



# IWSA NEWSLETTER

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Inauguration of IWSA's renovated Hall, by Dr. Pheroza Godrej on 14<sup>th</sup> June 2025



Children engrossed in activities- Summer camp at IWSA HQ from 19<sup>th</sup> - 24<sup>th</sup> May 2025



School Activities: IWSA-BRNS talk in Sainath Hindi medium school, Vashi and Poster making competition in Pallavi School, Hyderabad on 22<sup>nd</sup> and 4<sup>th</sup> August 2025 respectively

## HIGHLIGHTS

**Inauguration of SOONU NAVAL GODREJ HALL** in IWSA Head Quarters, Vashi on 14<sup>th</sup> June 2025 by Dr. Pheroza Godrej

**Article: Integrating Art into Education Deepens Learning - A Multidisciplinary Educational Approach-** by Ms Savita Makkar and Cdr. J P Singh

**Trail blazers-** Dr. Rukmani Krishnamoorthy and Dr. Dorothy Crowfoot Hodgkin

**Women Achievers** - Banu Mushtaq, Lt Cdr Dilna and Lt Cdr Roopa, Col. Sophia Qureshi and Wg Cdr Vyomika Singh

## 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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## Contents

	Page no.
From the Editor's Desk	3
President's Message	4
Report from Head Quarters	5
Report from Branches	18
Article: Integrating Art into Education Deepens Learning - A Multidisciplinary Educational Approach	24
Women Achievers	30
IWSA members- Honors, achievements and Invitations	32
Trail Blazers (Rukmani Krishnamoorthy & Dorothy Hodkin)	33
Unsung Heroines (Radha T K)	35

## Editorial Board (2025 – 27)

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## From the Editor's Desk

Dear Readers,

It is indeed a privilege for me to take charge as the Editor of IWSA's newsletter.

My association with the IWSA Newsletter has been a long one. The experience of being part of the previous teams of many illustrious and perfectionist editors makes me aware of the magnitude of this responsibility. With the guidance and support of three senior editors in our team, I sincerely hope that I can live up to the expectations.

Election was held in HQ as well as many branches during this time. I take this opportunity to congratulate all the newly elected office bearers and committee members and wish them a very successful tenure.

Although the Monsoon months are comparatively lean on visible events for IWSA HQ and branches, many unique programs did happen. The regular BRNS lectures started in June in the new academic year. A collaboration of HQ with Inner Wheel Club kickstarted with an online garden workshop. Renovation of our hall with better acoustics and projection facilities was completed. It was inaugurated and renamed as Soonu Naval Godrej Hall in June. I invite all of you to go through all the reports in this issue and appreciate the variety and vision behind each of these activities. I also want to mention that this was actually a very active season. Seeds of many new activities were sown and nurtured during this time, which will be seen as a rich harvest in the forthcoming months.

As always, we have a thought-provoking article on a very contemporary and relevant theme, on a new approach of integrating art into education for deep learning. We are also bringing to you inspiring stories of some remarkable women - some recent achievers, some who dared to walk through new paths and were celebrated, some who did the same but were forgotten. I am sure all of you will enjoy going through the contents of this issue.

We would like to receive comments, suggestions and also some original contributions as science related articles, photos, cartoons or any other creative ideas. Please email them to [iwsa.newsletter2123@gmail.com](mailto:iwsa.newsletter2123@gmail.com)

Wishing you happy reading and looking forward to hearing from you

--- Dr. Dhanya Suresh

([dhanya.mangala@gmail.com](mailto:dhanya.mangala@gmail.com))



### **IWSA Newsletter is now 52 years!**

**Started --- in 1974**

**First Editor --- Ms Vidya Khubchandani (1929 – 2015), Founder member, IWSA**

**Registered as Newspaper----- in 1985**

**Got International Standard Serial Number (ISSN0972-6195) ---- in 2002**

**Digitally archived in website --- from 2009 onwards**

## President's Message

Dear members,

Greetings to all!

Our new team took charge in June at a particularly exciting time for IWSA, alongside the tenure of the newly constituted committees. Recent months have been unusually active, as the organisation accelerates into greater momentum. IWSA is positioned to compound its contribution to society with new strides and achievements.



We reached a significant milestone in June with the inauguration of the fully renovated and transformed auditorium. We are deeply grateful to the Godrej Foundation and Dr. Pheroza Godrej, whose guidance and support made this possible. The upgraded auditorium integrates modern technology with improved facilities, substantially enhancing our capacity to host events, and ensuring a comfortable experience for attendees and participants.

The strategic objective for the current term is to advance holistic personality development by integrating the arts with the sciences - two domains often treated as distant relatives despite sharing the same intellectual DNA. Every art form embeds scientific principles, whether acknowledged or not; and equally, science gains resonance and relevance when communicated with artistic sensibility. Art here extends well beyond performance, visual, or literary arts to include communication, emotional intelligence, and overall personality development. These are no longer optional soft skills but core competencies. At IWSA, we aim to deploy Art-integrated pedagogy which narrows the divide between classroom theory and real-world application.

STEM (Science, Technology, Engineering, Mathematics) needs to become STEAM (Science, Technology, Engineering, Arts, Mathematics).

As Einstein once aptly remarked, "The greatest scientists are artists as well."

If scientific thinking is to travel beyond its traditional borders, language must travel beyond logistics and become strategy. To engage meaningfully with wider audiences, local Indian languages are indispensable. As our founders recognised, science cannot remain confined within laboratories and lecture halls. To reach the public, science must speak the language of the people - both figuratively and literally.

We trust readers will find this new newsletter format clearer and more engaging. As always, feedback and suggestions are welcome.

Thank you.

Dr. Nootan Bhakal

Email: [nootanbhakal@gmail.com](mailto:nootanbhakal@gmail.com)

# Reports from Head Quarters

## Science Awareness Programs

### A. IWSA – BRNS Popular Science Lectures for Colleges

These lectures were conducted onsite at various Colleges on the topics of 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 speakers.

#### 1. Green Hydrogen: Paving the way for sustainable solution at the last mile

Date: 21st July, 2025

Speaker: Prof. Prakash Ghosh, Department of Energy Science & Engineering, Indian institute of Technology, Bombay Mumbai

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



Outreach : 140

**Abstract 1:** India's 3,200 kilometers of high-altitude borders present significant challenges in meeting the energy needs of local populations, as well as Indian troops stationed in these regions. The supply of fuel to these remote areas is particularly difficult. A renewable energy-based system offers a promising solution to address the electrical requirements of these areas. Moreover, traditional space heaters, such as the "bukhari," commonly used for heating, contribute to severe health hazards by releasing pollutants like carbon monoxide, carbon dioxide, and sulphur dioxide into indoor air. A green hydrogen-based heating system provides a sustainable alternative, helping to mitigate these health risks. Additionally, the oxygen produced as a byproduct in the green hydrogen system can serve as a life-sustaining resource at high altitudes. The presentation focused on the viability of such a system in high-altitude regions, as well as the practical experience of implementing it.

#### 2. Translational AI for Accessible Healthcare

Date: 2<sup>nd</sup> August, 2025

Speaker: Dr. Kshitij Jadhav, Koita Centre for Digital Health, IIT Bombay Sectoral Expert & Chief Project Coordinator, AI Centres of Excellence, Ministry of Education, Government of India

Venue: Dept. of Biotechnology, SIES College of Arts, Science & Commerce; Sion, Mumbai

Outreach : 140

**Abstract 2:** This presentation surveys the AIDE Lab's growing portfolio of clinically-grounded AI/ML projects that share a common goal: deliver data-efficient, explainable tools that can be deployed cost-effectively in low- and middle-income settings. We begin by outlining the practical hurdles that limit mainstream deep-learning adoption—heavy annotation effort, GPU costs, protocol heterogeneity—and motivate our emphasis on harmonisation engines and clinician-in-the-loop refinement. The core of the work spans multiple specialties. In breast imaging, we demonstrate state-of-the-art classifiers for screening mammography (normal vs abnormal, BI-RADS density) and MRI-based tumour subtype prediction, achieving subtype recall above 80%. Orthopaedic



innovation is represented by OrthoVision, an interactive tool that automates 28 hip-knee-ankle measurements while capturing radiologist corrections for continual learning. Pathology efforts include whole-slide image analytics

for Hodgkin's lymphoma and plasma-exchange outcome modelling after rodenticide poisoning. Beyond imaging, we apply goal-programming to optimise state-specific food baskets in the Nutrition-PDS study. Finally, we showcase multimodal and language-centric advances: Rad-Flamingo generates chest-X-ray reports with patient-friendly explanations, and medically tuned chain-of-thought prompting improves large-language-model differential diagnosis. Collectively, these projects illustrate a translational pipeline that moves from robust model design to real-world integration while prioritising affordability, interpretability, and societal impact.

### 3. Frozen Secrets: An Antarctic Voyage into Microbes, Microplastics, and Hidden Frontiers

Date: **8<sup>th</sup> August 2025**  
 Speaker: **Dr Femi Anna Thomas, Asst. Professor,**  
**Union Christian College, Aluva**  
 Venue: **St. Xavier's College for Women**  
 (Autonomous), Aluva  
**Outreach: 415**



**Abstract 3:** Antarctica, often regarded as Earth's last pristine frontier, is increasingly showing evidence of global environmental challenges, including microplastic pollution. Insights from the 44<sup>th</sup> Indian Scientific Expedition to Antarctica underscore the urgency of studying the accumulation of microplastics and their associated microbial communities, known as the "plastisphere." Sampling was conducted along three oceanic transects - from Capetown to Prydz Bay, along the Antarctic coastline, and from India Bay back to Capetown, targeting seawater and sediment to document presence of microplastic and characterize associated microbial life. The abundance, types, and characteristics of microplastics as well as the identity and resistance traits of plastisphere microbiomes were also studied using Raman spectroscopy, SEM-EDX, and metagenomic sequencing.

Based on the previous studies in the Arctic region, the presence of metal- and antibiotic-resistant

microbes in Antarctic environments were investigated. The plastisphere may act as a vector for antimicrobial resistance and pathogens, raising ecological concerns. Details of the study, which seeks to elucidate pollution pathways, microbial colonization, and the emerging biological impacts of microplastics in Antarctic marine ecosystems were presented in the talk.

### 4. Environmental Sustainability and Governance

Date: **8<sup>th</sup> August 2025**  
 Speaker: **Shri Kedarnath Rao Ghorpade,** former  
 Chief Planner of the Mumbai Metropolitan Region  
 Development Authority  
 Venue: **Department of Biotechnology and IQAC**  
**Jai Hind College of Arts, Science and**  
**Commerce, Churchgate, Mumbai**  
**Outreach: 130**



**Abstract 4:** The talk critically examined the shifting contours of environmental sustainability and governance in the Mumbai Metropolitan Region (MMR), emphasizing the interconnections between legal instruments, institutional capacities, and spatially grounded case studies. As one of India's most densely inhabited urban agglomerations, MMR grapples with the dual imperative of managing accelerated urban growth while safeguarding fragile ecological systems.

The session analysed key legislative frameworks, with particular attention to the Environment (Protection) Act, 1986, and its procedural mechanisms for environmental clearances. It contextualized governance within MMR's complex mosaic of land-use typologies, zoning regulations, and green buffer policies, shaped by varied geographies and development controls. Institutional dynamics was explored through the roles and operational constraints of regulatory bodies, notably the National Green Tribunal (NGT), Maharashtra Pollution Control Board (MPCB) and State

Environmental Impact Assessment Authority (SEIAA), alongside development agencies steering infrastructure and land transformation agendas. The recent and representative case studies, the contested Aarey Forest and Metro Line 3 alignment, the socio-environmental complexities of Dharavi Redevelopment, and governance tensions surrounding generic coastal infrastructure projects were presented.

