IWSA NEWSLETTER

The Official Publication of the Indian Women Scientists' Association

Volume 51 | Issue No. 1 | ISSN 0972-6195 | January - April 2024

Inauguration of Science Day, 9-02-2024

IWSA scholarship Awardees, 27-01-2024

BRNS Popular Science Talks, Somaiyya College, 28-2-2024 and VIVA College, Virar, 09-03-2024

Cancer camp on 23-04-2024, IWSA Members with CPAA Medical Team & Coordinators, AARAMBH Team, Lions Club representatives

Rainbow- The learning festival on 22-03-2024 Puppet Show

BRANCHES

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

BRNS TALKS IN COLLEGES

Khalsa College, Mumbai on 3-2-2024

Sarada Kurup College, Mumbai on 2-3-2024

St. Xaviers College, Mumbai 24-01-2024

Sophia College, Mumbai 13-2-2024

BRNS TALKS IN SCHOOLS

Dutta Meghe School, Airoli on 22-02-2024

Adarsh School, Dombivil on 28-02-2024

Gifting books on Indian Scientists, published by DAE, to schools- Greenfield School, Diva

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From the Editor's Desk

Dear Readers,

Warm Greetings from IWSA! We are back again with our January to April Issue of the News Letter 2024, getting you glimpses of the happenings at IWSA Headquarters and our Branches!

In this quarter, the 'Science Awareness wing at our Headquarters was very active in organizing offline BRNS sponsored Popular Science Lectures for Colleges (10), for Schools (5), and 5 online Lectures for our SAOL (Science and our Lives) series, which are open to the public. We also conducted an intensive Internship Program for 5 MSc Part I Biotechnology students of Vaze College, at IWSA, on "Sustainable Practices in Compost Preparation and Plant Studies".

Our annual event of Science Day, was celebrated at the IWSA campus, with the theme this year being "Natural and Man-made Disasters: their scientific reasons and Emerging Technologies for Disaster Management". The campus was abuzz with activity with exhibits from DAE, BRIT, RAF on display, and student created models, charts and apps showcased for winning awards. Keeping in mind the importance of drones in Disaster Management, we held a Drone Making Workship for school students at IWSA.

The annual IWSA scholarship award function was held in January, with several merit-cum-means meritorious students from UG to PhD, and ECCE categories, receiving scholarships.

Our 'Community Programs' in this quarter were also not far behind. Our Nursery, ECCE, Computer center, Library, Health Care center actively organized and participated in several events. A visit to ACTREC, Kharghar, was organized for IWSA members, staff and their family members. It is heartening to note that ten out of our eleven IWSA branches, held science outreach activities in this quarter.

I am sure you will find the two articles in this issue, one on 'Work Ergonomics', and the other on 'Gaganyaan', both interesting and enlightening! Do read and enjoy!

I feel proud to say that our own IWSA member, Dr. Susan Eapen, Ex President and Trustee of IWSA was selected as part of a 15-member delegation of women to UN, for participating in the 68th session of the Commission on the Status of Women organized by UN Women in March 2024 in New York. Keep it up Dr Susan, and keep it up IWSA!

Another IWSA achievement was our publication "Millets for Children-Rhymes, Recipes and Resources for all ages" was awarded the Enlit Book Award 2024.

We close this issue with recognition of unsung heroines, women achievers, and an obituary to two of our distinguished IWSA members, Dr Bimla Buti, a pioneer in Plasma Physics, and Dr Rohini Iyer, a passionate agriculturalist, who brought technology to the grass root level farmers for their upliftment. May their souls rest in peace, and may their work inspire the next generation!

Sheela Donde (drdonde@gmail.com)

Contents

President's Message

Dear IWSA Members,

After the year-long celebration of IWSA's Golden Jubilee during 2023, the new year 2024 started with new vigour for IWSA members to take forward the activities of IWSA to greater heights. This is reflected in the novel topics of lectures for Colleges, Schools and "Science and Our Life" series. The theme for the Science Day Exhibition also focussed on Emerging Technologies for Disaster Management. It was heartening to see the interactions between the Early Childhood Care and Education Diploma students and Science Nurture teachers for the mutual benefit of both the teams. Another vibrant program, Rainbow - The Learning Festival was successfully conducted during this quarter, which was an enriching experience for children, parents and educators alike. The Eye camp and Cancer Detection Camp programs emphasize our commitments towards health care for the society. Presence of Ms. Shobha Murthy of Aarambh whose goal is to provide educational, health and vocational skills to underprivileged children and women was highly motivating for all IWSA members during the International Women's Day Celebrations at IWSA.

Activities organised by IWSA's library, health centre, computer centre, Early Childhood Education programs (ECCE) are all oriented towards various educational and community welfare. All the branches of IWSA have their own unique activities through which they reach out to society, through lectures on health-related topics, women's safety, basic scientific concepts and interacting with Zilla Parishad School students etc. Through this Newsletter we bring interesting articles on various subjects; in this issue, the article on "Gaganyaan" is written in an interactive story telling method. Several IWSA members participated in the 68th session on Status of Women (CSW – 68) held at the UN Headquarters at New York from March 11 – 22, 2024. It was a proud moment for IWSA when our former President and former Trustee, Dr. Susan Eapen was invited by UN Women to speak about STEM education for girls in India at this session. Indeed, there is growing international recognition for IWSA and its members. We aim to reach greater heights as we step into the 51 st year after celebrating the Golden Jubilee last year.

Shyamala Bharadwaj
shyamala.bharadwaj@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 speaker.

1 . Date: **19th January 2024**
Topic: **Seaweed-Associated Heterotrophic bacteria as novel sources of Pharmacological agents**
Speaker: **Dr. Sumayya Ashraff**, Dept. of Environmental Science, Mahatma Gandhi University, Kottayam
Venue: **Post graduate and Research Dept. of Botany, Catholicate College, Pathanamathitta, Kerala**

Abstract: The wide diversity seaweed associated heterotrophic bacteria represents an excellent source of bioactive compounds with potential biotechnological and pharmaceutical applications. This study developed a culture-dependent method for isolating and characterizing seaweed-associated heterotrophic bacteria belonging to the phylum Firmicutes, as a source of potential antimicrobial agents, and their perspective pharmacological properties. Further, the research was focused on bioactivity-guided isolation and spectroscopic characterization of polyketide compounds from seaweed-associated *Bacillus velezensis* with anti-infective activities against multidrug-resistant pathogens. The study evaluated the pharmacological property of the organic extract of heterotrophic bacteria through various in-vitro assays. The organic extract of *B. altitudinis* MTCC13046 displayed significantly greater radical quenching ability other than attenuating hydroxy methyl glutaryl coenzyme A reductase and angiotensin-converting enzyme-1 relative to other studied heterotrophs. The organic extract of *B. tequilensis* MTCC13043 displayed significantly greater attenuation potential against pro-inflammatory 5-lipooxygenase and dipeptidyl peptidase-4. Seaweed-associated *B. altitudinis* MTCC13046 was screened for its capacity to diminish the cell proliferation of the human hepatocellular adenocarcinoma (HepG2) cell line without upsetting the normal cells. The bacterial extract showed the anticancer property in a dose-reactive form against HepG2 (IC50, half maximal inhibitory concentration – 29.5µg/mL) on tetrazolium bromide analysis with less significant cytotoxicity on common fibroblast (HDF) cells (IC50-77 µg/mL). The apoptosis assay results showed that the crude extracts of *B. altitudinis* maintained 68% viability in normal cells compared to 11% in the cancer cells (IC50 76.9µg/mL). Marine macro alga act as potential host organisms for symbiotic existence for associated heterotrophic bacteria, which could be the promising sources of novel antimicrobial metabolites.

Outreach:80

2. Date: **24th January 2024**
Topic: **Cancer and Clinical Genetics**

Speaker: **Dr. Pratibha Amre,** Lab Director and Chief, Cancer and Clinical Genetics, Lilac Insights Pvt. Ltd.
Venue: **Caius Research Laboratory, St. Xavier's College, Mumbai**

Abstract:

- Genetic studies of cancer have been valuable in diagnosis, prognosis and disease management. They have also provided insight into underlying mechanisms and development of targeted therapy. COSMIC, CGC database has revealed involvement of oncogenes (90%), tumor suppressor genes (90%), transcription factors (72%), kinases (62%), receptors (60%), and the phosphatases (20%).
- Predictive genetic markers with relevance to targeted therapies are BCR-ABL tyrosine kinase, a fusion gene: t(9;22) in chronic myeloid leukemia, acute leukemia which shows significant response to targeted therapy Imatinib ; KRAS mutations in colorectal cancer (Sotorasib), mutations in ALK,EGFR, KRAS in lung cancer (Gefitinib, Cetuximab), ERBB2 amplification in breast cancer (Transzumab). Genetic markers testing is based upon cytogenetic and molecular profile of each cancer. Specific chromosome aberrations are uniquely associated with various leukemias, lymphomas, less frequently in solid tumors. Alterations like reciprocal translocations, insertions and deletions are the most frequent abnormalities, playing a critical role in cell cycle regulation and differentiation.
- Conventional or metaphase cytogenetics is standard method to identify changes at chromosome level. Molecular cytogenetic techniques such as fluorescence in situ hybridization (FISH), spectral karyotyping (SKY), comparative genomic hybridization (CGH) are useful tools for identification of chromosomal changes as well as changes at gene level e.g. gene fusions, allelic loss of gene; gene amplification etc and are used in the diagnosis and disease management. Molecular techniques like qualitative and quantitative PCR are also useful for detection of gene fusion, amplification and minimal residual disease.
- Sanger sequencing techniques are used to detect somatic gene sequence variants like base substitution, deletion, insertion and amplification in cancer genes. Recently, next-generation sequencing technologies have been used to detect multiple driver somatic and germline mutations in various cancers which have significant applications in personalized medicine.
- In conclusion, genetic studies of cancer have been valuable in diagnosis and prognosis and provided insights into understanding the mechanisms of malignant transformation. The additional genetic mechanisms underlying malignancy are yet to be discovered. Identifying and understanding of these mechanisms will increase the diagnostic armamentarium and allow better patient stratification for therapeutic purposes.

Outreach:70

3. Date: **3rd Feb., 2024**
Topic: **How can we control the spread of Malaria?**
Speaker: **Dr. Shobhona Sharma,** INSA Honorary Scientist, Institute of Chemical Technology, Mumbai, Former Senior Professor and Chairperson, Department of Biological Sciences, TIFR, Mumbai.
Venue: **Department of Microbiology,** Shiromani Gurdwara Parbandhak Committee's **Guru Nanak Khalsa College of Arts, Science & Commerce (Autonomous),** Nathalal Parekh Marg, Matunga, Mumbai

Abstract: Malaria remains a major scourge throughout the tropical world. Despite nearly 140 years of identification of *Plasmodium* species as the causative agent for malaria, this disease is still not quite under control. There are three major ways to control malaria: a) eradicate mosquitoes; b) diagnose and treat the disease and c) generate an effective vaccine. The mosquito menace continues to spiral and therefore eradication of mosquitoes would control malaria as well as several other diseases. Diagnosis and usage of antimalarial drugs has been an effective means of controlling the disease. Many antimalarials have been developed

against malaria, but the inevitable ability of the parasites to develop resistance to these drugs has caused major problems. We do not as yet have an effective malaria vaccine. Our relationship with parasites has been along one on the evolutionary scale, and the methods adopted by parasites to thrive and colonize our bodies are truly fascinating. While we fight the parasites using our immuneresponses, the parasites use our immuneresponses towards quorum sensing, limiting their own numbers, but surviving. In this talk the current efforts towards each of the set three aspects towards control of malaria were discussed.

Outreach: 95

4. Date: **13th Feb., 2024**
Topic: **Towards Sustainable "Green Heat" Generation with Nanostructured Porous Carbons**
Speaker: **Dr. Chandramouli Subramaniam,** Professor, Department of Chemistry, IIT Bombay, Powai, Mumbai
Venue: **Dept. of Chemistry, Sophia College,** Mumbai

Abstract: Heat forms the single largest end-use of energy, accounting for ~45% of global carbon dioxide emissions. Production of environmentally benign 'green-heat' is imperative for sustainable development, realizing carbon-neutrality and thereby simultaneously addressing several targets under the United Nation's Sustainable Developmental Goals (UN-SDG). Conversion of abundantly available solar energy to heat forms an important pathway to achieve this. However, this is severely limited by the choice of materials and their technological adaptability. In this context, this lecture will showcase nanostructured carbon florets1-8 (NCF) as unique material exhibiting exceptionally high efficiency (~90%) towards conversion of solar energy to thermal energy. Robust coating of NCF on arbitrary substrates ranging from polymer to metals, transforms the dormant substrates into functional ones that can convert solar energy to thermal energy. Such conversion of light energy to heat results in increase in the surface temperature of any NCF-coated surface by up to 160 ^{o}C, that can be further extended beyond 350oC using concentrated solar power. Translation of such properties into practical applications has been achieved over a wide range of domains such as (a) Water-heating for producing outlet temperature up to 85^{o}C with an output capacity of 75 l/day, (b) contact-less, low-power and rapid bacterial decontamination of water capable of handling bacterial concentration of 106 CFU/ml, and (c) room/space-heating, where temperature differential of ~80^{o}C can be produced. All these performances have been realized for over 30 days of continuous operation with solar-energy, implying almost-zero carbon foot-print and is therefore expected to drive a paradigm shift in sustainable development and moving towards a positive food-water-energy nexus.

Outreach: 62

5. Date: **28th Feb., 2024**
Topic: **Brain- the Master Puppeteer**
Speaker: **Dr. Niveditha T.,** Assistant Professor, Department of Biosciences and Bioengineering, IIT, Bombay, Mumbai
Venue: **Life Sciences Dept., Sophia College,** Mumbai

Abstract: Movement is a key function of our brain. Movements can be categorized as voluntary (those that are in our control, like walking) or involuntary (those that are not under our direct control, like breathing). The ability for voluntary control of action (and thought) is integral to our existence. Our brain is not only responsible for producing these movements,

but also for generating the sense of 'voluntariness'. The feeling that one had the intention to move and that the actions were self-initiated imparts a sense of voluntariness and a feeling of being in control. The talk provided an overview of how we generate voluntary movements and delve deeper into how we perceive the sense of control over our movements. What happens when the sense of control is lost was also discussed and the talk was concluded with a summary of the latest research findings in this field.

Outreach**: 102**

6. Date: **29th Feb., 2024**
Topic: **Raman Spectroscopy & its applications**
Speaker: **Dr. Rekha Rao,** Scientific Officer H, Solid State Physics Division, BARC, Professor at Homi Bhabha National Institute, Mumbai
Venue: **Department of Physics, K. J. Somaiya College of Science and Commerce** (Empowered Autonomous)**,** Vidyanagar, Vidya Vihar East, Ghatkopar East, Mumbai

Abstract: Raman spectroscopy is a popular technique with applications in many fields. The present talk introduced basic principles of Raman spectroscopy, starting with a historic background, describing classical theory to explain the properties of Raman scattered radiation. This was followed by essence of semi-classical theory, description of the instrumentation required and some typical spectra. A glimpse of wide range of applications of Raman spectroscopy in various fields from materials science to medical/ biological sciences was provided.

Outreach: 104

7. Date: **2nd Mar., 2024**
Topic: **The Importance of Communication in Science Education**
Speaker: **Dr. Lalitha Dhareshwar,** Former Raja Ramanna Fellow, BARC, Former Head, Laser & Neutron Physics Div, BARC Member, Board of Trustees, IWSA
Venue: **Tilak Education Society's Sarada Kurup College of Education, Ghansoli**

Abstract: Communication assumes paramount importance in science education. Indian Women Scientists' Association (IWSA) is engaged in imparting a scientific temper in the society by taking science to the masses; by encouraging the right approach to science education at all levels- from pre-primary to research level, where beneficiaries are school students, college students, parents, teachers and faculty and community at large. NEP 2020 highly advocates an enquiry-based, holistic learning. In particular, it is observed that in science education, experiential hands-on learning is of great importance at all levels. Science education includes lecture based, project based, peer-led team learning and many more novel methods which were discussed. Some of the practical case studies on science education conducted at IWSA were presented. It is proved that a joyful, compassionate, exploratory and enquiry-based learning environment is extremely essential to enhance the scientific knowledge and skills.

