



IWSA NEWSLETTER

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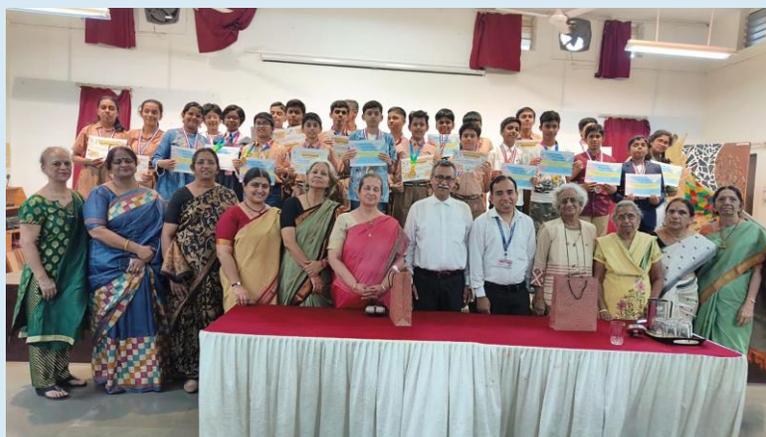
January - April 2025



IWSA Triennial Conference in Vengurla-
21st & 22nd March 2025 (Kolhapur Branch)



IWSA- BRNS talk in Green Field School, Diva
Learning Science through games - 8th February 2025



Valedictory function of IWSA Ganit Pratiyogita
on 5th January 2025 at IWSA HQ, Vashi

HIGHLIGHTS

Women who shaped the destiny of Bio-Medical Science - article by **Dr. Susan Eapen**

BRNS sponsored Popular Science Talks in Schools, Colleges and for the Public: 35 talks, with an outreach of more than 3500

IWSA's XVI Triennial Conference at Vengurla-

"Science and Technology of Natural Aromas for Societal Benefits and Women Empowerment"

Lecture Series on "NANO R1 Challenge" for Engineering College Students

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.

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Editorial Board (2023 – 25)

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From the Editor's Desk



Dear Readers,

A very warm welcome to all our readers with our NEW LOOK January to April issue of the NewsLetter 2025! Our NL Committee decided to make a complete *makeover* of our NL to increase its viewership, and make it more interesting and trendier! In the current and upcoming issues look out for a few additional quirky anecdotes, science facts, science in the news events, nature and its amazing secrets etc! Contributions (even in Hindi) from members in the fields of art, poetry, photography, cartoon drawing, etc on any scientific topic are most welcome, and would be included in our NL.

A major highlight in this issue, is the excellent review written by Dr Susan Eapen, our IWSA member, paying tribute to 25 women scientists who have contributed to the field of Biomedical Research in the last two centuries! These women are indeed epitomes of grit, determination, and self-belief, and are true inspirations to all our young students, scientists and entrepreneurs. Other highlights include the Triennial Conference hosted by our Kolhapur branch on a very significant topic, "Science and Technology of Natural Aromas for Societal Benefits and Women Empowerment". Besides, the BRNS sponsored lectures were at their peak this quarter, with HQ organizing 13 lectures for colleges, 7 for schools and 5 for society, with an overall outreach of about 2500; and 10 lectures were organized by our Branches, with an outreach of 1005. Another unique activity, namely the Nano R1 Challenge for Engineering and AI students, was conducted by our Computer Education Center, at HQ, in collaboration with the Bharadwaj Foundation, Jaipur.

The ECCEd and Nursery Committee, as well as the Hostel and Day Care Committee were active with their usual yearly activities. The Library Committee conducted an outreach program for 3 rural schools in Kharadi, Thane, by distributing story books, crayons, writing material etc. Activities, like the Science Day, Annual Cancer Camp, Demonstration of Science Experiments for school students etc were conducted at off-site venues, due to renovation of the IWSA Auditorium. IWSA Scholarships were awarded to PhD, MSc, and BSc students on a merit-cum-means basis. Also 4 rural students and 2 ECCEd students were given financial aid for payment of fees. IWSA-Ganit Pratiyogita (IGP 2024) which was conducted separately for SSC and CBSE students of Mumbai, Hyderabad and Nagpur, through their respective IWSA branches, culminated in the Valedictory function, held at IWSA HQ.

It is indeed very heartening to note that 11 out of our 12 IWSA branches (the Ajmer branch was added recently), held a variety of science outreach activities ranging from BRNS lectures, Science Day and Women's Day Celebrations, Workshops, technical lectures, World Wetland Day celebration, Poster competition etc, with a much larger outreach than earlier!

Several of our IWSA members were invitees to various academic events, a few received accolades for their sustained contributions to science, and several others have been featured and acknowledged in National and International reviews.

We close this issue acknowledging a few women achievers of our time, who have crossed all boundaries and achieved great heights. Lastly, we pay tribute to mother Nature, by admiring its beauty and wonders, through photographs taken by our passionate photographer members!

Happy and enjoyable reading! Looking forward to your feedback!

Dr Sheela Donde
drdonde@gmail.com

President's Message



Dear IWSA Members,

All of you must have noticed the new look of IWSA Newsletter that you are reading now. The editorial team has introduced several novel features to make the IWSA Newsletter more attractive for the readers. We would appreciate receiving your feedback on any further improvements.

IWSA's Science Awareness team conducted simple and interesting science experiments for the students of ECCE course and for the students of BMN college of Home Science. They also conducted science experiments for the students of Adarsh Vidyalaya, Chembur in their efforts to generate curiosity and love for science among school children

and others.

The release of DeepSeek R1 on 20th January 2025 caught the imagination of the world. IWSA always tries to impart the latest knowledge to the students. Therefore, we organized seven online sessions in NANO R1 Challenge to Engineering College Students all over India. The students were given a challenge to upload their Nano R1 models on Hugging Face and successful students were given certificates.

I congratulate the library team of IWSA for conducting story telling sessions with children of St. Judes India Centre at ACTREC, Kharghar and their outreach to rural schools at Khardi Village in Thane District. The Cancer Detection Camp conducted every year at IWSA's Health Care Centre in collaboration with Cancer Patients Aid Association (CPAA) is one of our Community Welfare programs which helps in early detection of cancer in patients and timely action by CPAA has benefited several patients.

The IWSA branches have conducted some interesting and innovative programs during this period. The most important event among them was IWSA's 16th Triennial Conference conducted by Kolhapur Branch at Vengurla on 21st and 22nd March 2025. We appreciate the efforts of the Conference team, for selecting a unique topic of Natural Aromas and conducting the National Conference in a small town.

Dr. Susan Eapen's article on the role of women in the development of Bio-medical sciences brings out the fact of how often the contributions to science by women have remained unrecognized and under-rated in the past. Yet, we can hope for a brighter future for the young girls taking up a career in science, as Dr. Susan has highlighted the stories of recent women Nobel laureates like Jennifer Doudna, Emmanuelle Carpenter and Katalin Kariko.

This issue also highlights the achievements of some Indian women and IWSA members who have received some prestigious awards or have become the first women to be appointed as head of a group in Government organizations. Their achievement should motivate young girls to take up career in STEM.

I am sure readers will enjoy all the contents of this newsletter and also look forward to the forthcoming issues for more food for thought.

Dr. Shyamala Bharadwaj
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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 interest to the College. The speakers were identified by IWSA. Students from various classes-FY BSc-to-MSc, attended the lectures along with faculty. For each of the lectures the audience was informed about IWSA and the college. The lectures were followed by discussions with the speaker.

1. Wealth from Nuclear Waste - Recovery and Recycle

Date: 16th January 2025

Speaker: Dr Smitha Manohar, Ex Director, Nuclear Recycle Group, Bhabha Atomic Research Centre, Mumbai

Venue: SIES College of Arts, Science & Commerce, Nerul, Navi Mumbai

Outreach : 140



Abstract: Nuclear energy is well recognized globally as being the cleanest form of energy. But, management of spent nuclear fuel has a significant bearing on its sustainability. In the Indian context, with the adoption of a closed fuel cycle, both sustainability as well as long term waste management goals are being achieved. Such recycling operations, invariably leads to the generation of High-Level Radioactive Wastes, which are presently vitrified in borosilicate matrices in our country in line with internationally endorsed methodology for the safe management of high-level radioactive wastes. Recent advancements in the field of partitioning technology at BARC, have presented us with an opportunity to have a fresh perspective on management of high-level liquid radioactive wastes streams, that emanate from recycling operations. In addition to significant reduction in radiotoxicity associated with HLLW, this can lead to harvesting of useful radionuclides for societal applications. An example is the separation of Cs-137 from HLW and its conversion to Cs-137 pencils for use in blood irradiators.

Strontium-90 when separated from such waste streams, leads to the milking of Yttrium-90 which is being used for cancer treatment. Ru-106 when electrodeposited on silver plate and made into a silver plaque is being used for treatment of eye cancer in our country. The talk gave an overview of such developmental efforts at BARC and showcased the technological aspects of setting up and operating such advanced back-end fuel cycle facilities

2. Biodiversity for Life and Future

Date: 23rd January 2025

Speaker: Dr B. Meenakumari, Former Chairperson National Biodiversity Authority and Former Deputy Director General (FS), ICAR

Venue: Union Christian College, Aluva, Kerala

Outreach: 140



Abstract: Biodiversity is important as it represents the almost infinite variety of plant and animal life and the variety of the types of Earth's ecosystems that support life. India is one of the 17 mega-diversity countries of the world and is ranked 8th in terms of species richness. At the international level, the Convention on Biological Diversity (CBD), signed at the 1992 Rio Earth Summit, creates a new plan for international action on environmental and development issues. In National level, the Biological Diversity Act (BDA-2002) is the umbrella legislation that contains the framework for the promotion of conservation, sustainable use and the fair and equitable sharing of benefits arising out of utilization of the biological resources and the associated knowledge. Biodiversity which are crucial for the well- being of life on earth is under threat due to various reasons and there is an urgent need to take action to protect the magnificent biodiversity of our planet. It is essential to reform our educational system whereby the study of natural history is made part of the curriculum from the early stages. Ultimately, all citizens should be naturalists for empowering them to ensure better outcomes for nature.

3. Harnessing the power of Microbiomes: Innovations & Applications in Science & Industry

Date: 28th January 2025

Speaker: Dr. Jasmin C., Project scientist, Nansen Environmental Research Centre (NERCI), Kerala

Venue: St. Peter's College, Kolenchery, Kerala



Outreach : 100

Abstract: Our understanding of the microbiome associated with various components and organisms within ecosystems has significantly advanced over the past few decades. A comprehensive understanding of the phylogenetic composition and functional roles of microbiomes has established a foundation for the development of innovative products and processes of biotechnological significance. For instance, our previous research has successfully identified a bacterium associated with marine sponges that secretes melanin, providing protection for host cells against oxidative stress. This molecule holds potential applications in sunscreens and metal chelation. Additionally, we have developed a microbial consortium using bacteria isolated from diverse marine ecosystems, specifically designed to degrade organic waste accumulated in aquaculture ponds. This product is currently marketed under the brand name "Sehat Sol" for aquaculture ponds in India. The latest breakthroughs and practical applications of microbiome science, emphasizing how these microorganisms are reshaping industries and contributing to a more sustainable and health-oriented future etc. were examined in this presentation.

4. Epidemiology of Tuberculosis, Diagnosis and Treatment, Prevention & Control and Country guidelines

Date: 1st February 2025

Speaker: Dr Fazila Patankar, Head, Dept of Preventive and Social Medicine, Terna Medical College, Navi Mumbai & Dr. Shalini Ojha Pandey, Asst. Prof., Terna Medical College

Venue: Dept. of Zoology, SIES College of Arts, Science and Commerce, Mumbai

Outreach : 94



Abstract: Tuberculosis is one of the world's leading infectious killer diseases. 1 in 4 people globally is estimated to be infected by TB bacteria.

Despite being a preventable and curable disease, 1.5 million people worldwide die from TB each year. India has the highest burden of TB with two deaths occurring every three minutes from tuberculosis (TB). Multidrug-resistant TB remains a public health crisis.

Undernutrition, HIV infection, alcohol use disorders, smoking (especially among men), and diabetes have emerged as significant factors driving the TB epidemic. Ending the TB epidemic by 2030 is among the health targets of the United Nations Sustainable Development Goals (SDGs) and India has pledged to achieve the "End TB" targets by 2025, five years ahead of the global 2030 goal. A comprehensive strategy that combines cutting-edge diagnosis, preventive care, patient support, and cross-sector partnerships, innovative care solutions, and community engagement is in place to make this possible.

The talk gave an overview of epidemiology of Tuberculosis and India's National TB Elimination Program with special emphasis on recent advances with respect to diagnosis, treatment and prevention and control.

5. X Ray Crystallography for structure determination of molecules

Date: 6th February 2025

Speaker: Dr Ashok Verma, ACTREC

Venue: Depts. Of Physics and Chemistry, Viva College, Virar, Mumbai

Outreach :132



Abstract: X-ray crystallography is one of the best approaches to determine three-dimensional structure of biological molecules. The main goal to study molecular structures is to visualize their complexities at the atomic level. For this it is necessary to have crystals of the material whose structure is to be investigated.

A crystal is a well-defined arrangement of atoms and molecules in a three-dimensional environment. The definition of crystals is different in different disciplines. However, once crystals are exposed to x-ray, discrete diffraction patterns are obtained which define crystals in a better way. There are mainly two kinds of biological molecules, small molecules and macromolecules. Crystallizing the small molecules is easy, however crystallizing the macromolecules is bit difficult. But once we obtain the crystals of macromolecules and their atomic arrangements it is easy to decipher their structure.

In this lecture an overview was provided about crystals, symmetry, diffraction patterns and three-dimensional electron density for their use in structure determination. Further, it described how determination of protein structure by Xray crystallography provides information about their function from their orientation in three-dimensions. From such studies, different protein structures are now available in the Protein data bank, which provide novel opportunities for scientists and clinicians to correlate the function of proteins from their structure.

6. Animal Models for Biological and Clinical Research

Date: 6th February 2025

Speaker: Dr Pradip C. Chaudhari, ACTREC

Venue: Dept. of Bioscience, Viva College, Virar, Mumbai

Outreach : 98



Abstract: Scientists have understood and solved medical problems, cured diseases, and developed vaccines—all by using animals in biomedical research. “Biomedical research” means according to the Webster’s Dictionary by splitting the terms we find “bio” meaning “life or living organism,” “medical” meaning “healing; pertaining to the science, study, or practice of medicine, or the art of healing diseases,” and “research” meaning “careful, patient, systematic, diligent inquiry or examination in some field of knowledge, undertaken to establish facts or principles”. Simply we can define as the search for ways to heal living organisms such as humans and other animals.

Animal models are essential tools in biological and clinical research, providing valuable insights into human diseases, treatments, and biological processes. Mice and rats are the most commonly used models due to their prolificity, genetic similarities to humans, ease of manipulation, and ability to mimic various diseases. Mice are particularly useful in genetic research, cancer studies, and immunology, while rats are employed in behavioral studies, cardiovascular research, and drug testing. Non-human primates, such as macaques, offer closer genetic and physiological similarities to humans, making them invaluable for studying complex diseases, neuroscience, and vaccine development, although their use is limited by ethical concerns. Mini pigs, with their organ sizes and physiology akin to humans, are essential in surgical and transplantation research. Additionally, fruit flies are widely used in genetics and neurobiology due to their simplicity and short lifecycle. Other models, like zebrafish and *C. elegans*, serve as powerful systems for developmental biology, genetic studies, and drug screening, while guinea pigs and dogs are used in oncology, respiratory and cardiovascular research, respectively. Although canines make a small portion of the animals used in research (less than 1%), they continue to play a major role in preclinical evaluation of drugs and the development of surgical techniques, prosthetic devices and new physiological information. Particularly in case of Cancer, dogs are playing a role as a translational animal model in developing and evaluating new drugs / strategies against cancer. This has opened up a new field; Comparative Oncology, dealing with similarities and dissimilarities between human and animal cancers. ACTREC has initiated comparative oncology program to utilize spontaneous animal cancer in understanding and developing/evaluating anticancer drugs / radiopharmaceuticals.