## 5. Radiations: Discovery and Historical Developments

Date: 13<sup>th</sup> August 2025

Speaker: **Dr. R. K. Vatsa**, Foreign Secretary, National Academy of Sciences, Prayagraj, INDIA

Venue: Department of Chemistry, Sophia College, Mumbai

**Outreach: 27**



**Abstract 5:** The lecture presented an account of discovery and historical developments of different types of radiations, electromagnetic (visible, infrared, ultraviolet, radio-waves and X-rays) as well as particle (alpha, beta gamma and neutron). Some of the greatest findings from the beginning of 19th century and the basic idea behind them were discussed. Specific emphasis was given on the power of observation, power of logic and the power of quantification leading to new scientific discoveries. How was the velocity of light measured for the first time and what was the accuracy of that measurement? Who inspired Maxwell to write down the equations for the propagation of light? Few examples of serendipity were referred to, stressing upon the fact how important it is to follow unexpected results in scientific research, in line with the famous quote of Enrico Fermi "Experimental confirmation of a prediction is merely a measurement, an experiment disproving a prediction is a discovery." The possible pitfalls for a young researcher were discussed along with an advice on how to handle those pitfalls.

## 6. Recent Advances in Nanomaterials and their polymer Nanocomposites

Date: 14<sup>th</sup> August, 2025

Speaker: **Dr. Sabu Thomas**, former Vice Chancellor, Mahatma Gandhi University, Kottayam & Chairman, TrEST Research Park, Trivandrum, Kerala

Collaborators: Depts. of Chemistry, Physics & IQAC, **Union Christian College, Aluva.**  
Venue: **Union Christian College, Aluva, Kerala**

**Outreach: 100**



**Abstract 6:** Nanomaterials are materials with at least one dimension of 100 nanometres or less. They can be made from a variety of materials, including carbon, minerals, and metals. The talk covered history of the nanoscience and technology, the major contributors to this field, the basic definitions, concepts and the applications of nanomaterials in all the major fields. The polymer nanocomposites often exhibit physical and chemical properties that are dramatically different from conventional microcomposites. A large number of nanoparticles, layered silicates and polymeric whiskers are being used for the preparation of nanocomposites. Since the Toyota research group's pioneering work on nylon67 layered silicate nanocomposites, polymer nanocomposites containing layered silicates have attracted much attention. They can exhibit increased modulus, decreased thermal expansion coefficient, reduced gas permeability, increased solvent resistance and enhanced ionic conductivity when compared to the polymer alone. The various preparation and characterization techniques for polymer nanocomposites and the role of various surfactants in improving the polymer/filler interaction were discussed. The recent developments in cellulose nanocomposites, bio-nanocomposites and nanomedicine (drug delivery and scaffolds) were discussed in details. Some aspects of semi crystalline polymers and nanocomposites were also presented.

## 7. Rewiring the Brain: Brain Plasticity and the Art of Learning

Date: 20th August, 2025

Speaker: **Dr Baby Chakrapani**, Dept. of Biotechnology, CUSAT, Kalamasserry & Director, Centre for Neuroscience

Venue: Dept. of Zoology, **St. Albert's College**, Ernakulam, Kerala

**Outreach: 225**



the high demands of modern life, managing stress is a challenge we are facing. Not everyone possesses the skills to navigate stress effectively. Ultimately, this lecture aims to provide insight into the fundamental structure of the brain, the key concepts of learning and memory, and practical applications of neuroscience that can help mitigate stress, boost attention, and improve memory.

**Abstract 7:** Brain Plasticity and the Art of Learning Neuroscience is a captivating field that intrigues many of us. It is often linked to how we learn, remember, think and relate to our mental health. While the capacity of the human brain is remarkable, many individuals find themselves at a point where they are not entirely satisfied with their cognitive abilities. This talk will navigate the intricacies of the brain, our body's most complex organ, and introduce some engaging 'brain exercises' designed to illustrate brain plasticity- the brain's remarkable ability to adapt and reorganise itself. We will discuss how brain plasticity intersects with learning and memory, both of which are critical cognitive processes involved in nearly all aspects of our daily lives. Whether preparing for a competitive exam, participating in a job interview, or meeting deadlines, our memory is constantly put to the test.

Recognizing that each person learns differently raises important questions. What factors contribute to our unique learning abilities? Is it possible to enhance our memory? Can we counteract the memory loss that comes with aging? The discussion will centre around the types of memory, alongside the mechanisms behind memory storage, consolidation, and retrieval. Additionally, stress plays a significant role in the degradation of memory. Given

## 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. रेडियोधर्मिता और विकिरण - मानव जाति के भविष्य के निर्माण के लिए

Date: 22<sup>nd</sup> August 2025

Speaker: **Dr Yojana Singh**, Former Senior Manager, Market Research & Publicity (MR&P), Board of Radiation and Isotope Technology (BRIT), DAE, BARC Vashi Complex,

Venue: **Sainath Hindi High School and Jr. College, Vashi**

**Outreach: 150**



**Abstract 1:** आज विकिरणों का उपयोग स्वास्थ्य सेवा (health care), कृषि (agriculture), उद्योग (Industry) और अनुसंधान (Research) के क्षेत्र में किया जाता है। स्वास्थ्य सेवा में इनका उपयोग कैंसर के निदान (diagnosis) और उपचार (therapy) तथा मानव शरीर के कार्य (Functions of body) का अध्ययन (study) करने के लिए किया जाता है।

बढ़ती जनसंख्या के साथ कृषि में वे फसलों के उत्परिवर्तन (Increase quantity of crops by Mutation) में मदद करते हैं ताकि अनाज की मात्रा बढ़ाई जा सके। अनाज को संरक्षित (store) रखने और फसलों को खराब होने से रोकने तथा सतत कृषि (Sustainable agriculture, टिकाऊ कृषि) को बनाए रखने के लिए भी विकिरणों का उपयोग होता है। औद्योगिक क्षेत्र में, वे हमें, उन दरारों (Cracks)

को खोजने में मदद करते हैं, जो मानव आंखों को दिखाई नहीं देती। इसके अलावा, वे तरल (fluid) पदार्थों के प्रवाह और कार्यप्रणाली (working) का अध्ययन करने में मदद करते हैं।

विकिरण का उपयोग मानव जाति (mankind) के सामाजिक लाभ के लिए किया जाता है।

## 2. Nanotechnology: The Future of Medicine and Super Materials

Date: 25<sup>th</sup> August, 2025

Speaker: **Ms. Sumiran Singh**, Project Research Scientist, ACTREC, Tata Cancer Hospital, Kharghar, Navi Mumbai

Venue: **SVB's International School, Dombivli**

**Outreach: 80**



**Abstract 2:** Imagine science so small it works at the scale of atoms and molecules—thousands of times tinier than the width of a hair—yet powerful enough to transform the way we live. In this engaging talk, students will journey into the

how scientists are pushing the boundaries of what's possible. From life-saving drug delivery systems to super-strong, lightweight materials, nanotechnology is shaping the future of healthcare, electronics, and everyday products. This talk takes you inside the fascinating world of nanotechnology, and will discover how scientists use nanotech to fight diseases, build smarter materials, and even mimic nature's designs. The "super small" is making a huge difference — truly tiny science with giant possibilities.

### IWSA is proud of its mentees – listen to Sumiran Singh, who delivered the BRNS talk at SVRM School, Dombivli

From my early college days, my journey in science has been deeply shaped by my interactions with the Indian Women Scientists' Association (IWSA). Attending their workshops and lectures opened my eyes to the impact women can create in research and innovation. Those sessions not only inspired me but also gave me the confidence to see myself in the world of R&D.

Motivated by that spark, I pursued a double master's degree—first in Biotechnology and then in Nanotechnology—which strengthened my foundation and curiosity for scientific exploration. Today, I am proud to work as a Project Research Scientist at ACTREC, Tata Memorial Centre, where I contribute to meaningful research that has the potential to change lives.

Life has come full circle as I am now a member of IWSA, the same community that once inspired me. I am stepping into a role where I can deliver lectures and interact with students, especially young girls, to share my experiences and encourage them to envision a future in science. It is my goal to pay forward the motivation I received and help build a stronger, more empowered generation of women in STEM.



### Monsoon Magic..

Each and every location in Western Ghats is transformed to serene, vibrant and refreshing landscapes!

Photo from **Igatpuri, Maharashtra**, by **Dr. Sushma Lehri**, IWSA member

## C. IWSA– BRNS “Science and Our Life” (SAOL) Series of Webinars

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

**61<sup>st</sup> SAOL**  
**Rethinking the Obvious**  
 Date: 29<sup>th</sup> August, 2025  
 Speaker: Er. Vickram Krishna  
 Outreach: 41

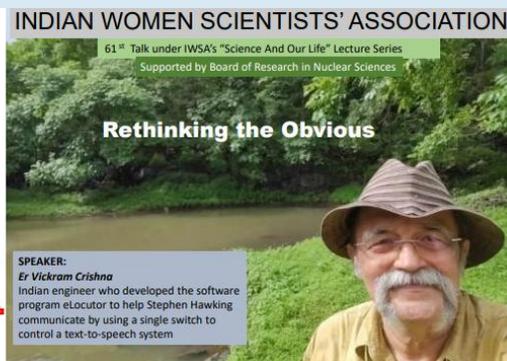
**Abstract:** In this discussion, we are going to look at an everyday technology, arguably the very second one developed and used by humanity, in its move towards modern civilization.

As often must happen when a technology becomes commonplace, without a full discussion of the underlying science, some consequences are so deep rooted, impacting air, water and land, that discussion itself might seem absurd.



On 29th August, 2025  
at 5 pm  
Please join by 4:55 pm

Join Online on Zoom at  
Meeting ID-  
839 0936 2165  
Passcode-  
IWSA@IASHII



Available at

[https://youtu.be/m1jL7aO6Sog?si=IVaB94w2\\_IrL0wbS](https://youtu.be/m1jL7aO6Sog?si=IVaB94w2_IrL0wbS)

## D. IWSA’s Learning Garden

### IWSA-IWC Online Workshop

Theme: **Kitchen Garden Delights- Gourds, Greens, Herbs**

Speakers: Dr. Pramila Battasse, Educator  
 Dr. Dilip Mali, Terrace Gardener

Date: 5<sup>th</sup> August 2025

Collaborators: **Inner wheel Club (IWC) District Thane 314**

**Outreach: 197**

Dr. Dilip Mali's Terrace, a green oasis of veggies, bursting with flavour & freshness was the setting of the first IWSA-IWC environment focussed workshops. Dr Pramila Battase & Dr Dilip Mali demonstrated how Kitchen Gardening is a journey of nurturing life connecting with the earth, and savoring the homegrown produce.

Every step from seed to harvest was shown with tips & tricks acquired from years of practice. Odour-free composting using a balance of green and brown waste was demonstrated. The potting mix for container gardening was explained. In the shady balconies leafy greens, herbs and root vegetables can thrive.

Terrace gardening: Tomatoes, brinjals, chillies, cabbage, cauliflowers, various gourds and more grow well on terraces. Useful tips like staking gourds and creepers with bamboo sticks, pinching the tops of creepers & bush vegetables to increase the harvest and grafting of brinjal were all shared. Planting depths were very effectively narrated through poetry. Seeds need holes- 1 to 2 times their size deep; saplings must be planted only till the soil mark. To see the apple tree producing fruit in Kolhapur was indeed a miracle.