Outreach:75

8. Date: **6th Mar., 2024**
Topic: **The Journey & Landscape of Diagnostic Pathology: An Oncopathology perspective**

Speaker: **Dr. Poonam B. Gera,** Officer in Charge of Cancer Genetics and Genomics Lab & Biorepository, ACTREC, Tata Memorial Centre, Kharghar, Navi Mumbai
Venue: **S.I.W.S., N.R. SWAMY COLLEGE OF COMMERCE & ECONOMICS AND SMT. THIRUMALAI COLLEGE OF SCIENCE (AUTONOMOUS)**

Abstract: Diagnostic pathology is a very dynamic field. It has grown tremendously from the use of a simple microscope to that of complex robotic microscopes with artificial intelligence attempting to replace the involvement of humans. The field of microscopy has become colorful with advent of many molecular techniques like IHC, FISH etc. In this era of Precision medicine, various molecular technologies are being used to simplify the choices of treatment from ONE FITS ALL to those that can be customized to individuals. Amplification and sequencing technologies have evolved from real time PCR, digital PCR and Sanger sequencing. In the last decade they have taken-off to fly high with Personalized Genomics. Thus, from being a paramedical supplementary branch, Pathology has become an integral, important, and irreplaceable part of patient care. Pathologists no more just peep ONLY into the microscope but have Big Windows to see through. This lecture was a walk through this landscape of changes which provided a glimpse of various aspects of diagnostic pathology. While moving along these changes, emphasis was on Cancer diagnostics as cancer incidence is on a rising curve. It was apparent that advances in Oncopathology are at par with other fields of medicine.

Outreach**: 80**

9. Date: **9th Mar., 2024**
Topic: **Applications of Nuclear Radiations**
Speaker: **Dr. Yojana Singh**, Retd. Senior Manager, Market Research & Publicity (MR&P) Board of Radiation and Isotope Technology (BRIT), DAE.
Venue: **Department of Biotechnology, Research Cell & IQAC, Vishnu Waman Thakur Charitable Trust's, Bhaskar Waman Thakur College of Science, Yashvant Keshav Patil College of Commerce, Vidhya Dayanand Patil College of Arts, (VIVA College**) Viva College Rd, Vartak Ward, Virar West, Virar, Mumbai

Abstract: A historical pledge to use "atoms for peace" was taken after the landmark and maiden speech of 34th US president Dwight David Eisenhower in 1st UN assembly meet in 1953. Dr. Homi J Bhabha was made the president of the 1st UN Congress on "atoms for peace" that was held in Vienna, Austria in 1955.

Dr. Bhabha, realizing the importance of nuclear power, put the words into action and made first research reactor in Asia called "Apsara" on 3rd August, 1956 and the rest is history.

Unfortunately, misuse of nuclear energy by bombing in Hiroshima & Nagasaki, is still imprinted in peoples' minds. The word "Radiation" brings out only destruction reaction but as said "atoms for Peace" scientists and engineers brought out a revolution in the field of using radiation in different spheres of life.

Today radioisotopes and its radiations are used in the field of health care, agriculture, industry and research. In healthcare, progress was made in leaps and bounds. Use of radiation in healthcare has improved the diagnosis and therapy (Treatment) in field of cancer, studying the functions of human organs etc. This has helped to diagnose on time, accurately and with speed, resulting in patients getting treatment on time. This has saved thousands of lives and also improved the quality of life.

The lecture highlighted how radiations are used in the field of healthcare and covered the use of radiation in other fields too.

Outreach: 120

10. Date: **12th Mar., 2024**
Topic: **Laser- the wonder ray (Solution looking out for a problem)**
Speaker: **Dr. Lalitha Dhareshwar**, Former Raja Ramanna Fellow, BARC, Former Head, Laser & Neutron Physics Div, BARC Member, Board of Trustees, IWSA
Venue: **Department of Physics, Research Cell & IQAC Vishnu Waman Thakur Charitable Trust's, Bhaskar Waman Thakur College of Science, Yashvant Keshav Patil College of Commerce, Vidhya Dayanand Patil College of Arts, (VIVA College)** Viva College Rd, Vartak Ward, Virar West, Virar, Maharastra

Abstract: Einstein's insights into the interaction between light and matter, discovered more than 100 years ago led to the invention of the "Wonder ray of the century"- The LASER. Laser plays a wide variety of roles in research, industry and daily life. They are extensively used in spectroscopy, holography, manufacturing and the medical field as surgical scalpels, fibre optic communication to checkout scanners in markets. They have, thus, become a part of everyday life.

The first Nobel prize was awarded to the scientists in 1964, for the discovery of lasers followed by the second Nobel Prize in 2018, which was awarded for generation of ultra- short light pulses (10^{-15} sec). In 2023, the third Nobel prize was awarded for Generation of Attosecond (10^{-18} sec) laser pulses and using them to study electron dynamics in matter. In this talk, the basic principles of lasers were discussed. This was followed by a discussion on one of the most interesting application, generation of fusion plasmas in one of the most advanced laboratories using the most powerful laser in the world.

Outreach: 97

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. Date**: 17th February, 2024**
Topic: **Mysterious Magnetism**
Speaker: **Ms. Dhanya T C**, Senior Software Engineer, TIAA GBS Ltd., Mumbai
Venue: **VDS Public School**, Turbhe

Abstract: "It is unbelievable that people are living on the Earth and not understanding why the compass needle points North," says Emmanuel Dormy.

People have been using compasses to find their way around for over 2000 years, but we still don't know where the Earth's magnetic field comes from and how exactly it behaves. Man has been curious about magnetism since ages. Though many of its aspects are still a mystery, the practical applications of magnetism in our daily life are numerous. This talk dived deep into

the wonderful world of magnetism and explained why magnetism; the phenomenon of earth's magnetism and applications of magnetism.

Number of attendees: 52

2. Date**: 22nd February, 2024**
Topic: **Guardians of the Digital Realm: Nurturing Cyber-security Awareness in Schools**
Speaker: **Dr. Seema Purohit,** Professor Emeritus, B. K. Birla College, Mumbai.
Venue: **Dutta Meghe World School, Airoli**

Abstract: In an era where technology permeates every aspect of our lives, it is imperative to equip the younger generation with the knowledge and skills necessary to navigate the digital landscape securely. This cyber-security talk for schools was aimed to empower students with a fundamental understanding of cyber threats, emphasizing the importance of responsible online behavior and digital hygiene.

Number of attendees: 155

3. Date**: 28th February, 2024**
Topic: **The Raman Effect: Impact on Science and Technologies**
Speaker: **Dr. C. Murali Krishna,** Professor, Translational Research Principal Investigator and Scientific Officer G, Chilakapati Laboratory, Advanced Center for Treatment, Research & Education in Cancer (ACTREC), Tata Memorial Center (TMC), Kharghar, Navi Mumbai
Venue: **Adarsh English School, & GSB Mandal's S.A. Pai Memorial School Dombivli**

Abstract: The discovery of Raman effect in the year 1928 demonstrated that the analysis of inelastically scattered light from the simplest molecule H2O could provide unique fingerprint of molecular structure. In the last couple of decades, popularity and versatility of Raman scattering spectroscopy have increased in many ways and a diverse family of Raman -based techniques has been developed. More and more sensitive experimental approaches continue to be developed to explore the molecular mechanisms of complex biological phenomena. Latest developments in light sources (lasers) and detectors (CCDs), have made Raman spectroscopy of even weakly scattering samples feasible.

This talk dwelled on the life and times of Sir C V Raman, genesis of Raman effect, evolution of Raman instrumentation and bird's eye view on diverse Raman spectroscopy applications.

Number of attendees: 125

4. Date**: 1st March, 2024**
Topic: **Biotechnology: Unlocking Nature's Potential for a Brighter Future**
Speaker: **Dr. Pallavi Gaikwad,** ICMR-Post Doctoral Fellow, ICMR- National Institute of Immunohematology
Venue: **NES School, Dombivli**

Abstract: Biotechnology has become essential in our daily lives, impacting healthcare, food production, sustainability, and industry. It revolutionizes healthcare with new drugs, vaccines, and diagnostics. In agriculture, it boosts crop yield and quality while addressing food security

challenges. Biotechnology aids in environmental cleanup and reduces fossil fuel reliance through biofuels and materials. It offers sustainable manufacturing processes and contributes to forensic science, personal care, waste management, and bioinformatics. As it advances, biotechnology promises to address global challenges and enhance quality of life.

Number of attendees: 70

5. Date**: 14th March, 2024**
Topic: **Acids and Bases**
Speaker: **Mrs. Belapurkar, Retired from Atomic Energy Junior College**
Venue: **Green Valley English School, Sadguru Nagar, Diva, Thane**

Abstract: In our daily life we come across materials with different tastes. Lemon and tamarind are sour while washing soda is bitter. They have these properties due to their chemical constituents which are called acids and bases. In this lecture the properties of acids and bases were discussed in detail and the link between taste and chemical composition was explained

Number of attendees: 74

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

The following webinar was conducted online through Zoom platform during January to April, 2024 under "Science and Our Life" Series.

1. 44th SAOL talk

Date**: 13th January, 2024**
Topic: **Urban Wildlife**
Speaker: **Dr. Roopa Satish**, Wildlife Veterinarian at Bannerghatta rehabilitation centre, Bangalore
Abstract: Bannerghatta rehabilitation centre (BRC) receives a wide variety of wildlife especially from the city hence called Urban wildlife. They include mammals, birds and reptiles. They are rescued, treated (if injured), and rehabilitated back into their natural habitat in the wild. They are mainly rescued due to trauma/injuries caused by road accidents, electrocutions, dog bite cases, manja injuries, intentional trauma etc. Confiscations by police, forest department from illegal pet trade, wildlife trafficking are important reasons for rescue.
All the wild animals are protected under the Wildlife protection act of India, 1972, which makes it illegal to hurt, injure, maim or kill them, or keep them as pets, or use their skin, feathers, claws, meat, body parts etc.
Outreach:20

2. 45th SAOL talk
Date**: 17th February, 2024**
Topic: **Evolution of Mobile Communication Networks**
Speaker: **Shri Vikas Bonde**, Senior Vice President, Reliance Jio Infocom Ltd.

Abstract: Mobile networks have become an integral part of our modern society, enabling seamless communication and access to information on the go. The evolution of mobile networks has revolutionized the way we communicate and access information.

From the early days of basic voice calls to the era of high-speed data transfer, mobile networks have undergone significant advancements. This lecture explores the key milestones in the evolution of mobile networks, including the transition from 1G to 5G, the introduction of data services, and the development of technologies like LTE and Wi-Fi.

Technological innovations have helped overcome the challenges such as the need for increased bandwidth and improved network coverage. The impact of mobile networks on various services and the potential for further advancements in the field were discussed.

Outreach:14

3. 46th SAOL talk

Date**: 22nd February, 2024**

Topic: **More than skin deep: A holistic approach to skin health**

Speaker: **Dr. Ashwini Manjare Modi**, MBBS, M.D., D.N.B. (Skin), D.V.D., D.D.V., F.C.P.S., MNAMS, Consultant Dermatologist, Trichologist at Sentra Clinic, Malad East, Mumbai

Abstract: Achieving and maintaining healthy, radiant skin encompasses a holistic approach that goes beyond just skincare products. We will explore the synergy between skincare, nutrition, and mindset to help men and women achieve the best possible skin health.

Effective skincare is not just what we apply on the skin but also what we consume in the form of diet and also our thoughts.

In addition to external care, the impact of nutrition on skin health is undeniable. Equally important is the influence of a positive mindset on skin health- because the thoughts we think determine what appears on our skin or how we appear to ourselves in it. Dr. Ashwini Modi, a dermatologist and a Rapid transformational therapy practitioner helped the audience to delve deeper into how to heal the skin with the right products, diet and positive thoughts and to be one's best version in and out.

Outreach:31

4. 47th SAOL talk

Date**: 23rd February, 2024**

Topic: **Coastal and Marine livelihoods**

Speaker: **Ms. Durga Thigale**, Biodiversity & Livelihood Consultant

Abstract: Livelihoods in coastal and marine landscapes have been changing as the environment is changing. The talk addressed the key livelihood practices, community dependency and challenges. It also focused on the scope and integration of Biodiversity Conservation into livelihood activities.

Outreach:14

5. 48th SAOL talk

Date**: 5th March, 2024**

Topic: Meditation as a Management Tool

Speaker: **Shri Sanjay Bhatia**, Uplokayukta, Maharashtra State, Ex Chairman, Mumbai Port, Kandla Port & Indian Ports Association, Ex MD, CIDCO, Heartfulness Meditation Trainer with **Mrs. Anuradha Bhatia**, Member (Technical) NCLT (Retd.)
Venue: IWSA Multipurpose Hall, IWSA Vashi Campus

Abstract: Through their meditation journey, Mr. & Mrs. Bhatia shared their methods of stress reduction, evolution of consciousness and how meditation could be used as a management tool for changing organizational culture.

Outreach:105

D. IWSA – Student Internship Program

Duration: **12th Jan to 20th Feb**
Number of Students**:** 5
Affiliation: **Vaze College of Arts, Science and Commerce (Autonomous),** Mulund East, Mumbai
Title: **"Sustainable Practices in Compost Preparation and Plant Studies, including Laboratory visits, Practical Demonstrations, Field Visits and Hands on Experience"**
Mentors: **Dr. Rita Mukhopadhyaya, Ms. Vijaya Chakravarty, Dr. Paramjit Anthappan, Dr. Smita Kekatpure, Ms Malathi Rao.**

Abstract

The internship program focused on imparting knowledge and practical skills related to sustainable practices in compost preparation, plant studies, and environmental conservation. Mentored by experts in the field, participants gained valuable insights into various aspects of composting, traditional ecological knowledge, waste management, and laboratory techniques.

Overview of Activities:

1. Compost Preparation: The program commenced with an introduction to the purpose and importance of composting. Participants engaged in hands-on activities such as collecting dry leaves, shredding them using appropriate safety precautions, and initiating compost heaps. Lectures by experienced faculty members provided insights into waste disposal management, composting basics, and effective waste management methods.

2. Plant Studies and Environmental Conservation: Eminent speakers delivered lectures on topics including healing landscapes, traditional ecological knowledge, and the relationship between tribal communities and forests. Discussions highlighted the importance of biodiversity conservation and sustainable land management practices. Participants gained a deeper understanding of ecosystem dynamics and the role of composting in promoting natural growth. Also enlightening sessions covering bioinformatics, molecular biology, and computer history in biology, besides PCR machine demonstration and insights into the Plant tissue culture technique and DNA extraction methods were conducted at IWSA.

3. Laboratory Visits and Practical Demonstrations: Visits to FDA-approved laboratories offered participants an opportunity to observe advanced microbial identification techniques and state-of-the-art instrumentation rooms. Practical demonstrations on animal tissue culture protocols,

RNA extraction, cDNA synthesis, and real-time PCR techniques were conducted, enhancing participants' understanding of laboratory procedures and techniques.

4. Field Visits and Hands-on Experience: Field visits to research labs focused on practical applications, such as Trichoderma virens inoculation in sorghum for enhanced composting. Participants observed ongoing compost formation and test plantations, contributing to their understanding of compost quality and its effects on plant growth. These experiences provided invaluable hands-on learning opportunities and reinforced theoretical knowledge gained during lectures.

The internship program provided participants with a holistic learning experience encompassing theoretical knowledge, practical skills, and hands-on fieldwork. By integrating traditional ecological knowledge with modern scientific techniques, participants gained valuable insights into sustainable practices, waste management, and environmental conservation. The program not only equipped them with essential skills but also instilled a sense of responsibility towards nature and the environment. As stewards of the environment, participants are well-positioned to contribute positively to sustainable development initiatives in their future endeavours.

3. Students involved in the internship Program: **Customised Internship for 5 M.Sc. Part 1 students of Biotechnology- Omkar Dantkale, Shreyash Powar, Deepak Kharat, Nishad Karadkar and Sumukh Kakad, as part of their curriculum requirement, through application to IWSA.**

4. College Mentors: **Dr. Francin Pinto, Dr S. L. Samant, Ms Leena Pilani and Ms Kavita Jadhav.**

E. Activities in Collaboration with Vigyan Prasar

VIPNET Science Club

Following is the activity of the VIPNET Science Club (VP-MH 0248), held online, on the google meet platform during the period January to April 2023 which was for the benefit of VIPNET members from Maharashtra (Students and Teachers) and IWSA Members:

ACTIVITY 16

Date**: 26th Feb. 2024**

VIPNET Activity was held online to celebrate Lavoisier's large-scale decomposition of water on 26th Feb. 2024. Out of 30 participant presentations, 2 were chosen to load onto IWSA's youtube channel.

Outreach: 30

F. Garden-Based Learning (GBL) Activities

Food stalls were put up during science day program (9th and 10th Feb), which encouraged small women entrepreneurs. They served millet based healthy combo meals and snacks for students and visitors. Recipes from IWSA's Millet book were used in combo meals. All the stalls made good profits from the sale.