7. Microbial Ecology and its Role in Ecosystem Management

Date: 12th Feb., 2025

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

Venue: **Department of Microbiology, PTVA’s Sathaye College (Autonomous), Vile Parle (E), Mumbai**



Outreach: 104

Abstract: Microbial ecology correlates to the scientific study comprising of microbial habitats, their populations along with their interaction with the biotic and abiotic components of their environment. It not only remains restricted to the marine or the terrestrial ecosystems, however focuses on finding the suitable balance among all the existing ecosystems. Among the diverse lifeforms in marine ecosystem, microorganisms represent a vast majority of the genetic and metabolic diversity on Earth, driving essential processes including decomposition, carbon sequestration and symbiotic relationships. Laboratory based culture and culture independent techniques allow identification of microbial species, their evolutionary relationships, and their environmental abundance. In extreme conditions like the deep sea, where culturing and identification of microbes are challenging due to harsh conditions, the culture-independent methods allow the analyses of eDNA along with metagenomics, transcriptomics, and other high-throughput sequencing techniques aiding in bioremediation and bioprospection studies. For instance, the successful isolation of *Pseudomonas mendocina* ABF786, has demonstrated remarkable potential in mitigating the plastic pollution. Another example is *Bacillus enclensis* AGM_Cr8, the bacteria that was isolated from Versova Creek, Mumbai, has

potential in mitigating the plastic pollution. Another example is *Bacillus enclensis* AGM_Cr8, the bacteria that was isolated from Versova Creek, Mumbai, has demonstrated extreme tolerance to chromate stress (>3000 mg/l), showcasing a MIC exceeding 5000 mg/l. In search of novel bioactive compounds, Aspergillus species, found in close association with the mangroves were also explored. Successful harnessing of these microbial resources through targeted research and discovery can contribute to sustainable ecosystem management and pollution mitigation.

8. Discoveries and Inventions that Enable Machine Learning with Artificial Neural Networks

Date: 15th Feb., 2025

Speaker: Mr Amit Batra, Tata Consultancy Services, CBG Retail Americas Team

Venue: Mukesh Patel School of Technology Management & Engineering, NMIMS University, Vile Parle, Mumbai



Outreach
100

Abstract: Artificial Neural Networks (ANNs) are computing systems inspired by the biological neural networks designed to mimic the way the human brain processes information. ANNs are composed of interconnected nodes or units called artificial neurons which are organized in layers. These layers process information and pass it on to the next layer allowing the network to learn and make predictions.

ANNs are powerful tools for machine learning with significant potential to solve complex problems and revolutionize industries by the building of intelligent systems that can learn from data and make predictions without explicit programming. John J. Hopfield and Geoffrey Hinton were awarded Nobel Prize in Physics for their significant work on artificial neural networks essentially laying the groundwork for modern machine learning using neural networks. Key features of ANNs in machine learning include non-linearity, feature extraction, adaptability and generalization. Machine learning with ANNs combination has led to significant advancements enabling machines to perform tasks that were previously thought to be exclusive to humans.

Machine learning along with ANNs learns complex relationships in data, handles large datasets effectively, automates feature extraction (reducing manual effort), performs well on unstructured data (images, text, speech)

and continuously improves with training. Applications of ANNs in Machine Learning include computer vision (Object detection (e.g. self-driving cars)), Natural Language Processing (Sentiment analysis), Financial and business applications (Fraud detection in banking) and Healthcare (Drug discovery and genomics). The development of deep learning architectures, quantum neural networks, and neuromorphic computing is pushing ANNs to new frontiers in AI research with better explainability and human AI collaboration.

9. Unravelling Microbial Genomes: Innovations and Implications in Health and Environment

Date: 17th Feb., 2025

Speaker: Dr Gargi Bindal, Applied Genomics Section, BARC

Venue: Dept. of Microbiology, Vivekananda Educational Society College, Chembur, Mumbai



Outreach
100

Abstract: The study of microbial genomes has emerged as a transformative field, offering deep insights into the complexities of microbial life and its vast implications for health, the environment, and biotechnology. With the rise of multidrug resistance, microbial genomics plays a pivotal role in the discovery of novel antimicrobial agents, providing new avenues for combating infectious diseases. This talk will explore the innovative genomic approaches driving antimicrobial discovery, emphasizing the urgency of addressing antibiotic resistance through genomics. In addition, we will delve into the power of computational genomics and structural bioinformatics in characterizing microbial populations, their functional traits, and their roles in various ecosystems. Beyond medicine, microbial genomics is also revolutionizing environmental science and biotechnology, offering solutions to pressing challenges such as waste treatment, climate change, and sustainable agriculture. This talk provided understanding of current trends in microbial genomics and its potential to address both global health challenges and environmental issues, highlighting the field's transformative impact in biomedical research.

10. Biodegradable waste management: Contribution from BARC

Date: 21st Feb., 2025

Speaker: Dr Poulomi Mukherjee

Venue: Dept. of Biotechnology, Vikas College, Vikhroli, Mumbai

Outreach:

89



Abstract: BARC has long been working with solid waste management research. It has offered several solid waste management technologies to a wide range of entities- government institutes, corporates, individuals and has assisted in deployment all over India through its constant pursuit to Research activities. These technologies are customizable to the quantities of solid wet waste generated.

It is a classic example of a circular economy that reduces material use, redesigns materials and products to be less resource intensive, and recaptures “waste” as a resource to manufacture manure.

BARC strongly believes dissemination and use of these technologies as much as possible to different stakeholders and provide the clients with a cost-effective solution. The speaker emphasized the strong focus of BARC on community outreach and education, promoting waste reduction and recycling initiatives. The Goal is to help reduce the amount of waste going to the landfills and processing waste at the source and gain the advantages of cost benefit. This initiative by BARC shall best be viewed as minimizing waste generation and promoting circularity in waste recycling practices.

11. Regenerative Medicine

Date: 28th Feb., 2025

Speaker Dr Pratibha Shetty, Regenerative Medicine Group, Reliance Life Sciences Pvt Ltd, Mumbai

Venue: Dept of Life Sciences, Sophia College for Women (Empowered Autonomous), Mumbai



Abstract: Stem cells are characterized by their potential to self-renew & to differentiate into several different lineages for the lifetime of an individual. These two properties of stem cells have made them very useful therapeutic tools for the restoration of a variety of organ functions. Stem cells can be derived from the blastocyst (embryonal stem cells), fetal tissue (fetal liver stem cells), new born infant (cord blood or cord tissue stem cells) or adult tissue (bone marrow stem cells, neuronal stem cells). Of the different types of adult stem cells, hematopoietic stem cells and mesenchymal stem cells are the best studied stem cells. A current treatment for various degenerative disorders such Neurodegenerative, Cardiac, Vascular, Renal etc. rely on surgical interventions and drugs that modulate the system, but these have their own limitations when it comes to regeneration of damaged tissues and cells. To address this shortcoming, cell-based therapies are gaining importance. Adult stem cells have generated great amount of interest amongst the scientific community for their potential therapeutic applications for unmet medical needs.

Outreach: 120

12. Advancements in Next-Generation Proteomics Technologies and Software Solutions.

Date: 5th Mar., 2025

Speaker: Dr Sanjeeva Srivastava, Professor, Dept. of Biosciences & Bioengineering, IITB, Powai, Mumbai

Venue: MGM School of Biomedical Sciences, Kamothe



Outreach: 210

Abstract: Proteomics has witnessed transformative advancements in recent years, with high-resolution mass spectrometry (MS), targeted approaches, and powerful computational tools propelling large-scale analysis of protein expression, modifications and interactions. These innovations, combined with databases and interactive platforms, have broadened the scope of proteomics across diverse fields, from basic research to clinical applications. Despite these advancements, the full potential of these technologies remains largely untapped in clinical and biological applications.

This talk highlighted key developments in MS-based proteomics, focusing on advancements in instrumentation, workflows, and data acquisition strategies such as Data-dependent Acquisition (DDA) versus Data-independent Acquisition (DIA). A comparison between discovery and targeted proteomics will be discussed, alongside non-MS-based approaches, including protein arrays and label-free Surface Plasmon Resonance (SPR) and Biolayer interferometry (BLI) was also briefly discussed.

The speaker also explored emerging proteomics applications, including single cell proteomics and cell surface proteomics, aimed at understanding the functional crosstalk between cells and advancing our knowledge of disease biology. Innovative platforms like Proximity Extension Assay (PEA) and SomaScan, along with the Proteograph platform, will be presented as tools for plasma proteomics.

In the realm of software and database development, the recent work on tools such as AlphaCross-XL for identifying protein cross-linking, and BrainProt, a comprehensive resource for the Human Brain Proteome Project, which integrates proteomic and

transcriptomic data with clinical insights into brain diseases etc were showcased. BrainProt offers cutting-edge analysis tools to accelerate biomarker discovery and drug development for neurological disorders. Additionally, a novel computational pipeline for predicting the druggability of human proteins was discussed, using machine learning models like Random Forest and XGBoost. By highlighting these advancements, this talk demonstrated the vast potential of next-generation proteomics technologies and software solutions to propel scientific discovery and precision medicine.

13. From Gene to Gene Editing: Frontiers in Biomedical Sciences

Date: 5th Mar., 2025

Speaker: Dr Susan Eapen, former Senior Scientist, Bhabha Atomic Research Centre, Mumbai

Venue: MES College, Marampally, Aluva, Kerala



Abstract: Biomedical Sciences have made rapid strides in the last few years ever since the discovery of DNA and recombinant DNA techniques leading to the development of new processes and products. Development of climate resilient crop plants, treatment of diseases using gene editing technologies, development of lab grown meat, 3D printing of organs and development of other novel products are a few applications which were dealt with in the talk. The presentation also covered various milestones in biomedical sciences, exploring the journey and its potential to revolutionise human health and life.

Outreach: 120

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. AI for You

Date: 10th Jan., 2025

Speaker: Dr Seema Purohit, Professor Emeritus, B. K. Birla College, Mumbai

Venue: Adarsh Vidyalaya, Sahakar Nagar, Shell Colony, Chembur, Mumbai **Outreach: 100**

Abstract: Students are aware of the existence of virtual assistants like Siri and Alexa. They have seen image recognition on Facebook and Google photos. But these are AI applications in our daily lives. After a simple introduction to the basics of AI, its types and its functioning there were interactive activities such as AI-themed quizzes or games, learning how to build simple AI powered models using blocks or kits and creating AI inspired artwork during this session.



2. Measurement of heat...is it possible?

Date: 22nd Jan., 2025

Speaker: Dr Shirish Pathare, Scientific Officer F, Homi Bhabha Centre for Science Education, (TIFR), V. N. Purav Marg, Mankurd, Mumbai

Venue: Sainath English High School, Vashi

Outreach: 84

Abstract: Heat and temperature are the topics to which students get introduced well before their formal school education. Students are somewhat aware of measurement of pressure, volume and temperature as far as thermal physics is concerned. During the session, the speaker demonstrated these measurements using different sensors. But measurement of heat is not dealt anywhere starting from school to post-graduate education. So, the question that we will explore in this session – Is it even possible to measure “HEAT”?



3. Inside the Atom

Date: 3rd Feb., 2025

Speaker: Ms. Bhakti Belapurkar, Retd. from Atomic Energy Junior College, Anushaktinagar, Mumbai

Venue: Changu Kanu Thakur Vidyalyaya, New Panvel, Raigad

Outreach: 200

Abstract: The world is made up of matter. Several scientists like John Dalton, J. J. Thomson, Ernest Rutherford, Niels Bohr etc. carried out experiments to explain the nature and structure of matter and how it is formed. All the matter around us is made up of a large number of elements. The smallest particle of an element, that retains its properties is an atom. Atoms can take part in chemical reactions and form molecules. An atom consists of protons, neutrons and electrons. These particles are indivisible. The different arrangement of these particles gives different properties to atoms. Protons and neutrons are at the center of an atom and electrons are revolving around them. Atoms of each element have different electronic configuration. This arrangement determines the valency of an element and also, its properties. A Russian scientist Mendeleev placed all the known elements in a table which is referred to as the PERIODIC TABLE. In this table, elements are arranged in horizontal rows based on their atomic mass and in columns based on their properties such as valency. This lecture provided more details about the structure of the elements and their properties.



4. E waste Management

Date: 5th Feb., 2025

Speaker: **Dr Sanjay Digambar Joshi**, Former Faculty, Department of Environmental Sciences, K. J. Somaiya College of Science and Commerce, Vidyavihar, Mumbai
Venue: **Sterling School, Nerul**

Outreach: 74



Abstract: 'Electronic Waste', also described as the Waste Electronic and Electrical Equipment (WEEE), comprises discarded computers and peripherals, office electronic equipment, entertainment gadgets, mobile phones, television sets and refrigerators, air conditioners and variety of electrical appliances which are destined for reuse, resale, salvage, recycling, or disposal. Essentially, Electronic waste, or e-waste, is a term for electronic products that have become unwanted, non-working, and have essentially reached the end of their useful life.

According to a recent survey conducted by the United Nations Environment Program, in 2023 alone, 48.8 million tons of electronic waste (e-waste) was discarded worldwide, with only 10 to 40 percent of disposal done properly.

E-waste is much more hazardous than many other municipal wastes because electronic gadgets contain thousands of components made of deadly chemicals and metals like lead, cadmium, chromium, mercury, polyvinyl chlorides (PVC), brominated flame retardants, beryllium, antimony and phthalates. Long-term exposure to these substances damages the nervous systems, kidney, bones, reproductive and endocrine systems. Some of them are carcinogenic and neurotoxic. Acids and sludge obtained from melting computer chips, if disposed on the ground causes acidification of soil, leading to contamination of water resources.

However, there are some passionate people out there who are using their knowledge and trying to tackle the problem of e-waste handling, management and disposal. There are quite a few success stories associated with this issue.

5. Managing Electronic Waste

Date: 5th February 2025

Speaker: **Mr. Hafiz Ansari**, Director, Envirocare Recycling Pvt. Ltd. & Director, Netcare Electronics India Pvt. Ltd & **Ms. Samjuncta Mokashi Rao**, Partner, Environact Consultancy, Mumbai; Associate Partner, Envirocare Pvt. Ltd; Research scholar, Ramnarain Ruia Autonomous College
Venue: **SSS Global School, Sion**

Outreach: 90

Abstract: In today's world where technology advances faster each year, electronic devices are getting obsolete very rapidly. Huge piles of this obsolete and/ or irreparable e-waste are creating a crisis. This talk created an awareness regarding e-waste and its management.



Abstract: This session on novel Play and Learn method for learning basic sciences especially chemistry has been based on inputs from cognitive sciences; how our brain learns and works, builds memory and retains it. In Science, one of the biggest barriers any new student faces is the barrage of information spread out in the form of a periodic table. Until the learner truly understands what is given in the periodic table, it will be difficult to progress in science. Two games designed to remove the fear of chemistry by playful engagement in the classroom were introduced during this talk.

6. Gearing for Chemilympics

Date: 8th Feb., 2025

Speaker: **Mr. Nikhilesh Nav Vigyan**, Scientific Officer, BARC

Venue: **Green Valley English School**, Sadguru Nagar, Diva-aganan Road, Diva East, Thane

Outreach: 165





7. Understanding AI: The Smart Technology in Our Daily Lives

Date: : 28th Feb.,2025

Speaker: Ms. Shalini Mittal, Freelance Java & UI Trainer & Developer

Venue: Adarsh English School, & GSB Mandal's S.A. Pai Memorial School Dombivli, Ambika Nagar, Gograswadi, Dombivli East

Outreach: 153

Abstract: This beginner-friendly workshop introduces students to artificial intelligence through familiar everyday examples. Using simple activities and real-life situations, students will discover how AI works in things they might already use-like basic mobile phones, local bus services, or grocery stores. No computer knowledge is needed! Through interactive demonstrations and group discussions, students learnt about this important technology that's changing our world.



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” Series.

56th SAOL

INDIAN WOMEN SCIENTISTS' ASSOCIATION
56th Talk under IWSA's "Science And Our Life" Lecture Series
Supported by Board of Research in Nuclear Sciences

**An Insight into Architectural Acoustics :
An Experiential Imprint**

On 17th January, 2025
at 5 pm
Please join by 4:55 pm

Join Online on Zoom at:
Meeting Id-850 2235 9675
Passcode- IWSA@VASHI
<https://us06web.zoom.us/j/85022359675?pwd=dzW5ZjRvdlpGdXlQ1XemKfzPcAT9l8.1>

Speaker:
ROLINS THOMAS ROY
Principal Consultant,
CEO,
Rolins Arcoustics LLP

Abstract: The session touched upon the importance of acoustics while designing any space. The speaker gave a brief overview of the stages involved in projects with acoustic detailing & stringent spatial requirements that impact the user. From the drawing board to setting acoustic design criteria & specifications and then moving onto the execution at site until completion – irrespective of the type of project i.e. private & public spaces like studios, theatres, sports venues or cultural halls and more. An Architect/Acoustic consultant's perspective on the 'process' of how these are addressed and brought to reality.