**KITCHEN GARDEN DELIGHTS**  
**GOURDS GREENS HERBS**

- Grow your own healthy food.
- Get maximum health benefits and immunity from your own Kitchen garden.
- Join the workshop and learn easy ways to grow your organic veggies

**SPEAKERS**  
 DR PRAMILA BATTASSE, M.SC. PH.D (CHEM) AND EDUCATOR  
 DILIP MALI, M.SC. PH.D. ELECTRONICS, TERRACE GARDENER

**AUGUST 5<sup>TH</sup> 2025 AT 3.30 PM**  
**ON ZOOM PLATFORM**

**LAKSHMI SINGH**  
 DISTRICT CHAIRMAN  
 DISTRICT 314

**PDC DR.SHOBHA AHUJA**  
 PROJECT CHAIRMAN  
 DISTRICT 314

**DR. BAKHTAVER S MAHAJAN,**  
 CHAIRPERSON, BOARD OF  
 TRUSTEES, INDIAN WOMEN  
 SCIENTISTS' ASSOCIATION

## E. IWSA's Green Initiatives

### 1. Discussion on using Green Hydrogen as Kitchen Fuel

Dates: 30<sup>th</sup> July and 12<sup>th</sup> August 2025

Collaborators: Prof. Prakash Ghosh, IIT Bombay and Mahanagar Gas Ltd. (MGL)



IWSA organised a meeting with Prof. Prakash Ghosh from Department of Energy Science and Engineering (DESE), Indian Institute of Technology, Bombay (IITB) and officials from

Mahanagar Gas Ltd. (MGL) in the IWSA campus on 30<sup>th</sup> July 2025 to understand his mission Green Hydrogen. Although NITI Ayog has not approved hydrogen as a kitchen fuel, it has endorsed the use of Green Hydrogen, including its potential for community-level applications like heating and cooking. Dr. Ghosh's project uses hydrogen as kitchen fuel, generated onsite by electrolyzers using solar panels as the source of energy. The generated hydrogen is stored in a tank and used for cooking with a help of a compatible burner. It can be blended with suitable quantity of LPG before supplying to the burner. Such systems are in use at Adani and NTPC sites and are important in the transition towards renewable energy and bringing down the carbon footprint.

Prof. Prakash Ghosh invited IWSA members to visit IIT Bombay to further understand the working of the plant which he has designed and is operational.

Ten IWSA members and Dr. B.G. Tilak, Expert Consultant, Hydrogen & Renewable Energy, visited the Department of Energy Science and Engineering (DESE), IITB on 12<sup>th</sup> August 2025. Prof. Manaswita Bose, Head, Department of Energy Sciences and Engineering also attended the introductory meeting. Prof. Ghosh presented a video of about 6 mins duration featuring the Green Hydrogen work done at DESE, IITB along with their partners Zest Clean Power Pvt. Ltd., and Pratishna Greentech Pvt. Ltd. The video clearly explained about the need for Green Hydrogen Fuel in Indian kitchens, especially in the rural remote areas. Dr. Shyamala Bharadwaj made a brief presentation about the activities of IWSA. This was followed by a brief account of the evolution of the work of DESE over the last 18 years (the department started in the year 2007). Later, the team visited the Green Hydrogen Fuel Laboratory located on the 7<sup>th</sup> floor of the building which houses green hydrogen cooking system. Prof. Ghosh demonstrated the working of the specially designed hydrogen burner which had the supply of Hydrogen generated using alkaline electrolyser. Though the hydrogen flame is colourless, Prof. Ghosh has introduced an ingredient that provided an orange colour to the flame. With pure hydrogen as the fuel, boiling of water in a glass vessel was demonstrated. With the help of hydrogen sensor, Prof. Ghosh could show that percentage of hydrogen is more than 4% only very close to the area of the burner when hydrogen is supplied. Just a little away from the burner, the percentage drops below 4 %, which is nonexplosive. He also demonstrated a flame in a normal burner by mixing LPG and hydrogen in various ratios.

This was followed by an active session of discussion and interaction. The possibility of IWSA getting involved in this green initiative, to spearhead the awareness campaign and spread the knowledge about Green Hydrogen Fuel, was discussed in detail. MGL officials are interested in installing the "Solar Hydrogen and Direct Burner Injection (DBI) Pilot Plant" in IWSA's Working Women Hostel Canteen, offering their full support.

President, IWSA, members of the Board of Trustees of IWSA, some of the EC members of IWSA and Dr. B.G. Tilak are having detailed discussions with MGL officials and Dr. Ghosh about various aspects of this project. The final decision about the installation will take place only after the above mentioned IWSA Members are convinced about the safe use of Green Hydrogen in the kitchen of IWSA's Hostel.

## F. IWSA – Student Internship Program

Title: **From Research to Videography: Contributing to IWSA's Learning Garden and Living Museum Project**

Duration: **12<sup>th</sup> to 22<sup>nd</sup> August 2025**

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

Number of Students: **8 (BBA students from Term V - Batch (2024-27))**

IWSA Mentors and Expert invitees: **Dr. Rita Mukhopadhyaya, Dr. Paramjit Anthappan, Ms. Vijaya Chakravarty, Ms. Priya Jacob, Ms. Sukhvinder Sandhu, Dr. Sweedle Shivkar, Dr. Sushma Lehri and Mr. Animesh Das.**

ITM Mentors: **Prof. Shrilaja Palur, Dr. Namita Soni and Ms. Bhargavi Narahari**

The internship project was aimed at mentoring interns on how to make meaningful contributions to IWSA's upcoming book on *Creating Learning Gardens & Living Museums: Biodiversity, Conservation, and Sustainability*. The book is not just about documenting plants— it integrates cultural knowledge, scientific details, and even QR-linked videos to make learning more interactive. Objectives of project included (i) Literature survey from library and online sources for data documentation of plant species with accurate scientific and cultural details. Reviews of new and available books relevant to internship subject was also included. (ii) Editing and refinement of scripts for QR-linked videos. (iii) Supporting video production by coordinating of recordings and assistance to speakers (iv) Creation of promotional content like pitching videos for social media. The pedagogy adopted during the internship period combined fieldwork, research, and digital learning. Plant research and photography required on-site visits and observation, while video editing and script work were supported through online tools. Peer feedback through NLP Session and expert guidance played a major role throughout. **The learning outcomes** expressed by interns included knowledge enrichment and skill empowerment for scientific and cultural plant documentation, basics of video production, hosting online sessions to editing, Improved adaptability by working both online and offline depending on the climatic situation, confidence built up in teamwork and leadership, especially while hosting multi-speaker sessions and overall understanding of how projects can combine science, culture, and technology to benefit society.



## Community Programs

### A. Indirabai Padhye Nursery School and Education Committee

#### 1. Inauguration of the new ECCE Batch

Date: 18<sup>th</sup> June 2025

Chief Guest: **Ms. Shobha Bharat**, Head of the Doshi Master's program

Number of students: **14**

Shadow Teacher Training program: **3**



#### 2. Creativity activities of ECCE trainees:

A class entitled 'Ignite the Creative Spark' on the 9th July using chart paper, origami paper and crepe paper.

An **online creativity class** on 14th July using chart paper, silver foil, wool, ice cream sticks, broom sticks etc.

**Crayoning Workshop** on 16<sup>th</sup> and 17<sup>th</sup> July by **Ms Aruna Khanolkar Joshi Ganapati** making workshop using dough was also conducted by **Ms. Aruna**

**Creative corner-** with materials of own choice from a set of pre-selected material without any suggestions or instruction.



#### 3. Visits by ECCE students

Field visits to **Twinkling Angels Playschool**, Amulakh Amichand International school, Matunga on the **24<sup>th</sup> July 2025** and to **Kilbil**, a day care centre in Anushaktinagar on **22<sup>nd</sup> August 2025** with the objectives of understanding the teaching methodology and philosophy and to observe the infrastructure, facilities and equipment.

#### 4. Visit of Nursery Children

Bhoomi Nursery on **30<sup>th</sup> July 2025**.



**5. Celebrations:** The nursery children tied Rakhis and celebrated Rakhi in the traditional way on **8<sup>th</sup> August 2025**.

#### 6. Independence Day Celebrations

Flag hoisting ceremony was done in the presence of nursery children, parents, ECCE Trainees, hostel inmates and IWSA Members. Nursery children, led by their teachers and ECCE trainees did an Independence Day parade. Some children came dressed as Freedom Fighters. ECCE trainees sang patriotic songs. Trainees conducted some games and activities for the nursery children and parents. The program also consisted of **Ek Ped Maa Ke Naam, an initiative of Govt. of India, where mothers will plant trees for the environment**. Mothers and Children planted saplings in the IWSA Garden. A placard carrying the name of each mother and child was put near their plant.



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

### Independence Day Celebration:

Hostel celebrated Independence Day along with nursery children, parents, ECCE Trainees and IWSA members. Flag hoisting was followed by patriotic songs etc.

The children of Day Care Center celebrated Rakhi and Independence Day



## C. IWSA's Pirojsha Godrej Foundation Library

### 1. Summer Camp

Theme: **Frolicking with Books and Nature**

Date: **19<sup>th</sup> – 24<sup>th</sup> May 2025 (10 am to 12 pm)**

Venue: **IWSA Head Quarters, Vashi**

Facilitators: **Prema Basargekar, Abha Basargekar and Jyoti Narayan**

Outreach: **20 children of age 5 to 15 years**

The objectives were (1) to inculcate love for reading books in children (2) to nurture their creativity (3) to build symbiotic relationship with nature in the surroundings and (4) to introduce them to different genres of books with library related activities.

Each session incorporated four key aspects:

1. Energizers – Engaging games, songs, and activities to foster a sense of unity.
2. Interactive Read-Aloud – A book reading session followed by discussions.
3. Silent Reading – Encouraging independent exploration of books and
4. Art & Craft – Creative activities based on the book or theme of the day.

The summer camp was a fulfilling experience for children, and also for organizers and



facilitators. It provided children with invaluable exposure to books. Younger participants gravitated towards pop-up picture books, while older children actively engaged in library-related activities such as creating and maintaining personal library cards, reading independently, and participating in book-themed exercises.

### 1. Shravan Mela

Date: **2<sup>nd</sup> August 2025**

Title: **"Shravan @ the Library: Celebrating Stories, Wisdom and Community"**

Outreach: **30**

**Objective:** To create an engaging and inclusive program for senior citizens that leverages library resources and celebrates the Shravan theme, to promote intergenerational learning, social interaction, community building and to preserve cultural heritage and personal narratives through storytelling and library resources.

Glimpses from the program



As Shravan is a season of celebration of womanhood in certain way, the theme was around women empowerment. In read aloud session two engaging stories of Usha Uthup (for seniors) and Borris the Pirate (for children) were covered by Dr. Prema Basargekar along with Jyoti Narayan and Ms Abha respectively.

The participants went through number of curated selected pictures books on various dimensions of gender. The discussion was also held on the adverse impact on men in a patriarchal society due to their inability to express their emotions fully as brought out in the story Tough Boris. The enthusiastic participants created their shoes and bindi designs on paper, depicting their identity, taking a cue from Rockstar in a Sari book. The outreach was more than 30 which includes kids with grandparents and parents. The participation of the staff of all the committees in the dance, happening for the first time, was something remarkable.

## D. IWSA's Murli Laj Chugani Health Care Centre

### Visit and Activities at Dr. R.V. Subramanian Autism Centre at Seawoods

Collaborators: Inner Wheel Club of Thane Hills

Organizers: IWSA's HCC & Early Childhood Care and Education (ECCE) team

Date: 17<sup>th</sup> July 2025

Outreach: 70

The visit was organized with the objective of conducting skill-building and cultural activities aimed at enhancing fine motor skills, creativity, and motivation among the students. The Autism Centre is a joint initiative of the Triumph Foundation (a charitable trust of the Rotary Club of Thane Hills) and Matru Milan Vikas Kendra. The centre caters to approximately 70 students up to 20 years of age and offers services such as early intervention, therapy, vocational training, and educational support.