G. Celebration of Science Day

a. Date: **9th and 10th February 2024**

Theme: **Natural and Man-made Disasters: Their Scientific Reasons and Emerging Technologies for Disaster Management.**

This year IWSA celebrated Science Day by organizing a Science Exhibition on the 9th and 10th of February, 2024, on the above theme. Four different categories of exhibit competitions were included, namely, models (working or still)- Category 1, posters-Cat 2, Development of computer Apps-Cat 3, and Science drama- Cat 4, on the mentioned theme. Students from VII Std upwards, from 12 schools from all over Mumbai participated in this exhibition. There were 10 projects under Cat 1, 6 under Cat 2, 3 under Cat 3 and 2 under cat 4.
This year we included the Junior colleges and Degree colleges also in this competition. There were 4 posters from college students.
There were **sixteen exhibits from The Department of Atomic Energy and four from Board of Research in Isotope Technology (BRIT) show-casing interesting projects, and posters on Disaster Management on both the days.** We are thankful to both the departments for their financial support. We are also thankful to some of our members who came forward with generous donations for the Science Exhibition activity.
Besides, the 102 Battalion of RAF from Taloja displayed an entire array of arms and protective gear worn by the RAF personnel during mitigation of riots. The famous anti-riot vehicle VAJRA used by them to disburse mobs was also parked on the premises on 9th. The Chief guest for inauguration of the Science Exhibition on 9th February, 2024, Shri. Jatin Kishore, Commandant, 102 Battalion, Rapid Action Force, Taloja, delivered an interesting talk on the work done by RAF and the requirement for awareness among the general public concerning crisis management.
On the 10th of February, Dr. Daniel Babu, Head, Public Awareness Division, DAE was the Chief guest at the valedictory function and prize distribution ceremony. He inspired the students on awareness on Crisis management.
The list of prize winners in the science exhibition is as below-
Category 1: First Prize- "**Oil Spills**" – Fr. Agnel Multipurpose School.
Second Prize- "**Natural and Man- made Disasters**"- P A Menon English High School, Bhandup
Third Prize - "**Fiery Insights**"- New Horizon Public school, Panvel
Third Prize- - "**Nuclear Power Plant**"- Vishwajyot High School
Category 2: First Prize- "**Uttarakhand Tunnel Disaster**"- Sainath High School, Vashi.
Second Prize- "**Mangroves- Storekeepers of Mumbai**"- Sacred Heart School
Third Prize- "**Alert today- Alive Tomorrow**" - Shardashram English Medium School
Category 3: First Prize- "**Fire Alarm App**"- Fr. Agnel Multipurpose School
College Poster- First Prize - "**Man made disasters-Chemical Leakage**" - KLE College
Outreach: 300

b. Date: **4th February 2024**
Event: **Workshop on Drone making**
The Science Day celebrations started a week in advance. Drones are a very integral part of crisis management. Therefore, A DIY workshop on Drone making was held on 4th February for school students, in collaboration with SPACE GEEKS. Fourteen school students participated in this workshop.

H. IWSA SCHOLARSHIP

IWSA Scholarship Award function was held on **27th January 2024 at 2.30 pm,** at ICICI Multipurpose Hall, IWSA campus, Vashi. Chief Guest, **Dr. Shobhona Sharma,** Former Senior Professor and Chairperson, Department of Biological Sciences, Tata Institute of Fundamental Research, delivered a talk on challenges faced by women pursuing Science. Four awards were given to PhD students, two in biological sciences and two in chemistry. In addition, six awards were given to MSc students, six awards to BSc students and three awards to students of ECCE. All applicants were from Maharashtra. Total participants were around 70, including awardees and guests.

Community Programs

A. Indirabai Padhye Nursery School and Education Committee

1. Date**: 12th January, 2024**
Event: **Science Workshop organized by ECCE**
Venue: **IWSA Hall, IWSA headquarters, Vashi**

ECCE organized a half-day science workshop for the trainee students in collaboration with Science Awareness committee. The program was conducted on 12th January 2024 at 2.30 pm in IWSA hall. The workshop aimed to equip educators with the skills necessary to cultivate a scientific mindset in children aged 5-10 years, emphasizing the importance of making science both enjoyable and intriguing.

The workshop commenced with engaging demonstrations by teachers of Science Nurture Program including Dr. Suparna Kamath, Ms. Tripta Tewari, Ms. Vijaya Tilak, and Ms. Priya Jacob. They showcased hands-on science experiments based on day-to-day observations. Demonstrations on how air occupies space and exerts pressure, nature of acidic and basic substances, magnetic fields, use of magnets and its applications, types of mirrors and lenses etc. were showcased, providing an understanding of fundamental scientific principles. Students also explored the botanical wonders through simple experiments on water transport in plants, transpiration, pollination and types of leaves and flower parts. Few fun toys were displayed explaining the science behind them and a model of a fan was also presented.

The workshop, which created an enriching learning environment was successful in fostering scientific thinking and techniques among early childhood educators. This enabled to instil a love for learning in young minds, ensuring that science becomes an enjoyable and integral part of early childhood education.

Outreach: 25

2. Date**: 22nd and 23rd March 2024**

Event**: Rainbow - The Learning Festival**

Venue**: IWSA HQ, Vashi**

The vibrant annual program, **Rainbow - The Learning Festival** was successfully conducted, which was an enriching experience for children, parents and educators alike. The festival showcased an array of activities aimed at fostering creativity and enhancing learning

outcomes. Attendees could explore innovative teaching tools and aids through the Display of Teaching Aids. There were puppet shows with enchanting performances and captivating story telling sessions which were capable of igniting the imagination and instilling a love for literature among the participants. There were engaging hands on activities, games and other interactive sessions covering science, language, and mathematics. These were designed to stimulate young minds and to make learning a fun experience. Parents and teachers got opportunity to participate in workshops tailored to provide valuable insights and practical strategies for early childhood development. Workshop on "Overcoming Fears and Building Bonds of Trust", Workshops on "Wooden Wonders", "Joy of Creation", "Fun with Clay" etc., conducted by experts were well appreciated. Another highlight of the program was Toy Bus run by the Children Toy Foundation on 23rd March.

Entry to the event was free for all, ensuring that everyone got an opportunity to benefit from this educational and entertaining experience aimed at developing scientific temper in children. Many schools from the neighbourhood such as NMMC school, Modern School, Sainath School, Anjuman etc. registered full slots for students as a group accompanied by a teacher. Attending / organizing these events gave the ECCE trainees an insight into the management and conducting of the activities and handling a large number of children.

Outreach: 2000

3. **Celebraions**

Nursery children celebrated Republic Day and Gudi Padwa.

4**. Training, workshop and Contests**: IT Training of 15 hours was conducted by Ms.Kadambari In March 2024. A Display Board Contest, a Story Telling Workshop and a Story telling contest was held. A Nutrition contest on "Healthy sweets and salty snacks" was also held on 19th / 20th February, 2024.

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

Date: 7-1- 2024
Event: Sports Day for Hostel
Date: 14 -1-2024
Event: Hostel Day
Date: 20-1-2024
Event: Sports Day for Day Care Children
Date : 6-4-2024
Event: Eye check up for children, parents and staff

Repair and renovation work was taken up in the hostel during this time. Keeping up with safety measures is essential, renewed the fire protection license online on March 2024.

C. IWSA's Satish Haware Computer Education Centre

(i) A computer course was organized for the Science Nurture children from Sainath school, focusing on the basics of MS Office. The students were tasked with creating two presentations, which they completed with impressive creativity. In addition, they were

introduced to HTML coding, commonly used in web design, which sparked great interest among them.

(ii) The Science Day celebration took place on 9th and 10th February, featuring participants in the 3rd category who developed apps on the theme "Development of Apps for Disaster Management." The judging was conducted online.

(ii) In March, one school student joined the to seek assistance with his school syllabus. Towards the end of March, two more students and a homemaker who wanted to take up a job joined the course of Basic MS Office.

(iii) Story Telling Session by Vijaya C. at St. Jude child Care Centre at ACTREC

(iv)

D. IWSA's Piroshja Godrej Foundation Library

1. Inspection audit of the library, conducted by a committee of experts from the Directorate of Libraries, State Government
2. On **15th March 2024**, visited St. Jude Child Care Centre at ACTREC, Kharghar, handed over 20 books in 3 languages
3. On **21st March 2024**, an online talk **-"Reviving Traditional Tamil Poetry In The Modern Era" by Ms. Prasanna Venkatesh** was conducted. **Outreach -20**
4. On **27th March 2024**, a story telling session was arranged at St. Jude Child Care Centre, ACTREC, Kharghar. Outreach: 45
5. On **27th March 2024**, first Rural Outreach was initiated with 100 books, and 4 plays by Goshtarang group in Tribal villages, for teachers of Zila Parishad Schools and Anganwadi teachers at Khardi.
6. **Story Telling Session** by Vijaya C. at **St. Jude Child Care Centre at ACTREC** in **April**. The Programme was well appreciated by Usha Banerji and the Wholetime Director of St.Jude, Anil Nair. From IWSA library committee Dr. Paramjit A., Dr. Santhini, Maitreyi P. and Manashi C. played different roles for the "Andher Nagari Chaupat Raja"
   Outreach: About 50, 30 kids and parents.

E. IWSA's Murli Laj Chugani Health Care Centre

1. Eye Camp

Date: April 6, 2024

Venue: IWSA Health Center

In collaboration with the Rotary Club of Satellite City Navi Mumbai, HCC organized a successful free eye camp at the IWSA health centre on 6th April. Dr. Tushar Muni and his team from Dhrushti Eye Clinic & Microsurgery Centre, along with World Optix, conducted examinations for a diverse group of participants including IWSA staff and members, gardener, kitchen staff, helpers, parents of DCC, nursery children and parents, library members, science nurture students and ECCE trainees. Patients were examined by Dr. Tushar Muni/ Dr. Archana Koregaonkar for common eye problems and visual defects. The camp was well received by all participants. Individuals with financial constraints were prescribed spectacles at a reduced rate, while a select few were eligible to receive spectacles free of charge. Special appreciation was extended to Rotarians Ms. Mangala Ghorpade and Mr. Kedarnath Rao Ghorpade for their support.

Number of participants: 69

Results: Paediatric OPD – 11, Diabetic retinopathy -1,
Cataract: 1, Glaucoma- 3, Lens prescription: 16

2. Cancer Detection Camp:

Date: 23/04/2024, Duration: 1:00 pm-4:00 pm
Venue**:** Lions Club Medical Centre, Turbhe Stores & Aarambh Gyan Vikas Kendra, Turbhe
Beneficiaries Targetted: 100 women

A cancer detection camp was held in collaboration with Cancer Patients Aid Association (CPAA) on April 23, 2024 in Turbhe slums at Shobha Murthy's Aarambh Gyan Vikas Kendra between 1 pm and 4 pm. Dr. Sandhya Gavane from Lions Medical Centre of Aarambh, supported by a dedicated team of volunteers, facilitated the screening of individuals, primarily comprising sex workers. Screening team comprised of two gynaecologists, ENT, pathologist, physician and a counsellor to provide post screening counselling and support ensuring they received necessary guidance and information. Biscuits and condoms were provided as a supportive measure. Noteworthy referrals for further evaluation were made for 56 participants for early detection and intervention. Educational pamphlets were made accessible to participants by CPAA.

Number of participants: 82

Results: Total referrals- 56 (Thyroid, tobacco habitués, USG pelvis & abdomen, sono and mammo of breast)

3. Pilates program: Dr. Sidhi Bhosale initiated a new exercise program focusing on Mat Pilates sessions in the evenings. Mat Pilates is a strengthening and lengthening form of exercise that focuses on the core (trunk) muscles while also training one's arms and legs besides building coordination and balance as well and works on mobility. This program offers members opportunities for both group and individual participation, emphasizing benefits such as improved posture, strength, and spine stabilization.

Other Activities at IWSA

1. Women's Day Celebration

Date**: 11th March 2024**
Venue**: IWSA Hall, Vashi**
Speaker**: Ms. Shobha Murthy, Aarambh, Turbhe**

On the occasion of Women's Day IWSA arranged a guest lecture by a remarkable woman, Ms. Shobha Murthy, who after a considerable stint in the finance sector with corporates changed her track and started an NGO, Aarambh, which carries out outstanding work in the slums in Turbhe industrial belt. Ms. Shobha Murthy has worked with several national and international corporates and non-profits like Lakme, CRY, USAID, and others before starting Aarambh. The goal of Aarambh is to provide educational, health and vocational skills to underprivileged children and women. The organization, which started with providing educational support to 70 school drop-out children in one centre in 1996, has grown to approximately 2000 children, women and youth in 10 community centres today.

Dr. Shyamala Bharadwaj, President, IWSA welcomed and introduced the chief guest, Shobha Murthy. She was felicitated by presenting the Millet Book of recipes and poems for children, published by IWSA. Ms. Shobha Murthy shared her experience during her journey as the Founder Trustee and Director of AARAMBH, and mid-day meal program. There were many questions from the audience regarding the challenges she faced and also the issues faced by NGOs in general. She talked about how organizations like Lions Club came forward to support her. Dr. Sudha Padhye, founder member of IWSA and Dr. Bakhtaver Mahajan, Chairperson of Trustees and Ms. Mangala Ghorpade, an IWSA member and an active Rotarian, remembered

their association with Shobha Murthy and the work carried out together. Ms. Shaheena Shaikh, teacher from ECCE course also talked about how Ms. Shobha Murthy and Aarambh came forward to help students of ECCE for internship during covid time, when no other platform was available and expressed her gratitude.
Outreach: 40

2. Unveiling of a Plaque in the memory of Smt. Vidya Ranadive

Date**: 11th March 2024**

On 11th March, Smt. Geeta Sethi, daughter of late Smt. Vidya Ranadive, a very senior member of IWSA, unveiled a plaque in her memory in IWSA HQ, to mark donation by her children and grandchildren. Smt. Vidya Ranadive had contributed significantly in IWSA's growth in various capacities, such as Hon. Secretary of IWSA Building Complex and Fund-Raising Committee, Co Convenor of IWSA's JMM Working Women's Hostel, Member of IWSA's Constitution Drafting Committee etc. The event was attended by Dr. Sudha Padhye, founder member, Trustees and EC Members.

3. Visit to ACTREC, Kharghar

Date**: 26th April, 2024**

A group of twenty two IWSA members, IWSA staff and some of their spouses and friends visited ACTREC on Friday, 26th April, 2024. The visit was arranged by IWSA Trustee Dr. Surekha Zingde who is a former Deputy Director, ACTREC in coordination with Dr. Kishor Amin, Dr. Pradnya Kotwal, Dr. Ojaswini Upasani and Dr. Satish Munnolli.
After an introductory overview of the campus facilities by Dr. Kishor Amin, the group was taken to the Confocal microscopy unit. Ms. Vaishali Kailage showed the group the difference between an ordinary upright microscope and a confocal microscope and explained in detail how Confocal microscopy helps in obtaining detailed layer by layer information which may be overlooked/missed by conventional microscopy. The group were then shown the Small Animal Imaging Facility at the adjacent building by Dr. Pradip Chaudhari and Dr. Shashi, where rats, mice and other lab animals were maintained and studied using the high resolution microCT.
At the Proton Therapy Centre, Dr. Bhat showed the Gantry of the soon-to-be commissioned Proton therapy Unit which is a state-of-the art technology. Dr. Vysakh explained the theory behind the use of proton beam to treat solid tumours. Proton beams are more precise than x-ray beams which allows for more energy to be used to attack cancer cells with minimum damage to nearby healthy tissue and vital organs. A cyclotron generates the proton beam and it can be adjusted to generate beams of different energies so as to target the tumours at various depths.
A quick view of the other blocks at the campus such the Paymaster Shodika, Dinshaw block, Asha Niwas (for patient's relatives), the Raja Rao Shodika and new OPD block completed the half day visit. It was heartening to know about how the members of the ACTREC team are taking care of the environment and animals even in their busy schedule, through their foundations for rescuing peepal trees on the highways and for treatment of sick animals. Always at service with a broad assuring smile!

Reports from Branches

Amravati

1. BRNS sponsored Talk

Date: **1st Mar., 2024**
Topic: **Innovation in Cancer Care and Prevention**
Speaker: **Dr. Monali S. Dhole**, Consulting Obstetrician and Gynaecologist
Venue: **Vidya Bharati Mahavidyalaya, Amravati**

Abstract: Cancer is a severe and complex disease that still presents significant challenges to societies and health systems around the world. Cancer continues to be a major cause of morbidity and mortality, affecting millions of lives every year, despite advances in medical knowledge and technology. In spite of these difficulties, there is sufficient evidence for optimism since advancements in cancer prevention and treatment are changing the oncology landscape and creating novel opportunities for better patient outcomes and less disease burden. It is important to focus on finding new ways to fight cancer. Innovation in cancer care and prevention encompasses a broad spectrum of developments, ranging from groundbreaking treatment modalities to innovative strategies aimed at reducing cancer incidence through early detection and lifestyle interventions. These breakthroughs are the result of technological advancements, progress in biological study, and a growing understanding of the complex biology of cancer. The pursuit of innovation in cancer care and prevention has the promise of advancing progress towards a future where cancer is not only treated but also preventable through cooperative efforts across disciplines, sectors, and geographical regions.

The objective of this lecture was to clarify the transformative potential of innovation in reducing the burden of cancer on individuals, families, and communities by exploring the most recent developments, obstacles, and opportunities in this sector. By bringing these important issues to light, we seek to stimulate discussion, encourage cooperation, and promote group action in the direction of a future when cancer will no longer be a constant threat to people's health and well-being.