<https://www.youtube.com/watch?v=a5zqjgaAijg>

Outreach- 65

57th SAOL

INDIAN WOMEN SCIENTISTS' ASSOCIATION
57th Talk under IWSA's "Science And Our Life" Lecture Series
Supported by Board of Research in Nuclear Sciences

Providing hope and healing in Cancer care

SPEAKER:
Dr Ravi Kannan
• Director,
Cachar Cancer Hospital & Research Centre, Silchar
• Ramon Magsaysay Recipient- 2023
• Padma Shri Recipient- 2020

On 1st February, 2025
at 5 pm
Please join by 4:55 pm

Join Online on Zoom at:
Meeting ID: 845 1014 7914
Passcode: IWSA@SAOL
<https://us06web.zoom.us/j/84510147914?pwd=eqGHNXZlRlUjI4IUYiMlRFRmYXVlL1>

Abstract: Cancer care is often approached through the lens of medical treatment and technological advancements, yet true healing is understood to extend beyond clinical interventions. I work as an oncologist in a Cancer hospital in Silchar that serves a population of about 10 million in the Barak valley of Assam and the adjoining regions. These are underserved regions of India, where access to quality cancer care is limited. Providing hope and healing to cancer patients and their families from such communities requires not only medical expertise but also empathy and a commitment to the human aspect of care. We have tried to use a combination of proactive pro-poor branding, cost reduction strategies, reducing waiting time using technology to decentralize cancer care

and democratize access to such care... though not very successfully every time. Over time we came to understand that the acceptance of care offered needs much more than just low/ no cost treatment, boarding and lodging. A series of knee-jerk reactive strategies as a response to the barriers patients faced, that we implemented, as we organically came to understand them helped to some extent. Currently we are looking at taking care closer to the homes of the community through a network of hospitals, day care clinics and PEP (prevention, early detection and palliative care) centres, closing the gap between health care, education and livelihoods for patients and their families, ensuring continuity as organizational leadership changes and growing value-based leadership for health care in the community.

<https://www.youtube.com/watch?v=uKIVYXqOa6Q> **Outreach: 46**

58th SAOL

INDIAN WOMEN SCIENTISTS' ASSOCIATION
58th Talk under IWSA's "Science And Our Life" Lecture Series
Supported by Board of Research in Nuclear Sciences

Shooting Stars: Discussing the basics of Astrophotography

SPEAKER:
Dr Soumyadeep Mukherjee (Linguistics, IIT K)
Astrophotographer & Astrophotography Educator ;
Columnist (DIY Photography);
Freelance Contributor (Astronomy & Amateur
Astrophotography Magazine)

On 7th February, 2025
at 6 pm
Please join by 5:55 pm

Join Online on Zoom at:
Meeting ID: 841 2728 2957 Passcode: IWSA@VASHI
<https://us06web.zoom.us/j/84127282957?pwd=akR5c2l0SEUuNnh7V3BhMmYzZDRhL1>

Abstract: Astrophotography refers to the photography of astronomical objects. What makes it more interesting is the combination of science and art in photography. This can even be done with the simplest of equipment, even with your smartphone. This talk explores the basics of astrophotography, myths associated with it, its various sub-genres. The discussion included a brief overview of 3 'p's of astrophotography: planning, photographing and processing.

<https://www.youtube.com/watch?v=KfweDICRW34>

Outreach: 35

Abstract: Electronic waste or waste electronic and electrical equipment (WEEE) includes unused and 'end of life' electronic and electrical devices that we normally store in our homes as they become obsolete, or we simply discard in the dustbins without realizing the fact that these items contain valuable materials that could gain a new life. From our dustbins, such discarded devices are ultimately dumped into a common dumping ground. This results in contamination of soil and water. Illegal dismantling and open burning of this waste results in release of toxicants in the air. Billions of tons of e-waste are discarded every year. All these activities drastically affect the environment in general. This also has a direct impact on human health. There are stringent rules and regulations for proper treatment and safe disposal of this waste. Manufacturers and producers of such

goods have been involved under the extended producer responsibility or EPR. Recycling is the best solution to solve the crisis of e-waste. As there are challenges, there are also opportunities in the management of this waste. Authorised recyclers have a mechanism of collection of e-waste from different sources of generation including households, educational institutions, etc.

<https://www.youtube.com/watch?v=JtXYBObdJJA> **Outreach: 20**

59th SAOL

INDIAN WOMEN SCIENTISTS' ASSOCIATION
59th Talk under IWSA's "Science And Our Life" Lecture Series
Supported by Board of Research in Nuclear Sciences

E Waste Management in India- Challenges and Opportunities

SPEAKER:
Dr Sanjay Joshi
Vice President,
Paryavaran Dakshata Mandal,
Thane

On 1st March, 2025
at 6 pm
Please join by 5:55 pm

Join Online on Zoom at:
Meeting ID: 813 4917 1177
Passcode: IWSA@SAOL

60th SAOL

INDIAN WOMEN SCIENTISTS' ASSOCIATION
 60th Talk under IWSA's "Science And Our Life" Lecture Series
 Supported by Board of Research in Nuclear Sciences

ENVIRONMENTAL INFLUENCES ON DIABETES MELLITUS

SPEAKER:
Dr. Sudha Tinalkar, MBBS; MD (Internal Medicine),
 MBA (Hospital Admn), PGDMLE
 • Pvt. Practitioner- Internal Medicine & Diabetology
 • Empaneled admitting consultant, Manipal Northside Hospital, Malleswaram, Bengaluru

On 8th March, 2025 at 6 pm
 Please join by 5:55 pm

Join Online on Zoom at:
 Meeting ID 841 2728 2957 Passcode- IWSA@VASHI

Abstract: The burden of Diabetes Mellitus, especially the Type 2 is rising globally. Its impact is felt more in a country like India where the health care system and the economy of the affected population are unable to bear this rising burden. This disorder has a strong interplay of genetic and environmental factors. In countries like ours which are westernizing at a rapid rate, there are many environmental triggers which bring about clinical diabetes in much younger populations. Though we have a growing number of options in the treatment of diabetes and its complications, more and more stress now is on preventing, delaying or even reversing the disorder. In this direction, a deeper understanding and manipulation of the environmental

factors become very critical. This is a very vast subject and extensive work has been done on the various environmental influences starting from diet patterns to environmental pollutants. I would like to introduce the environmental influences on clinical manifestation and management of Type 2 DM. Interestingly Type 1 DM has also been shown to be influenced to quite an extent by the environmental factors which will be also dealt with passing reference. In the limited time frame, the speaker dealt with only the most important aspects of the said influences on this important life style disorder.

https://www.youtube.com/watch?v=c7TsG_nVU6w

Outreach: 35

D. Valedictory function of IWSA Ganit Pratiyogita

Date: 4th January 2025

Chief Guest:- Dr Anandkumar, Principal, AECS 2 Tarapur

Guest of Honour- Mr. Vijay Kumar Shukla, AECS 2, Anushaktinagar

Other guests- Ms. Lata Pillai

Venue: IWSA ICICI Multipurpose Hall, Vashi

1st, 2nd and 3rd prizes were awarded for std. 6, 7 and 8 of both SSC and CBSE board students. In some cases, the prize was shared by more than one student. In the case of 6th std. of CBSE, the topper had secured 100% marks.



E. Science Day Celebration

Visit to St. Jude's Centre, ACTREC on 1st March 2025

IWSA members celebrated Science Day with children at St. Jude's Centre, ACTREC. About ten children along with both parents enjoyed the various experiments shown. These experiments were very simple demonstrations of the properties of air, like air exerts pressure, air occupies space and air can be compressed on cooling and expands on heating. Similar experiments were shown to understand some of the physical properties of water such as the pressure it exerts and how air pressure and water pressure interact using simple plastic bottles and straws. Pinwheels were used to demonstrate reverse rainbow wherein seven colours merged to a white colour. Children were happy to do some of these experiments like the simple hovercraft using a CD disc and balloon with a simple push n pull lid. Members also demonstrated the extracts



changed colour in presence of lemon juice and cooking soda. Parents and the older kids tried to answer the reasons why such seemingly magical phenomena happened. The coordinator explained how these excited children would repeat some of these and explain it to their caretakers in the following days and study science with renewed enthusiasm.

F. Demonstration of Science Experiments

a. ECCEd and BMN College Students

Date: 27th February 2025

Some simple and interesting science demonstrations and experiments were conducted for the students of IWSA-ECCE and students from BMN college of Home Science.

Outreach: 40



b. Adarsh Vidyalaya, Chembur

Date: 21st March 2025

Four IWSA members went to Adarsh Vidyalaya to show a few simple and interesting science experiments to 4th standard students. The children were quite excited and the visit helped in generating curiosity and love for science.

Outreach: 240



G. IEEE-IWSA online Lecture on Healthcare

Topic: **MedTech Transforming Indian Healthcare-The Gandhian Way**

Date: 19th April 2025

Outreach: 50

Indian Women Scientists' Association joined hands with IEEE EMBS Pune chapter, Special Interest Group (SIG) Healthcare, Maharashtra Institute of Technology, Art, Design and Technology University (MITADT) and College of Engineering Pune (COEP) to conduct an online lecture on "**MedTech Transforming Indian Healthcare-The Gandhian Way**" on 19th April 2025, 3.00pm.

Mr. Sushil Borde, Founder President, Anjani Mashelkar Foundation advised students to think beyond the classroom education and take science to society with innovative ideas. He gave a brief about the Anjani Mashelkar Foundation which has identified young people with innovative ideas and provided them support to convert their ideas into marketable products relevant for our needs.

He introduced Gayathri Choda, Founder, AARCA Research, Inc and Rahul Rastogi, Founder and CEO at Agatsa software Pvt. Ltd who have made innovative products. Ms. Gayathri and Mr Rahul gave an insight about how they took their text book science to marketable products. They also addressed issues related to regulatory requirements and market surveys which are necessary to launch a new product for medical use. Their lectures were useful for the students to understand how they can also put on their thinking caps and plan innovative projects.

More details about these young entrepreneurs are available at

<https://mashelkarfoundation.org/anjani-mashelkar-prize/intelligent-health-risk-assessment-ihra-winner-details-2023/>

<https://mashelkarfoundation.org/anjani-mashelkar-prize/sanket-winner-details-2015/>

Kudos to IWSA Member Ar. Sonam Ambe for making Holi holier for kids by adding science, and sustainability in the colours!

During the pandemic, Ar. Sonam Ambe came up with an innovative idea to celebrate Holi by making colours at home for her family. In 2024 she took the fun further to the community by conducting a free workshop for 15 children. To extend her impact, Sonam, who is also the founder of "Local Gyan", a STEM-based learning initiative that promotes learning from nature, recently organised a community founded workshop for 27 children from Girija Orphanage in Kharghar, Navi Mumbai. She uses good-quality dry turmeric for yellow, spinach puree for green, beetroot for pink, and blue pea flowers (Shankha Pushpa) for blue. By mixing these extracts with corn flour she makes dry Holi colour powders. These four primary colours can be further mixed with each other to create different colours. Kids were excited and amazed and learnt few lessons of science as well as sustainability.



Community Programs

A. Indirabai Padhye Nursery School and Education Committee

a. ECCEd (Early Childhood Care and Education) Programs

VISITS of in 2025

Edista School based on the Reggio Emilia philosophy on **9th January**
Lonavala Balgram and **SOS Children's Village** on **13th January**
Balmela at **BMN college of Home Science, Matunga** on **17th January** - conducted games and activities
Besant Montessori School, Juhu on **20th February**
Inodai Waldorf School, Marol on **21st February**
Maths Lab at HBCSE on **12th March**- how to develop logical thinking and love for maths through innovative games

Workshop: Building beyond towers- Get play into classrooms using building blocks by

Mr. Mrunal Shah, founder at Sunday Bricks

Date: **4th March 2025**

Venue: **IWSA auditorium**

Nutrition Competition

Theme: 'Immunity-Boosting Lunch Box Treats'

Date: **11th March 2025**

Venue: **IWSA auditorium**



Glimpses from Nutrition competition

Participation in Virtual Hackathon

Date: **8th February 2025**

Number of participants: **4**

Winners: **4 in two different categories**



Results

2023 – 24 batch: **21st February- 7 O (> 80%), 7 A+, 7 A, 2 B+, 1 P, 1 F**

Among the first 5 in the national merit list 4 were from IWSA!

2024 – 25 batch: **1 O, 8A+, 2A, 2B+, 1F**

On Campus Interview- conducted for the first time on **17th March** at **DPS School, Nerul.**

b. Nursery - Celebrations and Visits



Visits to a departmental store and fire brigade

Learning and Observing Road Traffic

Celebrations

Republic Day
Gudi Padwa
Holi

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

Hostel Sports Day : 7th January 2025

Hostel Day : 11th January 2025

Day Care Sports: 1st February 2025



Hostel Day

Day care sports



C. IWSA's Satish Haware Computer Education Centre

New Ventures at IWSA's Computer Education Centre (CEC)

Seven online sessions were conducted on Nano R1 Challenge by Mr. Sudhir Gupta, spread over 3rd to 17th March, 2025. 100 participants Registered. Inauguration was held on 3rd March 2025. 103 students from engineering colleges across India participated, out of which 27 were able to complete the program and upload their Nano R1 models on Hugging Face and were issued e-certificates signed by Bhardwaj Foundation and IWSA.

Four AI TECH TALKS, conducted by Expert Speakers on 18th & 24th March 2025 were attended by 40 students. This event was covered by the Hindi newspaper of Rajasthan and the lectures were uploaded on YouTube.

Both events were held in collaboration with Mr. Sudhir Gupta, Technology Evangelist & AI expert, Dr P.M. Bhardwaj, Founder Bhardwaj Foundation & Dr S. N. Vijayvergiya, CEO Renewable Technoites Consultants Pvt. Ltd.

Future Plans

During the inauguration on 3rd March, 2025 for the sessions on Nano R1 for engineering students in the field of AI, it was decided to continue the collaborative ventures beyond the Nano R1 sessions. Dr. Vijayavergiya proposed the name - **WISER** - Women empowerment, Industry academia interaction, Skill development in latest technology, Entrepreneurship development and Rural development for these collaborative ventures.

D. IWSA's Piroshja Godrej Foundation Library

1. Nursery children's Day Out in Library

Date: 15th Jan 2025

Day care and Nursery Children were explained the importance of a Library, encouraging Love for reading. Libraries provide a wide variety of books that can spark children's interest in reading and help them develop a lifelong love for it.



2. Rangoli Workshop

Date: 22nd January 2025

IWSA's Pirojsha Godrej Foundation Library welcomed the new year with open arms and a vibrant colourful program. On 22nd January 2025, rangoli workshop was organised where participants learnt the history, art and simple tricks in making rangoli from Ms. Anjali S. Kulkarni (Sanskar Bharati & Free Hand Rangoli Designer) It was a very interesting workshop where children picked up much faster than adults. There were about 30 participants in all.

Useful tips with one finger continual movement design, color mix sieving, comb spreading, permanent Rangoli display glued on acrylic sheet, etc shared by the resource person captivated participants and IWSA members present with awe and appreciation! In brief the science of Rangoli designs including mathematical precision, symmetry, biology structures, choice of spring colours, etc. bloomed in full swings during the workshop!



3. Subhash Chandra Bose's birthday. Date: 23rd January 2025

This was celebrated in the library with Science Nurture students. Students were explained that his birth anniversary is celebrated as **Parakram Diwas** in India to honour his contributions to the country's independence movement. The talk was given by **Ms. Radha Chattopadhyaya**, a Bengali guest staying in the hostel. Snacks were also arranged for students.

4. Visit to St. Jude's, ACTREC, Kharghar

Date: 5th February 2025

At St Jude both children and teachers were extremely happy with the story telling and drawing activity session conducted by IWSA library team. The library team gratefully acknowledges the spontaneous and valuable support rendered by our resource person Ms Prema Basargekar (Library Educator,) to conduct the session!



5. Outreach to Rural Schools in Khardi, Thane

Date: 25th February 2025

For the trip to Khardi, we brought a total of 40 books in Marathi and Hindi, 50 boxes of crayons, 100 plain sheets of paper for activities, and 10 butterfly plants.

Vaitagwadi School: First Visit 20 students with 1 teacher

Shared books to inspire a love for reading and distributed crayons to enhance their creative development.

Kashti School: 15 students with 1 teacher

Books were given to encourage reading and crayons to support their creativity.

School 3: Vinchupada School 20 students

Very Active, very responsive. The team was shown their dance performance.

To foster a love for reading, books were provided for them to share and exchange. Additionally, crayons to nurture their creative growth were distributed.



E. IWSA's Murli Laj Chugani Health Care Centre

1. Cancer Camp

Date: 8th January, 2025

Duration: 11.00 am to 3.30 pm

Venue: VIVA College of Science, Commerce & Arts, Virar, Palghar (Dt)

Participants: 124- 30 males, 94 females

Outreach:

Camp Highlights: Ms. Minal Parab from CPAA, along with NSS volunteers of the college coordinated the screening process. Seven stations were setup for the participants, directing them through a structured examination process:

1. Registration Counter (details of medical history, family history, tobacco & alcohol habit history were recorded)
2. General & Systemic examination, which included BP, Pulse, History, complaints or discomfort (if any) and prescription.
3. Blood Tests (Haemoglobin & WBC Count)
4. ENT Examination for T3, T4, TSH, tobacco habitues etc.
5. Gynaecological Examination (for female participants)
6. General Examination (for male participants)
7. Counselling & Guidance-provided self-examination techniques and health awareness.

