserve (what is today Gombe Stream National Park) in Tanzania to study wild chimpanzees (*Pan troglodytes*). He felt her passion for and knowledge of animals and nature, high energy, and fortitude made her a great candidate to study the chimpanzees. Leakey felt that Jane's lack of formal academic training was advantageous because she would not be biased by traditional thought and could study chimpanzees with an open mind. His hope was that by studying our closest living relatives (chimpanzees who share a common ancestor with humans) he could discover more about what early humans were like−things he could not learn from fossils alone.

In December 1958, Jane returned home to England and Leakey began to make arrangements for the expedition, securing the appropriate permissions from the government and raising funds. To prepare for her upcoming expedition Jane moved to London to work in the film library of Granada Television's film library at the London Zoo where she spent her spare time studying the behavior of primates. In May 1960, Jane learned that Leakey had obtained funding from the Wilkie Brothers Foundation. Permits in hand, she boarded a plane to Nairobi.

Gombe Stream National Park

On July 14, 1960, Jane arrived by boat at the Gombe Stream Game Reserve on the eastern shore of Lake Tanganyika with her mother−local officials would not allow Jane to stay at Gombe without an escort−and a cook, Dominic.

Jane Goodall with IWSA Members Dr. Bakhtaver Mahajan and Ms. Vijaya Chakravarthy

The early weeks at Gombe were challenging. Jane developed a fever−likely malaria−that delayed the start of her work. Once recovered, the rugged terrain and the thick vegetation made traversing the reserve a challenge and often she hiked miles without seeing a single chimpanzee.

Finally, an older chimpanzee −whom Jane named David Greybeard, although the practice of naming one's study subjects was taboo in ethology−began to allow Jane to watch him. As a high-ranking male of the chimpanzee community, his acceptance meant other group members also allowed Jane to observe. It was David Greybeard whom Jane first witnessed using tools. She spotted the chimpanzee sticking blades of stiff grass into termite holes to extract termites. Excited, she telegraphed Dr. Leakey about her groundbreaking observation. He wrote back, "Now we must redefine 'tool,' redefine 'man,' or accept chimpanzees as humans."

Jane continued to work in the field and, with Leakey's help, began her doctoral program without an undergraduate degree in 1962. At Cambridge University, she found herself at odds with senior scientists over the methods she used−how she had named the chimpanzees rather than using the more common numbering system, and for suggesting that the chimps have emotions and personalities. She further upset those in power at the university when she wrote her first book, 'My Friends, the Wild Chimpanzees,' published by National Geographic, aimed at the general public rather than an academic audience. The book was wildly popular, and her academic peers were outraged. Dr. Jane Goodall earned her Ph.D. on February 9, 1966, and continued to work at Gombe for the next twenty years.

Conservation

Jane shifted from scientist to conservationist and activist after attending a primatology conference in 1986. Then, in the early 1990s, she flew in a small plane over the park and was shocked to see large-scale deforestation on the other side of the park where local villages were rapidly expanding. Miles of bare hills stretched where once untouched forests had stood. Jane knew that she had to take action to protect the forest and preserve the critical habitat of the chimpanzees.

She established the Jane Goodall Institute (JGI) in 1977, a global community-centered conservation organization, and JGI's program Roots & Shoots in 1991, which encourages young people around the world to be agents of change by participating in projects that protect the environment, wildlife, or their communities.

She was traveling around 300 days a year giving speeches, speaking with government officials and businesses around the world and encouraging them to support wildlife conservation and protect critical habitats.

Jane passed away on October 1, 2025, at 91 years old, her life dedicated to raising awareness and funds for protecting chimpanzees, their habitats, and the planet we all share.

https://education.nationalgeographic.org/resource/jane-goodall/

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