Outreach: 100

Baroda

Date: **27th April 2024**
Event: **Tech Transformers: How Women Leaders Bring Change and Disruption**
Venue**: Parul University Auditorium in Waghodia, Vadodara**

Business and Trade Association (BTA), Ahmedabad organized the programme 'Tech Transformers: How Women Leaders Bring Change and Disruption' in association with Parul University on 27th April 2024 from 3.30 PM to 8.00 PM. The programme was supported by IWSA along with organizations like CEO, GESIA, FICCI, AWS User Groups and ISTD, while Axis Bank was the banking partner and Mahendra Bhavsar and Co. was the legal partner. The program was held in Parul University Auditorium in Waghodia, Vadodara. Dr. Vipul Vekaria, Dean and Principal of the Faculty of Engineering and Technology, Parul University gave the welcome address. Dr. Abhilasha Vyas delivered the theme address as the conference

chairperson. Her Excellency Lebohang Valentine Mochaba, the High Commissioner of the Kingdom of Lesotho to India was the Chief Guest. She gave keynote address on the empowerment of women in Lesotho and the steps taken by their government. H.H. Rajmata Shubhangini Raje Gaekwad, Chancellor of The Maharaja Sayajirao University of Baroda, Vadodara was the Special Guest. She underlined the various contributions of women to science and technology at the national and international levels. Ms. Deepa Sharma, Director, BTA gave the concluding address.

Mr. Chanakya Bhavsar from Mahendra Bhavsar and Co. talked about women entrepreneurs and several successful enterprises of women such as Nyka and many more. Mrs. Hiral Dave, Founder and CEO, HVDSOFT Pvt. Ltd. Conducted a fireside chat with Dr. Nivedita Srivastava, founder and business psychologist of 9Links on women in leadership roles and how they are recruited and assessed in various organizations. Dr. Mala Singh, Founder and Director PEC Greening India delivered an interesting talk on the financial aspects of establishing small and medium enterprises.

The highlight of the programme was a group discussion on 'Tech Transformers: How Women Leaders Bring Change and Disruption'. Prof. C. Ratna Prabha, Head, Department of Biochemistry, The M.S. University of Baroda & Convener, IWSA Vadodara branch represented IWSA in the discussion, was joined by Ms. Hiral Dave, Mrs. Shivani Shitole, Managing Director, the cloud Pros., Mrs. Dimple Vaghela, AWS Community Builder Director at Electromech Cloudtech Pvt. Ltd. Dr. Abhilasha Vyas presided over and guided the discussion through various important questions.

Some of the question addressed in the discussion are: What inspired you to pursue a career in the tech industry, and how did you overcome the initial challenges you faced? How do you foster diversity and inclusion within your organisation? How do you foster diversity and inclusion within your organisation and why is it important for driving innovation and success? How do you balance the need for innovation and risk-taking with the demands of maintaining stability and security in your organization? What are some of the key trends and developments you see shaping the future of the tech industry, and how do you plan to adapt and stay ahead of the curve?

The questions were thought provoking. Every woman planning to contribute effectively and significantly to the process of nation building as a scientist, technologist, technocrat, entrepreneur, teacher or belonging to any other walk of life has to ask these questions to self and find answers appropriate for their own field. The programme was a success in bringing forth the importance of maintaining gender equality in work place for attaining intended goals.

Bengaluru

1. BRNS sponsored talk

Date: **25th January 2024**
Topic: **Cancer Research – Bench and Beyond**
Speaker: **Dr. Pratibha Ranganathan**, Asst. Prof., Centre for Human Genetics, Biotech Park, Electronic City Phase I, Bengaluru
Venue: **Dept. of Life Sciences- Biotechnology, Indian Academy Degree College-Autonomous** Kalyan Nagar, Hennur Cross, Bengaluru

Abstract: Cancer - as is known to all is the Emperor of all Maladies. The more we delve into the biology of cancer, the more intriguing it gets. Years of efforts by clinicians and researchers all over the world has given us insights into how a cancerous cell functions.

This basic understanding of disease has also paved the way for many different ways of identifying and treating cancer and continues to do so. This talk gave an overview of some basic findings in cancer which have led to diagnostic or therapeutic methods -essentially translational potential of research findings.

Outreach:161

2. Awareness Program on Career and Internship Opportunities in ISRO

Date: **5th March 2024**
Speaker: **Ms. Rima Ghosh, Scientist, UR Rao Satellite Center (URSC), ISRO**
Venue: **, BMS College of Engineering, Bengaluru**

Women cell, BMS College of Engineering, Bengaluru, in association with IWSA, Bengaluru branch organized general awareness regarding career and internship opportunities at ISRO for the students of various branch of engineering on 5th March, 2024 as part of international's women's day. Ms. Rima Ghosh, Scientist, UR Rao Satellite Center (URSC), ISRO enthusiastically talked about the projects she has been part of at ISRO, about the incredible achievements of Women Scientists at ISRO. She motivated and inspired students to explore careers and internships at ISRO by applying at various labs of their interest.
Outreach:100

Delhi

Date: 12th March 2024
Event: **Lecture on Eye Health**
Speaker: Dr. Kamal B Kapur is Co-founder and Director, Sharp Sight Eye Hospital, Pusa Road, New Delhi
Venue: CSIR-NPL, Delhi

For celebrating this year's International Women's Day, a general awareness lecture on Eye Health was jointly organized by CSIR-NPL and Indian Women Scientists' Association (IWSA) Delhi chapter on March 12, 2024 from 4 PM – 5 PM at Auditorium, CSIR-NPL. Eye health is an issue of concern for all. These days, concern is all the more due to life style, increased screen time, pollution and poor diet. Most of us work extended hours either on computer screens for work or on precision measurements. Therefore, a general awareness lecture was organized to learn how to take better care of eyes. The Speaker, Dr. Kamal B Kapur is Co-founder and Director, Sharp Sight Eye Hospital, Pusa Road, New Delhi. He talked about the need for eye care and necessary medical interventions. He also enlightened the audience with simple tips like taking proper rest, proper diet and frequent breaks between screen time for better eye health. It was a very lucid, informative and interactive talk and was appreciated by all attendees.

Dr. S. R. Dhakate, Acting Director, CSIR-NPL gave the welcome address. Dr. Kanika Malik, Secretary IWSA (Delhi Branch) gave brief overview about IWSA activities. The program was followed by felicitation of the speaker and high tea.
Outreach: 70

Hyderabad

Date: 14th March 2024
Event: **Health camp and Health Card to School Girls**

A health camp was conducted by Prof. Anjali Devi, Former Registrar of Sri Padmavathi Mahila Visvavidyalayam, Tirupati and Former Dean of Acharya NG Ranga University. Health Cards were developed and distributed to school children up to the age of 16. This is a card developed after two years of study titled as Nutrition and Health Card for school children designed for classes 1 to 12, by Dr. Anjali Devi. This card was released in the camp by Sri Kishen Reddy hon'ble minister of development of Northeastern Region, culture and Tourism Government of India. The card contains immunization particulars, nutritional status, BMI, nutritional deficiencies, congenital defects, and allergies. It will be acknowledged by the parent and signed off by the medical officer. The card shall cover familial and non-familial health status, hospitals visited for any health issues and doctors who attend to the child, vaccination details etc. It will be acknowledged by the parent and signed off by the medical officer.

Extensive work was carried out by Dr. C. Anjali Devi, which predominantly focused on identifying undernourished children in rural and urban areas, trying to guide parents on how to feed and correct nutritional deficiencies, conducting health camps to provide individual check-ups, talks and demonstrations etc. The idea was that If schools are taken as a place for assessing the nutritional and health status of children, it will create a history of health and nutrition status of the student that parents and doctors can refer, to address an individual's health concerns. It will also serve as a cornerstone to help identify communities of concern and highlight deficiencies on a broader spectrum. The accumulation of this data will be a vital factor in creating future policies and programs that will directly impact the health status of the people of this nation. Nutrition and Health Card was prepared and is approved by experts, teachers, and stake holders in the field. A pilot study was conducted on children for a period of three years in rural and urban areas as a proof of concept.

Outreach: 100

Kalpakkam

1. Date: 18th **January 2024**
   Event: **School Science demonstration Program** (Part of National Science Day)
   Venue: Panchayat Union Government middle school, Irumbulicheri and Adidravida welfare government higher secondary school, Nerumbur

Every year as part of National Science Day celebration, IWSA, Kalpakkam organizes, programs for the students of neighbourhood schools with the objective of promoting the active involvement of students and teachers in science related activities. This year, as part of the Science Day activity, Science demonstration program was conducted by IWSA, Kalpakkam for the students studying in Class 6th, 7th and 8th at Panchayath Union Government Middle School, Irumbulicheri and in Class 9th and 11th at Adidravida Welfare Government Higher Secondary School, Nerumbur on 18th January 2024. This program covered topics of general science, and few are: a) demo on constituents of colours in white light, the working principle of light dependent resistor and its usage in the automated operation of street lights, security and fire safety surveillances, b) experiments using liquid nitrogen detailing its effects on materials and its extended applications in the laboratory, working models on Stirling engine converting heat to mechanical energy and Seebeck effect on generation of electric current, and c) experimental demonstration detailing basics of electricity, magnetism, electromagnets and Faraday's law of induction conducted in two sessions. The demonstration of the exhibits were designed and carried out by Mrs. P. Anitha, EC member of IWSA, colleagues from MSG, IGCAR Mr. C. Kumar and Dr. Amrithapandian, and Dr. S. Selvakumar former Scientists, SQRMG, IGCAR. Total of 100 students participated in this program. The gifts were given to the students as a token of appreciation. The "IWSA Achievers award" conferred to Dr. S. Kalavathy was handed over to her at Panchayath Union Government Middle School, Irumbulicheri in the presence of students, staffs and IWSA members.

Outreach: 150

2. Date: 31st January 2024
   Event: **Technical Talk**
   Topic: Polymer nanocomposites as Lead- free diagnostic X-Ray Shielding materials
   Speaker: Dr. Sangeetha Jayakumar, Scientific Officer E, IGCAR

Dr. Sangeetha Jayakumar discussed the successful indigenous development of the polymer-based nano-composites materials and its proven shielding efficiency on X-Ray radiation that enables cost effective usage at the field of radiology and makes it affordable to the people in need. The lecture was followed by an active interactive session.

Outreach: **35**

3. Date: 8th February 2024
   Event: **Special lecture** on Child rearing practices in the Modern era
   Speaker: Dr. Vineetha, former head-pediatric, DAE hospital, Kalpakkam

Dr. P. Vineetha gave an informative lecture on practices and food habits that are to be followed from infants to childhood better to create future India. The speaker discussed about the importance of mental preparedness and nurturing an infant to the best citizen. Followed by the interactive session, colleagues who gave support to conduct science demo program at two schools in the month of January were felicitated.

Outreach: **250**

4. Date: 17th February 2024
   Event: **Financial Literacy & Advisory program**
   Speaker: Mrs. Mangala Padmanabhan (M/s. Integrated Enterprises (India) Pvt. Ltd.,
   Venue: Anupuram and Kalpakkam Township

Two sessions were arranged for the benefit of all colleagues and home makers. The interactive lecture discussed in detail the necessity of financial planning, advantages of the long term guaranteed investments, about the performance of mutual fund and equity. The talk also covered the salient features of DigiTrade Account opening, NPS, Gold ETF and Gold bond. The team was very supportive to clear the doubts of the audience. The team discussed

about the selection of fund depending on the market appreciation and its investment on the sector such as energy, infrastructure, finance, education.

Outreach: 150

5. International Women's Day Programme - 2024

Date: **7th March, 2024**

Venue: Sarabhai Auditorium, HBB, IGCAR.

International Women's Day-2024 was celebrated by Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam, in association with Indian Women Scientists' Association, Kalpakkam branch (IWSA-K). Dr. N. Sivaraman, Director, Materials Chemistry & Metal Fuel Cycle Group, IGCAR, was the chief guest and the special speaker for the programme was Mrs. Shiny Surendran, Nutritionist, Founder & Director, Art of living LLP, Chennai. Selected girl students in the neighbourhood village schools who have excelled in their high secondary board exam and their parents were also being part of the celebration. The celebration started with an invocation song, Tamil Thai Vazhthu. Smt. Jemimah Ebenezer, Convener, IWSA-K welcomed the dignitaries and audience. Dr. B. Sasi, Secretary IWSA, read the activity report of IWSA, Kalpakkam for the year 2023-2024 and listed the various programs conducted. Chief guest Dr. N. Sivaraman discussed the significant roles that women play in society as well as their hardships, dedication and perseverance that led to inventions and accomplishments. Under STHREE (Scientists' Trust for Health, Rural Education and Environment) fund of IWSA-K, 6 number of girl students from neighbourhood village schools who are economically backward but with academic excellence at higher secondary level, were selected for award. Dr. M. Manohari and Dr. Gurpreet Kaur conducted the proceedings of the award distribution. Dr. N. Sivaraman presented the cash awards and compliments to the STHREE awardees and advised them to focus on their studies to achieve their ambitions. Special speaker for the programme, Mrs. Shiny Surendran delivered a talk titled "Eat Right…Get Fit". Throughout her speech, she emphasized the need of maintaining good health through a balanced diet with all supplementary nutrition. She discussed in detail about the meal plan having seasonal vegetables and fruits. The lecture was followed by an interactive session during which she addressed the audience's questions and concerns. The chief guest and special speaker were honoured with gifts and mementoes. Dr. Sangeetha Jayakumar compeered the program and Mrs. K. Shivakamy, treasurer, IWSA proposed the vote of thanks and the event was concluded with National Anthem.

The women's day celebration was attended by men and women colleagues from IGCAR, Madras Atomic Power Station, BARC Facilities and General Services Organisation at Kalpakkam complex.

Outreach: 350

Kolhapur

1.Date: **3rd January 2024**

Event: **Lecture on Menopause**

Speaker: **Dr Alpana Chougle**

Venue**: Gopal Krishna Gokhale College, at Padali Khurd , Kolhapur**

A Lecture was organized by IWSA-Kolhapur & Gopal Krishna Gokhale College Kolhapur for students of 10+2 level at the NSS Camp. Dr. Sopan Chougule gave guidance on precautions to be taken.

Outreach: 60

2.Date: **4th January 2024**

Event: **Free Medical Camp**

Venue**: GKG college, Kolhapur**

Free Heart checkup through Diamond Hospital & Athaayu Hospital, eye check-up by Inshoyar Eye Care, muscular disease check-up by Doshi Orthopedic Center was organized by IWSA-Kolhapur and Gopal Krishna Gokhale College Kolhapur during 10+2 Level NSS Camp.

Outreach: 350

3. Date: **28th February 2024**

Event: **National Science Day**

Venue**: Utkarsh Vidyalaya, Sangola**

An activity consisting of Science Exhibition & Science Experiment Competition was held on National Science Day for school students from 5th to 9th Std. at Utkarsh Vidyalaya, Sangola.

Outreach: 145

4. Date: **4th March 2024**

Event: **Workshop on Hydroponics for Home**

Venue**: Rotary Samaj Seva Kendra, Nagala Park, Kolhapur**

IWSA Kolhapur branch in association with Inner Wheel club of Kolhapur Heritage conducted a six hour- workshop on Hydroponics for Home. Mr. Akshay Ghorpade from School of Gardeners gave information on how to grow vegetables commercially as well as at home by hydroponics methods.

Outreach: 40

5. Date: **11th, 12th, 14th, 19th March 2024**

Event: **Felicitation of teachers on the occasion of International Women's Day**

On the occasion of International Women's Day, teachers who promote science to masses from Schools and Jr. Colleges including three members of IWSA-Kolhapur, were felicitated. The teachers felicitated were Mrs. Rutuja Kulkarni, Mrs. Tejashri Patil at Shri Shahu Highschool & Jr College Kagal; Dr. Sharmili Mane, Mrs, Kalpana Sawant, Mrs. Manjiri Kamat, Sunita Swami at GKG College Kolhapur; Mrs.Surekha patil, Mrs. Smita Chougale at Vadgaon Vidyalay Vadgaon; Mrs. Tanuja Honamane at Nyayamurti Ranade Vidyalay and Jr College Senapati Kapashi and Mrs. Tejaswini Patil, Mrs. Vaishali Gurav, Mrs. Ashwini Koli at Murgud Vidyalay & Jr College Murgud. The functions were held on 11th, 12th, 14th, 19th March 2024 respectively at each institution.

Outreach: 137

6. Event: **Mrs. Sangola - 2024**

Venue**: Town Hall, Sangola**

A competition, Mrs. Sangola 2024 was organized jointly by IWSA Kolhapur Branch and Shri Chamundeshwari Devang Kosthi Mahila Manch. The f**irst round** was a competition on saree wearing of different regions of India with few words about it. The **Second Round was talking**

about the Environment issues and its solutions. During this event, Smt. Geeta Gulmire from New English School and Junior College, Sangola was felicitated as Best Science Teacher. Mrs. Arpana Shinde, Director Mridula Laboratory & Research Center was felicitated for ecofriendly products such as liquid bio- fertilizer, organic floor cleaner etc.