Results: referrals were made for 24 participants for further evaluation and intervention by CPAA.

Overview: The annual Cancer Detection Camp, at VIVA College in Palghar was conducted in collaboration with the Cancer Patients Aid Association (CPAA). The camp took place between 11:00 AM and 4:00 PM. Ms. Deepa Dalvi, Assistant Professor, and Dr. Deepa Verma, Vice Principal of VIVA College, facilitated the enrolment of staff members for screening. NSS students were actively involved in ensuring the smooth execution of the camp.



Glimpses of the cancer camp and (left) IWSA & CPAA members with college representatives & NSS students



F. IWSA's Scholarship

IWSA Scholarship Award function was held on **18th January 2024 at 3.00 pm**, at ICICI Multipurpose Hall, IWSA campus, Vashi. Chief Guest was **Dr. Uma M. Shankar**, Director, Academics of South Indian Education Society, Sion. Three awards were given to PhD students, one each in biological sciences, chemistry and mathematics. Eleven one-time scholarship awards were given to MSc students and thirteen to BSc students. For the first time scholarship was awarded to one student of paramedical course and four students from the Rural/Adivasi sector were awarded financial assistance for their studies at the Junior and senior college level. In addition, two students of IWSA ECCEd course were given assistance in the form of payment of their fee. All applicants were from Maharashtra. Total participants were around 100, including awardees and guests.



Scholarship award function and awardees with the chiefguest and IWSA members

Outreach: 100

Reports from Branches

Ajmer

1. IWSA – BRNS Popular Science Lecture for Colleges Title- Rethinking Waste: Plastic and Beyond

Date: 15th February, 2025

Speaker: Dr. Ruby Makhija, Founder - Why Waste Wednesdays

Venue: S.S. Jain Subodh P.G. College Department of Environmental Science, Jaipur

Outreach: 100+



Abstract: Plastic, once celebrated as a revolutionary material, has become a symbol of environmental distress, contributing significantly to the global waste crisis. This session delved into the dual challenge of managing plastic and other waste forms, highlighting their impacts on ecosystems and human health. Through innovative solutions and sustainable practices, we can rethink our relationship with waste and transform it into an opportunity for conservation and change. The talk was a call out to the participants to chart a path toward a cleaner, greener future together.



2. IWSA – BRNS Popular Science Lecture for Colleges Title: Unlocking Mental Wellbeing: A Deep Dive with a Mental Health Expert

Date: 17th March, 2025

Speaker: Dr. Tulsee Giri Goswami, Behaviour Scientist, Co-convener, IWSA, Ajmer

Venue: Radha Govind Government College, Brahampuri, Jaipur

Outreach: 114



Abstract: Mental well-being is the foundation of a fulfilling and productive life, yet it remains widely misunderstood and often overlooked. This session explored evidence-based strategies for fostering mental wellness in personal and professional spheres. Participants gained practical insights into recognizing early signs of distress, building emotional strength and implementing mindfulness-based techniques for sustained well-being. This session was to equip people irrespective of being a professional, student, or mental health enthusiast, with valuable tools to navigate life's challenges with confidence and clarity. This engaging



to take proactive steps towards mental wellness and holistic self-care. Additionally, Dr. Goswami conducted several mindfulness activities to help participants experience relaxation techniques and improve their overall mental well-being. These activities provided hands-on experience in stress reduction and self-awareness. The session witnessed active participation from students and staff members. The interactive discussion allowed participants to share their experiences, ask questions, and seek guidance on handling stress and emotional challenges. Dr. Goswami provided practical solutions and real-life examples to help students implement mental wellness strategies effectively.

3. Satyaa – स्त्री सम्मान – A Tribute to Womanhood

Date: 29th March 2025

Venue: Auditorium, Taxila Business School, Jaipur

Outreach: 300

Organized by Satya Foundation Charitable Trust, in collaboration with SIMHANS (Satya Institute of Mental Health and Neurosciences) and Satya Universe – Holistic Learning & Development

Associate Partners & Institutional Support

- **Indian Women Scientist Association (IWSA), Ajmer Chapter** – Advocacy partner, encouraging academic and research nominations
- **Indian Society for Training & Development (ISTD)** – Knowledge partner for skill- based categories
- **Satya Universe – Holistic Learning & Development** – Provided content support and hosted the award application portal

Concept and Uniqueness of the Ceremony

Satyaa – स्त्री सम्मान was conceived as a heartfelt tribute to womanhood in all its strength, beauty, and resilience. The awards aimed to highlight the often-unnoticed contributions of women who go beyond professional success and enter the realm of silent sacrifice, cultural preservation, and family unity.

While there are many award platforms that recognize corporate leaders, entrepreneurs, or celebrities, **Satyaa – स्त्री सम्मान 2025** along with **professional women** uniquely acknowledged the **non-professional women**—homemakers, caregivers, and cultural guardians—who continue to uphold the values of Indian tradition with strength and grace. The ceremony was thus a blend of honoring both **professional excellence and personal sacrifices**, making it a **pioneering initiative in inclusive recognition**.

From over **100+** nominations received from all over India, across **15 carefully designed categories**, final selection of **22 awardees** was done based on collective consensus of the eminent jury panel of professionals and domain experts. Assessment was based on criteria like **impact, innovation, social value, and personal story**. The categories were Women in Leadership & Entrepreneurship, in Mental Health & Well-being, Social Change & Human Rights, Healthcare & Community Service, Education & Research Excellence, Arts, Culture & Media Impact and many more.

Chief Guest was Dr. Premchand Bairwa, Hon'ble Deputy Chief Minister, Govt. of Rajasthan.

Malini Agarwal, IPS, Dr. Alka Gaur, MD, Souvenir Hotels and President, FORTI WW were distinguished guests. Dr. Prakash Giri, Chairperson, Satya Foundation Charitable Trust and Dr. Tulsee Giri Goswami, Behavioural Scientist also talked on this occasion. Open Panel Discussion was another event during the Awards Ceremony.



The topic was **Mental Health Among Youth – A Collective Concern**, moderated by: **Dr. Tulsee Giri Goswami**. The panelists were **Mr. Ranjeet Singh**, NLP Coach, **Mr. Alok K**, Corporate Trainer, **Ms. Deepa Mathur**, from QUALIS, and **Dr. Mohini Gupta**, Clinical Psychologist. The session highlighted growing challenges in youth mental health and the importance of emotional literacy and systemic support. This award is now planned to be an annual tradition.

Amravati

1. The Global Women's Breakfast (GWB) 2025

Theme: **Accelerating Equity in Science**

Collaborator: **Department of Chemistry, Sant Gadge Baba Amravati University (SGBAU), Amravati**

This event was promoted by the Association of Chemistry Teachers (ACT), c/o Homi Bhabha Centre for Science Education (TIFR), Mumbai, under the banner of IUPAC (International Union of Pure and Applied Chemistry). The theme for this year's event was "Accelerating Equity in Science," emphasizing the importance of gender equality and inclusivity in scientific fields.

The event was graced by distinguished guests, including Prof. N. N. Inamdar, I/C Principal, Govt. College of Pharmacy, Amravati, who served as the Chief Guest. Dr. M. M. Rathore, Convenor of Indian Women Scientists Association, Amravati Branch, Amravati, attended as the Guest of Honor.



The Chairperson of the event was Dr. Swati S. Sherekar, Head, Incubation centre, Sant Gadge Baba Amravati University, Amravati. The event was led by Dr. P. A. Gawande, Head of the Department of Chemistry, SGBAU. The organizing team included Dr. J. M. Barabde, Associate Professor, SGBAU, as the Convener, and Dr. M. M. Kodape, Associate Professor, SGBAU, as the Co-Convener. During the event, Dr. J. M. Barabde delivered an inspiring speech, emphasizing the importance of women's participation in science and the need for gender equity in STEM fields. Her speech motivated attendees and highlighted the contributions of women scientists throughout history. Ms. Vaishnavi Shukla the student of M.Sc. I compered the program and vote of thanks proposed by Vedika Thawali., Associate Professor, SGBAU, as the Co-Convener.

A poster competition was also organized as part of the event, allowing students and researchers to showcase their ideas and innovations related to the theme of gender equity in science. The competition provided a platform for inclusivity and the challenges faced participants to express their perspectives on by women in scientific careers.

GWB 2025 was a resounding success, bringing together academicians, researchers, and students to discuss and promote gender inclusivity in science. The event provided a platform for knowledge-sharing, networking, and motivation for aspiring women scientists, reinforcing the need for collective efforts to achieve gender equity in the scientific community.

2. Celebration of National Science Day

Theme: **Poster Competition**

Date: **2nd March 2025**

Venue: **Vidya Bharati Campus**

Outreach: 43



Baroda

1. IWSA – BRNS Popular Science Lecture for Colleges

Title- **The Roadmap to Net Zero Goals: Role of the Sustainable Catalysts and Biomass**

Date: **1st March 2025**

Speaker: **Prof. Anjali Patel**, Department of Chemistry, The M.S. University of Baroda

Venue: CVR Seminar Hall, Department of Biochemistry Faculty of Science, The Maharaja Sayajirao University of Baroda.

Outreach: 50



Abstract: India has committed to achieving net zero emissions by 2070, demonstrating its commitment to climate action. Sustainability and green energy are essential pillars for achieving this goal, ensuring a balance between economic growth and environmental responsibility. The crucial role of chemical sciences in achieving India's Net Zero goal by 2070, highlighting the potential of biomass as a sustainable resource for green energy and a circular economy. Biomass conversion can help to reduce the carbon dioxide emission and paving the transition to Net Zero economy as it is a carbon neutral energy source that can be converted into heat fuels and other energy products. Prof. Patel presented her contribution along with her team towards advancing net zero society via developing sustainable catalysts for biomass valorization, especially for the upgradation of sugar cane bagasse to value-added products.

2. IWSA- BRNS Popular Science Lecture for Colleges

Title: **Microscopy: A Key to Understanding the Microscopic World**

Date: **25th January 2025**

Speaker: **Dr Anuradha Nerurkar**, Professor of Microbiology (retd.) Dept. of Microbiology & Biotechnology Centre, The Maharaja Sayajirao University of Baroda, Vadodara

Venue: **Science College, Congress Nagar**

Outreach:94

Abstract: Microscope is a vital scientific instrument harnessed to observe the world of microbes and other intricate structures invisible to the naked eye that exist in the biological world. Antonie Van Leeuwenhoek was the first to detect minute entities under microscope constructed by himself which he termed 'animalcules.' Curiosity of scientists to know about the realm of the microbial world led to many rapid developments in the microscope technology. Brightfield microscope routinely used in the laboratory was refined in many aspects such as resolution, lenses, components, etc. Modifications in light microscope like Dark-field, Phase contrast, Fluorescence enhanced the details of the objects viewed. Further advanced specialised microscopes were developed for different applications viz. Electron, Confocal, Differential interference contrast, scanning probe, Inverted, Polarising, Cryoelectron microscope etc. In present day, microscopy finds use in not only biology but also in the areas of Medicine, Material science, Nanotechnology to name a few, leading to groundbreaking discoveries throwing light on our understanding of our invisible world.

Bengaluru

1. IWSA- BRNS Popular Science Lecture for Colleges

Title: **Building Knowledge-based Societies for Global Sustainability**

Date: **23rd January 2025**

Speaker: **Dr Shannon Olsson**, Founder & Global Director, the echo network; Special Scientific Envoy to India, Danish Academy of Technical Sciences

Venue: Faculty of Life and Allied Health Sciences, **M. S. Ramaiah University of applied sciences** and Dept. of Biotechnology, **Ramaiah Institute of Technology, Bengaluru**



Abstract: Join Shannon Olsson, Founder and Global Director of the echo network and Special Scientific Envoy to India for the Academy of Technical Sciences, as she discussed the pivotal role of knowledge-based societies in achieving global sustainability. Drawing from her extensive expertise at the nexus of science, technology and international policy, Olsson explored how innovation, education, and collaboration can address global challenges like climate change. With a focus on India and examples of successful global initiatives, she highlighted the power of cross-sector partnerships, data-driven decisions and equitable access to knowledge in building a sustainable and resilient future.

Drawing from her work in international science-policy collaborations, she emphasized the role of knowledge-based societies in addressing climate change and ecological preservation. The lecture included interactive elements, such as AI-supported quizzes, and highlighted the importance of equitable access to information, community empowerment, and cross-sector partnerships for a resilient and sustainable future.

Outreach 135

Delhi

1) Online Lecture on KAMP (Knowledge and Awareness Mapping Platform)

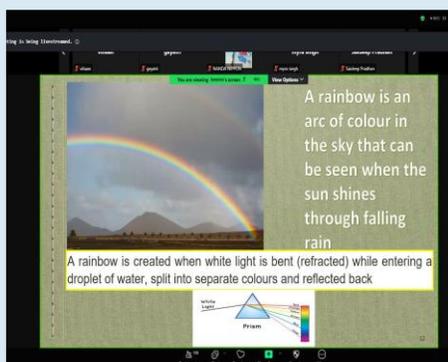
Date: 6th February 2025

Topic: Let's see the world around us through science

Dr. Poonam Arora, Secretary, IWSA Delhi Branch coordinated the lecture with the help of Dr. Kanika Malik, Convener, IWSA Delhi Branch. The lecture was delivered by Mrs. Savita Makkar, IWSA member and co-founder, Sohsheel Education Research Foundation. The lecture got participation from various school across the nation. The lecture was perfect to create the curiosity in young students and motivate them to make observations all around them and science can help them understand everything. There was no financial expenditure associated with the organization of this lecture. The lecture was streamed live on KAMP's FB page.



Outreach: 150



2. One Day Workshop at CSIR-National Institute of Science Communication and Policy Research (CSIR-NIScPR), New Delhi

Theme: **Empowering Girls for Participation in STEM: Fostering Awareness for Inclusive Education**

Date: **11th February, 2025**; Venue: **Pusa Campus**

Outreach: 56

This one-day workshop was organised on the first decadal anniversary of the International Day of Women and Girls in Science on 11th February 2025. The event aimed to inspire and encourage young girls to pursue careers in Science, Technology, Engineering, and Mathematics (STEM). Aligning with UNESCO's theme, "Unpacking STEM Careers: Her Voice in Science," the workshop was held at the CSIR-NIScPR, which brought together 56 undergraduate female students from four renowned women's colleges of the University of Delhi, Gargi College, Kalindi College, Lady Irwin College, Deshbandhu College and Miranda House, alongside esteemed academicians, researchers, and policymakers. It provided a valuable platform for mentorship, resources, and critical insights into government initiatives, scholarships, and funding opportunities available for women in STEM.

Dr Kanika Malik, (Senior Principal Scientist and Delhi branch convenor of the IWSA), delivered an IWSA -related talk. The interactive segment of the workshop included a group discussion based on pre-filled questionnaires, allowing students to express their aspirations and challenges in STEM education. Mrs Sandhya Wakdikar, Senior Principal Scientist, CSIR-NIScPR, delivered a talk on "Opportunities for Undergraduate Girls in STEM" and provided valuable information on government schemes, funding opportunities, and resources available to support women in STEM careers.



3. National Science Day Lecture -Online

Theme: **Unravelling the Mysteries of Science**

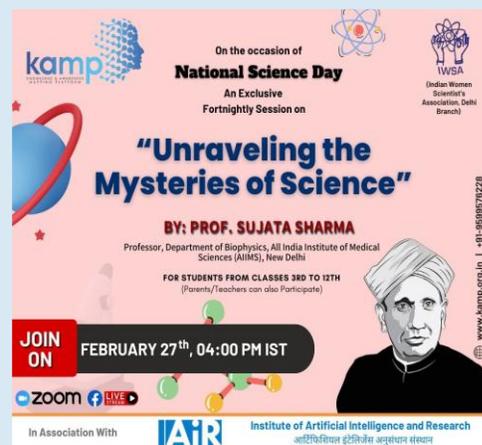
Collaborator: **KAMP**

(Knowledge and Awareness Mapping Platform).

Date: **27th February 2025**

Dr. Poonam Arora, Secretary, IWSA Delhi Branch coordinated the lecture. The lecture was delivered by Prof. Sujata Sharma, AIMS New Delhi. Students from various school across the nation participated. The lecture was perfect for National Science Day with information on how Science helps us understand the world better. The lecture was streamed live on KAMP's FB page.