The interactive and sensory-focused activities included rakhi making, diya painting, garden-based task, i.e., planting saplings in pots and salad decoration followed by music and dance. Students were warmly welcomed and gently guided through each task with verbal and visual cues and physical guidance. These activities helped children develop hand-eye coordination through fun and festive crafts and also fostered joy and creativity. All the beautifully completed items were displayed for everyone to admire. The program was focused, with good participation and joyful interaction with the children across age groups. This collaborative effort enabled IWSA members to gain a deeper understanding of the unique challenges of autism and the value of inclusiveness in society.



## 2. Cancer Camp – 2025

Date: 7<sup>th</sup> August, 2025

Duration: 11.00 am to 3:30 pm.

Venue: IWSA HQ, Vashi, Navi Mumbai

Beneficiaries: 33 Males, 74 Females

Support: Sainath Education Trust's Rajiv Gandhi College of Arts, Commerce & Science and Cancer Patients Aid Association (CPAA)

The doctors, namely Dr. Jyoti Tasker (Gynecologist), Dr. Satish Kanekar (General Surgeon), Dr. Veena Borkar (General Physician), Dr. Ashish Kondangire (ENT Surgeon), the Counsellor (Ms. Minal Parab) and other medical and managing staff were from CPAA. Registered participants underwent complete physical examination (BP, pulse history, complaints of any discomforts and prescription for the same), ENT Examination, Pathology (Haemoglobin & WBC count)



Registration counter



IWSA Team with CPAA Medical Team and Sainath Education Trust representatives along with NSS Volunteers



Beneficiaries

Gynaecological Examination and General Examination for male patients. The structured examination process also included a registration counter where details of medical and family history along with Tobacco and alcohol habit history was recorded. Few elderly participants and household helpers from different nodes of Vashi, besides the teaching and non-teaching staff of Sainath Education Trust benefitted by attending the camp. Noteworthy referrals were made for 19 participants for further evaluation and intervention by CPAA. The participants expressed the need for such health check-ups and conveyed their satisfaction with the overall examinations conducted.

### 3. Stroke Awareness Program

Title: **“Know Stroke: Act Fast, Raise Awareness.”**

Speakers: **Dr. Pradeep Tiwari, Neurologist**  
And **Dr. Agnes Robin, Neuro Physiotherapist**

Date: **16<sup>th</sup> August, 2025**

Venue: **IWSA HQ, Vashi, Navi Mumbai**

Collaborator: **MGM New Bombay Hospital, Vashi**

Outreach: **60**



Stroke continues to be one of the leading causes of death and long-term disability worldwide. While early detection and prompt medical attention can significantly improve outcomes, awareness about the warning signs, risk factors, and emergency response remains low. This program was designed to bridge that gap by educating the public on stroke prevention, identification, and timely treatment. Dr. Pradeep Tiwari, Neurologist, provided an overview of stroke and highlighted the rising incidence in India across all age groups, attributing stress, anxiety and lifestyle-related disorders as major contributors. He emphasized the importance of yoga, diet management, and controlling hypertension and diabetes to reduce risks. For easy vigilance, he used the acronym **BEFAST**, i.e., spotting changes in **B**alance, **E**yesight,

**F**ace, **A**rms and limbs and **S**peech, which should be followed by **T**imely action to hospitalize the person. CT angiogram or MRI is necessary to confirm stroke.

Dr. Agnes Robin, Neuro Physiotherapist, delivered a comprehensive talk on the definition, signs, and symptoms of stroke. She outlined preventive steps such as- Managing blood pressure, blood sugar, and cholesterol, staying physically active, eating healthy and fresh food and ensuring adequate sleep. She also explained the vital role of neuro physiotherapy in helping patients regain mobility and recover after a stroke.

Welcome and Introduction were given by Dr. Yojana Singh, EC Member and Dr. Nootan Bhakal, President and Ms. Hemangi Deshpande, Secretary – Health Care Committee, delivered the vote of thanks. The session ended with an engaging Q&A round, where experts addressed queries from the audience, making the program interactive and practical.

## E. IWSA's Building & Hall Maintenance Committee

### Hall Upgradation and Inauguration of “SOONU NAVAL GODREJ HALL”

Date: **14<sup>th</sup> June 2025**

Chief Guest: **Dr. Pheroza Godrej, Chairperson, Godrej Archives**

The old ICICI Multipurpose Hall of IWSA was renovated mainly through the donation from Pirojsha Foundation. The inauguration function started with the welcome song by DCC children followed by the felicitation of Dr. Pheroza Godrej and other members of the Pirojsha Foundation. Other donors, Shri. Madhukar Kotwal, Smt. Vera Mahajan, Rashtra Tej Manch, Shri. Ashwin Mehta, Dr. Lalitha Dhareshwar, Smt. Chhaya Kelkar as well as the friends of IWSA, Dr. B.G. Tilak and Mr. Kulbir Sandhu who contributed immensely to the upgradation of the Hall were also felicitated. Dr. Pheroza Godrej gave her inaugural address in which she shared the special bond that she and her mother-in-law, Mrs. Soonu Godrej shared with IWSA. IWSA founder member, Dr. Sudha Padhye shared the interesting anecdotes regarding the building of IWSA premises and specially the ICICI Multi-Purpose Hall, which has been now renamed as “Soonu Naval Godrej Hall”. This was followed by a dance program by students of Ms. Gayatri Subramanian, Guru G. V. Ramani Natya Kala foundation and high tea.

IWSA is extremely grateful to Pirojsha Godrej Foundation and all the other donors for their generous donation for this work. This hall has been used for all our Science Education related programs- National and International Conferences, College Student & faculty Workshops and Refresher Courses, Science Exhibitions, Scientific



lectures by experts and many more, for over the past 27 years. With the advent of modern technology in Audio-Visual instrumentation, there was an urgent need to upgrade the Hall for improved performance. The up-graded hall with the new facilities will indeed help us further in our science awareness and outreach activities.

### IWSA HQ Subcommittees for 2025 – 27

#### 1. Building and Hall Maintenance Committee

Convener: Dr Sudha Rao  
 Secretary: Ms. Vijayalakshmi Tilak  
 Treasurer: Ms Chhaya Kelkar  
 Members: Ms. R. Bhuvaneshwari, Trustees, Office bearers of EC

#### 2. Hostel and Day Care Centre Committee

Convener: Ms Vijayalakshmi Tilak  
 Secretary: Ms Bhuvaneshwari  
 Treasurer: Ms Chhaya Kelkar  
 Members: Ms Kumud Balkrishnan  
 Ms Malathi Rao  
 Ms Snehlata Bhavsar  
 Ms Asha Khandkar  
 Ms Sukhvinder Sandhu  
 Ms Usha Chaturvedi  
 Dr Radha Srinivasan

#### 3. Nursery School and Education Committee

Convener: Ms Rekha Pradhan  
 Secretary: Ms Anuradha Shekhar  
 Treasurer: Dr Dhanya Suresh  
 Members: Ms Usha Chaturvedi  
 Dr Seema Das

#### 4. Library Committee

Convener: Dr Paramjit Anthappan  
 Secretary: Ms Sukhvinder Sandhu  
 Treasurer: Ms Hemangi Deshpande  
 Members: Ms Vijaya Chakravarty  
 Ms Manashi Chakraborty  
 Ms Malathi Rao  
 Dr Prema Basargekar  
 Ms Jyoti Narayan  
 Ms Snehalata Bhavsar  
 Dr Seema Das  
 Ms Parul Negi

#### 5. Health committee

Convener: Dr Maitrayee Paul  
 Secretary: Ms Hemangi Deshpande  
 Treasurer: Ms Tripta Tewari  
 Members: Ms Priya Jacob  
 Ms Snehlata Bhavsar  
 Ms Ambika Janakiraman  
 Dr Yojana Singh  
 Ms Param Jyoti Madan

#### 6. Computer committee

Convener: Ms Sukhvinder Sandhu  
 Secretary: Dr Sweedle Shivkar  
 Jt. Secretary: Ms Tripta Tewari  
 Treasurer: Dr Paramjit Anthappan  
 Members: Dr Seema Purohit  
 Ms Bhanumati Ganesh  
 Ms Samita Vij

#### 7. Science Awareness Committee

Convener: Dr Yojana Singh  
 Secretary: Dr Paramjit Anthappan  
 Jt. Secretary: Ms. Tripta Tewari  
 Treasurer: Dr Srirupa Mukherjee  
 Members: Ms Vijaya Chakravarty  
 Dr Radha Srinivasan  
 Ms Ambika Janakiraman  
 Dr Sheela Donde  
 Ms Manashi Chakraborty  
 Dr Smita Kekatpure  
 Ar Sonam Ambe  
 Dr Maitrayee Paul  
 Dr Seema Das  
 Ms Priya Jacob  
 Ms Malathi Rao  
 Dr Sweedle Shivkar  
 Dr Suparna Kamath

#### 8. Scholarship Committee

Convener: Dr Yasmin Khan  
 Co-Convener: Dr Seema Das  
 Secretary: Dr Dhanya Suresh  
 Treasurer: Dr Smita Kekatpure  
 Member: Dr Srirupa Mukherjee

#### 9. Newsletter Committee

Editor: Dr Dhanya Suresh  
 Members: Dr Shyamala Bharadwaj  
 Dr Sheela Donde  
 Dr Susan Eapen  
 Dr Seema Das  
 Ms Priya Jacob

#### 10. Publication Committee

Convener: Ms Vijaya Chakravarty  
 Secretary: Dr Yojana Singh  
 Treasurer: Dr Sweedle Shivkar  
 Members: Dr Susan Eapen  
 Dr Paramjit Anthappan  
 Dr Seema Das

## Reports from Branches

### Ajmer

#### 1. IWSA–BRNS Popular Science Lecture for Colleges

Topic: **Radiation: A constant Companion in Daily Life**

Date: **20<sup>th</sup> August 2025**

Speaker: **Dr Rajni Verma**, Medical Physicist & Asst. Prof. of SMS Medical College, Jaipur & Radiation Officer, Rajasthan

Venue: **University Maharaja's College, University of Rajasthan, Jaipur**

**Outreach: 156**



**Abstract:** Radiation is an ever-present part of our environment, coming from natural sources like the sun, cosmic rays, soil, rocks, and even the human body, as well as from man-made sources such as medical X-rays, nuclear power, and house hold electronics. In our daily lives, we are constantly exposed to low levels of radiation, most of which are harmless and sometimes even beneficial, such as in medical diagnosis and treatment. Awareness of radiation sources, effects and safe limits helps us understand that it is not just a potential hazard, but also a valuable resource that supports modern technology, healthcare and scientific advancement.

### Bengaluru

#### A. One Day Workshop on Scientific Illustrations

Date: **20<sup>th</sup> August 2025**

Speaker: **Dr Ipsa Jain**, Science Communicator and Illustrator, Ipsawonders, Bangalore

Venue: **Department of Biotechnology**, Faculty of Life and Allied Health Sciences, Ramaiah University of Applied Sciences

Collaborators: **Department of Biotechnology, Ramaiah University of Applied Sciences, Bangalore**

Sponsors: **Juniper Life Sciences**

**Outreach: 35**



The workshop aimed to introduce participants to the art and science of scientific illustration and its role in effectively communicating complex scientific concepts visually. Dr. Jain shared her career journey from molecular oncology research to science illustration, providing insights into the interdisciplinary nature of this field. The workshop combined informative talks, interactive drawing exercises, and creative group activities, allowing students to learn by doing and fostering both creativity and observational skills.

