



IWSA NEWSLETTER

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Technology Day Celebration at IWSA on 5th May, 2018.



Environment Day Celebrations at IWSA on 5th June, 2018.



Science Academies' Workshop Neurosciences on 3rd & 4th August, 2018.

BRANCHES

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



BRNS Popular Science Lecture by Mr. Ulhas Paranjpe at Bharati Vidyapeeth College of Architecture, Navi Mumbai on 13th July, 2018.



BRNS Popular Science Lectures by Dr. Suvarn Kulkarni and Dr. Ruchi Anand at Khalsa College, Mumbai on 8th August, 2018.



Hostel girls (L) and Day care children (R) celebrating Independence Day on 15th and 18th August, 2018, respectively.



Workshop on Early Childhood Education by Dr. Swati Popat Vats on 23rd August 2018.

From the Editor's Desk



Dear IWSA Members,

In this issue of the Newsletter, you will find reports on 14 BRNS Popular Science Lectures that were held between May - August 2018, in various colleges in Mumbai and Navi Mumbai. Some of the lectures were held along with hands on experiments which served the purpose of popularizing science among college students and also exposed them to the latest excitements in scientific research. We bring you a detailed report on Science Academies' Lecture Workshop on **Neurosciences: Biology to Disease Management** held at IWSA Complex, Navi Mumbai during 3rd and 4th August, 2018. This issue includes reports on several science nurture programs organized for school students, such as the Technology Day Celebration on 5th May, 2018 by organizing a science exhibition on "Robotics, 3D Printing and Electronics" and starting computer classes for IX std. students etc. Celebration of International Yoga Day on 23rd June, 2018 and a workshop on "Understanding Impact of Brain Development on Curriculum and Behaviour Management in Pre-schoolers" which was held on 23rd August, 2018, in association with Early Childhood Association at IWSA's Multipurpose Hall were two important events that had benefitted the participants immensely. You find a detailed report on a new initiative of IWSA, i.e., "IWSA's Learning Garden" which has taken off very well and is attracting several visitors including school children, college students and many more admirers of this Garden.

This issue also brings the interesting activities held at IWSA Branches at Bengaluru, Hyderabad, Kalpakkam, and Kolhapur. I have also included short write ups about three women achievers who have excelled in their respective professions and have shown how women can reach great heights in their career with their dedication and perseverance.

In the back covers of this issue you will find the photographs of women who are at the helm of affairs in IWSA branches and at the headquarters. I hope that all of you will enjoy reading about these reports and the scientific information content of this Newsletter.

With best wishes

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Dr. Devaki Ramanathan
Dr. Dhanya Suresh
Dr. Nalini Bhat

President's Message



Dear IWSA Members,

The summer of 2018 has been extremely busy at IWSA Headquarters, Vashi and at some of our branches.

In May 2018 we initiated our tenth branch: IWSA's Bengaluru Branch, with Dr. Savithri Bhat, Head of Dept of Biotechnology, BMS, College of Engineering, Bengaluru as the Convener. We look forward to exciting events being conducted by the young team at Bengaluru.

On 19th May 2018, we held our AGBM and Central Council Meeting at IWSA Vashi. We were very happy that Kalpana Sawant, Convener, Kolhapur Branch along with members Dr. Smita Giri, and Ms. Seema Gaikwad could join us. Dr. Deeplaxmi Kulkarni, Convener, Amravati Branch and Dr. Sandhya Kiran, Convener, Baroda Branch were also present.

At the SGBM held on 9th Sept. 2018, at IWSA Vashi, Dr. Shashikala Gangal, Convener, Dr. Nilima Rajurkar, Co-Convener, Dr. Neeta Zatakia, Treasurer and Dr. Ranjana Bhadane, Jt. Secretary from Pune Branch, Dr. K. Ratna, Convener, Hyderabad Branch, and Dr. N. Prathibha, Treasurer from Bengaluru, Branch, could join us.

It is wonderful when office bearers and members from our branches join us at our meetings so that we can exchange ideas and information. It improves the connectivity between us all, and this is really important to work as a large team to meet the mandate of the Association and the Vision of the Founders.

Our next to be branch is from Nellore. Dr. Bindu Menon, a Neurologist from Apollo Speciality Hospitals, Nellore is the Convener of the Adhoc branch. Her team has been actively conducting various events to qualify as a full fledged IWSA Branch.