Outreach: 110



4. IWSA-BRNS Popular Science Lecture

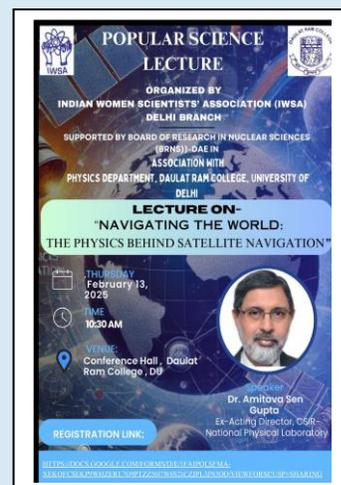
Date: **13th February, 2025**

Topic: **Navigating the world: The Physics behind Satellite Navigation**

Venue: **Daulat Ram College for Girls, Delhi University**

Outreach : 110

Abstract: Satellite based navigation is an example of a few contemporary applications that have revolutionized our daily lives. Today, no matter where we are on the earth, thanks to the satellite constellations of the Global Navigational Satellite Systems (GNSS), we never have to worry about our precise Position, Navigation and Time, abbreviated as PNT. There are currently several operational GNSS systems covering the entire globe, the oldest and the most well-known being the American Global Positioning System (GPS). GNSS is used globally for myriads of applications ranging from surveying, road transport, aviation, agriculture, telecommunications and so on.



5. Interactive session on Diet and Nutrition

Date: 5th March 2025

Theme: Find Healing Power Within

Speakers: Acharya Dr Mohan Gupta and Ms. Pooja Bansal

Venue: CSIR-NPL

Outreach: 30



Acharya Dr Mohan Gupta and Ms. Pooja Bansal shared insights for a healthy lifestyle through balanced diet & nutrition. Many women staff and students of NPL participated in the session.

6. Lecture on Mental Well-being

Date: 6th March 2025

Speaker: Dr. Sudha Ashwin (Ayurveda Practitioner), CARI

Venue: CSIR-NPL

Outreach: 30



During International Women's Day Week, CSIR-NPL & IWSA Delhi branch organized an inspiring talk by Dr. Sudha Ashwin (Ayurveda Practitioner) from Central Ayurveda Research Institute (CARI) on Traditional Wisdom for Modern Lives: Balancing Life the Holistic Way, shared insights on mental well-being. The talk benefitted many women staff and students of CSIR-NPL.

Hyderabad

1. IWSA-BRNS Popular Science Lecture

Date: 10th February, 2025

Topic: Nuclear Energy for a Sustainable Energy Security

Speaker: Dr. G. Amarendra, Formerly Material Science and Metallurgy group, IGCAR

Venue: Dept. of Physics, University College of Sciences, Osmania University, Hyderabad



Abstract: There is a synergistic interplay between the availability of energy resources and economic development of a country. Various available energy sources of power production in our country were discussed, with their merits and demerits. A biographic sketch of Dr Homi Jehangir Bhabha, the founding father of our atomic energy program, based on the nuclear fission was highlighted and useful isotopes were also discussed. After introducing the concept of moderation of neutrons, the development of thermal and fast reactors was explained. Three stage nuclear power program, as envisaged by Bhabha, for the energy security of the country was highlighted. Career opportunities for young students in pursuing scientific research in various scientific establishments were also highlighted.



Outreach: 85

Kalpakkam

1. Science Day Celebration

- a. **Science Elocution Competitions** were conducted at Kendriya Vidyalaya-1 and Kendriya Vidyalaya-2 on January 25, and February 1st 2025 respectively. The events saw enthusiastic participation from both the schools, with 16 students competing in the junior group and 17 in the senior group in KV1. In KV2, 22 students in junior group and 16 students in senior group participated. A twelve-member panel from the Indian Women's Scientists' Association (IWSA) evaluated the performances, and the results were announced on the same day.
- b. **National Science Day – 2025 celebration** was on 28th Feb 2025 at Atomic Energy Central School – II, Kalpakkam Township. The celebration started with the welcome address by Convener, IWSA-K. Secretary IWSA-K briefed the activities of IWSA-K to the students and staff. The Presidential Address was delivered by Shri. Girish Chathre, BARCF. In his address, he explained about the benefits of hard work, sincerity, consistency, perseverance and focus in studies to become successful in life. Students were very much motivated by his speech. Special talk was delivered by Smt. Shivakamy, Treasurer, IWSA-K on "Own your health - A Teens Guide to Hygiene". In her talk, she has covered in detail personal hygiene, keeping surroundings clean, food etiquette, regular exercise, substance abuse etc to keep one's self clean. Also, she touched upon keeping the mind clean from excessive use of mobile, internet, chats & mobile games. It was followed by prize distribution to the winners of Science Elocution Competitions. Around 110 students and 15 faculty members participated the program.

Outreach : 125



2. IWSA – BRNS Popular Science Lectures for Colleges

Title: Polymer Films for Lead-free Diagnostic X-ray Shielding Materials and Antimicrobial Applications

Date: 12th February 2025

Speaker: Dr. Sangeetha Jayakumar, Physical Metallurgy Division, Materials Characterization Group, Metallurgy and Materials Group, Indira Gandhi Centre for Atomic Research, Kalpakkam

Venue: Hindustan College of Arts & Science, Affiliated to Anna University, Rajiv Gandhi Salai, OMR, Padur, Kelambakkam, Chennai

Outreach: 100



Abstract: Lead based shielding materials are being used as thyroid collars, aprons and gloves for the protection of patients and operators during diagnostic X-ray scans. As lead based shielding materials are heavy and toxic, there is a demand for the development of lead-free X-ray shielding materials. Recently, polymer nano-composites have been shown to exhibit radiation attenuation property, particularly, against X-rays of diagnostic energy range (20-125 keV). Polymer based nano-composites provide a good platform to study the role of various nanofillers in X-ray attenuation, in addition to providing flexibility and being light-weight. The prime requirements of diagnostic X-ray shielding materials

are high attenuation property, non-toxicity, cost-effectiveness and comfort. This talk focused on the recent developments in polymer nano-composites for lead-free attenuation of diagnostic X-rays and the radiopaque properties of single and multi-filler loaded nano-composites developed in our Smart Materials section. The application of polyvinyl alcohol films (PVA) containing plant extracts as antimicrobial films was also discussed. Phytochemicals exhibit a wide range of antimicrobial activities. Therefore, PVA films containing plant extracts were prepared using a simple solution casting technique at a temperature of 42°C. The antimicrobial activity of the films was studied using Kirby-Bauer Disc Diffusion method and the polymer films containing plant extracts were found to exhibit antimicrobial activity against both *E. coli* and *S. aureus*. Quantitative analysis of the antimicrobial property of these films was carried-out using turbidimetry which corroborates the antimicrobial property of these films. PVA-plant extract-based films are promising candidates for antimicrobial applications, such as, in wound dressing as a ready to use bandage. Further, these polymer films can be tuned to provide flexibility, self-absorbing property and breathability for probable application as a first line of defense in patients with burn injuries.

3. Celebration of International Women's Day on 06.03.2025

International Women's Day-2025 was celebrated by IWSA, Kalpakkam branch in association with Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam on 6th March 2025 at Sarabhai Auditorium, HBB, IGCAR. Shri. K. Rajan, Outstanding Scientist & Director, Reprocessing Group, IGCAR, was the chief guest and the special speakers for the programme were Dr. S. T. Aruna, Chief Scientists, CSIR –National Aerospace Laboratories, Bangalore and Dr. K. Rajeshwari, Founder & Managing Director, Bioklone Biotect Private Limited, Navalur, Chennai.

The speakers were welcomed by giving saplings and were introduced by EC members of IWSA-K. Dr. B. Sasi, Secretary IWSA, read the activity report of IWSA, Kalpakkam for the year 2024-2025 and listed the various programs conducted. In his presidential address, Shri. K. Rajan discussed women's multitasking skills and their equal contributions and accomplishments in DAE. In the talk titled "My Research Journey: From Burning Chemicals to Earning Laurels", Dr. S. T. Aruna detailed her work on developing thermal and environmental barrier coatings for different applications, tapecast ceramic substrates for electronic applications and oxygen sensor and reversible solid oxide fuel cells which lead to 11 patents and also technology transfer to industry for bulk production. In the talk titled "Building a Biotech enterprise: Journey of a Biopreneur", Dr. K. Rajeshwari stressed on the importance of long-term planning for a successful business and said that having a successful career is like running a marathon and not a sprint. She also told that for being an entrepreneur one need to have a passion and should think in terms of long-term sustainability. Both talks were followed by the interactive session. The chief guest and special speakers were honored with gifts and mementoes. The event ended with vote of thanks, a token Women's Day gift from IWSA-K, and High Tea. The function was cherished by all the participants.

Outreach : 200



4. Technical Talk on Hypertension and preventive measures

Speaker: Mrs. V. Vanasundari, Asst. Matron, Nursing, DAE Hospital, Kalpakkam

Date: 22nd April 2025, Venue: Auditorium Nondestructive Evaluation Division, IGCAR.

Smt. Jemimah Ebenezer, Convener, IWSA-K welcomed the audience and introduced the speaker. The speaker discussed the cause of hypertension and risk factors. She emphasized that preventing or managing high blood pressure is largely within our control through lifestyle changes, regular monitoring, and medical management when required. She detailed about the way to follow healthy diet, regular physical activity, maintain healthy weight and managing stress. The lecture was followed by an interactive session. As token of appreciation Smt. Jemimah Ebenezer, Convener, IWSA-K presented a memento to the speaker. Dr. Gurpreet Kaur, Joint Secretary, IWSA-K thanked the speaker and the audience.

Outreach : 22



Kolhapur

1. World Wetland Day Celebration

Theme: **"Protecting wetland for our Common Future"**

Date: **2nd and 3rd February, 2025**

Objectives:

- To highlight the significance of wetlands in maintaining ecological balance.
- To educate participants on the threats faced by wetlands and conservation strategies.
- To encourage community participation in wetland restoration and protection efforts.
- To create wetlands warriors to create awareness through environmental games.

Activities:

- Inaugural Session where eminent environmentalists, researchers, local authorities shared insights on wetland conservation.
- **Bird watching and Bird Counting Activity**
- **Expert Talk and Panel Discussion**
- **Field Visits:** guided tour was conducted to Ambekhan wetland, Nishan Talav, Pat- lake wetland, Walawal wetland and Dhamapur Wetland
- **Clean-up Drive** of plastic waste and other pollutants from wetland area.
- **Students Competitions and Awareness Programs**
Essay writing competition on "Wetland conservation" & elocution competition on "Youth for Wetland Conservation"
- **Pledge for Wetland Conservation**
The event fostered engagement among students, researchers and local communities, emphasizing collective action for wetland conservation.

"World Wetlands Day Celebration"

Vanashakti, MPCB,
Br. Balasaheb Khardekar College, Vengurla,
Municipal Council, Vengurla,
Mangrove Foundation, Malvan
& Department of Forestry

Jointly Organized Two Days Workshop On:

"PROTECTING WETLANDS FOR OUR COMMON FUTURE"

Date: 2nd & 3rd, February, 2025

Venue : Br. Balasaheb Khardekar
College, Vengurla.

Resource Persons :

1. Dr. Anilraj Jagadale,
Geologist.
2. Dr. Nagesh Daptardar,
Wetlands Expert.
3. Mr. Pravin Sawant,
Youngest Wetland
Researchers, Birds Expert.

Highlights of the Workshop :

- Field visits with renowned Experts.
- Opportunity to know wetland Flora -Fauna.
- Lectures by experienced Researchers.
- Importance of Marine Debris Cleanup Program
- Be Wetland warriors to create awareness through environment games by, TEAK nature club members.



2. IWSA – BRNS Popular Science Lectures for Colleges

Title: Artificial Intelligence: Progress, Impacts & Challenges

Date: 21st February 2025

Speaker: Dr Vivek Patkar, Freelance Researcher, Science Communicator, Mumbai

Venue: Dept of Physics, Rajaram College, Kolhapur

Outreach: 87

Abstract: Before talking about artificial intelligence (AI) it is necessary to understand the basic features of human intelligence, such as 1) thinking capacity, 2) constructing abstract models, 3) learning through experience, 4) creative & innovation ability, and 5) capacity to understand, use and control one's own emotions. So, building these features on a computer, or simply stated, the implementation of these human intelligence features through machines or software constitutes AI. This dream was boosted with the remarkable progress of the digital computer and allied technologies in the 1950s. Considering the complexity of human intelligence, separate development of systems that can act as expert in areas such as Mathematical theorem proving, Game experts in different areas, such as Mathematical theorem proving, Game playing, Language translation, Pattern recognition, Development of task-specific robot etc., were taken up.

By integrating these developments in the last 75 years, it is considered plausible to build an AI-based system that will be competent enough to nearly match human beings in the near future.

Current AI systems are technically divided in three categories namely, Artificial Narrow Intelligence (ANI), Artificial General Intelligence (AGI) and Artificial Super Intelligence (ASI). Though appreciable advances have happened in ANI, the progress in AGI is moderate and ASI is in primitive state. Most of these systems are trained on a given data set and algorithms (Machine Learning and Deep Learning) so that they can use that learning to address a new decision situation. Large Language Modelling and ChatGPT represent the ongoing phase of the machine learning journey. Next stage of this process is: Explainable Artificial Intelligence (XAI), which will provide the reasoning for its actions or advice in a simple language. This is already seen while using a software like DeepSeek for generating or editing a text. All the above details, the applications of AI in almost all the sectors of human activities, the short and long-term impacts of AI, the challenges posed by AI etc. were discussed in the talk.



Outreach: 87

3. Celebration of Science Day

Event: Poster Presentation and Aromatic Plant Exhibition

Theme: Fragrances for Future

Date: 28th February 2025

Venue: Dr.Ganpatrao Deshmukh Mahavidyalaya, Sangola

Number of posters: 27



4. Celebration of Women's Day

Event: One-day training programme on Chemical free fruit pulp preservation and Floral Drinks

Date: 7th March 2025

Collaborators: Sangola Nagarparishad, Sangola

Beneficiaries: Women Self Help Groups

Number of participants: 135



5. IWSA's XVI Triennial Conference

Title: Science and Technology of Natural Aromas for Societal Benefits and Women Empowerment

Date: 21st and 22nd March 2025

Collaborators: Br. Balasaheb Khardekar College, Dr. Ganpatrao Deshmukh Mahavidyalaya, Sangola and Vengurla, Municipal Council

Number of participants: 148

Spanning two days, the IWSA's XVI Triennial Conference aimed to explore the ecological and clock economic significance of aromatic plants, with a particular focus on sustainable practices and community involvement.

Keynote sessions featured experts discussing various topics, including the importance of natural fragrances for a greener future, genomic advancements in medicinal and aromatic plants, and the potential for entrepreneurship through the CSIR Aroma Mission. Notably, the conference highlighted the commercial viability of endemic species like *Mammea suriga* and emphasized the integration of traditional knowledge with modern scientific practices in extracting aromatic compounds.

The technical sessions covered extraction methods, biotechnological innovations, and the role of aromatic plants in healthcare through aromatherapy. The conference concluded with a cultural program, a visit to the Surangi Grove, and a valedictory session recognizing the contributions of all participants.



Nagpur

1. IWSA – BRNS Popular Science Lectures for Colleges

Topic: Microscopy: A Key to Understanding the Microscopic World

Date: 25th January 2025

Speaker: Dr. Anuradha Nerurkar, Professor Microbiology (Retd) Maharaja Sayajirao University, Vadodara

Collaborators: Shri Shivaji Society's Science College, Nagpur

Outreach: 100

Abstract: Microscope is a vital scientific instrument harnessed to observe the world of microbes and other intricate structures invisible to the naked eye that exist in the biological world. Antonie Van Leeuwenhoek was the first to detect minute entities under microscope constructed by himself which he termed 'animalcules.' Curiosity of scientists to know about the realm of the microbial world led to many rapid developments in the microscope technology. Brightfield microscope routinely used in the laboratory was refined in many aspects such as resolution, lenses, components, etc. Modifications in light microscope like Dark-field, Phase contrast, Fluorescence enhanced the details of the objects viewed. Further advanced specialised microscopes were developed for different applications viz. Electron, Confocal, Differential interference contrast, scanning probe, Inverted, Polarising, Cryoelectron microscope etc. In present day, microscopy finds use in not only biology but also in the areas of Medicine, Material science, Nanotechnology to name a few, leading to groundbreaking discoveries throwing light on our understanding of our invisible world.



2. IWSA Science Day

Date: 22nd February 2025

Venue: NEERI Auditorium, Nagpur

Outreach: 80

Indian Women Scientists' Association (IWSA), Nagpur Branch, celebrated National Science Day at the NEERI Auditorium, Nagpur. To mark the occasion, an intercollegiate elocution competition was organized, where students from various colleges participated, showcasing their oratory skills on science related topics. The event commenced with a warm welcome by Dr. Seema Somalwar, Convener of IWSA & Principal, Nikalas Mahila Mahavidyalaya. Dr. Lalita Sangolkar, Executive member and program coordinator IWSA, Ex- Scientist NEERI, delivered the introductory remarks, explaining the history, objective and theme of Science Day. The competition was evaluated by a panel of esteemed judges.



Judges:

- Er. Smita Muley, Former Scientist, BARC
- Dr. Padma Rao, Head, EIA Division, NEERI
- Dr. Rita Israni, Retired Microbiologist, Agmark

Students expressed their insightful views on how science brings about peace and development, ways to bridge the gap between science and society and foster public trust in science.