Nagpur

1. BRNS sponsored science talk

Date: **16th Feb., 2024**
Topic: **Introduction to the fascinating world of Nanomaterials**
Speaker: **Dr. Seema Ubale,** Retd. Prof., Dept. of Physics, Dharampeth M. P. Deo Memorial Science College, Nagpur
Venue: **Dharampeth M. P. Deo Memorial Science College, Nagpur**

Abstract: 'There is plenty of room at the bottom', This was quoted by an American physicist Richard Feynman in 1959 in one of his lectures. Feynman described a process where scientists could manipulate and control atoms and molecules. Feynman is known as 'Father of Nanotechnology'. Modern nanotechnology began in 1981 with the invention of scanning tunneling microscope. The scanning tunneling microscope allowed scientists and engineers to see and manipulate individual atoms. Prof. C.N.R. Rao is considered as the "Father of Indian Nanotechnology"

Nano is one billionth part of one meter i.e. 10-9m. The materials exhibit different properties at bulk and nano scale. Bulk materials have constant physical properties regardless of size while the size of a nanoparticle dictates its physical and chemical properties.

Nanomaterials possess some special properties due to their small size thus nanomaterials are very widely used in the field of electronics, construction, packaging, food, energy, health care, automotive, and defence.

Outreach: 60

2. Date: **24th February 2024**

Event: **Intercollegiate Students Symposium on herbal Extracts in cosmetics formulations.**

Venue**: Department of Botany, Hislop College, Nagpur**

IWSA in collaboration with Department of Botany, Hislop College organized a student symposium aimed at exploring advancements in herbal extraction techniques and commercial viability of herbal products. The symposium provided valuable educational insights as well as potential career opportunities in the growing field of Herbal Sciences. Also, the importance of further research and collaboration in the field of herbal sciences was emphasized.

3. Date: **9th March 2024**

Event: **Women's Day Celebration**

Speaker**: Dr. Supriya Kashikar**

Venue**: GenNext Genomics, Amravati Road, Nagpur**

Women's Day celebration was marked by a visit to state-of-art Biotechnology laboratory of GenNext Genomics and Ankur seeds Pvt Ltd. Genext Genomics Pvt Ltd is emerging life

science research up and contract research organization in central India, with focus on providing purpose-based solution for life science customers. Founded and managed by a team of scientists with extensive experience in both academia and industry, GNG is working for development of recombinant and monoclonal antibodies against clinically relevant targets. During this visit IWSA members took a tour of the labs and understood the cutting-edge techniques particularly tissue culture and hybridoma technique. Dr. Kashikar also made a presentation about this start up. The work at GeNext Genomics pioneered by Dr. Supriya Kashikar was very impressive and left an indelible mark on the visitors.

No of Attendees: 30

Nellore

1.Date: **12th March 2024**

Event: **Neurology Health Hub**

Speaker: Dr Bindu Menon

Venue**:** UPHC Chandra Mouli Nagar

The session was for educating ASHA workers about stroke and epilepsy to ASHA workers and it was very interactive.

Outreach: 80+

2. Talk on Brain Health

Date**: Feb 17th 2024**

Speaker**: Dr Bindu Menon**

Venue**: Zilla Praja Parishad Govt High School**

A talk on nurturing brain health at Zilla Praja Parishad Govt High School was arranged. The interaction with students in the school was very good and it was a great opportunity to inspire young minds. Necessity of action on the neglected NCDs (non communicable diseases) was emphasized.

Outreach: 250

Pune

1. BRNS sponsored Science Talks

(i) Date: **13th Mar., 2024**

Topic: **Biochemistry of Amino Acids**

Speaker: **Dr. Vivek Bobade,** Scientist, Peptide Chemistry

Venue: **IQAC, HPT Arts and RYK Science College, Nashik, (IWSA Pune Branch)**

Abstract: Proteins play a key role in biological processes like catalysis, transport and information transfer. All of this results from the peculiar structure of proteins. Protein function can be understood only in terms of protein structure. For an enzyme to function, it has to adopt a particular conformation so that the active site then binds with the substrate. The active site is usually a small portion of the enzyme with a typical secondary structure. There are many interactive forces operating within the enzyme such as electrostatic, hydrophobic, hydrogen bonding etc., that makes the active site to adopt a particular secondary structure. Protein structure can be understood in term of its primary, secondary, tertiary and quaternary structure. The primary structure which constitutes of the sequence of amino acids has major role and dictates the overall structure. As amino acids are the building blocks of proteins and each of the 20 amino acids having different structure, their sequence in the protein dictates

the overall structure of a protein. Each of the 20 amino acids have a different propensity towards their contribution in a secondary structure like helix, bends or sheets. These preferences of the amino acids can be understood using the Ramachandran plots. Using such plots one can synthesize artificial enzymes with known structures.

Outreach: 111

(ii) Date: **14th Mar., 2024**
Topic: **Nanobiotechnology @ ARI**
Speaker: **Dr. Jyutika Rajwade, Scientist F, Nanobioscience Group, Agharkar Research Institute, Pune**
Venue: **H V Desai College, Pune**

Abstract: Nanobiotechnology is the interface of nanobiotechnology and biotechnology with a focus on the application of nanotechnology inthe life sciences. It is a multidisciplinary field that covers a vast and diverse array of technologies coming from engineering, physics, chemistry, and biology. Research in Nanobiotechnology @ARI started about two decades ago when we started developing biosynthetic and eco-friendly technology for manufacturing transition metal nanoparticles at the nanoscale level i.e., in the size range of 1-100 nm. With time, several new and novel materials and methods ofmaking them evolved, which have led to applications in health, agriculture, and the environment. The talk highlighted the research at ARIon the interface of biological science and nanostructured materials for agriculture, nanomedicine, microfluidics, rapid-field usable diagnostics, etc.

Outreach: 70

2. Date: **11th Mar., 2024**
Event: **Workshop on "Women's safety & Defensive Driving skills**
Venue**: Department of Microbiology, Savitribai Phule Pune University**

Indian Women Scientists' Association (IWSA), Pune Branch and Department of Microbiology, Savitribai Phule Pune University had organized a workshop entitled "Women's safety & Defensive Driving skills" on Monday, 11th March, 2024 on the occasion of 'International Women's Day'. Guests of honour, Mrs. Bageshree Manthalkar, Independent Woman Director, Maharashtra Natural Gas Ltd. and Prof. Smita Zinjarde, Director School of life sciences, SPPU graced the inaugural function and addressed the audience. M.Sc. students and faculty from various departments on campus and many eminent scientists attended the workshop. IWSA, Pune Branch felicitated Dr. Neelima Rajrukar, Dr. Pragati Thakur, Dr. Manisha Bora and Dr Mohini Kute for the achivements and awards received by them in 2023-24. Ms. Sonali Hinge, Women Police Officer, Damini Pathak, Shivajinagar Police Station, Pune gave a talk on "Women's safety". A training session was conducted by Mr. Pradeep Katekar, Manager, Maruti Driving School, Sai Service, Pune on Defensive Driving Skills. Overall, the sessions were very informative for the participants.

Outreach: 80

Articles

Power Up: Need of the Hour

Dr. Preethi John
Global Business School of Health, University College London

Power is often thought of as a negative value to aspire for. Yet it has been recognized that no big change is possible in life whether at family or at work without leveraging power of right persons as well as applying the concepts from power. Relegated to social sciences it is only recently it has made inroads into other areas and most importantly a subject that all need to learn from.

Working in healthcare there is a growing literature of influence of power to make a change. The power needs to be studied at multiple levels – self, interpersonal, at societal or workplace level. For me there were three distinct pathways that made me relook at power in a significantly different way.

1. Along life's way I have met so many different women who have been powerful changemakers despite having low power themselves. Perhaps it is just this persistence at doing their work against all odds because they understood their work would improve health. Among these women will figure the midwives who did so much to ensure safe delivery despite all odds. Another group which came into limelight during COVID were the frontline health workers. Braving hostile environments, they continued serving and making a difference. Talking to them and listening to their stories highlighted the personal empowerment they felt and their focus to bettering another woman's life.

2. At a conference hosted by LSHTM (London School of Hygiene and Tropical Medicine) I was introduced to the world of women change makers through the Women Leaders in Global Health conference. I was introduced to Women Deliver; and more importantly Women in Global Health. This led my path to being the co-founder of Women in Global Health (WGH) India chapter. I was also privileged to be able to be accepted into Harvard Lead fellowship a distinctive experience. One of the important and lifechanging course which I attended there was on Women and Power. I then went onto teach Power and Politics in Healthcare at the Global Business School for Health.

3. As I celebrated 25 years plus of work, I realized the career continuity and career progression I have had was a unique experience that I was privileged to have. This is an experience that I share with a minority of women. While education opportunities for women have increased globally the work opportunities have opened up but not kept pace with the aspiration of women. Many women who began their careers alongside mine fell by the wayside as family responsibilities, childcare, elderly care, illness, priority for husband career took over. There continues to be insufficient support from workplaces, societal economic institutions and not much of cultural changes have happened that support a woman to work except in certain countries like Vietnam.

Literature does provide information on the need to focus on power to influence change for the better. This is definitely a clarion call for all women whether early careers, mid- careers, to recognise power in their life and shape it to make a difference not only for themselves but for the lives around them. Here are 1 to 5 steps which anyone can apply to improve power.

1-2-3-4-5 actions to power up

1. **Impact**

   What is the impact you wish to make through your contribution in life?

2. **Outputs for 2024**

   What 2 outputs can you achieve in 2024 towards that goal?

3. **Power Maps**
   a. Map your power network – family, workplace, locality – who holds the key to power for achieving your goals
   b. Map your own power: strengths and weaknesses
   c. Map areas you can power up: at personal; inter- personal and organisational or societal level.

4. **Key Power Equations**
   a. Identify resistor and supporters and those who are not yet aligned to your goal from your network map
   b. Identify priority areas you need to work on from your strength weakness map
   c. Identify your improvement action plan – is it training; do you need a coach and / or do you need a mentor
   d. Identify power strategies to achieve your outputs

5. **Actions to Power Up**
   a. Connect with your coach or mentor on a fixed regular frequency
   b. Complete appropriate training and apply the learning
   c. Review power maps on a periodic basis
   d. Recalibrate the power equations
   e. Implement the strategies and see whether you are on the way to achieving outputs against milestones planned

As a woman in career, it is important to not only ensure career continuity but also career progression. Proactively thinking through your power can help make it possible.

About the author

Dr. Preethi John is the deputy director of the Global Business School of Health, University College London. Dr. John is a Harvard LEAD Fellow, Commissioner for HRH Workstream in The Lancet Citizens' Commission for Reimagining India's Health System, a Global Health Mentor as well as chair and co-founder of Women in Global Health India. She did her PhD from IIT Madras.

10 PIECE OF ADVICE- I give to every DESK JOB WORKER

Have you heard of WORK ERGONOMICS?

Dr. Sidhi Bhosale

Ergonomics comes from two Greek words; where **"ergon"** means work and **"nomos"** means laws. The **International Ergonomics Association** defines, "Ergonomics is the scientific disciplineconcerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimize human well-being and overall system performance."

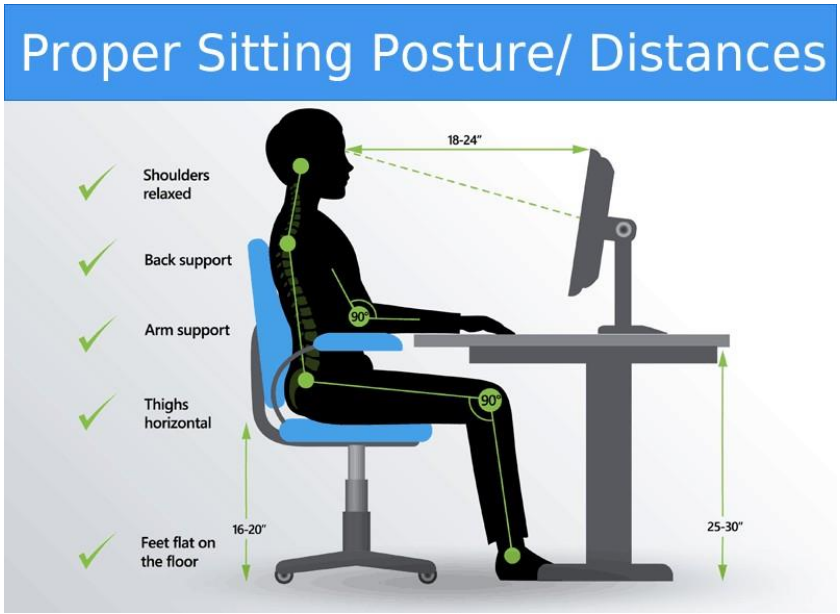
Work Ergonomics deals with creating a better working environment based upon the job profile of the individual, considering their capabilities and limitations such that the task, equipment and environment suits the worker.

Desk job workers have a very demanding task, they generally sit in front of the desktop for approximately 8-9 hrs a day. Thus, causing musculoskeletal disorders due to awkward postures, repetitive strain injuries, occupational overuse syndromes, work-related strains and injuries, etc.

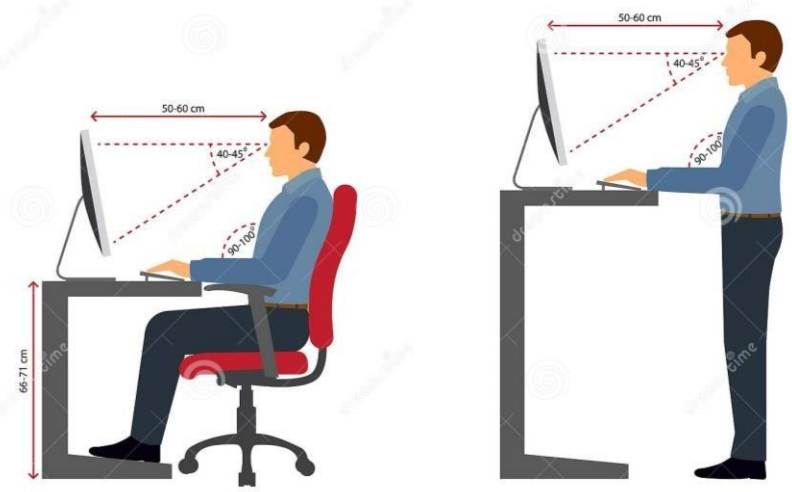
Here are my 10 advices for the Desk Job Workers

1. Watch your POSTURE, always work in a GOOD posture….

Avoid working in improper posture such as slouching your back, kneesdangling the chair, twisting, bending, crossing legs. Prolong working in an awkward posture leads to muscle overexertion and ultimately fatigue. Which gives you PAIN. Faulty posture affects your neck,shoulders, back, leg, leading to musculoskeletal disorders. Hence,having a correct sitting posture is necessary. Sit on a well-designed adjustable chair, with your back supported, feet resting on ground andhand supported, hip knee at right angles, with neck in neutral.



2. Adjust your workstation to you, don't adjust yourself for the workstation.



As shown above, the desktop screen must be 18-30 inches away from your eyes. With brightness and contrast controls, keyboard must be sloped at 10°-15° properly placed such that the wrist and elbow rest parallel to floor, arms closer to body elbows at 90°. Mouse at same level with easy reach. Also similar for standing, just the desk height to be adjusted.

3. Have Minibreaks!

Don't forget to take frequent 5-10 min breaks in those long hours of working, to avoid accumulation of fatigue.

4. Stretch, stretch and stretch!

In between the work perform stretches to ease out the muscles working for so long in same position.

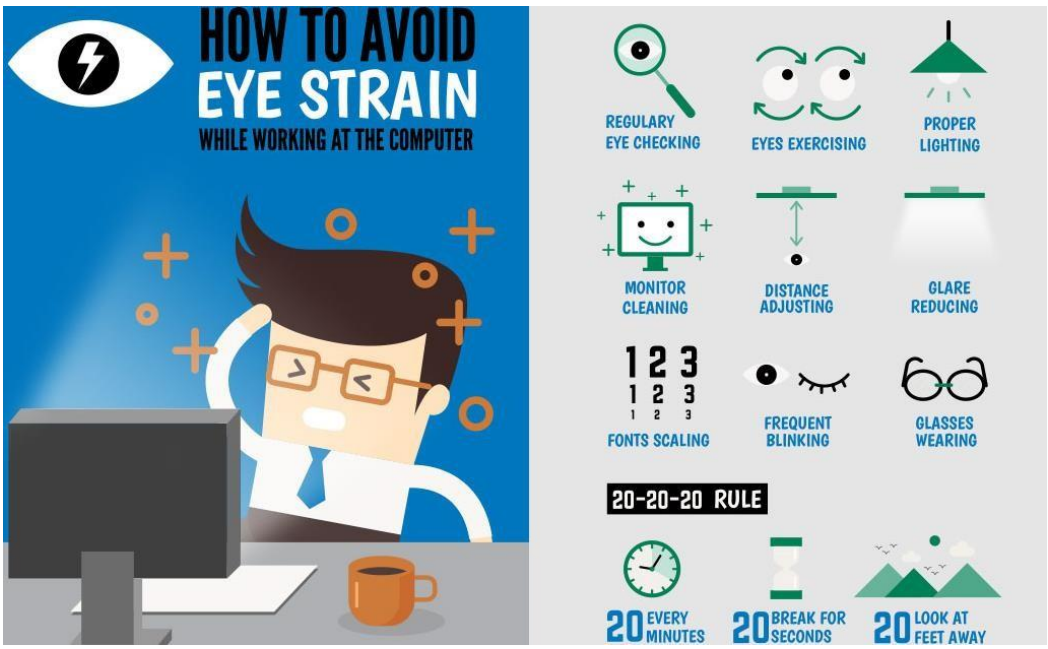
5. Take good care of your back

Having a good cushioned support to the arches of your back is very important. Good

lumbar support, seat height, equal weight on both sides while sitting, feet supported are necessary to prevent pain.