The drawing-based activities consisted of (i) Observation-Based Sketching where students drew an object based on descriptive instructions (ii) Plant Part Study where students quickly sketched a plant part from five different perspectives within a minute, followed by a detailed drawing of the same part in

20 minutes (iii) Explanation of Scientific Illustration Classification promoting critical thinking.

In the final creative activity, students individually or in pairs designed a poster, zine, or diagram on a sheet. Guidelines were provided before the activity, followed by feedback with peers and expert comments and suggestions from Dr. Jain. Participants understood the importance of scientific illustrations in science communication, learnt fundamental principles for designing educational visuals and gained practical skills in drawing biological subjects. The workshop inspired many students to explore scientific illustration as a creative practice and a potential future career path.

## Hyderabad

### 1. Tree Plantation Drive Aligned with Sustainable Development Goals

Date: 21<sup>st</sup> June 2025

Collaborators: OWSA (Organisation for Women in Science for the Developing world), MLBC (Maha Laqa Bai Chanda Centre for Women Studies) and IWSA (Hyderabad branch)

Outreach: 55

This program was organized by Dr. Hameeda Bee, Director, MLBC, CWS & Minority Cell, Osmania University (OU), at Phule - Ambedkar Centre for Inclusive and Empowerment Studies, in association with Rotary Club of Smart Hyderabad Green Belt, OU, Dr.B. R. Ambedkar Research Centre, Centre for Telangana Studies, Mahatma Jyotiba Phule Research Centre, SC/ST Cell, BC Cell & Minorities Cell OU. Prof. Kumar Molugaram, Vice Chancellor, OU was the chief guest and many other dignitaries were present. This program also



Included plantation of ayurvedic medicinal plants in and around the centre to bring awareness of Indian knowledge system. A compost plant was also initiated to provide the biomanure necessary to maintain the plants.

### 2. Inroads of AI in Biological Sciences"— An Awareness Programme

Date: 16<sup>th</sup> July 2025

Venue: Telangana social welfare residential degree and PG College for women, Mahindra Hills, Ghatkesar Campus

Collaborators: Department of Microbiology, Bhavan's Vivekananda College of Science, Humanities and Commerce, Sainikpuri, Secunderabad

Outreach: 200



This program was arranged keeping in view the 'World Youth Skill Day' which is celebrated on 15th July. Dr. K. Anuradha, Head, Department of Microbiology, Bhavan's Vivekananda College, gave the keynote address, providing an engaging overview of Artificial Intelligence (AI) and highlighted its growing relevance in biological sciences. She traced its evolution over the years and stressed the need for life science students to stay abreast with AI-driven tools and approaches. In the second session, Dr. S. Anju, Asst. Prof. Department of Microbiology, Bhavan's College, elaborated on the AI process workflow and its practical implementation. She demonstrated Google Colab and Orange software applications in biological data analysis, giving the students valuable

Insight into how these platforms can be used for bioinformatics, predictive modeling, and biomedical research. She also touched upon the career opportunities and industry roles that students can aspire to after acquiring skills in AI and data science.

This was followed by address by other senior members of IWSA, Hyderabad and an interactive session on AI with the students. There was an interactive session with the faculty of the college also, giving them an overview of the

activities of IWSA and motivating them to join in the forthcoming programs. The session was very successful, with active participation of the faculty who shared their issues related to internship etc. and possible facilitation by IWSA.

### 3. Guest Lecture on “Regenerative Medicine in the Management of Diseases – An Overview”

Date: 18<sup>th</sup> July 2025

Speaker: Dr. Vijaya Lakshmi Venkatesan, Director-Grade Scientist (Retd.), ICMR–NIN Hyderabad

Venue: Department of Zoology, RBVRR Women’s College, Hyderabad

Outreach: 127

While bridging the fundamentals of stem cell science with preclinical and translational research, this talk highlighted the **immunomodulatory, anti-inflammatory, and paracrine functions** of Mesenchymal Stem Cells (MSCs), reinforcing their role as promising agents in disease modulation. The talk gave insights into how stem cell research is offering novel therapeutic strategies for preclinical diabetes and many more disease conditions. In addition to the real-world applications, she spoke candidly about the **ethical challenges in stem cell research**, especially around the **development and lineage modulation of lab-grown stem cells using growth factors**, which could potentially replace animal models in future studies. She also offered students a glimpse into other leading institutes such as **LV Prasad Eye Institute**, Hyderabad, where extensive regenerative research is shaping India’s medical innovation landscape.



**Dr. Mahtab S. Bamji**, INSA Honorary Scientist, former Director-Grade Scientist at ICMR–NIN, shared her journey as a woman in science and about her work in combating malnutrition and enhancing community health, especially through **Dangoria Charitable Trust** in rural Telangana. Other members of IWSA, Hyderabad, **Prof. Vijaya Khader**, Convener, **Dr. J. Padmaja Rambabu**, Co-convener, **Dr. Vani Motha**, Joint Secretary, IWSA, and **Dr. Gita Sharma** spoke on this occasion about their respective fields. The speakers showed how science becomes transformational when guided by purpose and created a vibrant atmosphere of dialogue, mentorship, and collective empowerment. The event brought together pioneering researchers, academic leaders, and enthusiastic students in a shared space of learning and inspiration.

### 4. Poster Making Competition

Theme: **Food Adulteration and Its Impact on Human Health**

Date: 4<sup>th</sup> August 2025

Venue: Pallavi International School, Attapur, Hyderabad

Outreach: 35



35 students from Grade 6 to 9 actively participated and showcased their ideas on the topic through designs and creativity. The students also explained their posters to the audience sharing their thoughts with everyone. The posters presented by the students were evaluated by a panel of three judges. 3 best winners were chosen based on their comprehensive understanding on the concept, their ability in expressing the same by making a relevant poster in order to convey a meaningful message. In an interactive session, Dr. Padmaja, co-convenor, IWSA Hyderabad branch educated the students on how they should adopt safe measures and follow safety precautions before consuming any food item available off the shelf. She further emphasized the alarming need for being alert to prevent food adulteration and promote safe health measures so as to protect oneself from adverse health effects. This was reported in The South India Times and Telugu Newspaper Vartha Mirror.

## 5. IWSA–BRNS Popular Science Lecture for Colleges

Topic: **Eco-Enterprises: Reviving Traditions through Natural Dye Innovations ”**

Date: **20<sup>th</sup> August 2025**

Speaker: **Dr. A. Saradha Devi**, Former Dean, Faculty of Home Science, ANGRAU.

Venue: **College of Horticulture, Rajendranagar, SKLTGHU**

Outreach: **300**



**Abstract:** The resurgence of eco-consciousness in contemporary society has sparked a growing interest in traditional practices that are both environmentally sustainable and culturally significant. Our rich heritage of creating exquisite naturally dyed and printed textiles offers immense potential for revival through innovative applications of natural dyes. By effectively bridging indigenous knowledge with contemporary techniques, eco-enterprises provide sustainable alternatives to synthetic dyes, mitigate environmental harm, and support circular economic models. This talk outlines promising natural dye sources along with innovative techniques for dye extraction and textile application. Through case studies, it highlights successful community-based models that empower rural artisans, especially women, while conserving biodiversity and safeguarding intangible heritage. Ultimately, the talk underscores the transformative potential of natural dye innovations in driving green entrepreneurship, promoting ethical fashion, and fostering inclusive and sustainable development. Among the distinguished attendees were Dr. Mehtab Bamji, Founder Member of IWSA-Hyderabad branch, and office bearers, including Dr. Vijaya Khader, Dr. Kalpana Shastri, Dr. Padmaja, and Dr. Satyavani, as well as Dr. Veeranjanelu and Dr. Anitha Kumari.

## Kalpakkam

### 1. Technical Talk

Title: **Use of Film Forming Amines for Corrosion Prevention in Steam Generator System**

Date: **19<sup>th</sup> August 2025**

Venue: **Raja Ramanna Auditorium IGCAR**

Speaker: **Dr. Veena Subramanian**, Water and Steam Chemistry Division, BARC Facilities

Outreach: **28**

Dr. Veena stressed on the importance of corrosion mitigation in steam generator systems in this talk. This presentation provided an overview of ongoing studies aimed at evaluating Film Forming Amines (FFA) such as octadecylamine for corrosion inhibition of structural materials in Indian Pressurised Heavy Water Reactors (PHWRs), with the objective of reducing corrosion product transport and ensuring material integrity during both extended shutdowns and normal operation. The lecture was followed by an interactive session.



### Blue Mormon- (*Papilio polymnestor*)

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

#### Did you know?

This stunning beauty is **the state butterfly of Maharashtra**

This is the **fourth largest butterfly in India**, with a wingspan of 120 – 150 mm.

It is a **common swallowtail butterfly** found in heavy rainfall areas (India, Srilanka, Bengladesh). Seen in plenty during the monsoon months.

## Kolhapur

### 1. IWSA–BRNS Popular Science Lecture for Colleges

Topic: **Societal Benefits of Space Technology- a way forward**

Date: **23<sup>rd</sup> August 2025**

Speaker: **Dr Deepti Deobaghkar**, former Professor of Molecular Genetics, Head, Zoology & Director, Bioinformatics Centre, Former, ISRO Chair Professor, Space Technology cell, ISRO, Savitribai Phule Pune University, Pune  
Venue: **Rajaram College, Kolhapur**

**Outreach: 110**

**Abstract:** Space Science and technology have enumerable applications in agriculture, water management, forestry, fisheries, environment, mining, ecology, green technologies, medicine, education, communication, climate studies, disaster management and many more. These applications have transformed our day to day lives and have far reaching implications in security, surveillance and defence strategies. ISRO has also set up New Space Technology Ltd. (NSIL) to foster innovation and entrepreneurial ventures. There are many possibilities of utilising these novel facilities, high throughput information gathered for providing many opportunities and challenges in cutting edge research, start-ups and also to facilitate commercial ventures. The societal benefits of space applications and possibilities of exploring new approaches and avenues in many walks of life were discussed.



This talk was organized as part of observation of National Space Day commemorating the successful landing of Chandrayaan -3 in 2023. The theme of celebration for 2025 was "From Aryabhata to Gaganyaan: Ancient Knowledge to Infinite Possibilities." During the event, a floral tribute was paid to Dr. Vikram Sarabhai, the father of India's space program.

## Nagpur

### 1. IWSA–BRNS Popular Science Lecture for Colleges

Topic: **Recent Developments in AI and possible impact of Job Roles in IT**

Date: **22<sup>nd</sup> August 2025**

Speaker: **Mr. Shekhar Patankar**, Senior Vice President, Persistent Systems, Nagpur

Venue: **Dr Ambedkar College, Deekshabhoomi, Nagpur**

**Outreach: 270**

**Abstract:** The past few years have seen rapid development in the field of Artificial Intelligence. While Machine Learning Technology has been in use in the IT industry for several years now, the implementations have focused on use cases such as recommendation engines or classification models.

Generative AI and Agentic AI technologies have emerged rapidly in the last three to four years. These technologies are being explored and adopted by enterprises as well as by consumers at scale.



In the field of IT, Gen AI/Agentic AI technologies show potential to perform many tasks that have been done by human engineers. In this talk, AI adoption trends in the IT industry were reviewed and some job roles that could get partially or fully automated by AI, as well as new job roles that are being created were discussed.