Dr. Pratibha Deshmukh, Professor & Director Department of Anesthesiology of Datta Meghe Medical College, Nagpur graced the event as the Guest of Honor. She congratulated the students for their enthusiastic participation and shared her perspective on the vital link between science and society. Dr. Anuradha Gadkari, Founder Member of IWSA & Ex - Scientist NEERI, appreciated students' participation and advised them to make use of opportunities for their progress.

Competition Winners:

- Best Speaker: Afifa Shafia (Seth Kesrimal Porwal College, Kamptee)
- Second Prize: Sanyukta Burande (Nikalas Mahila Mahavidyalaya, Nagpur)
- Third Prize: Netra Raut (Shri Shivaji Science College, Nagpur)
- Best Team Award: Datta Meghe College of Medical Science (Team members: Vedant Kohle, Chimthanwala, Nandini Singh)

The event concluded with a vote of thanks proposed by Mrs. Prachi Lakhe, Secretary of IWSA. The program was skillfully conducted by Mrs. Asmita Duragkar, while Life members Dr. Chandra Chakrabarti, Dr. Bharati Ganu, Dr. Monika Borikar, Mrs. Mamta Chopde and Mrs. Mamta Karikar worked hard for the success of the program.

3. Meeting with RGSTC Chairman Padma Bhushan Dr. Anil Kakodkar

Date: 4th March, 2025



A delegation of IWSA members met Padma Bhushan Dr. Anil Kakodkar, Chairman Rajeev Gandhi foundation for Science & Technology. The delegation discussed possibility of MoU between RGSTC and IWSA to develop R&D ecosystem in higher education institutes Nagpur division. Dr. Mayee ex director Central Cotton Research Institute was also present. Discussion centered around how expertise of IWSA members can be used for mentoring research projects.

Number of participants: 15

4. International Women's Day Celebration

Date: 15th March, 2025
No of Attendees:30



The program organized at Ravi Bhavan Hall began with an inspiring speech by Dr. Anuradha Gadkari, wherein she emphasized that we are women of substance, driven by values and we must uphold the same. We must do our roles correctly at work and at home and continue to do best. The speech was followed by song presented by Dr. Banashree. Dr. Pranita added a beautiful touch to the program. Dr. Gidwani took everyone on a laughter trail by sharing some jokes. A good tribute was offered to women through marathi poems read by Dr. Saroj Desai and Dr. Saoji. Skit presented by Dr. Dipti, Dr. Soni and Dr. Pankule was a tribute to women's day. It skillfully depicted transformation of women along the timeline. In changing times and roles, the one thing that remains constant is affection and values instilled by parents. The skit was appreciated by all. Dr. Chandra Chkrabarti and Dr. Rita Israni coordinated the program. The workshop was attended by Dr. Seema Somalwar, Mrs. Prachi Lakhe, Mrs. Mamta Chopde.

Nellore

Orientation Program on Stress Management

Date: 16th Feb 2025.
Speaker: Dr Bindu Menon
Venue: Vikrama Simhapuri University, Nellore
Outreach: 80+



Pune

Women's Day Celebration

Event: One Day Seminar on Mental Health and Fitness
Venue: Department of Microbiology, SPPU
Date: 8th Mar 2025.

International Women's Day was celebrated by organizing a seminar on Mental Health and Fitness. Prof. (Dr.) Jyoti Bhakare, Officiating Registrar of Savitribai Phule Pune University (SPPU) inaugurated the seminar. Prof. Bhakare, with her vast experience in cases related to reproductive health and the social stigma surrounding women in India. She highlighted the challenges and triumphs of women in Indian society and the associated changes in the Indian law.



Articles

WOMEN WHO SHAPED THE DESTINY OF BIO-MEDICAL SCIENCE

Susan Eapen

INTRODUCTION

Bio-medical science has witnessed many remarkable inventions during 20th and 21st centuries, which led to rapid progress in the field and many women have given substantial contribution to these developments. Many of them did not get due recognition. However, there is a gradual change in trend towards the end of 20th century and the beginning of 21st century, with more women scientists getting due credit they deserved. Some of the women who created history in bio-medical science are listed below.

1. NETTIE MARIA STEVENS [1861-1912]



Nettie Maria Stevens was an American Geneticist, who in 1905 discovered the sex chromosomes in meal worms (*Tenebrio molitor*) immediately after Mendel's laws of Inheritance were rediscovered in 1900. She found that male meal worms produced two types of sperms, one with a large chromosome (later called X) and one with a small chromosome (later called Y). When the sperm with X chromosome fertilized an egg, it produced a female offspring and the sperm with Y chromosome fertilized an egg, it produced a male offspring and her work was published in 1905. She, later extended her studies to other insect species as well.

She took her under graduate and post graduate degrees from Westford Academy and Stanford University and did her PhD in Bryn Mawr college in 1903.

She also worked in institutes in Italy and Germany, besides Carnegie Institute of Washington. Stevens was not immediately recognized after her path breaking discovery of sex determination by sex chromosomes because gender bias existed during that time in science. She had worked with T H Morgan, who received Nobel prize in 1933. Her singleminded devotion combined with her keen power of observation was responsible for her achievement. She died of breast cancer at the age of 50 and just before her death she was offered the position of a professor at Bryn Mawr college, which was not accepted by her because of her poor health.

2. E. K. JANAKI AMMAL [1897-1984]

Janaki Ammal was an Indian Cyto-geneticist and Plant Breeder, who worked on cytology of a range of plants and coauthored the book "Chromosome atlas of cultivated plants" along with C D Darlington in 1945. She was born in Thalassery, Kerala and got her Bachelor's Degree in Botany from Queen Mary's College, Madras and moved to University of Michigan earning a Master's Degree in Botany in 1926 and a PhD in 1931. On her return, she worked as a Professor of Botany in Maharaja's College, Trivandrum and later in Sugarcane Breeding Institute in Coimbatore. She also spent 6 years in John Inn's Institute, UK and later at Royal Horticultural Society, Wisley from 1945 to 1951. Thereafter, she was invited by Indian Government

to be the Director of Central Botanical Laboratory, Allahabad. She also worked in Regional Research Laboratory in Jammu and BARC, Bombay.



In Sugarcane Breeding Institute, Coimbatore she produced a high yielding variety of sugarcane. Her studies on chromosomes and inducing polyploidy using colchicine were exemplary. She faced discrimination in India because she belonged to a backward class. In England, she had worked on hybridization of Magnolia and later a Magnolia variety she developed is named after her as "*Magnolia Kobus Janaki Ammal*". She also developed many hybrids of brinjal. In an age when most women did not even complete high school, she did her PhD and made several contributions. She was awarded Padmashri by Indian Government.

3. GERTI CORI [1896-1957]



Gerti Theresa Cori was a Bohemian-Austrian American Biochemist, who in 1947 was the first woman to win a Nobel Prize in Physiology and Medicine along with her husband and one more scientist for the ground breaking work on catalytic conversion of glycogen.

Gerti Cori was born in a Jewish family in Prague and joined the medical school in Prague. In 1922, she with her husband Carl Cori migrated to US and joined the institute, which later became Rosewell Park Cancer Institute in Buffalo, New York and worked on carbohydrate metabolism. She with her husband published their work on how human body breaks glycogen in muscle tissue. Her husband Carl Cori was offered a job in several universities after their trailblazing work; but not Gerti Cori. Her husband joined Washington University, St. Louis; but Gerti had to be satisfied with a research associate position and had to wait 13 years until she became an associate professor. When she won the Nobel Prize, she was promoted to a full professor and remained there till death.

4. CHARLOTTE AUERBACH [1899-1994]

Charlotte Auerbach was a German Jewish Geneticist, who contributed to the founding of chemical mutagenesis. In 1942, she along with two other scientists showed that mustard gas could cause mutations in fruit flies. She studied biology and chemistry at Wurzburg, Freiburg and Berlin.

She did her post-graduate research at Kaiser-Wilhem Institute of Biology, Berlin in 1929, but fled to Edinburgh because of the war situation under Nazi party. She did her PhD in University of Edinburgh. Later she worked on mutagenesis



by mustard gas in fruit fly (*Drosophila melanogaster*) and her results were considered classified by government due to the war related problems, which existed at that time and she could publish her results only in 1947. She continued working in University of Edinburgh, received several awards and became a Professor Emeritus in 1969.

5. BARBARA McCLINTOCK [1902-1992]



Barbara McClintock was an American Cyto-geneticist, who was awarded Nobel Prize in Physiology and Medicine in 1983. Using maize as an experimental material she elucidated genetic crossing over between homologous chromosomes, which resulted in genetic recombination during meiosis. She produced the genetic map of maize linking chromosome loci to physical traits. McClintock also demonstrated the role of centromere and telomere in the chromosome. The most significant discovery was that of transposon, which was responsible for turning the physical characters on and off.

She did her graduate degree in Botany at Cornell College of Agriculture in 1923, her MS in 1925 and PhD in 1927, continued working in Cornell on maize genetics, followed by 6 months' work in Kaiser Wilhelm Institute for Biology in Berlin, Germany. She returned back to Cornell, where she had studied earlier, but found that University would not hire a woman professor. Then she became an assistant professor at University of Missouri. Later, she joined Department of Genetics at Cold Spring Harbour and became a permanent member of faculty. She studied the mosaic colour pattern of maize seed, which showed unstable inheritance. She identified two dominant genetic loci and named them Dissociation (Ds) and Activator (Ac). In 1948 she made the surprising discovery that showed that these elements could transpose or change position and called them "Controlling elements". Her work could not be understood or appreciated by other scientists at that time and they thought she was crazy. McClintock's discovery challenged the classic knowledge that genome was a static set of instructions passed on to generations. Then she stopped publishing her work from 1953 onwards since she did not want to alienate other scientists and was confined to lab work. Later, after more than ten years, in 1960s, importance of McClintock's work was confirmed when French scientists F. Jacob and J. Monod described lac operon in *E.coli*. New techniques in Molecular Biology confirmed McClintock's work. McClintock's work of the role of transposons or jumping genes was ahead of scientific thinking at the time of publication. She received Nobel Prize in 1983 in Physiology and Medicine. She passed away in 1992 at the age of 90.

6. RITA LEVI-MONTALCINI [1909-2012]

Rita Levi-Montalcini was an Italian neuro-biologist, who was awarded Nobel Prize in Physiology and Medicine in 1986 along with colleague Stanley Cohen for the discovery of nerve growth factor, the protein which causes cell growth. She was born in Turin to Italian Jewish parents and studied medicine at the University of Turin Medical school. A neuro-histologist Giuseppe Levi sparked her interest in neuro-biology when she worked in his lab. During second world war, she lost her job and started working from her bed room on growth of nerve fibers in chicken embryos. Later, she along with the family fled to Florence and returned to Turin after the war.



In 1946, she went to Washington University, St. Louis and worked with Viktor Hamburger. She continued her association there for nearly 3 decades. She isolated the nerve growth factor in 1952, along with Hertha Meyer at Federal University of Rio de Janeiro. Soon she found that tumor cells released a substance which was stimulating growth of nerves. Her discovery of nerve growth factor had profound implications in understanding neuro-degenerative diseases. Later, she worked as Director of Cell Biology at Rome and also founded the European Brain Research Institute in 2002. She was appointed as a Senator for Life by President of Italy. She passed away at the age of 103.

7. DOROTHY HODGKIN [1910-1994]



Dorothy Hodgkin was an English Chemist who advanced the technique of X-ray crystallography to determine the structure of bio-molecules. Her most influential discoveries are the confirmation of the structure of penicillin and mapping the structure of vitamin B12, for which she was awarded Nobel Prize in 1964 in Chemistry. Hodgkin also elucidated the structure of insulin in 1969 after 35 years of work.

On her 16th birthday, her mother gifted her a book by W H Bragg on X-ray crystallography, which inspired her to choose the field for her future work. She studied chemistry at Somerville College, University of Oxford and later did PhD

at University of Cambridge. Then she went to Somerville, one of the few Oxford colleges for women and worked on Insulin structure. By 1945 she succeeded in elucidating the structure of Penicillin and in 1950's elucidated the structure of vitamin B12. She continued working with an international team and she discovered the structure of Insulin in 1969, 35 years after she took the first X-ray photograph of insulin crystal. Her important studies of biological molecules resulted in understanding how the molecules carry out their tasks in living organisms.

8. KAMALA SOHONIE [1911-1998]



Kamala Sohonie was an Indian Biochemist, who after graduation in Chemistry from Bombay University, applied for Masters course in Indian Institute of Science (IISc), Bangalore. Director of the institute, Nobel laureate C. V. Raman denied her admission, though she had good marks on the ground that women were not suitable for scientific research. She was determined and challenged Dr. C. V. Raman's decision. Finally, he admitted her with several conditions and she was the first woman to be admitted to the institute. Kamala was very hard working and put her heart and soul in her work on proteins in milk and legumes and came out with flying colours. In 1936, Kamala completed her MSc degree with distinction and earned a research scholarship in Cambridge University. Her work was impressive and she got a chance to work with Nobel laureate

Frederick G. Hopkins. Using potato tissues, she discovered the enzyme Cytochrome C, which plays an essential role in electron transport chain. Later, she returned to India and worked at Delhi's Lady Hardinge Medical College as professor and the Nutrition Research Laboratory in Conoor. Then she moved to Institute of Science, Bombay and developed "Neera", a drink which contained sizeable amount of proteins and iron for malnourished children.

Kamala Sohonie is an incredible woman, who did not let anything stop her from fulfilling her dream of working in science. Her acceptance into work at Indian Institute of Science Bangalore paved the way for women to be accepted subsequently for research in IISc.

9. GETRUDE B. ELION [1918-1999]



Gertrude Belle Elion was an American biochemist and pharmacologist, who was awarded Nobel Prize in Physiology and Medicine along with two others in 1988 for contributions for using innovative methods of rational drug design to develop a multitude of new drugs for herpes, leukaemia, malaria, gout, lupus, immune disorders, AIDS and also for developing Immune-suppressants to overcome the rejection of organ transplants. The new method of drug development focused on rational drug design for targeting the drug at specific points rather than trial and error method. She got 45 patents to her credit.

She was born in a Jewish family in New York and graduated in Chemistry from Hunter College, but was unable to find a research job because she was a woman. Later, she earned enough money doing odd jobs and earned a Master's degree from New York University, but could not complete her doctoral degree due to lack of financial support. She worked in several pharmaceutical companies and also in National Cancer Institute, World Health Organization and many organizations. She played a significant role in development of AZT, one of the first drugs used for HIV and AIDS. Elion's research contributed to the development of a large number of drugs, which are used for treatment of various diseases. She joined as head of experimental therapy at Burroughs and Wellcome and synthesized anti-metabolites of purines. In 1950, she developed anti-cancer drugs like mercaptopurine. She was affiliated as an adjunct professor at Dukes University. Her mission in life was to alleviate human suffering using novel drugs and she succeeded in that.

10. ROSALIND FRANKLIN [1920-1958]



Rosalind Elsie Franklin was a British chemist and X-ray Crystallographer, whose work on X-ray crystallography of DNA laid the foundation for the elucidation of DNA structure by James Watson and Francis Crick. While Watson and Crick won a Nobel Prize, Rosalind was a forgotten heroine of DNA.

Rosalind was born in an affluent British Jewish family in London. She did her PhD from Cambridge in 1945. With post-doctoral experience from Paris on X-ray crystallography, she joined Kings College in London in 1951 and discovered the key properties of DNA using X-ray crystallography. Owing to disagreement with the Director John Randall and colleague Maurice Wilkins, Franklin was compelled to move out of Kings college to join Birkbeck college in 1953. Franklin's X-ray

diffraction image Photo-51, which she did along with her student Gosling was the basis for the discovery of structure of DNA double helix, for which James Watson, Francis Crick and Maurice Wilkins shared the Nobel Prize in 1962. Later, Franklin did pioneering work on molecular structure of viruses in Birkbeck college. Her colleague Aaron Klug continued her work after her demise and won Nobel prize in Chemistry in 1982. She was struck with ovarian cancer and even while undergoing cancer treatment, Franklin continued to work and published 7 papers in 1956 and 6 more in 1957. She passed away in 1958 at the young age of 38. Franklin deserved a Nobel Prize for her excellent work on elucidation of DNA structure. Franklin received recognition only posthumously and is an unrecognized heroine of Molecular Biology.

11. ROSALYN SUSSMAN YALOW [1921-2011]



Rosalyn Yalow was an American medical physicist, who received Nobel Prize in 1977 in Physiology and Medicine along with two other scientists for development of radio-immunoassay (RIA) technique.