6. **Avoid straining your eyes**

Adjust the lighting, anti-glare screens to be used. 20/20 rule to be followed and do these exercises.

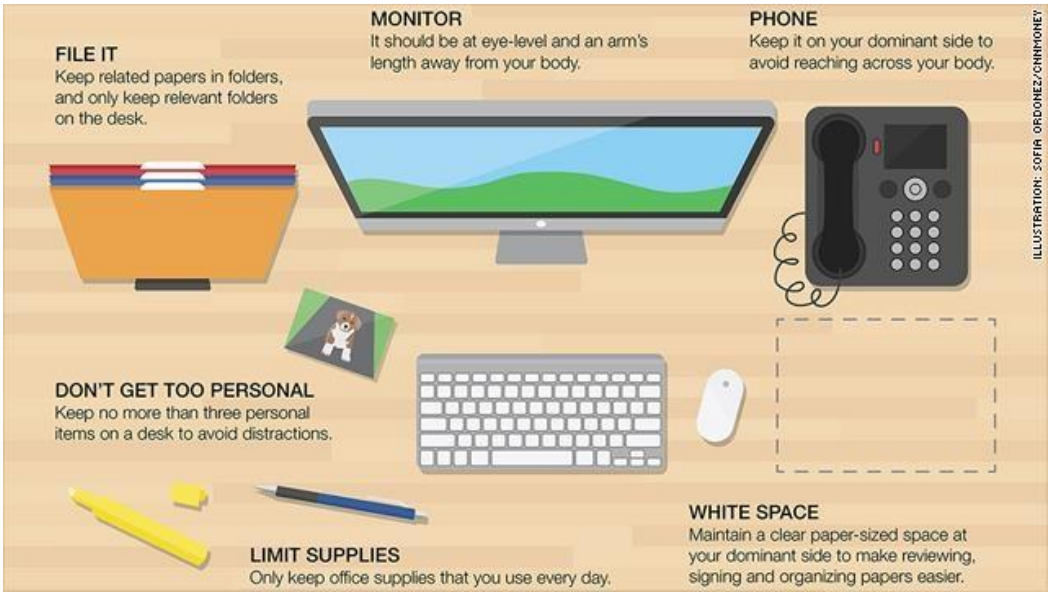


7. **Reduce excessive repetitions**

Prevent repetitive works, pace all the task so that you do not land up with strain.

8. Keep your accessories in easy reach

Organize your workstation with all the necessary things kept in easyreach so that extra energy is not spent on such task.



9. Hydrate yourselves!

Hydrating is important for improving the overall body functioning,regulating physiological functions, preventing cramps, etc

10. Lastly, Exercise is all you have!

Involve in some fitness activities like gym, sports, swimming, yoga, meditation etc. to reduce work stress and improve overall fitness.

Images Courtesy: Google

About the author:

Dr. Sidhi Bhosale holds a Master's Degree in Physiotherapy from NMIMS University, Mumbai. A licensed physiotherapist, she is currently consultant at IWSA's community health care centre and possess technical skills to enhance mobility, prevent future injuries and expedite recovery. Her professional credentials include certification in Orthopaedic Manual Therapy, Mat Pilates instruction amongst other specializations in the field of physiotherapy. She has three research publications in the field. She works with compassion and strong commitment towards exceptional patient care.

Gaganyaan - India's big dream of Manned Space Travel

(An Interactive article on ISRO Program to send humans to Space)

Sreenatha Ratnakumar,
Scientist, Indian Space Science Data Centre,
ISTRAC / ISRO, Bengaluru

All children are sitting outside class room for an open house quiz by science teacher. National Space Day is celebrated on August 23 to commemorate the successful landing of the India's Space craft called Vikram near the south pole of the moon. Popular programs are organized to inspire the young kids to pursue careers in space. This quiz is organized especially on space science. The teacher asked the question,

"Who is the first Astronaut of India?"

Pin drop silence and many were thinking, what to say?

Teacher gives hint saying He was test pilot from Indian Air force etc..

One girl child stood up and answered clearly, "Wing Commander Captain Rakesh Sharma"!!

Wing Commander Rakesh Sharma (Now and During Flight)

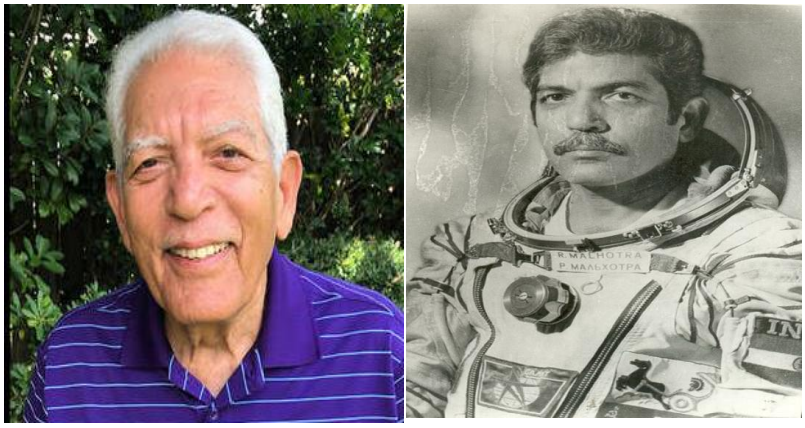
Teacher declared the answer was right and all students gave big round of applause, she was very happy and proud after teacher gave a chocolate for the correct answer.

The next question is on, who was the astronaut along with Rakesh Sharma trained to go to space?

Again, all students got deep into their memory to find out…

Again same girl, stood up and said, "Madam, He is Mr.Ravish Malhotra" am I right madam?

The teacher was really moved and came forward to hug the girl and gave another chocolate for the perfect answer. The girl said few historical references with the permission of the teacher.



Astronaut Ravish Malhotra (Now and During Training)

It was when Mrs. Indira Gandhi asked Rakesh Sharma on-board space station, "Uper se Hindustan kaisa dikhta hai (How does Hindustan look from space?)". Rakesh Sharma replied, "Saare jahan se achcha

Hindustan hamara (From everywhere Hindustan looks better)". After listening to this, all children clapped for the girl and teacher wrapped up the quiz.

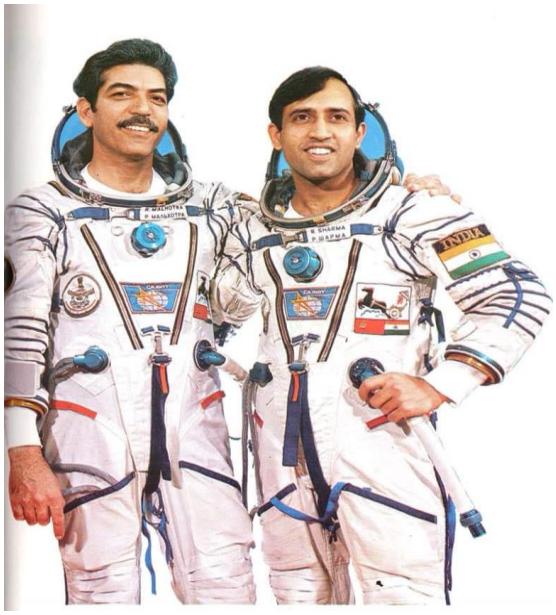
The girl reached home by school bus and was waiting at the entrance of her house for her mother to return from office. She opened the two chocolates she won during the quiz competition and she wanted to surprise her mother by giving one to her. Mother comes in car and the girl runs to hug her and gives her a chocolate.

"Wow baby!", Mother said.

"Mom, do you know, one for Rakesh Sharma and one for Ravish Malhotra!!", uttered the girl. Finally this is for you mom and other one is for me. The mother understood by seeing the joy of the girl, that she has won these as prize during quiz competition and a bit worried that she will pose her so many questions now.

"Mom, can you explain why after Rakesh Sharma, no one travelled to space from India?"

As expected!, mother who works in the project of India's Manned mission, said, "Baby, I will tell you".



When I joined the Space program, this was the question I too had in my mind and the following answer I got from my senior scientists. India started its space program very modestly with the vision of Vikram Sarabhai, who is the father of India's Space Program. Though he was very much aware of the various space activities of the United States of America and Soviet Union of Russia, his dream was to uplift the society using space technology and hence he started a special program called Satellite Instructional Television Experiment (SITE), which was a very successful program across India in selected villages. Today, we have in every household a television because of the initiative taken by him at that time. He wanted to have a very strong self-reliant space program for making Rockets and Spacecrafts within India and also launch, operate and reach the various applications to the common man. Over the last five decades of Indian Independence, India became self-reliant in the field of building rockets like PSLV, GSLV and we have launch facility from Sriharikota in Andhra Pradesh. Also, we are building the satellites both for earth observations and communication within India and operationalized them very successfully. India became equally good with the rest of the nations doing space business. However, in the field of sending humans to space, India did not flag off in the beginning due the priorities of space applications for the common man and uplifting our society. Once India proved its capabilities in the field of sending satellites to Moon, Mars and building heavy lift off vehicles, our focus started on the mission to send Man into space called "MANAV or Human Space Program".

"Oh, mom then, Rakesh Sharma and others are not part of ISRO at that time?"

"Ya baby, you are right!" Russia's Cooperation helped India to see our astronaut in Space. From that time onwards, there was a thought process to make India's own Manned Program and now we have got the program as "GAGANYAAN".

"Mom, I could answer important questions related to your work!!" said the girl.

"Very good, baby!, you are always intelligent".

“Mom, can you tell me what is the program which Modiji announced at Red Fort; I saw it on TV!” said the girl.

“Yes my baby, I will tell you”.

India had dreams of sending man to space for the last two decades. The cumulative efforts of all of us was announced by the PM at Red Fort during the Independence Day speech. Not only ISRO, there are many other agencies working on this. This is a National Program and hence agencies like the IAF - Indian Air Force, IAM - the Indian Aerospace Medicine, DRDO - the Defence Research Development Organization, their labs and many more private and other industries in India are helping us. The astronaut selection, do you know that recently the astronauts are announced. They are Group Captain Prasanth, Ajit Krishnan, Angad Prata and Subhanshu Shukla. Do you know, they are the test pilots from Indian Air Force? Very recently it was announced that these astronauts are going to fly to ISS.

“Mom, why only from Air Force?”, the girl asked.

Yes! My baby, I will tell you.

This is for the first time India is going to have full-fledged, fool proof and a safe mission to carry humans to space and bring them back successfully to earth. For this, you need to have only test pilots with more than 300 hours of flying experience and many other fitness requirements. Hence it is preferred to have test pilots in the beginning of the missions.

Depending on the status of the progress and success, many other physically fit individuals can aspire to become Trainee astronauts in future. Do you know, so far more than 560 astronauts have travelled to space from all over the world?

“Mom that’s really great! When can we see our astronauts again travelling to space?”

“Yes baby, that’s being done…Work is in progress!”

Travelling to space is not an easy thing to do; lot more technologies have to be developed and tested and all these technologies have to be human rated assuring safety for the life.

In this regard, we are progressing very well. Recently we have tested many technologies like Space Capsule Recovery launches, Pad Abort Tests, Gaganyaan Test Vehicles etc.

If you see the challenges involved in the Gaganyaan, there are many which our scientists are overcoming successfully and one day soon we will achieve the feat of an Indian in Space launched from Indian soil. Just to give you the kind of decision making in Gaganyaan program, the launch of Test vehicle etc., you can see it in YouTube live streaming. (https://www.isro.gov.in/Gaganyaan_TV-D1_Livestreaming.html).

This is an example of the technological challenge and the decision-making capabilities. In the beginning a particular launch was scheduled in the morning around 8 am. Due to some weather-related issues it got postponed. Later when official launch count down started, the mission went to automatic hold due to insufficient ignition pressure in the first stage. Remember the Liquid engine first stage was being launched for the first time. This hold could have made this mission postponed to many days ahead. However, Dr. Somanth had reviewed it carefully and took a bold decision of re-pressuring the ignition bottles and gave clearance for the launch considering the various aspects of the mission. His bold decision has made this mission possible and successful. There are many such test vehicles planned and finally our human rated vehicle will fly off from Sriharikota in the coming years. Along with this, India has ambitious plans of building our own space station called 'Bharatiya Antariksh Station (BAS)' and many such missions to be launched from our soil.

"Let us look forward to this baby!"

"Yes, mom"

"All the very best."

Reference: *ISRO Web and other public information on internet.*
(https://www.isro.gov.in/Gaganyaan_TV-D1_Mission.html)

About the Author:

Sreenatha Ratnakumar is an ISRO Scientist who established a new facility at Byalalu, near Bangalore for the Chandrayaan-1 project, the Indian Deep Space Network, lead agency of ISRO for all planetary mission tracking, command and control. He has played a major role in Data Ingest, Process, Archive and Dissemination of **Chandrayaan -1, 2, 3, Mars Orbiter Mission, Megha Tropiques, Youthsat** and currently working on Data Archive preparation for the ongoing **Astrosat** ground systems for payload configuration, Data reception and processing in Indian Space Science Data Centre (ISSDC). He has also worked as facilitator for human rating certification and ground systems for future Gaganyaan Mission. He is the identified focal person for SPADEX Mission docking experiment of ISRO. He played an important role in **Chandrayaan-3** Lander in Data access and display of Lander. He was a member of **Rover path planning** and contributed for successful 100+m roving of the rover on Moon Surface. At present he has the responsibility of Data processing, Proposal handling and allocation for the ongoing **Aditya L-1** mission and Time allocation member for **EXPOSAT**.

He is interested in communicating the benefits of Science and Technology to the public through various platforms as Member of ATL of AIM and holds public outreach group called **CREATIVE TEAM** for the innovative talks covering non-textual, non-syllabus and non-academic knowledge. He has edited 4 books in Kannada and writes articles for science communication. His recent book **"Bahyakasha Yaana"** is very well received by the science readers and available in Amazon. He is the active member of KSTA and Founder member of Karnataka Physics Association – KPA.

Unsung Heroine: Gladys West and her Efforts behind GPS

GPS (Global Positioning System) is a heavily used technology, in everyday life as well as in many specialised fields such as defence, research etc. GPS, originally **Navstar GPS**, is a satellite-based navigation system owned by the US government and operated by the US space force. It is one of the global navigation satellite systems (GNSS) that provide geolocation and time information to a receiver anywhere on or near the Earth relying on the signals from a constellation of 31 satellites. Like many of the vital technologies in use today, GPS also was an offshoot of American Cold War competition with the Soviet Union after the launch of Sputnik. This technology turned 50 years old in September 2023 with the 'golden' anniversary of the US Air Force being given approval in 1973 to develop the Navstar GPS.

So, who invented GPS is an often-asked question. Many people and many agencies directly and indirectly contributed to the evolution of GPS to the present form. In late 1950s and early1960s an ingenious system was developed for tracking Sputnik's location by analyzing slight variations in the microwave signals transmitted from the satellite. This was reversed to develop a satellite-based navigation system in earth, a predecessor of GPS called TRANSIT. Success of this system depended on accurate timing, which was achieved by fitting each satellite with an incredibly accurate 'atomic clock'. In 2003, physicist **Dr Ivan Getting**, who worked on the radio transmissions from satellite network in TRANSIT and engineer **Col.**

Bradford Parkinson, who led the drive to get the technology of orbiting atomic clocks to the orbit were awarded the prestigious Draper Prize by the US National Academy of Engineering for making GPS a reality. However**, Dr Roger Easton** from Naval Research Laboratory had masterminded the radical concept of a network of orbiting atomic clocks, which keep time using more stable quantum effects. He was recognized for his contribution in developing GPS much later in 2010, to join the other two in the US National Inventors Hall of Fame.

The story does not end there. GPS is a technology designed to locate the receiver's position spatially, based on an ultra-precise measurement of time. But time gets distorted by earth's gravitational field and while measuring microseconds to determine the exact location using GPS, the gravitational variations do make a massive difference. Earth not being a perfect sphere and its gravitational field being distorted by many of its distinguishing features such as tides, mountain ranges, ocean trenches etc. makes the calculation of the gravitational field and the resulting time distortion in each location very complex. Thus, knowledge about the true shape of earth's gravity is also essential for the success of GPS. It was the pioneering work of Mathematician **Gladys West** on "satellite geodesy" which had solved this problem, but her contribution remained unnoticed and unacknowledged until recently. West is often called one of history's "hidden figures", like many individuals, often Black women, whose insightful contributions to science went unrecognized in their time because of their race and gender. In 2018, 20 years after her retirement and 15 years after honouring Dr Ivan Getting and Col Bradford Parkinson as inventors of GPS, Dr. West was formally recognized for her contribution to the development of GPS by the Virginia General Assembly. Hers is an inspiring story of boundless quest for learning, determination, and hard work.