## Pune

### 1. IWSA – BRNS Popular Science Lectures for Colleges

Topic: 'Tiger Vs पुलियल'

Date: 29<sup>th</sup> July 2025

Speaker: **Dr. Umesh Krishna Bhagat**, Founder and Director, NatEdu Welfare Foundation

Venue: **Swarsamragni Lata Mangeshkar Sabhagraha, Department of Zoology Modern College of Arts, Science and Commerce (Autonomous) Shivajinagar, Pune**

**Outreach: 80**

**Abstract:** In celebration of Global Tiger Day, this presentation shone a spotlight on the tiger — India's iconic and endangered national animal. Focusing on the Landscapes of Central India, which include renowned tiger reserves like Kanha, Pench, Satpura, and Bandhavgarh, the talk explored the tiger's vital role as a top predator and symbol of healthy ecosystems. It delved into the challenges tigers face in the wild — from habitat fragmentation to human-wildlife conflict — and how connected forest corridors are essential for their survival. With compelling visuals and stories from the field,

the presentation highlighted the importance of community participation, responsible tourism, and strong forest management in ensuring a secure future for tigers. Designed to raise awareness and inspire young minds, this session called for united efforts to protect the tiger and the wild places it calls home.

Mrs. Ashwini Deshkar, Asst. Teacher (Junior College wing), Dept. of Zoology was the coordinator. Dr. Bharat Kalbage, Head of Dept. of Zoology and Dr. Shubhangi Puranik, Vice Principal (P.G. section), Dr. Karishma Pardesi, Convener, IWSA Pune Branch, and Ms. Netra Kulkarni were present. The lecture started with a Tiger anthem showcasing a heartwarming video of a Tigress and her cubs within the forest.



## Article

# Integrating Art into Education Deepens Learning - A Multidisciplinary Educational Approach

Ms Savita Makkar and Commander JP Singh

### Introduction:

Art-integrated learning experiences bridge the gap between theoretical knowledge and practical understanding, transforming bookish learning into meaningful, real-world experiences. Immersive arts learning experiences are essential for cultivating critical thinking, creativity, imagination, and innovation in students. **Art Integrated Learning (AIL)** is a teaching-learning pedagogy that emphasizes learning "through" and "with" the arts. Different art forms, visual (drawing and painting, clay modelling, pottery, paper crafts, mask and puppet creation, heritage crafts, and so on) and performing arts (music, dance, theatre, puppetry, etc.) are used as a medium for teaching and learning. It has been observed that art experiences lead to a better understanding and construction of information or knowledge about various subject concepts. Learners engage in creative exploration while making connections between seemingly disparate ideas. AIL offers a flexible and adaptive approach, providing learners of all ages with opportunities to explore and discover on their own pace. This is aligned with the approach to experiential learning and multi-disciplinary pedagogy. The art integration can be used to teach students at all levels of education. It is observed that AIL enhances the development of cognitive, socio-emotional, behavioral and psychomotor domains.

Art integrated learning (AIL)	Cognitive domain	critical thinking, problem- solving and creativity
	Socio- emotional domain	empathy, self- awareness and collaboration
	Behavioural domain	self- motivation, discipline and resilience
	Psychomotor domain	fine motor skills, coordination, and spatial awareness

As these are key competencies and crucial skills for students to navigate through life, they need to be integrated as part of a well-rounded education.

We, at Sohsheel Education Research Foundation (SERF), integrate art with core subject teaching with an aim to tap into students' prior knowledge and experiences, foster active hands-on learning, facilitate peer-to-peer learning, encourage reflection on learning processes, incorporate self and peer assessment and cultivate a supportive classroom environment.

In this article, we are presenting findings of one of our research projects i.e. "Mathematics meets Art: A powerful fusion that ignites interest and reveals the beauty in both". Under this project, Warli art was integrated with concepts of geometry, and it was observed that this can be further developed to leverage integration of art with academic concepts leading to better learning outcomes. A few examples of the positive outcomes of this fusion are listed below:

- Warli patterns and geometry intersect to enhance spatial reasoning
- Maths-infused art projects develop problem- solving skills
- Cultural storytelling through Warli art enriches character development
- Art- academic integration boosts critical thinking and creativity

**Highlights of the research (SERF 2021)**

At the end of Covid 2021, (the time when students were not in touch with regular classroom teaching and even without any teaching/learning environment at home for about two academic sessions), SERF started this research project to bring forward AIL in the teaching learning process.

Around 150 students from diverse socio-economic backgrounds across various education levels – primary, middle and high school were engaged for a period of eight months at three different centres (two children’s homes and one government school) in Panchkula, Haryana, to explore Warli painting (a traditional tribal art form originating from the North Sahyadri Range in Maharashtra, India) and to understand the connect of this art with mathematics. This ancient art form is simple and expressive visual art, characterized by basic geometric shapes. Its simplicity, versatility and suitability at all levels and with different age groups were the main rationales behind selecting this form of art for research.

The research work was conducted through different activities keeping in mind the level of learners:

- Primary level (student strength - 3 groups with ~ 20-25 in each group): Introduced fundamental concepts of dots, lines and shapes focusing on basic geometry
- Middle level (student strength - 3 groups with ~15-20 in each group): Explored types of triangles, circles and their dimensions building on foundational knowledge
- High school level (student strength -2 groups with ~ 10-15 in each group): Integrated advanced concepts including congruent triangles and their applications in architecture integrating mathematical concepts with artistic expression



Fig. 1 Students of Primary level, Middle level and High school level learning geometry with the help of Warli art form from fundamental concepts to advanced concepts.

In order to understand the impact of fusion process of Warli painting with mathematics on cognitive/ intellectual development of the learner, taxonomic analysis was carried out. Details of this analysis are indicated in **Table 1** below:

Thematic Unit	Art Element	Activities undertaken	Cognitive Factors
Fusion process of Warli painting with mathematics	Drawing	Painting Sketching Colouring	Planning Visual-spatial Verbal Reasoning Vocabulary Nonverbal Reasoning Quantitative

This analysis revealed that geometrical concepts can be woven into Warli art element and its activities, which in turn provides multiple ways through which an art can be integrated with core subject concepts and help in cognitive and conceptual development.

**Authentic Experiences**

Art-Integrated Learning (AIL) fosters authentic learning experiences at all levels which help learners to develop deeper understanding, creativity, critical thinking and problem- solving ability.

**At primary level:** During activities like placing a dot, connecting dots to form lines and creating different shapes, children freely associate their experiences with multiple senses - what they see, feel, think and hear. This

enables them to process information cognitively. AIL encourages students for multiple interpretations and then develops their visual learning skills.

**At middle level:** Students engage with various art forms such as drawing circles with different radii, exploring perimeter and circumference concepts and incorporate diverse triangles to depict male and female, trees, leaves, birds and musical instruments in Warli paintings.

**At high level:** Students explore fundamental elements of geometry including conceptual elements (e.g. point, line, plane and volume), visual elements (e.g. shape, size, colour and texture). The metamorphic power of art unveils significance of geometry in architecture as it enables transformation of conceptual forms into perceived realities. Geometric shapes such as congruent triangles, form strong bases that reinforce structures, distribute weight evenly without compromising proportions.

This principle is also evident in bridge construction, where triangles provide stability and resistance to loads. Circular architecture also offers benefits like extra structural strength and flexibility due to interconnecting points. It also symbolically represents cycles, rebirth, growth and perfection. Innovative applications of circular architecture can be seen in urban planning, creating resilient, resource-efficient cities and pushing technological boundaries to achieve complex, round buildings/ constructions.

Moreover, AIL’s adaptability to multiple perception modes makes it inclusive for children with diverse thinking styles and catering to their various learning needs. This approach fosters an integrative thinking process, combining emotions, perceptions and cognitive faculties to promote deeper insights and understanding of the core subjects. Various parameters were used to capture development of these aspects and the same are listed below against each aspect in **Table 2:**

**Table:2**

Aspect	Parameters
Integrative thinking process	Analysis - ability to identify pattern
	Contextual understanding - capacity to consider multiple perspectives
	Synthesis - capability to combine disparate elements
Combining emotions	Perspective-taking - ability to see things from another person’s point of view
	Emotional labelling - capacity to accurately label and categorize emotions
Perceptions	Attention - ability to focus on specific information
	Selection - capacity to prioritize given data
	Organisation - ability to categorize and structure information in a meaningful way
	Integration - capacity to assign meaning to information
Cognitive faculties	Focus -ability to concentrate
	Short term memory
	Long term memory

**AIL -The continuum between historical moments and modern times**



Fig. 2 Largest Warli Art Wall Painting in India at The Manik Public School, Manik Nagar, Karnataka

By integrating art into learning, students can traverse the bridge between past and present, enriching their understanding of historical events and contemporary culture. Above project facilitated the acquisition and retention of given below Warli painting knowledge among students of all levels.

Warli painting, a 10th-century folk art form, is a vibrant expression of the Warli tribe's deep connection with nature and farming. Originally created on clay huts using natural materials, including a white pigment made from rice flour and water, with gum as a binder, and a chewed bamboo stick as a paintbrush, applied to the red ochre background of the walls, these ritual paintings marked special occasions and conveyed the tribe's

respect for the environment. In the 1970s, Warli painting evolved from ritualistic to artistic expression, when Shri Jivya Soma Mashe and his son Shri Balu Mashe began creating art for artistic purposes, transitioning from walls to paper and canvas. Recent initiatives, such as the Coca-Cola campaign and a record-breaking large-scale Warli art wall painting at The Manik Public School in Karnataka designed by Shri Avanti Sandeep Kulkarni, have promoted Warli culture, leading to its recognition as a Geographical Indication under Intellectual Property Rights. This safeguarding ensures the preservation of Warli traditions, intellectual property, and cultural heritage.

### AIL and Social-Emotional Learning (SEL): A Powerful Partnership

During interactions with students while conducting research, it was observed that Art integrated teaching/ learning methodologies create a nurturing and supportive classroom environment. This helps in developing confidence, initiative, collaboration and appreciation for diversity among learners, which are basic social-emotional learning (SEL) skills. The key finding of merging these two pedagogies is that, it enhances the level of sensitivity, responsibility, self-reliance, design-thinking and industriousness in learners. The unique ability of artistic expressions in core subject, helps in developing positive social skills. The four major art forms i.e. music, visual arts, dance and theatre —have unique ways of engaging learners and developing many social-emotional skills. While each art form has its own characteristics, elements and mediums to express, they all share one common characteristic i.e. the ability to promote skills like self-expression, empathy, collaboration and resilience. As per Maslow's psychological theory, every learner has different need levels and the same is required to be kept in mind in order to achieve desired learning outcomes. Before entering any classroom and performing academically, students first require a foundation of physiological well-being and a sense of safety. Once in a classroom, students have the need to belong to the class and benefit from a feeling of self-worth. When these foundational needs are fulfilled, then only students can fully engage in their academics. AIL plays a vital role in creating a supportive and nurturing classroom environment that addresses these needs and results into a creative, social and emotional learning.

In the continuation of above findings, **SERF's research shows that economically disadvantaged students**



**thrive in student-led learning environments with AIL playing a pivotal role in improving their academic trajectories, contrary to conventional wisdom.** This conclusion

has been drawn based on observations and evaluation of two student groups (one group comprised of 35 public school students of grade 8 and the other group comprised of 40 students of grade 8 from a local Children Home). One activity (focusing on fusion of Warli art and mathematics) was conducted with both student groups. The results showed that the students from

Fig. 3 Student groups engaged in several activities involving Warli paintings

children's home demonstrated higher absorption of mathematical concepts, better comprehension and greater enthusiasm and eagerness to explore the integrated concepts. They maintained better focus and concentration throughout the activity and expressed their understanding more effectively through Warli art.

Furthermore, the assessment of the students also highlighted six areas, namely spatial reasoning, critical thinking and reasoning, problem solving, hands on learning, peer to peer learning, supportive classroom environment in which they displayed improvements as compared to before implementing AIL module (this finding is based on conduct of various activities like Warli painting, stone art, newspaper canvas, roleplay, natural leaves and flowers drying and using in art craft, clay modelling, wax candle making etc., under this module).