Yalow was born in New York and graduated in physics from Hunter College in 1941 and did her PhD from University of Illinois at Urbana-Champaign in 1945. She was the only woman faculty among the department's 400 members and the first since 1917. After her PhD, she returned to Hunter College to teach physics and got associated with Bronx

Veteran's Administration's Hospital. She soon developed a radioisotope laboratory at Bronx VA Hospital and collaborated with Solomon Berson to develop RIA technique. The technique was used to detect hormones, vitamins and enzymes, which were present in minute quantities, too small to be detected by conventional techniques. In 1968, Yalow was appointed as a Research Professor in the Department of Medicine at Mount Sinai Hospital. Yalow's RIA technology is currently being widely used to detect thyroid hormones, iodine deficiency etc. In 1977, she was the first American born woman to win a Nobel Prize in Physiology and Medicine. She was recipient of several awards and is known as the "Mother of Endocrinology".

12. ESTHER LEDERBERG [1922-2006]



Esther Miriam Zimmer Lederberg was an American Jewish microbiologist and pioneer of bacterial genetics. She discovered the bacterial virus Lambda phage, the bacterial fertility factor 'F', devised the first implementation of Replica plating and furthered the understanding of gene transfer between bacteria by specialized transduction. Despite her fundamental work in genetics, she never got a tenured position in a university. Her husband Joshua Lederberg won the Nobel Prize in 1958 for the joint work with Esther. In 1970s and 80's, Esther Lederberg assumed a curatorial role at Stanford and directed its plasmid collection centre. She retired in 1985, but continued to volunteer at the plasmid centre.

Esther graduated from Hunter College, New York in Biochemistry, worked in New York Botanical Garden, Carneige Institution at Washington and published her first paper on *Neurospora crassa*. Later, she joined Stanford University and

worked with George Beadle and Edward Tatum. She did her masters from Stanford University in 1946 and PhD from University of Wisconsin in 1950. She continued in University of Wisconsin and made many path breaking discoveries like lambda phage, *E.coli* fertility factor, replica plating etc. She also contributed to specialized transduction. Although Esther was a pioneering research scientist, she had to face challenges as a woman. She was not allowed to continue her working on lambda phage and F factor by her husband Joshua Lederberg. Esther, although had made ground breaking discoveries, was overshadowed by her famous husband, who did not acknowledge her work. Esther had to fight to stay employed at Stanford University after divorcing her husband in 1966. She remarried Matthew Simon and she died in 2006 at the age of 86. She was a trail-blazing scientist, who missed the Nobel Prize.

13. MARTHA CHASE [1927-2003]

Martha Chase was an American Geneticist, who along with Alfred Hershey in 1952 proved that DNA indeed is the genetic material and not protein. The famous Hershey -Chase experiment was done by radio-labeling of bacteriophage T2 with P32 (for DNA) or with S35 (for protein) and using them independently for infecting bacteria *Escherichia. coli*. Their experiments conclusively showed that it was DNA and not protein, which was the hereditary material. Hershey won the Nobel Prize in 1969; but not Martha Chase. The famous Hershey-Chase experiment done in Cold Spring Harbor laboratory, Long Island was one of the most elegant experiments in the emerging field of Molecular Biology.



Martha Chase did her graduation from College of Wooster in 1950 and many years later did her PhD from University of Southern California. In 1950 she joined Cold Spring Laboratory as a research assistant and with Alfred Hershey conclusively showed that genetic information is held and transmitted by DNA. She left Cold Spring Laboratory in 1953, worked in Oak Ridge National Laboratory and then University of Rochester. Martha Chase also suffered a lot of personal setbacks including job loss in late 1960s. She then experienced short term dementia and stopped working. She was a remarkable and tragic person, who missed the Nobel Prize - probably because she was a very young woman, who was only 25 years old without any previous credentials when they did the elegant Hershey-Chase experiment. Martha Chase is an

example of how women historically faced challenges and were considered inferior to the general perception of men as more competent in science. She really deserved a Nobel Prize with Hershey for her elegant milestone experiment, but was not included.

14. TU YOUYOU [1930]

Tu Youyou is a Chinese malariologist and pharmaceutical Chemist, who discovered artemisinin from the plant *Artemisia annua* and later synthesized dihydroartemisinin. She was the first Chinese woman to be awarded Nobel Prize in 2015. Artemisinin saved the lives of millions of people with malaria, who were not responding to chloroquine, the conventional drug.

She graduated from Beijing Medical University School of Pharmacy and later worked at the Academy of Traditional Chinese Medicine in Beijing. She isolated artemisinin and characterized the



structure and later synthesized dihydroartemisinin. Tu Youyou had no postgraduate or PhD degree and no foreign research experience. She is a very different type of Nobel Laureate with a desire to help people who developed drug resistant malaria.

15. ARCHANA SHARMA [1932-2008]

Archana Sharma was a renowned Indian botanist, cyto-geneticist and cyto-toxicologist. Her contributions include the study of speciation in vegetatively reproducing plants, induction of cell division in adult nuclei which cause polyteny and cyto-taxonomy of flowering plants. Sharma has also worked extensively in human genetics and environmental mutagenesis.

She was born in Pune to a family of academicians. She did her BSc in Bikaner and MSc from University of Calcutta. She did her PhD in 1955 and DSc in 1961 from University of Calcutta and continued working at the University of Calcutta as a professor. She supervised and guided 70 PhD students and was a member of several scientific committees and won several prestigious awards.



16. SIPRA GUHA-MUKHERJEE [1938-2007]

Sipra Guha-Mukherjee was an Indian botanist, who specialized in plant tissue culture and biotechnology. She is credited with the discovery of anther culture, which has revolutionized the development of haploids for production of homozygous diploids in a single generation.

She did her schooling in Bombay and Delhi, and joined Jawaharlal Nehru University, Delhi for BSc Botany (Hons) in 1954 and later PhD in 1963. Guha Mukherjee joined Satish Maheshwari's lab when she did the ground breaking work on anther culture of *Datura innoxia*. She later went to Michigan State University in 1970-1972. On her return, she worked on rice haploids in collaboration with Dr. M. S. Swaminathan. She was a professor in Jawaharlal Nehru University, Delhi.



17. ADA YONATH [1939]



Ada Yonath is an Israeli Crystallographer, who was awarded Nobel Prize in 2009 in chemistry along with two other scientists for their pioneering work on structure of ribosomes, which are the protein factories of the cell.

She graduated from Hebrew University of Jerusalem with a Bachelor's Degree in Chemistry and Master's Degree in Biochemistry. She took PhD from Weizmann Institute of Science for X-ray Crystallographic studies on the structure of collagen. She then went to Carnegie Mellon University (1969) and MIT (1970). In 1970, she established the Protein Crystallography Lab in Israel. She was also a Group Leader at Max Planck Institute of Molecular

Genetics in Berlin and headed Max Planck Institute research unit at DESY in Hamburg, Germany along

with her research activities at Weizmann Institute. For enabling ribosomal crystallography, Yonath introduced a novel technique, Cryo bio-crystallography. She has also elucidated the mode of action of 20 different antibiotics targeting ribosomes.

18. CHRISTIANE NUSSELEIN - VOLHARD [1942]

Christiane Nusslein-Volhard is a German developmental biologist, who won the Nobel Prize along with two others in Physiology and Medicine in 1995 for her research on the genetic control of embryonic development in *Drosophila*.

She studied Biochemistry at University of Tübingen and did her PhD in 1974 on protein-DNA interactions and the binding of RNA polymerase in *Escherichia coli*. Later, she did her post-doctoral research in Biocentrum, University of Basel and worked on *Drosophila melanogaster* embryo pattern, followed by university of Freiburg. Subsequently, she set up her own laboratory in European Molecular Biology laboratory at Heidelberg along with Eric Weischaus and after years of hard



work published their work on 15 genes controlling segmental pattern of *Drosophila* larvae. Later, she took up the position of Director of Max Planck Institute of Developmental Biology at Tübingen and used Zebra fish for studies on developmental biology. She won several awards and was given several honorary doctorates. She is the only German woman scientist, who has won a Nobel Prize in science.

19. LINDA B. BUCK [1947]



Linda Brown Buck, an American biologist known for her work on olfactory receptors was awarded Nobel Prize in Physiology and Medicine in 2004 along with Richard Axel. In their paper published in 1991, they discovered hundreds of genes which code for the odorant sensors located in the olfactory neurons of human noses. Each receptor is a protein, which changes when an odour attaches to it and causes an electrical signal to be sent to the brain. The brain then interprets the varying signals from receptors as specific scents.

Using rat DNA, they estimated that there were approximately 1000 genes for olfactory system in mammals. Linda Buck did her BS in psychology and microbiology from the University of Washington, Seattle in 1975 and did her PhD in Immunology from University of Texas South Western Medical Centre at Dallas. She did her postdoctoral studies at Columbia University and later joined Richard Axel at Columbia Institute of Cancer Research, from where they published the ground breaking work on genes which code for odorant sensors located in the olfactory neurons of noses. Buck was awarded several honors and awards. She is currently a faculty at Fred Hutchinson Cancer Research Centre in Seattle.

20. ELIZABETH H. BLACKBURN [1948]



Elizabeth Blackburn was born in Hobart on the island of Tasmania, Australia. She studied at the University of Melbourne and did PhD in Cambridge University, England. Then she migrated to Yale University, New Haven, USA and later to University of California, USA. In 1980 she along with Jack Szostack found that chromosome telomeres have a particular DNA sequence. In 1982, Blackburn and Carol Greider discovered the enzyme telomerase, an enzyme which replenishes the telomere by conserving cellular division and preventing rapid loss of genetic information internal to telomeres.

For the understanding of telomere and enzyme telomerase, Elizabeth Blackburn, Carol Greider and Jack Szostack were awarded Nobel Prize in Physiology and Medicine in 2009. Telomeres are believed to

play an important role in certain types of cancers including pancreatic, bone, prostate, bladder, lung, kidney and head and neck cancer. The role of telomere and telomerase in cellular aging was studied by her later. Currently she is working on telomere and telomerase in many organisms from yeast to human cells and the effect of meditation on telomere and aging.

21. KATALIN KARIKO [1955]



Katalin Kariko is a Hungarian American scientist, who laid the foundation for m-RNA vaccine and won the Nobel Prize in Physiology and Medicine along with American immunologist Drew Weissman. Kariko was born in a small town in Communist Hungary and grew up in a small house without any facility like running water, refrigerator and a television. She obtained her BSc in Biology in 1978 and PhD in Biochemistry in 1982 from University of Szeged. She continued her post-doctoral research in Biological Research Centre (BRC) from 1978 to 1985, but the funding to the lab was stopped. Kariko was looking out for a job in other countries and was offered a job in Temple University Philadelphia, USA. Kariko along with her husband and two-

year-old daughter left for USA with 900 pound hidden in the daughter's teddy bear.

Between 1985 and 1988, Kariko worked as a post-doctoral fellow in Philadelphia and participated in a clinical trial on patients with AIDS and chronic fatigue syndrome treated with double stranded RNA (dsRNA). Her supervisor did not allow her to take up a job in John Hopkins, threatening her to be deported. In 1989, she joined University of Pennsylvania to work on mRNA. She applied for a grant for mRNA therapy, but her application was declined because they thought it did not have good potential. Her subsequent grant requests were also rejected and University demoted her in 1995. However, she did not give up and continued to work on mRNA.

In 1997 by chance she met Drew Weissman, a professor of immunology in a photocopying room and decided to collaborate. Kariko's determination, inquisitiveness, her up to date knowledge really helped in the mRNA therapy work. The synthetic mRNA caused inflammatory response and they replaced uridine in mRNA with pseudo uridine, which rendered it non-immunogenic. Later Kariko used lipid nanoparticles for encapsulation of mRNA for drug delivery.

Soon Kariko joined as Vice President of BioNTech RNA Pharmaceuticals. Kariko's work laid the foundation for BioNTech and Moderna, which created therapeutic mRNA vaccines. When Covid19 pandemic struck in December 2019, they could produce mRNA vaccine for Covid19 in record speed, which saved the lives of millions of people. The mRNA vaccine technology developed by Kariko can also be used for treatment of other diseases as well. From a butcher's daughter in Communist Hungary to the winner of Nobel Prize in Physiology and Medicine, the life and career of Katalin is extra ordinary. She is a scientist par excellence who refused to quit.

22. CAROL W. GREIDER [1961]



Carol Greider is an American molecular biologist and Nobel laureate, who discovered the enzyme telomerase in 1984, while she was a graduate student of Elizabeth Blackburn at the University of California, Berkeley. She was awarded Nobel Prize along with Elizabeth Blackburn and Jack C. Szostak in 2009 for the discovery of how chromosome ends are protected by telomeres and the enzyme telomerase.

As a child, she had dyslexia and had problems to get admission to the university because of her low grades.

However, she overcame the problem of dyslexia by her ability to think differently and hard work. She did her PhD in Molecular Biology in the University of California, Berkeley under Elizabeth Blackburn. She used *Tetrahymena thermophelia*, a fresh water protozoan for her studies and found that the enzyme telomerase could add extra bases to the ends of the chromosomes, thus rebuilding the tips of chromosomes, determining the life span of cells. Greider, also worked in Cold Spring Harbour Laboratory in Long Island, New York and later shifted to John Hopkins University in Baltimore in 1997. Her lab later used a variety of tools and used yeast, mice etc to study the progressive shortening of telomeres and regulation of telomere elongation. In 2020, she joined the University of California as a distinguished professor.

23. MAY-BRITT MOSER [1963]



May-Britt Moser is a Norwegian neuro-scientist and psychologist at the Norwegian University of Science and Technology (NTNU), who shared half the Nobel Prize in Physiology and Medicine along with her former husband Edward Moser in 2014. The Nobel Prize was awarded for the work concerning grid cells in entorhinal cortex as well as several additional space-representing cell types in the same circuit that make up positioning system in the brain.

May-Britt received her education as a psychologist at the University of Oslo and obtained her PhD in neurophysiology at the Faculty of Medicine in NTNU in 1995. She did post-doctoral positions in University of Edinburgh and University of London and finally joined as a full Professor at NTNU. Moser's work paved the way to gain new knowledge into the cognitive processes and

spatial deficits associated with human neurological conditions such as Alzheimer's disease. She, along with her husband Edward Moser established the Centre for Biology of Memory in 2002 and Institute of

Systems Neuroscience in NTNU in 2007. May-Britt Moser is the Head of the Department of the NTNU Centre for Neural Computation and received several awards and honours.

24. JENNIFER DOUDNA [1964]



Jennifer Anne Doudna is an American Biochemist, who pioneered work in CRISPR Gene Editing and received Nobel Prize in chemistry in 2020 with Emmanuelle Charpentier. Doudna graduated from Pomona College in 1985 and earned her PhD degree in biological chemistry and Molecular pharmacology from Harvard Medical School in 1989. She currently is in the Department of Chemistry and Department of Molecular and Cell Biology at University of California, Berkeley. She is also the co-founder and Chair of the Governance Board of Innovative

Genomics Institute since 2014. Doudna is also a Faculty Scientist at Lawrence Berkeley National Laboratory and an Adjunct Professor at University of California, San Francisco.

When Doudna was in her 6th grade, her father gifted her James Watson's book "The Double Helix", which was a major inspiration for her to take up biological Sciences. Doudna was introduced to CRISPR by Jillian Banfield in 2006. In 2012, Doudna and Charpentier discovered gene editing using CRISPR Cas9. Although it was discovered earlier, it was Doudna and Charpentier who for the first time showed that they could program and cut DNA at specific sites and edit it. She was included in Time Magazine's 100 most influential people in 2015. Her work on CRISPR Cas 9 has opened up new vistas for development of better crops and in healthcare for treatment of genetic disorders like sickle cell anemia, cystic fibrosis etc. She remains trail blazer in biological sciences and is an inspiration to girls who want take up science as a career.

25. EMMANUELLE MARIE CHARPENTIER [1968]



Emmanuelle Charpentier is a French scientist who is the director of Max Planck Institute for Infection Biology, Berlin, Germany. She founded the independent Research Institute the Max Planck unit for the Science of Pathogens in 2018. She was awarded Nobel Prize in Chemistry in 2020 along with Jennifer Doudna for their ground breaking work on CRISPR Cas9 gene editing.

Charpentier studied biochemistry, microbiology and genetics in Pierre and Marie Curie University in Paris. She was awarded PhD from the institut Pasteur. She worked as a post-doctoral fellow at Rockefeller University, New York from 1996 to 1997 and studied how the pathogen *Streptococcus pneumoniae* utilize

mobile genetic elements to alter its genome. She continued working in several institutes in New York from 1997 to 2002. Then she returned to Europe and became the lab head at Institute of Microbiology and Genetics at University of Vienna. She moved to several institutes in Europe and finally in 2015 she accepted an offer from Max Planck Society to join as Director in the Max Planck Institute of Infection Biology in Berlin.

In 2011, Charpentier met Jennifer Doudna at a research conference in San Juan, Puerto Rico and they began a collaboration, which led to the development of CRISPR Cas9 for gene editing. In 2013, she co-

founded CRISPR Therapeutics and ERS Genomics. In 2015, Time magazine selected her as one of the most influential people. She is an inspiration to girls in science.