Gladys West (Gladys Mae Brown), an African American, was born on October 27, 1930, in rural Virginia, where her parents owned a small farm in an area populated mostly by sharecroppers. Growing up, when not in school, she spent much of her time helping to harvest crops on the family farm. In her community, the only clear options for a young Black girl's future were continuing to work on a farm or working at a tobacco-processing plant. But from an early age she had an ambition to go beyond farm or factory work. She started her elementary education in Red school, where the group of black students were taught separately in one room. Being one of the bright students, she soon realized that education was the key for progress. Her parents tried to save some money to send her to college, but were finding it difficult. But she was determined to do everything possible to go for higher education, and with hard work she became valedictorian of her high-school graduating class and received a full scholarship to Virginia State College. With the help of a part time job to manage her other expenses, she earned a degree in Mathematics in 1952 and Master's degree in Mathematics in 1955. In the University, she was one of only a handful of women studying mathematics. She accepted a position at the Naval Surface Warfare Center in Dahlgren, Virginia in 1956. Military institutions like the Dahlgren center and NASA offered more opportunity to Black women to excel in intellectually challenging positions than most private sector enterprises did during that period—and West took full advantage of the opportunity. Her job was to analyse data from satellites. She was only the fourth black employee and the second black woman the institution had ever hired. Later she married one among those black employees, another mathematician, Ira West.

Dr. Gladys West Honouring at the Pentagon in Washington, DC, December

The office in the Naval Laboratory was not racially segregated, and her white colleagues were friendly and respectful. However, a fierce civil rights battle was going on outside, especially in Southern region, partly focusing on segregation in restaurants, transport etc. Gladys West and her husband did support peaceful protest and many of their college friends were deeply involved. But instead of joining the protest, Gladys West became determined to commit herself more towards her work. Her logic was that white people were used to seeing blacks working only at home and in yards, so this was an opportunity to show what black people were really capable of. She felt that her capability to successfully carry out the projects would help to remove the stigma black people faced.

Admired by her colleagues for her skill in calculating complex mathematical equations by hand, she excelled in programming for computers also. She worked on an award-winning program Naval Ordinance Research Calculator (NORC), to determine the movements of Pluto in relation to Neptune. Later, in 1978 West became project manager of SEASAT, an experimental U.S. Ocean surveillance satellite designed to provide data on a wide array of oceanographic conditions and features- wave height, water temperature, currents, winds, icebergs, coastal characteristics etc. Out of West's work on SEASAT came GEOSAT, a satellite programmed to create computer models of Earth's surface. By teaching a computer to account for gravity, tides, and other forces that act on Earth's surface, West and her team created a program that could precisely calculate the orbits of satellites. These calculations made it possible to determine a model for the exact shape of Earth, called a geoid. It is this model, and later its updates, that allows the GPS system to make accurate calculations of any place on Earth.

While working, she also attended evening classes and obtained a Master's degree in Public Administration from the University of Oklahoma. After working for more than four decades, she retired in 1998 at the age of 68. Terrified at the thought of not working, she enrolled for PhD in Public Administration and in spite of a stroke, obtained her PhD from Virginia Tech University at the age of 70!

All these whiles, she was unaware of the importance and impact of her own work. In her own words, while working the focus was only on perfection. Many years after her retirement, in 2010s, her conversation about her work with her sorority sisters for an event brought out her important contribution. In 2018, she was the recipient of the Air Force Space and Missile Pioneers Award, and was inducted into their Hall of Fame (the only black woman to get this honor). That same year she was named one of the British Broadcasting Corporation's 100 Women of 2018, a list designed to honour inspiring women worldwide. After decades of obscurity, the pendulum of celebrity finally swung in the other direction and so many awards

and recognitions came to her. Prince Philip Medal (2021) from Royal Academy of Engineering, Lifetime Achievement Award for her contributions to GPS during the 25th annual Webby Awards (2021), naming as a Dominion Energy Strong Men & Women and a Senate Resolution, first 'Freedom of the Seas Exploration and Innovation' Award from the National Museum of the Surface Navy (2023) etc. are some of these honors.

Dr. Gladys West lives in Virginia with her husband Ira West. Her heartwarming memoir, "It Began with A Dream", written by Dr. West and M. H. Jackson, was released in 2020. Her rise against all odds through sheer determination and hard work, in spite of being a woman and that too a black woman, makes her a true legend, and an inspiration to the future generations.

References: *https://www.britannica.com/biography/Gladys-West*
https://www.theguardian.com/society/2020/nov/19/gladys-west-the-hidden-figure-who-helped-invent-gps
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Women Achievers

Transoceanic Expedition by Indian Navy's Women Officers Lt Cdr Dilna K and Lt Cdr Roopa

Two women officers of the Indian Navy, Lt Cdr Dilna K and Lt Cdr Roopa returned triumphant to Goa on 21 Apr 24 after a historic transoceanic expedition of nearly two months duration on the Indian Naval Sailing Vessel (INSV) Tarini. Their exceptional journey marks a historic milestone as they become the first from India to accomplish such a feat. It also showcases the Indian Navy's commitment towards promoting gender equality and empowering women in the maritime domain

The expedition was Flagged off from Goa by renowned circumnavigator and their mentor Cdr Abhilash Tomy (Retd) on 28 Feb 24. After 22 days of navigating through the unpredictable elements of the Indian Ocean, they arrived at Port Louis, Mauritius, on 21 Mar 24. This historic moment was celebrated with a series of events where the officers had the privilege of interacting with government officials from the Mauritius Coast Guard and the Indian High Commission, strengthening bilateral ties and fostering goodwill between the two nations.

Following a hectic schedule at Port Louis, Lt Cdr Dilna K and Lt Cdr embarked on their return journey to Goa on 30 Mar 24. They faced continuous challenges posed by heavy winds,

adverse sea states, and rough seas. Their indomitable spirit and steadfast resolve propelled them forward, guiding INSV Tarini safely back to Goa on 21 Apr 24.
Undeterred by the challenges encountered during their expedition, the officers demonstrated exceptional seamanship and resilience, embodying the spirit of adventure and exploration. This remarkable achievement will not only inspire but also pave way for future generations of personnel especially women in the Indian Navy to volunteer for challenging maritime adventure activities. The two officers are now preparing for their next expedition of **a circumnavigation of the globe (Sagar Parikrama - IV expedition)** in INSV Tarini scheduled to commence in September this year.
https://pib.gov.in/PressReleaseIframePage.aspx?PRID=2018460

Jahnavi Phalkey – Infosys Prize 2024

Jahnavi Phalhe, Founding Director, Science Gallery Bengaluru was awarded the Infosys Prize 2023 in Humanities for her brilliant and granular insights into the individual, institutional, and material histories of scientific research in modern India. Her book *The Atomic State* (Permanent Black, 2013) and many articles insightfully braid the global history of science, especially nuclear science, with the anthropology of the postcolonial state to illuminate rich and textured histories of the everyday lives of science in India.

Dr. Phalkey did her B.A. at Elphinstone College and got her M.A. from Bombay University with a gold medal (1995). After an M.Sc. in the Politics of Asia and Africa (1996) from the School of Oriental and African Studies, University of London, she completed her Ph.D. in the History of Science and Technology from the Georgia Institute of Technology (2007). Jahnavi Phalkey was formerly Senior Lecturer in History of Science and Technology at King's College London (2011 – 2018) and a Fellow at the Wissenschafts kolleg zu Berlin (2013-14) and has held numerous other visiting appointments and fellowships. Her major work is the celebrated book, *Atomic State: Big Science in Twentieth Century India Science, History, and Modern India* (2013). She is also the co-editor of *Key Concepts in Modern Indian Studies* (2015) and the director of the documentary film *Cyclotron* (2020).

The jury citation says that her book *The Atomic State: Big Science in Twentieth Century India* (Permanent Black, 2013), on the rise of nuclear science research in India, tells a deeply researched, methodologically innovative, and passionate story of institutions, individuals, and the state. It highlights how people, instruments, and ideas across local, national and transnational flows developed the edifice of scientific research in twentieth-century science in postcolonial countries like India. After the second World War which ended with the use of nuclear weapon, the scale, budgets and priorities of scientific research changed globally and she examines India's nuclear physics program in this background. The study brings together individual narratives of ambition, effort, failure, and resilience with the institutional structures and state policy in which they are necessarily embedded. Her brilliant anthropology of science has emphasized the need to see the history of science as much a history of scientific ideas,

as one of power, practice, and the nation-state. In short, she brings out that science does not happen in isolation.

As the Founding Director of Science Gallery Bengaluru, she has organized creative exhibitions and activities there, with a vision of explaining to the wider public how complex science works. This vision sees the dissemination of science and the humanities together in order to critically root the histories and contemporary everyday practice of science and rationality in empirical practice and theoretical rigor. At the science gallery, Phalkey wants to create a welcoming space for young people to "just hang out", away from the absurdly competitive world outside, and be fascinated with whatever catches their curiosity—be it science or arts. She sees it as a contribution towards raising a generation of open and inventive minds across disciplines in India.
https://www.infosysprize.org/laureates/2023/jahnavi-phalkey-info.pdf
https://bengaluru.sciencegallery.com/what-we-do

IWSA Members Honoured

Dr. Susan Eapen – Participant in the 68th session of the Commission on the Status of Women, organised by UN Women.

Dr. Susan Eapen, Ex President and Trustee of IWSA was selected as part of a 15-member delegation of women with varied backgrounds for participating in the 68th session of the Commission on the Status of Women organized by UN Women from March 11th to 22nd 2024 in New York, during the World Women's Day Celebrations. It was indeed a proud moment for IWSA. The 15 members represented Indian Development Foundation (IDF), which has been given consultant status by UN. IDF is an NGO, which works primarily in the health sector, and in extending education to the handicapped, the poor and the marginalized children in the rural areas, tribal villages and urban slums.

Dr. Susan Eapen had a long and very successful career as a scientist in the field of plant biotechnology, in BARC. She is one of the pioneers in transgenic plant research, and was the President of IWSA. She was included by Stanford University in the list of top-ranking scientists in the world in the field of Plant Biology and Botany. She was invited to the UN Women's Day Celebrations event (March 11 - 22, 2024), World Women's Meet, at the UN HQ in New York by Her Excellency Ruchira Kamboj, the permanent ambassador to UN. She

was also invited by UN Women to speak about STEM education for girls in India. She shares her experience below.

UN Women – 68th Session on Status of Women at UN Headquarters, New York.

Dr. Susan Eapen

Last week of December 2023, I got an invitation from UN Women to attend the 68th session on Status of Women (CSW – 68) to be held at the UN Headquarters at New York from March 11 – 22, 2024. It took me some time to decide whether to go or not due to various personal reasons and my not having a US visa. I was nominated by Indian Development foundation.

When I was in school, I had taken part in United Nations' general knowledge examinations, scored very high marks and it was my desire to attend programs at UN; but it had never materialized. I was thrilled when I got this invitation and thought of giving a try for US visa, although there was a 2-year waiting period. My travel agents told me "Madam, this is next to impossible to get a visa in one month and travel to US in March 2024". I was determined and so thought of giving a try and registered at the visa site and uploaded my invitation papers, under special quota. Interview dates for biometrics and Counsular interview in Chennai on 7th and 28th February were granted. After getting Visa, I immediately booked the ticket by Emirates, arranged travel insurance, foreign exchange etc and reached New York on 8th March, Women's Day. My old classmate Dr. Nandini picked me up at NY airport and dropped me at Elizabeth Veedon's apartment which was adjacent to Central Park in Manhattan. Elizabeth helped me get the visitor's pass and guided me to travel by train, take a bus etc. to go to UN Headquarters situated on 17 acres of land in Manhattan,New York besides East river.

The UN complex is an architectural marvel and hosts General Assembly Hall with a seating capacity of 1800, Secretariat, Chambers of Economic and Social (ECOSOC) Trusteeship, Dag Hammarjkold library and several meeting halls. The front of the building was adorned by beautiful flags of the member states which swayed in the wind. Iconic structures like a Knotted gun - called Non -Violence, a Globe and others adorned the front and the hall of the building.

UN Women is a special organization of UN with the objective of delivering programs, policies and standards that uphold women's rights and ensures that every woman and girl gets a chance to live their full potential. The different fields of UN Women's activities include ending violence against women, encouraging women's leadership and political participation, ending poverty of women, economic empowerment and bringing peace and security to a world driven by war and violent conflicts.

The sessions were the UN's largest annual general gathering of women from all over the world and the meetings which spanned two weeks had the theme "Accelerating the achievement of gender equality of all women and girls by addressing poverty and strengthening Institutions and financing with a gender perspective". It brought together world leaders including two heads of States, three Vice Presidents, over 100 ministers and about 4800 participants, dressed in colourful national costumes from about 150 countries. On the side lines of CSW-68, approximately 300 side events were organized by UN member states, intergovernmental organizations and UN entities. Several parallel events were organized by civil societies, youth organizations and NGOs in nearby venues which were open to the public.

I could attend one main event, more than 30 side events and about 4 parallel events. Participation of young people including young girls and adolescent people to exchange

experiences, how to alleviate poverty and develop economic empowerment was really beneficial. UNDP, ITU, UNESCO, World Bank, Ford Foundation etc. collaborated with different countries such as UK, Israel, Egypt, India, Germany, Indonasia, Chili, Mexico, Japan, Kenya etc with topics ranging from – ending violence, improving environment, financial improvement of women, breaking down gender barriers, women and cyber violence etc. In a session hosted by Israel, the experience by an Israeli hostage of 7/10 brought tears in everybodys' eyes. Wars in Ukraine, Syria and parts of Africa resulted in rape of thousands of women leading to mental agony and suicides.

India hosted 3 side events under the leadership of Madam Ruchira Kamboj, India's ambassador to UN and I had the privilege of taking part in a panel discussion on 19th March on "Women led development: challenges and leadership". I was asked to speak on Science, Technology, Engineering and Mathematics (STEM) Education for girls in India and how to bridge the gender gap.

Panel Discussion- my presentation on STEM education for girls in India

Science and Technology are moving at a rapid pace, be it Artificial Intelligence (AI), personalized medicine, space technology or genome editing. India has a large proportion of young girls, who need special training in Science, Technology, Engineering and Mathematics - in short STEM to take the nation forward in the 21st century.

Government of India is revamping our educational system by introducing STEM at an early age under NITI Ayog and Atal Mission. Girls in general are not encouraged to take up STEM subjects because of the traditional mind set, resulting in gender gap in STEM skills.

What are some of the recommendations to address the gender gap in STEM?

Young girls are encouraged or specifically coached to take STEM subjects, so that a generation of highly skilled and empowered women are developed, who will play a pivotal role in shaping the future of the country and the world. It will give girls equal opportunities to excel in fields traditionally occupied by men. By giving girls strong foundation in STEM, we are equipping them with problem solving and critical thinking skills, fostering creativity and innovation. STEM education will prepare the girls to meet the demand in a rapidly evolving job market, where proficiency in these areas is highly sought after.

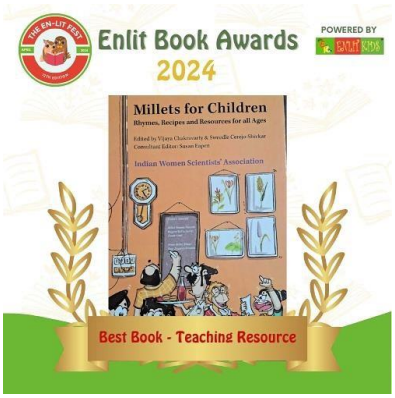
Now how do we achieve this?

1. Organize STEM clubs specifically for girls after school hours. Make them do hands on experiments.
2. Organize lectures in STEM fields by scientists and technologists working in the field on different topics to inculcate scientific temper among them.
3. Take the girls to neighbourhood factories with a retired professional female mentor to have practical experience.
4. Develop mentorship programs for young girls. Pair girls with a female STEM professional, who will teach, support and encourage them to take up STEM careers.
5. Organize STEM programs and competitions such as science quiz, science fairs, science dramas, robotic competitions, science exhibitions, project writing etc. Awards to be given away by famous women scientists.
6. Career awareness sessions tol be conducted by women in STEM fields who will speak about their personal career journeys and opportunities available in STEM fields.
7. Give scholarships to financially backward girls pursuing STEM career at undergraduate, post graduate and PhD levels.
8. Conduct meetings with parents and grandparents to make them aware of the opportunities and to encourage and support daughters/ granddaughters, both at home and at school.