These findings and modes of experimentation / teaching are aligned with the aspects related to incorporation of art integration with different core subjects emphasized by New Education Policy (NEP-2020) India, implemented in 2022.

### **Setting the pace**

Developing and implementing various innovative teaching pedagogies like AIL, which align multi-disciplinary approach towards education, need to be further worked upon in order to create an impactful and enriching learning environment. In addition, educators need to emphasize those teaching practices that give better learning experiences and improve learning outcomes. SERF's research helps in identifying different modules/ activities that facilitate smooth and purposeful integration of AIL with core subject concepts. It also provides suggestive ways to teachers to explore, innovate and improve instructional practices, thereby resulting in a nurturing and supportive class room environment.

### **Conclusion**

Primary objective of this research has been - To attempt integration of arts with core subject matter and determine how this integration processes contribute to the holistic development of learners of various socio-economic backgrounds. The study revealed that art-infused instructions aligned with thematic objectives foster improved and enduring learning experiences, promote conceptual and intellectual development and enhance cognitive variables. It also supports hierarchical implementation of instructional objectives (a concept elucidated by Bloom's Taxonomy, to ensure a logical progression through different cognitive levels, ultimately leading to deeper understanding and application of knowledge)

Additionally, the positive reinforcement that our efforts / experiments are in the same direction as envisaged in NEP-2020 and in line with contemporary research work in education, emboldens us to continue our work and spread the impact to other learning centres.

### **Acknowledgement**

SERF team wishes to acknowledge with gratitude Bal Niketan, Bal Sadan and Ashiana Panchkula Haryana, India, where this research work / experiments were conducted

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## About the Authors

**Mrs Savita Makkar** (MSc, MPhil (Chem), Gold Medalist) has certification from Yale University US in Psychology and a certification from Stanford University, US in Child Nutrition. She is a certified yoga trainer from Morarji Desai National Institute of Yoga, New Delhi. She is an experienced and distinguished educator with 20 years of experience in the capacity of Principal and Head of Chemistry department of various educational institutes. Since last 5 years she is Management Trustee, Sohsheel Foundation (Education Research Foundation), Panchkula, Haryana, which works on innovating and implementing various pedagogy/ alternative learning Methods. She conducts workshops and counselling sessions for students to help them to plan, prepare their academic performance. She also holds teachers training programs with an aim to



share the findings of the research and positive impact of different modules/ activities designed and executed by Sohsheel Foundation. Mrs Savita Makkar is also Co- Founder of an equity and research investment firm called Makk Consulting. She is State President of Education Policy Council, Women's Indian Chamber of Commerce Industry (WICCI) Chandigarh, UT, Governing Body Member, ASHI Haryana (Association for Social Health in India), Member, IWSA (Indian Women Scientists Association) since last two years.

Email: [sohsheelfoundation@gmail.com](mailto:sohsheelfoundation@gmail.com)



**Cdr (Retd) Jeetinder Pal Singh** is a B.Tech (Mechanical), M.Tech in Nuclear Technology (36<sup>th</sup> batch of BARC Training School) and MBA in Finance & Marketing. He served Indian Navy for 20 years and was one of the key design members of Indian Navy's construction of its first Nuclear Submarine. After taking VRS from Indian Navy in 2007, he served as Director Marketing, Mahindra Consulting (an IT company for implementing SAP ERP), Vice President, Dantal Hydraulics and a strategy team member of Reliance Naval Engineering Ltd (erstwhile Pipavav Shipyard). He started Makk Consulting, Panchkula (an equity research & investment firm in 2011 and co-founded Sohsheel Foundation (an Education Research Foundation), Panchkula Haryana in 2014. He co-

manages affairs of the Foundation, carries out sessions/workshops, engagements with learners, undertake education research and continuously evolve various short term/ long term strategies to improve learning outcomes. Email: [jeetinder999@yahoo.com](mailto:jeetinder999@yahoo.com)

## Jamun (Java Plum)- *Syzygium cumini* – Flowers and Fruits



Photo by

**Dr. Manisha Karpe,**

IWSA member (Ruia College)

This super fruit is rich in antioxidants, anthocyanins, and vitamin C. It helps in control of blood sugar, insulin sensitivity, cholesterol etc.

## Women Achievers

- Dr. Sheela Donde

### Banu Mushtaq scripts history with winning the **International Booker award 2025!**

Indian writer, lawyer and activist, 77-year-old Banu Mushtaq became the first author writing in the Kannada language to win the International Booker prize for her short story anthology, **Heart Lamp**, which was translated from Kannada to English by **Deepa Bhashthi**, who will share the £50,000 prize. Bhashthi, became the first Indian translator to win an International Booker. Featuring 12 short stories written by Mushtaq between 1990 and 2023, **Heart Lamp** poignantly captures the hardships of Muslim women living in southern India.



*LITERARY PARTNERS: Banu Mushtaq (left) with translator Deepa Bhashthi*

Mushtaq grew up in a small town in the southern state of Karnataka in a Muslim neighbourhood, and studied the Quran in the

Urdu language at school, and was later enrolled in a convent school where the medium of instruction was Kannada, a language she worked very hard to

master. She began writing while still in school. Her early marital years were marked by conflict and strife, about which Mushtaq, continued to write with fierce honesty. "I have consistently challenged chauvinistic religious interpretations. These issues are central to my writing even now. Society has changed a lot, but the core issues remain the same. Even though the context evolves, the basic struggles of women and marginalised communities continue,"

Over the years Mushtaq's writings have won numerous prestigious local and national awards including the Karnataka Sahitya Academy Award and the Daana Chintamani Attimabbe Award. In 2024, the translated English compilation of Mushtaq's five short story collections published between 1990 and 2012 - **Haseena and Other Stories** - won the PEN Translation Prize.

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### Lt Cdr Dilna and Lt Cdr Roopa - Bravehearts Sailing to Make History Again!

We had featured Navy officers **Lt Cdr Dilna** and **Lt Cdr Roopa** in the first issue of our Newsletter in 2024 after a historic transoceanic expedition of nearly two months duration, which was the first time anyone from India accomplished such a feat. Now the duo undertook the extraordinary expedition of **circumnavigating the globe**. In a remarkable milestone for maritime exploration and scientific collaboration, completed the historic **Navika Sagar Parikrama II** on board **INSV Tarini**, showcasing the nation's growing prominence in global maritime activities and gender equality on the high seas! They sailed **47,500 km in 238 days**, braved high seas and unpredictable weather, crossing four continents, three oceans, and navigating past three major capes—Cape Leeuwin (Australia), Cape Horn (South America), and the Cape of Good Hope (South Africa). They faced several storms, two cyclones and the incessant cold



**Lt Cdr Dilna K and Lt Cdr Roopa A**

fronts of the Southern Ocean, and became the first Asians to hoist the Indian flag at **Point Nemo**, the “oceanic pole of inaccessibility” in the South Pacific, the most remote location on Earth, situated approximately 2,688 kilometers from the nearest landmass.

Hailing from Kozhikode, Kerala, **Lt. Commander Dilna** joined the Indian Navy in 2014 as a logistics officer. Her achievements span far beyond the sea. A national-level shooter, cricketer, and winner of the prestigious YAI's Admiral Ramdas Trophy, she is a woman of many talents, all grounded in discipline and a hunger for challenge. She's known for her calm under pressure and razor-sharp focus and those were the qualities that served her well in turbulent waters and wind-battered decks. **Lt. Commander Roopa Alagirisamy**, a native of Puducherry, whose journey began with a degree in aeronautical engineering and work at the National Aerospace Laboratories. The daughter of a retired Indian Air Force pilot, she joined the Navy in 2017 in the naval armament inspection cadre. Her natural curiosity and technical prowess, coupled with her love for adventure, made her a natural fit for sailing. Like Dilna, she too is a YAI Admiral Ramdas Trophy recipient and an ocean voyager with an indomitable spirit.

**NAVIKA SAGAR PARIKRAMA II:** Navika Sagar Parikrama was a grueling voyage requiring extreme skills, physical fitness and mental alertness, and INSV Tarini, making its way through the vastness of the ocean, symbolised the indomitable spirit of adventure and uncompromising resilience of the voyagers, promoting maritime excellence and women empowerment! By completing their circumnavigation from the same port where they began, the officers have met the strict international criteria for a full maritime circumnavigation.

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## First batch of 17 women cadets march into history– A remarkable milestone

Graduating from the Pune based National Defence Academy (NDA), Khadakwasla, on Friday, 30<sup>th</sup> May, 2025,



**Breaking Barriers: The First Female Cadets at NDA**

alongside 319 male counterparts, marking the culmination of its first co-ed batch - 148<sup>th</sup> Course – Spring Term 2025. The journey began in 2022 when, following a Supreme Court directive, the NDA opened its doors to women for the first time in its 75-year history. These trailblazing women, hailing from diverse backgrounds across India, underwent the same rigorous

training as their male peers, setting a precedent for future generations. In a historic shift, reflecting India's evolving military ethos, more women are now stepping into leadership roles—from flying fighter jets to sailing across oceans and leading platoons. This milestone marks a significant step towards gender inclusivity in India's armed forces.

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## Col. Sophia Qureshi and Wing Commander Vyomika Singh - Operation Sindoor



**Both Col. Sophia Qureshi and Wing Cdr. Vyomika Singh** became household celebrities all over India after their briefing of the details of Operation Sindoor to the media. **Col. Sophia Qureshi** is an icon for young Indians who encourage women to join the military. Her message is “Join the Army, work hard for India and make everyone proud”. She is an officer from the Indian Army Corps. of Signals and belongs to a family with a long military background. Her great grandmother joined Rani Lakshmi Bai in the Indian Freedom Struggle. Her grandfather served in the army too. Sophia is married to Col. Tajuddin Bagewadi of Mechanised Infantry Division. She was born in Vadodara and she completed her post graduation in Biochemistry from M. S. University of Baroda. She was on the verge of completing her Ph.D when she joined the army to serve the nation.

Col. Sophia started working with the UN Congo Peace Mission (2006) and played a pivotal role in peace keeping services there. In 2016, she became the first and only woman officer to lead an Indian Army contingent at the multinational military exercise - 'Force 18' and she was honoured with the Chief of Army Staff Plaque. Her father Tajuddin Qureshi also served in the army.



**Wing Commander Vyomika Singh's** most high-profile contribution came during **Operation Sindoor**, India's retaliatory strikes on terrorist infrastructure in Pakistan and Pakistan-occupied Kashmir (PoK) on May 7, 2025. Launched in response to the Pahalgam terror attack on April 22, 2025, which killed 25 Indian nationals and one Nepali citizen, the operation targeted nine terrorist camps linked to Jaish-e-Mohammed, Lashkar-e-Taiba, Hizbul Mujahideen. The strikes, destroyed 9 sites in locations such as Muridke, Kotli, Bahawalpur, and Muzaffarabad.

As a senior IAF officer, Vyomika played a **pivotal role in the aerial operations**, ensuring the mission's success with surgical precision. She co-led the media briefing in New Delhi alongside Colonel Sophia Qureshi and Foreign Secretary Vikram Misri, presenting operational details to national and international media. During the briefing, Vyomika emphasized that the targets were carefully selected to avoid civilian casualties and damage to infrastructure, stating, "Operation Sindoor was launched by the Indian Armed Forces to deliver justice to the victims of the Pahalgam terror attack and their families." Her composed delivery and technical expertise underscored India's commitment to combating terrorism while maintaining restraint.

Vyomika's role in *Operation Sindoor* not only highlighted her operational acumen but also cemented her status as a national figure, as an "accomplished pilot" and a symbol of women's empowerment.