CONCLUSION

The role of women in the developmental history of Bio-medical sciences have often remained unrecognized and under-rated, although their contributions were quite substantial. The beginning of the 21st century has witnessed a welcome change and many women have been duly recognized internationally at the highest echelons. The Matilda Effect of downplaying or overlooking of the scientific contributions and achievements of women, while giving undue credit and recognition to their male colleagues or counterparts is on the wane. Jennifer Doudna, Emmanuelle Charpentier and Katalin Kariko are proud beneficiaries of the change, whereas Nettie Stevens, Rosalind Franklin, Esther Lederberg and Martha Chase are clear victims of gender discrimination. Future is brighter for young girls who want to take up science as their career. The path breaking achievements of the inspiring women scientists listed above should motivate a lot more girls to reach greater heights in their scientific career.

About the Author:



Dr. Susan Eapen retired from Bhabha Atomic Research Centre, Mumbai in the year 2011 as a Senior Scientist and Head of Plant Biotechnology and Secondary Products Section. Currently she is engaged in motivating scientific temper among faculty and students at Union Christian College, Aluva as an Adjunct Professor in Biosciences Group. She is a Past President and Member, Board of Trustees of Indian Women Scientist's Association and continuing her activities with them organising Symposia, Workshops, Webinars and other virtual activities remotely from Aluva where she has relocated in the year 2018. She is one of the pioneers in transgenic plant research and was listed among the top 2% scientists worldwide in the field of plant biology & Botany by Stanford University in 2020 as well as 2024. Red Dot Foundation in partnership with the Office of the Principal Scientific Advisor to Government of India listed her among the top 75 Women in STEAM on 3rd March 2022 and felicitated her while we were celebrating 75 years of India's Independence. She is featured in the second edition of "She is: 75 Women in STEAM" - Science, Technology, Engineering, Arts, Mathematics.



Groups of **painted storks (*Mycteria leucocephala*)** in Mini Sea shore, Vashi, near IWSA HQ

Photograph by **Prof Dr Sushma Lehri, IWSA Member**

Women Achievers

1. Dr. Shailaja Donempudi - First woman Distinguished Scientist to head Business Development Group at CSIR

Former scientist at the CSIR-Indian Institute of Chemical Technology (CSIR-IICT) Shailaja Donempudi has been appointed as a Distinguished Scientist (DS) to head the Business Development Group (BDG) at CSIR Headquarters in New Delhi.

This appointment marks a historic milestone as Dr. Shailaja becomes the first woman to be designated to the post in the eight-decade history of CSIR. She completed her MSc, and M. Phil from the University of Hyderabad and Ph.D. in Polymer Chemistry from Osmania University, working in IICT on controlled-release polymer formulations for healthcare and agrochemicals. After that she joined IICT in 1993 as a scientist. Over a career spanning more than 28 years, she has contributed to the fields of polymer synthesis, characterisation, and technology and development.



A Shift from Science to Strategy happened to Dr. Shailaja while she was deeply involved in her research work as a scientist. She was engaged in developing technologies for defence and space sectors and successfully transferring them to industries. Her transition to the Chair of Business Development and Research Management (BDRM) role at the same institute was on request, and it wasn't something she had planned. Though she was hesitant, her colleagues encouraged her, recognising her strong communication and interpersonal skills and leadership qualities and she took the tough decision. She had to leave her role as researcher, but as the spokeswoman of the organisation, Dr. Shailaja could pitch technologies to industries and secure high-value projects through her negotiation skills, having the techno-commercial edge. Being a resource person in the area of science diplomacy, science technology and innovation policy advocacy, she was also successful in managing International S&T Affairs Group (ISTAG) at CSIR-IICT with major overseas collaborations with Universities. These achievements have resulted in the new appointment as head the Business Development Group (BDG) at CSIR Headquarters in New Delhi and she is hopeful in taking CSIR's visibility, partnerships, and revenue growth to the next level, both in India and internationally.

Dr. Shailaja says that her mother, who pursued her graduation and post-graduation after having kids, is her biggest inspiration. IWSA is proud to mention that Dr. Shailaja is an executive committee member of our Hyderabad branch for 2024 – 26 term. We wish her more achievements and success in her new role.

Ref: <https://www.thehindu.com/news/national/telegana/first-woman-distinguished-scientist-to-head-business-development-group-at-csir/article69504967.ece>
<https://www.theceo.in/women/dr-shailaja-donempudi>

2. Prof. Neena Gupta, Infosys Prize Winner 2024

The Infosys Prize 2024 award ceremony was held on January 11, 2025, at the Taj West End in Bengaluru and Prof. Neena Gupta (Indian Statistical Institute, Kolkata) was awarded the prize in Mathematical Sciences for her work on the Zariski Cancellation Problem. Zariski Cancellation Problem, a fundamental problem in algebraic geometry, a version of which was first posed in 1949 by Oscar Zariski, one of the founders of modern algebraic geometry. In 2014 she proved the striking result that a 3-dimensional affine variety constructed by Asanuma yields a negative answer to the Zariski Cancellation Problem. Prof. Gupta's work not only resolved a long-standing problem, but also presents a theory that brings out unexpected connections between several concepts in the area. Her work has had a significant and lasting impact on algebraic geometry and commutative algebra, areas that are central to modern mathematics.



After her post graduation in 2008, Prof. Gupta earned her PhD degree in 2011 from Indian Statistical Institute Kolkata. She was a Shyama Prasad Mukherjee Research Fellow at ISI Kolkata from 2008 to 2012, and, after a visiting position at TIFR Mumbai, became INSPIRE Faculty at ISI Kolkata in 2012. She has been a professor in the Statistical and Mathematics Unit of ISI Kolkata since 2014. She has won the Shanti Swarup Bhatnagar Prize for Science and Technology in 2019 in the category of mathematical sciences. Prof. Gupta received the Nari Shakti Puraskar from the President of India for the year 2021, and the DST-ICTP-IMU Ramanujan Prize in 2021. There are many more accolades to her credit, already at this young age. She is married to Vishal Saraogi who has been supportive of her, and they are blessed with a daughter, Manya.

Prof. Gupta had given a talk on “Genesis and some very early results of Polynomials” in the 16th IWSA Triennial Conference, held in June 2023.

Ref: <https://www.infosysprize.org/laureates/2024/neena-gupta.html#read-more>

3. Kalyani Shinde- An emerging young Agripreneur



This International Women's Day, with [#SheLeads](#) as the primary slogan, Krishi Jagran presented the bold women agripreneurs driving change in the agri-sector with their visionary ideas, relentless determination, and lasting impact.40 Under 40: Emerging Women Agripreneurs. Kalyani Shinde, Founder & CEO of Godaam Innovations was one among them. Hers is an inspiring story how youngsters are bringing in simple workable solutions for ensuring food security in India. Born and brought up in Lasalgaon, Maharashtra, home to Asia's largest onion market, Kalyani Rajendra Shinde had witnessed firsthand the struggles faced by her farmer family and others due to post-harvest losses. This challenge became the seed of an idea during her computer engineering education, and she joined the Digital Impact Square, a TCS Foundation initiative in Nashik in 2018 as an innovator. This triggered her journey into agri-innovation and founding of Godaam Innovations, a tech-driven venture committed to solving one of the most persistent issues in Indian agriculture: onion storage. At its core is a revolutionary product called Godaam Sense— India's first IoT-

based onion storage solution. This smart device monitors the microclimate within onion warehouses by continuously tracking temperature and humidity, two critical factors that affect the shelf life of stored onions. Its patented technology can detect gases emitted during the early stages of onion spoilage. This allows for real-time alerts to warehouse owners, enabling them to act quickly and prevent large-scale losses. This early detection, often at just 1% spoilage, can save up to 30% of produce that would otherwise go to waste.

Equipped with a technology which is contextualized to Indian conditions, collaborating with Sahyadri, Tata Steel etc., and multiple grants from BIRAC, Pusakrishi, Kalyani is confident of making a big difference in onion storage. Youngsters like her entering the farming sector with workable solutions is a big hope for the future of Indian agriculture. We wish her success and hope that her successful story will be a great inspiration to others.

Ref: <https://krishijagran.com/success-story/revolutionizing-onion-storage-inspiring-journey-of-a-maharashtra-women-agripreneur-tackling-indias-onion-wastage-crisis/>

IWSA Members Honoured

1. Prof. Vijaya Khader - Global Women in Business and Leadership Awards 2025

Former Dean, Acharya N. G. Ranga Agricultural University, Convenor IWSA Hyderabad Branch.



Prof. Vijaya Khader received Global Women in Business and Leadership Awards 2025. This award, organized by GCPIT, (Global Council for Promotion of International Trade) is a prestigious one, that recognizes and celebrates the achievements of women leaders, entrepreneurs, and professionals globally. The awards highlight women who are shaping the future of business, innovation, and leadership. This prestigious event of award distribution serves as a platform for inspiration, collaboration, and action, bringing together CEOs, world leaders, entrepreneurs, policymakers, and industry pioneers to shape the future of women in leadership. Few months back, Prof. Khader featured in **She Inspires**, among **India's 50 Most Admired Women of 2024**. She is a recipient of many more awards and recognitions in the year 2024 – 25.

2. Dr. Syeda Azeem Unnisa, Women Achiever Award from OWSD-NCI

Dr. Syeda Azeem Unnisa, Senior Assistant Professor and Chairperson, Board of Studies in Department of Environmental Science, UCS Osmania University, and member of IWSA Hyderabad branch received **Women Achiever Award by Organization for Women in Science for the Developing World National Chapter of India (OWSD-NCI)** in 2025 and **Global Peace Award** by Telangana Citizens Council in 2024 for her research area in water and solid waste management.



3. IWSA members featured in “She Is – 75 Women in Chemistry



Ten IWSA members were featured in the book, “**She Is**” – **75 Women in Chemistry**, launched on February 6th at IISER Bhopal. This book is published by Beyond Black in collaboration with the **office of the Principal Scientific Advisor to Govt. of India** and the **Royal Society of Chemistry (RSC)**.

from top left to bottom right:

Dr. Surjeet Kaur (Ex IGCAR), **Dr. Shyamala Bharadwaj** (ex- BARC, President, IWSA), **Dr. Meera Venkatesh** (Ex IAEA), **Dr. K. Indira Priyadarshini** (Ex BARC), **Dr. Sharmishtha Dutta Choudhary** (BARC), **Dr. Vinita Grover** (BARC), **Dr. Anupama Prabhala** (BARC), **Dr. Dimple Dutta** (HBNI). **Dr. Sangita Devesh Kumar** (BARC), **Dr. K Shashikala** (Ex BARC), **Dr. Jyotirmayee Mohanty** (BARC)

4. Dr. Saloni Godbole – featured as emerging women leaders #40Under40 in the Agri space

Dr. Saloni Godbole was one among the 40 women under the age 40, selected by the leading agriculture publication Krishi Jagran in partnership with BCA and Pusa, IARI on International Women's Day. With #SheLeads# as the primary slogan, these visionary women transforming the agricultural landscape with their innovation, resilience, and impact were honored. Dr. Godbole is the Founder & CEO of Occamy Bioscience Pvt. Ltd., a startup that's on a mission to enhance human and animal lives based on WHO's ONE HEALTH principles. She had also won the Greenpreneur of the year award by WEP- NITI Aayog recently in 2024.



Invitation to IWSA members

1. **IWSA members of Nagpur** were invited as delegates to the National Workshop on Indigenous Medicinal Knowledge System (11th to 12th March 2025) organized by Science and Technology Resource Centre.

2. **Dr. Arti Saoji, IWSA member, Nagpur Branch** (Ex. Prof. & Director, Institute of Science, Nagpur) was Co-Chairman in SFS college for Dr. Dhamis (NEERI) lecture in two days national conference on, "Advances in chemical and life sciences towards sustainable biodiversity" on 7-8 Feb. 2025. She is a.

3. **Dr. Lalita Dhareshwar, Trustee, IWSA** was invited as a guest of honor in the science exhibition "Anveshana- Building Bridges to Innovation", arranged by Agastya International Foundation at Juinagar, Navi Mumbai on 10th and 11th of January. The theme of the exhibition was "Innovative solutions for sustainable living".



4. **Dr. Nootan Bhakal, Vice President of IWSA**, was invited for a panel discussion on "The Impact of Women in Science and Technology" at Vidyalkar School of Information Technology. This was arranged by Confederation of Indian Industry Western Region as a part of their International Women's Day Celebration. This discussion highlighted the groundbreaking contributions women have made in fields ranging from space exploration to artificial intelligence, the challenges women face in these spaces, the importance of diversity in driving innovation, and the initiatives that are empowering the next generation of female scientists and technologists and also explored strategies for creating more inclusive and equitable opportunities in STEM.

5. **Dr. Rita Dhodapkar, IWSA member, Nagpur Branch**, was invited as Panelist on discussion at National Investment and Infrastructure Fund NIIF ESG Summit 2025 on Charting the Path Forward: ESG Strategies for India's Sustainable Future. Spoke on circular economy strategic solutions for waste management on 20 Feb 2025.

6. **Er Smita Mule, IWSA member**, was appointed as part time advisor to Rajiv Gandhi Science and Technology Commission, Govt of Maharashtra on 20th Jan 2025 for 1 year.

7. **Dr. Suparna Kamat, Joint Secretary, IWSA** was invited as one of the two judges for judging 25 oral presentations by the undergraduate, postgraduate and academicians of various disciplines from various colleges at Sir Sitaram and Lady Shantabai Patkar College of Arts and Science and Varde College of Commerce and Economics, Goregaon (East), Mumbai. This was part of the RUSA sponsored Multidisciplinary International Conference, CONFAB '25 organised by the Patkar College, in collaboration with Rajamangala University of Technology Thanyaburi, RMUTT, Thailand on 11th January, 2025.



8. **Dr. Surekha Zingde, Trustee, IWSA** was invited for another panel discussion on 7th Mar ch 2025, arranged by Confederation of Indian Industry Western Region and IIM, Mumbai. The topic was "Women, AI, and the Future of Digital Marketing". This session explored the opportunities and challenges of leveraging AI to enhance marketing strategies and created authentic, compelling narratives. How automation can streamline processes, increase efficiency, and deliver personalized customer experiences, while AI-powered storytelling helps brands craft narratives that resonate deeply with today's consumers and how to navigate the intersection of technology and creativity to drive impactful marketing in the digital age etc. were discussed.



9. Prof. Vijaya Khader, Convener of Indian Women Scientists' Association, Hyderabad Branch was invited for a motivational talk for school students of Pallavi and DPS Group of Schools on 30th January 2025.

This was on Campus Kabar channel- a dedicated channel for school students of Pallavi and DPS Group of Schools. Upon request from the schools, Prof. Vijaya Khader, addressed the students, sharing some of the most helpful tips with them, which will help them in preparing well for their upcoming exams. The talk was very simple and informative, and the tips were easy for the students to understand and implement.

Outreach: 4000

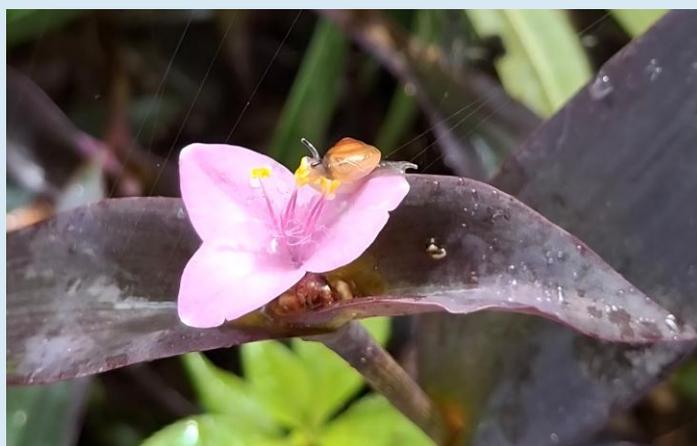


10. Dr Yojana Singh, Mrs. Bhakti Belapurkar and Ar. Sonam Ambe, IWSA members from Head Quarters were invited by Vedic Vishwa Humanity Cultural and Welfare Trust to give talks at Dyandeep Seva Mandal English School, Karave, Nerul in Hindi on 15th February (175 students), NMMC school no. 112 on 17th February, 2025 in Marathi (130 students) and NMMC school no. 6 in Marathi on 15th February 2025 (200 students) respectively.

Fascinating Tiny World



Deer Mushroom (*Pluteus cervinus*) - Monsoon is a pleasant season for all the creatures... This mushroom develops in a great hurry and complete life cycle within 36 hours!



Look at the tiny snail enjoying its breakfast (Royal jelly) from *Tradescantia*.

Photos by **Dr. Manisha Karpe, IWSA member** (Ruia College, Mumbai)

BOOK POST



Duck Flower: *Aristolochia grandiflora*



Jarul Flower: State Flower of Maharashtra
Lagerstroemia speciosa

Photos by **Prof Dr Sushma Lehri, IWSA Member**

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