9. Initiate coding and robotic clubs for girls to learn programming languages / building robots and develop problem solving skills.
10. Work with teachers and train them, so that they can impart STEM training to girls and ignite scientific temper in them.
Our girls in India are doing extremely well in STEM fields with 49% of students being girls in STEM. In STEM career, 29% are girls. I am proud to say that today the top positions in our space programs - mission to Moon- Chandrayaan, mission to Mars- Mangalyaan, and Sun mission - Aditya L1 are occupied by women. Let us develop critical thinking, problem solving skills, high creativity quotient, innovation, collaboration and team spirit in our girls to develop a better India and a better world.
At the end of the meetings, 54 recommendations were penned down by UN Women and submitted. It included special programs for achieving gender equality, empowerment of all women and girls, access to economic resources including credit, land ownership, inheritance, quality education, health, eradication of poverty, safe drinking water, prevention of environmental degradation, war crimes against women; women's leadership, for helping HIV - AIDS problems in South Africa etc.
The next session of CSW - 69 to be held in New York next year will be the 30th conclave after Beijing Platform and will be a major landmark in changing the world by women's participation. I wish Indian Women Scientists' Association also take steps to register with UN Women and participate.

Enlit Book Award 2024 for the book published by IWSA

"Millets for Children-Rhymes, Recipes and Resources for all ages" published by IWSA during the Golden Jubilee Year **received Enlit Book Award 2024 in the category** Best Teaching Resource. Editors are Ms Vijaya Chakravarthy, Dr. Sweedle Cerejo-Shivkar and Dr. Susan Eapen. The award was handed over in a function on an Award Ceremony at The En-Lit Fest 2024 on Sunday, April 21.



Invtation to IWSA Members for various events

Dr. Shyamala Bharadwaj
i. Dr. Shyamala Bharadwaj was invited as Chief Guest at the **celebration of International Day of Women and Girls in Science** at KLE Society's Science and Commerce College, Kalamboli on **12th February 2024.** The International Day of Women and Girls in Science serves as a global acknowledgement of the remarkable achievements of women in the field

of Science, Technology, Engineering and Mathematics (STEM). Another IWSA member, Dr. Deepa Khushalani of TIFR was the Guest of Honour at this celebration. Both Dr. Shyamala Bharadwaj and Dr. Deepa Khushalani gave motivational talks about scientific achievements of women. The talks were followed by an interaction session with the students at the college. Dr. Shyamala Bharadwaj and Dr. Deepa Khushalani were requested to evaluate the science exhibition posters displayed by the students and gave away prizes to encourage the students.

2. Dr. Shyamala Bharadwaj was invited to deliver a lecture on "**Breaking Barriers: A Women Scientist's Journey in STEM**" on 7th March 2024 at the KET's V.G. Vaze College of Arts, Science and Commerce (Autonomous), Mumbai as part of the **celebration of International Women's Day** by the college.

b. Dr. Lalitha Dhareshwar: Dr. Lalitha Dhareshwar was invited as the guest of Honour to deliver the inaugural address at the IDE BOOT CAMP at Pillai college of Engineering at Rasayani, titled "**Innovation, Design and Entrepreneurship Bootcamp for Student Innovators and Teachers of School**". This camp was organized under AICTE (All India Council of Technical Education).

Obituary

Prof. Bimla Buti – A Legend

On 24th February 2024, we lost a Physics legend, Prof. Bimla Buti. Born in Lahore in 1933, her family were refugees in Delhi, where Prof. Buti got her education at the University of Delhi. Selected for a government of India fellowship, Prof. Buti went to the University of Chicago, where she earned her doctorate in Plasma Physics under the supervision of the Nobel Laureate Prof. S. Chandrasekhar. She spent most of her professional career at the Physical Research Lab in Ahmedabad, which she joined on a special invitation from Prof. Vikram Sarabhai. She was a pioneer in the field of Plasma Physics and was the first woman in Physics to be a fellow of the Indian National Science Academy (INSA). Many accolades followed, including the Vainu Bappu Medal in 1994.

In 1986, Prof. Abdus Salaam asked Prof. Buti to initiate and direct the Joint ICTP-IAEA program in Plasma Physics at Trieste. Its main aim was to provide the best possible training in modern aspects of plasma physics, focusing on maturing scientists from all over the world with emphasis on developing countries. She successfully directed this program until 2003. In her own words: "During the couple of years before my superannuation, I started feeling that along with my research work, I must do something for society." With her retirement benefits, she founded the Buti Foundation (www.butifoundation.org) in 2003 for education in general and science education in particular. To meet these objectives, the Foundation has initiated numerous projects, including:

- Institution of awards for students, young scientists, and not so young scientists through the Plasma Science Society of India, Indian Physics Association, Physical Research Laboratory, Indian Institutes of Technology (Delhi, Madras, Indore), and National Academy of Sciences, India.
- Setting up Centres for Science and Society at Ahmedabad, Bareilly, Delhi, and Indore with aims to increase interaction between scientists and non-scientists, natural scientists and social scientists, and attract students (especially girls) to science careers.

The Indian Physics Association honoured Prof. Buti with a Lifetime Achievement Award at the "Pressing for Progress" conference in Hyderabad in September 2019. She was a true inspiration to women physicists and a wonderful role model. She will be truly missed.

Dr. Mrs. Rohini Iyer

Eminent Scientist Dr Mrs Rohini Iyer passed away on 24 April 2024 at Thazhava. A Scientist to the core, her wish was to bury her body to become a part of soil amidst trees, shrubs. With a passion to deliver technologies at grass root level, she established as managing partner, Navashakti Trust at Thazhava, Kerala along with her husband, a well-known Scientist Dr R D Iyer, Former Head, Crop Improvement CPCRI. Along with knowledge about intercropping, the Iyers also advertised cultivation of mushroom, which needs minimal resources to grow and is hugely beneficial to the farmers' family as a nutrition supplement. Navashakti Trust has led about 80 courses in agricultural development in Thazhava. Mushroom cultivation, production of value-added products and methods of intercropping are some examples of their courses. Through the trust activities, they wanted to showcase farming as a noble occupation, which can be as stable and profitable as any other occupation if innovative techniques are used. As a person with, her demise of Dr. Rohini Iyer, with such a huge commitment and passion towards agriculture, is a loss to scientific and arming community.

Dr. Rohini Iyer, niece of Dr. S. Swaminathan, was a talented singer, carnatic vocalist and mother of famous singer Chitra Iyer. She was an IWSA member. We express our heartfelt condolences to the bereaved family.

IWSA- BRNS Popular Science Lectures in Colleges

Catholicate College, Kerala,12-03-2024

SIWS College, Wadala, Mumbai 6-3-2024

At VIVA College, Virar on 9-3-2024 and on 12-03-2024

At Sharada Kurup College, Mumbai on 2-3-2024

At Somaiyya College on 29-02-2024 At Sophia College on 28-02-2024

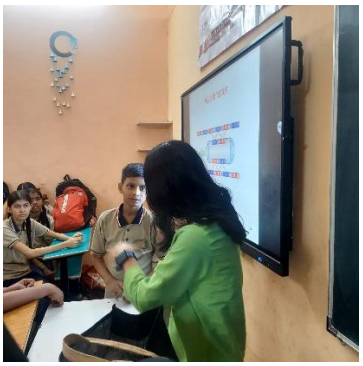
IWSA-- BRNS Popular Science Lectures in Schools


Adarsh School, Dombivli on 28-02-2024

Green Field School, Diva on 14-03-2024

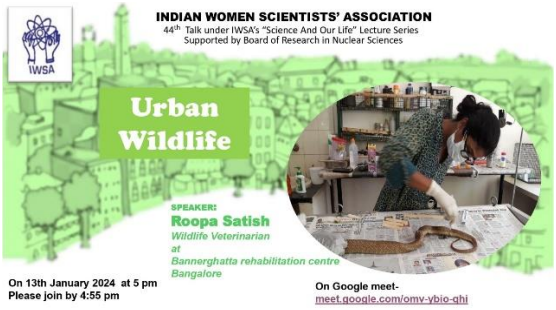


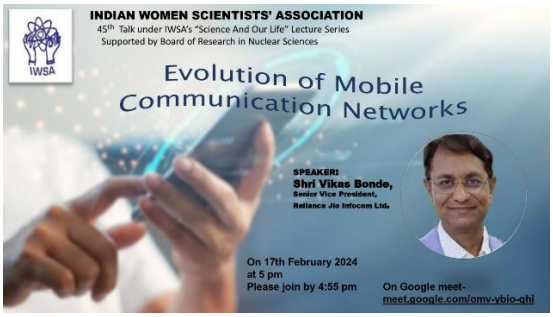
NES International School, Dombivili on 1-3-2024

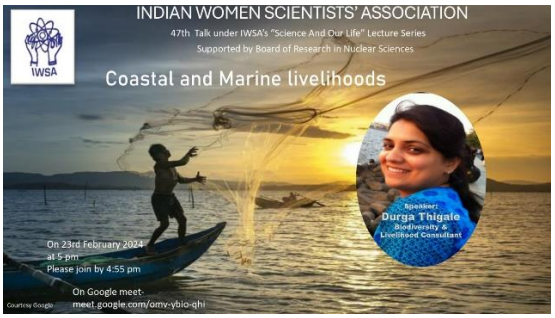



VDS School, Turbhe on 17-02-2024

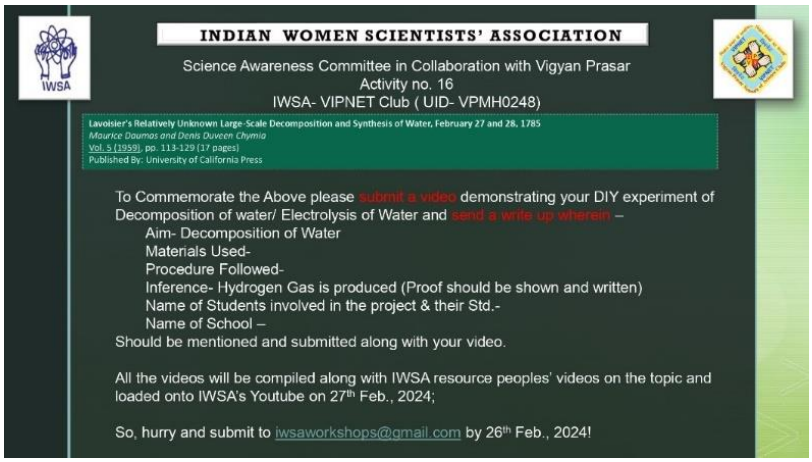
IWSA – BRNS "Science and Our Life" Series of Webinars







IWSA VIPNET Activities



IWSA Scholarship and awards on 27th January 2024

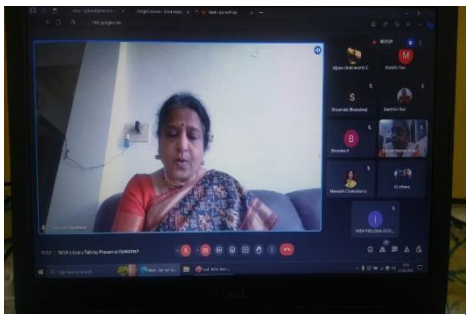
Drone workshop on 4th February 2024

Science Day Celebration on 9th and 10th February 2024

IWSA INTERNSHIP

Students from Vaze college doing biowaste composting 12-01-2024 to 20-02-2024

IWSA's Piroshja Godrej Foundation Library



Online Talk by Ms. Prasanna Venkatesh on 21- 3 - 2024

Story telling session at St. Jude Child Care Centre, Kharghar in April

Plays by Goshtarang Group in Tribal villages at Khardi on 27- 3-2024

Inspection audit from Directorate of Libraries, State Government, February 2024

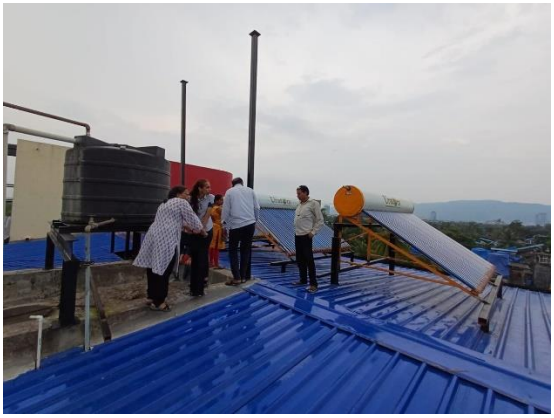
Nursery and ECCE Activities

Rainbow the Learning Festival – 22nd and 23rd March 2024

Science awareness program for ECCE

Day Care and JMM Working Women's Hostel

Sports Days and Hostel Day - 7th, 14th and 20th January 2024



Hostel terrace sheds and solar water heating system

Unveiling of plaque in memory of late Vidya Ranadive by her daughter on

IWSA's Murli Laj Chugani Health Care Centre

Free eye camp in IWSA premises on 6th April 2024


Cancer Detection Camp on 23rd April 2024

Women's Day Celebration on 11-03-2024




Millet Book Prize Winners – Authors, Designers and Editors

Visit to ACTREC on 26-04-2024

Activities from our branches

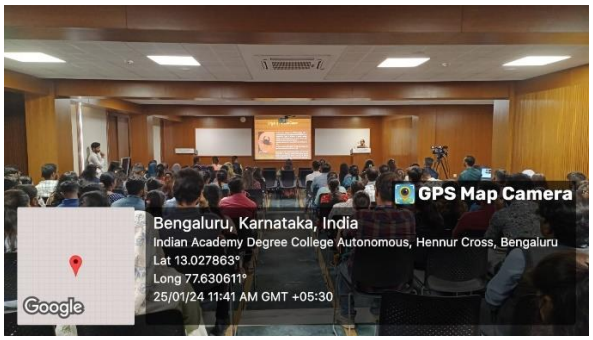
Amravati

BRNS Popular Science lecture on 1-3-2024

Baroda

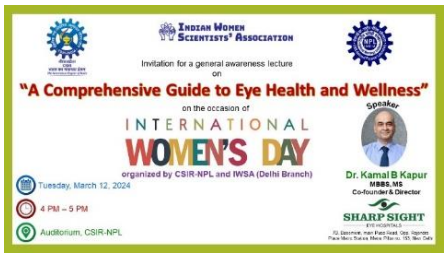
Conference "Tech Transformers: How Women Leaders Bring Change and Disruption" on 27-02-2024

Bengaluru



Popular Science Lecture on 25-01-2024 **Lecture on careers in ISRO 5-3-2024**

Delhi



General Awareness Lecture on Eye Health on the occasion of Women's Day on 12-3-2024

Hyderabad

Release of Health Cards for school girls on 14-03-2024

Kalpakkam

Science Demonstration Program on 18-01-2024

Financial Literacy& advisory Program on 17-2-2024

Women's Day program on 7-3-2024

Kolhapur

Program for Adolescent girls and women on 6 1-2024

Medical Camp on 4-1-2024

Felicitation of teachers on the occasion of Women's Day at different centers

Science Exhibition on 28-02-2024

Hydroponic Workshop on 4-3-2024

Nagpur

BRNS talk on Nanoparticles on 16-2-2024

Symposium on Herbal Extracts in cosmetics formulations

Nellore

Neurology Health Hubs in school on 17-2-2024 and for Asha workers on12-3-2024

Pune

V

Women's Day Workshop on 11-3-2024

BRNS talk on 14-3-2024

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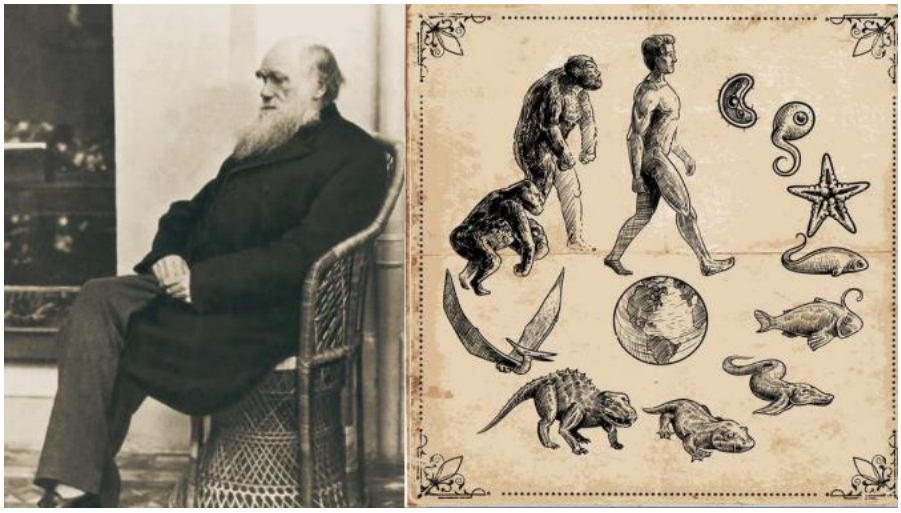

12th February, Charles Darwin's birthday, is celebrated as International Darwin Day

To

From
IWSA Head Office
Plot No.20, Sector 10A
Dr Mar Theophilus Road, Vashi
Navi Mumbai: 400703
Tel: 8657865475,
Email: iwsahq@gmail.com
Website: www.iwsa.net

Published by Dr Shyamala Bharadhwaj, President, IWSA, Plot No.20, Sector 10A, Vashi, Navi Mumbai 400703.

Editor Dr Sheela Donde