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## Honors, Achievements and Invitations

### 1. IWSA's work was mentioned in Geo Magazine

The **French Journalist Guillaume Delacroix** visited IWSA on 25th June 2024. He has written a small paragraph about IWSA in his article on **"India - Female Students taking on Science"** – showcasing pioneers as role models, which was published in the Geo magazine, May 2025 issue. **GEO** is an educational monthly magazine, known for its detailed reporting and photos.

Mr. Guillaume Delacroix quoted Dr. Sunita Mahajan (84), (computer scientist and senior IWSA member) in his article, "Sorry, but women are more rational. Balancing home and work made us natural programmers", while discussing the Breaking Prejudices in India. Quoting Dr. Shyamala Bharadwaj, he described IWSA activities, especially science nurture and internship activities, how IWSA is finding grassroot solutions by mentoring young girls in their labs, something public schools can't provide due to overcrowding.



**SUNITA MAHAJAN**, INFORMATICIENNE, 84 ANS, MEMBRE DE L'ASSOCIATION INDIENNE DES FEMMES SCIENTIFIQUES (MUMBAI).

presque la moitié des effectifs (%) dans les filières scientifiques baccalauréat, jusqu'à la licence; 34 % aux Etats-Unis et 22 % en ce, selon la Banque mondiale. Les es, Indiennes sont même majorités dans les facultés de biologie et chimie. Elles restent minoritaires

**❗ Désolée, mais les femmes sont plus rationnelles. À force de jongler entre la maison et le travail, nous sommes naturellement devenues des programmeuses ❗**



Guillaume Delacroix with IWSA scientists at IWSA HQ, Vashi

#### Principal frein aux carrières : le mariage

À Vashi, un faubourg propre de Mumbai, de brillantes scientifiques retraitées tentent de résoudre ce problème en incitant les filles à imiter leurs parcours. Sous la présidence de Shyamala Bharadwaj, ancienne chimiste, l'Association indienne des femmes scientifiques reçoit en stage des milliers d'entre elles afin de les initier aux expériences en laboratoire, ce que l'école publique n'a pas les moyens d'organiser, les classes étant surchargées. Ces sommités accueillent aussi des jeunes femmes ayant

interrompu leurs études pour se marier. Pour les remettre en selle, elles leur proposent des bilans de compétence et les aident à réintégrer un cycle universitaire.

2. **Dr. Mangala Ghorpade**, member, HQ, was invited to deliver a lecture on “women health and hygiene” at Rajeev Gandhi college on 18<sup>th</sup> August 2025.



3. **Book Launch:** A book titled **Berry Whispers: Tracking the Himalayas**



**and the Western Ghats** coauthored by **Dr. Dhanashree Patil**, Member, IWSA Kolhapur branch and **Dr. Jyoti Marwah**, Member, HQ, along with **Dr. A. Rajalakshmi** was launched on 5<sup>th</sup> August 2025 at Vaze College Auditorium, Mumbai. This book is a compilation of 47 berries with their phytochemicals and importance with respect to

health benefits as superfood, prebiotics and probiotics. The launch was done by Dr. A. D. Sawant, President, National Society of Friends of Trees, Ex pro-VC, University of Mumbai and was attended by about 150 people.

## Trailblazers:

### 1. Rukmani 'Mrs Fingerprints' Krishnamurthy

- Dr. Sheela Donde

At 74, the sari-clad forensic scientist, with a red bindi and silver hair, **Dr. Rukmani Krishnamurthy**, is busy learning new skills to help the police resolve complex crime investigations. Born as the sixth child to a PWD official-homemaker couple in Nagpur, Krishnamurthy is India's first female forensic scientist. After completing her MSc in Analytical Chemistry, she had three options: to take up a lecturer post in a government institute, to take up a clerk job at the RBI, or to take up the appointment as a scientist at FSL. She chose the last option and moved to Mumbai in 1974. She did her Ph.D. in Analytical Chemistry later (Chromatographic Analysis of Narcotic Drugs) from Mumbai University in 1997, post that did her MBA (HR). She got a united National Fellowship for studies in Narcotic Drugs in Biological fluids,



One of her earliest cases—in which a man poured kerosene on his wife and lit her—she lost sleep for two weeks. She overcame her faintheartedness, and soon matured to solve several high-profile, brutal and urgent cases, including the Joshi-Abhyankar serial murders in the late 1970s, The Neeraj Grover murder case, the Mumbai blasts of 1993 and the Matunga train fire in 1976 that eventually led to the ban on flammable material like kerosene and petrol on public transport.

In the early 2000s, as director of the Directorate of Forensic Science Laboratories, Maharashtra, she established six world-class laboratories in the state, offering services such as DNA analysis, cyber forensics, speech identification, lie detection, narco-analysis, and brain signature profiling. She has visited several countries, including the FBI facilities in the US, won over 10 National and International awards, and soon rose to become the Director General at the national level. Dr. Krishnamurthy is a life member of IWSA and had delivered talks for IWSA.

Krishnamurthy's life will soon be made into a biopic. Actor-producer Harman Baweja has already bought the rights to her story. But for a person who has revolutionized crime labs with DNA and Cyber tools, who has stood her ground and rewritten the rules, who made it her mission to link science with justice, does not need a biopic to be remembered!

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## Trailblazers: 2. Dorothy Crowfoot Hodgkin – The Woman Who Saw the Invisible

- Dr. Seema Das

For most of her life, Dorothy Crowfoot Hodgkin pursued one extraordinary goal: to make the invisible visible.



Using X-ray crystallography—a technique so indirect it resembled reading the shadows of atoms—she revealed the shapes of the molecules that keep us alive. Although her work transformed modern medicine, many people still do not know her name.

Hodgkin's fascination began in childhood. Growing up in Egypt, Sudan, and England, she wandered through archaeological sites with her parents but fell in love instead with minerals and crystals. She and her sister collected pebbles from streams and examined them using a small mineral-analysis kit. When she was fifteen, her mother gave her Sir William Henry Bragg's *Concerning the Nature of Things*, which explained that X-rays could be used to "see" atoms. The idea immediately captured her imagination.

At Somerville College, Oxford, she studied chemistry and chose to work on X-ray crystallography, crystallizing tiny samples, shining X-rays through them, and interpreting the faint diffraction patterns they produced. It was like trying to determine the shape of a cathedral from the shadows it cast. There were no computers, so she calculated everything by hand. Many scientists believed the technique was too complex to decode large biological molecules. Dorothy made it her life's mission.

Her path was not easy. As a woman in the 1930s, she was barred from certain laboratories and dismissed by male colleagues who doubted women's scientific abilities. In her early twenties she developed severe rheumatoid arthritis—her hands twisted painfully, and even simple movements became difficult. Yet she refused to abandon her research, teaching herself to handle delicate crystals despite constant pain.

In 1937 she earned her PhD at Cambridge under J. D. Bernal, a pioneer of molecular biology, and returned to Oxford, where she remained for the rest of her career. In 1945, after years of meticulous work, she solved the structure of **penicillin**. Although the drug was already saving lives during World War II, chemists had not understood its molecular form, making mass production difficult. Many doubted her results—until they were proven correct. Her work enabled large-scale manufacturing of penicillin, transforming global medicine.

Next, she tackled **vitamin B12**, a molecule far more complex than anything previously studied. In 1956 she solved its structure, revolutionizing the treatment of pernicious anemia and proving that crystallography could handle even the most intricate biological molecules. This achievement was central to her receiving the **1964 Nobel Prize in Chemistry "for her determinations by X-ray techniques of the structures of important biochemical substances"**, making her the only British woman ever awarded the prize.

Yet her most ambitious challenge was **insulin**. Diabetes was killing millions, and understanding insulin's structure was essential for developing better treatments. Hodgkin began this work in 1934. It took **thirty-five years**. Insulin resisted crystallization; experiments repeatedly failed; her arthritis worsened. But she would not give up. In 1969 she finally mapped the full three-dimensional structure of insulin, a discovery that laid the foundation for modern synthetic insulin and changed the lives of diabetics worldwide.



Beyond the laboratory, Hodgkin was a humanitarian. She advocated for nuclear disarmament, promoted scientific cooperation across political borders, and chaired the international Pugwash movement. Her students remembered her not for the Nobel Prize but for her kindness, humility, and generosity.

Hodgkin was one of the five 'Women of Achievement' selected for a set of British commemorative stamps issued in August 1996, where part of the structure of Vitamin B12 appears along with her portrait.

Dorothy Crowfoot Hodgkin died in 1994, leaving behind more than scientific achievements—she left a model of perseverance, brilliance, and compassion. Millions of lives have been saved because she refused to stop exploring molecules no one else could see.

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## Unsung Heroines: T. K. Radha From Kerala to Princeton, The Woman Who Worked with Oppenheimer – The Father of the Atomic Bomb - Dr. Susan Eapen

**Thayyoor K. Radha** (often written T.K. Radha or Thayyoor Radha) is a little-known but remarkable Indian physicist whose career briefly intersected with some of the 20th century's most famous scientific giants, including Oppenheimer, the Father of the Atomic Bomb.



T. K. Radha at Graduation

Born in Kerala in 1938, Radha grew up in a rural setting in Trissur, where basic amenities were scarce. Despite this, she excelled academically, studied physics at Presidency College (Madras), went on to earn a PhD in theoretical physics and published 14 papers in particle physics and quantum theory. By the mid-1960s, she had published work on Feynman propagators and particle interactions and had gained visibility through collaborations and presentations that brought her to the attention of leading international scholars.

The high point of her early international recognition came in 1965, when J. Robert Oppenheimer — then director of the Institute for Advanced Study (IAS) in Princeton — invited her to spend the 1965–66 academic year at the Institute's School of Mathematics/Natural Sciences. This appointment made Radha one of the Institute's earliest women of colour and placed her in direct intellectual proximity to a gathering of world-class theorists.

When Radha met Oppenheimer, she was struck by his knowledge of the Bhagwat Gita. She was excited to walk on the same campus as Einstein.

Like many women scientists of her generation, Radha’s public scientific profile dimmed after marriage and migration to Canada, since she could not continue in the same field. She married Vembu Gourishankar and is later recorded under the surname Radha Gourishankar. She shifted her field of work to computer science and programming alongside community engagement and mentoring. Family recollections and archival outreach



T.K. Radha at a summer school in Trieste, Italy, with Julian Schwinger and Abdus Salam. (circa 1960s)

decades later brought renewed attention to her scientific contributions and the broader question of women erased from popular histories of science.

In recent years, Radha’s story has resurfaced in Indian and international media and blogs as historians and archivists at institutions like the IAS have begun re-examining their own archival silences. These modern profiles emphasise lifetime of rigorous scientific work carried out under difficult social constraints — and the way institutional recordkeeping and social expectation combined to obscure many women’s scientific legacies.

Radha’s life is a reminder that the history of science is still incomplete: prestige and influence have often been distributed along gendered and geographic lines, and many capable scientists— particularly women— remain under-celebrated. Radha’s story is of resilience and triumph, an early Indian woman pioneer’s willingness and ability to rise above life’s obstacles and break through glass ceilings.

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## The fascinating world of Mushrooms - Colorful, tiny and delicate



Top left: *Microporus*  
 Top right: *Termitomyces*  
 Below: *Coprinellus*

Photos by **Dr. Sushma Lehri**,  
 Identification by **Dr. Sasirekha Iyer**,  
 IWSA members

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Please send your valuable feedbacks and contributions to  
[iwsa.newsletter2123@gmail.com](mailto:iwsa.newsletter2123@gmail.com)

**Our address**

**IWSA Head Office**  
Plot No.20, Sector 10A  
Dr Mar Theophilus Road, Vashi  
Navi Mumbai: 400703  
**Tel: 8657865475**  
Email: [iwsahq@gmail.com](mailto:iwsahq@gmail.com)  
Website: [www.iwsa.net](http://www.iwsa.net)

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