Since Dec. 2017 several of our branches have had a change in their Office Bearers. This Newsletter introduces you to our Trustees, the teams from eight Branches (who sent us photographs) and the EC team from Head quarters.

With Best wishes for the Holiday Season

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Reports from Head Quarters

Science Awareness Programs

A. IWSA – BRNS Popular Science Lectures

1. BRNS Popular Science Lecture at Mukesh Patel School of Technology Management & Engineering, NMIMS (Deemed-to-be University), Vile Parle (W), Mumbai on 9th May, 2018.

Dr. Konrad Forstner, Head, Core Unit Systems Medicine Institute for Molecular & Infectious Biology, Wurzburg, Germany delivered a lecture on “Introduction to Machine Learning for Biologists” at Seminar Hall (6th Floor), Mukesh Patel School of Technology Management & Engineering Bhakti Vedant Swami Marg, Near Cooper Hospital, JVPD Scheme, Vile Parle (West), Mumbai, on 9th May, 2018 at 10:00 am.

Dr Konrad Forstner, discussed about the Neural Network and Artificial Intelligence techniques that can be used by biologists and introduced the machine learning techniques to the audience. He explained the concepts of unsupervised learning, with dimension reduction, K-means clustering techniques etc. He also talked about support vector machine (SVM), decision tree and random forest.

Dr Sudha Padhye, (Founder member), Dr Mahrukh Joshi (Senior member), Dr Rita Mukhopadhyaya (Treasurer) and Dr Sunita Mahajan (Trustee) from Indian Women Scientists’ Association (IWSA) attended the lecture. Dr Ketan Shah, Professor, IT department, participated from Mukesh Patel College of Management and Technology. About 75 students and faculty attended the lecture and interacted actively with the speaker.



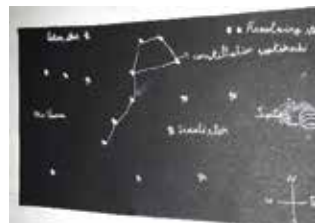
Dr. Konrad Forstner delivering the lecture and in discussion with participants .

2. BRNS Popular Science Lecture at IWSA’s ICICI Multipurpose Hall, Navi Mumbai on 15th May, 2018.

Dr. Sujatha Deshpande, Assistant Professor, Department of Zoology, St. Xavier’s College, Mumbai, and an active member of Khagol Mandal, delivered a lecture on “Life in the Universe” at IWSA’s ICICI Multipurpose Hall, Navi Mumbai on 15th May, 2018. She described the various theories about life in the far off space. After the

lecture, Mr Mahendra More along with other volunteers of the Mandal described constellations visible after sun set through the four telescopes arranged on the terrace. About 85 participants, consisting of college students, school children and their parents attended the lecture and enjoyed the sky gazing event late in the evening.

A drawing by one of the students after the sky gazing event.



3. BRNS Popular Science Lectures at Ramnarain Ruia College, Mumbai on 15th and 16th June, 2018.

During the Science Academies' Lecture workshop on Lasers and their applications, a lecture by Dr. Ajith Kumar on Laser Holography and his demonstration of recording holograms, encouraged several faculty members of different colleges to arrange a workshop exclusively on this topic. The subject of Lasers and their applications is an elective course in MSc Physics and a workshop on this topic was very much welcomed by several colleges. A workshop on "Sculpting Light--A Workshop on Laser Holography and Applications" was organized at Ramnarain Ruia College, Mumbai on 15th and 16th June, 2018. About 30 students participated in the workshop along with 8 faculty members from Ruia College and Somaiya College of Mumbai University. Four IWSA members also participated. The two day work shop had lectures in the mornings and demonstrations in the laboratory, in the post lunch sessions. On the first day the topics covered were- Overview on lasers, history of holography, basic holography principles, from lab to market- how it was achieved.

The afternoon session on first day introduced the students to properties of a laser, Spatial filter which is the vital component of the holographic system, alignment procedures etc. On the second day the topics covered were- Digital Holography and Digital Holographic NDT, Analog Holography, White Light Hologram recording by Denisyuk method, recording of HOEs and hands-on-training on recording of holograms.

The students and faculty enjoyed this rare opportunity of recording holograms and the two BRNS supported lectures were highly informative.



Dr. Ajith Kumar demonstrating the recording of holograms and a student enjoying the hands on experience at the Workshop on "Sculpting Light"

4. BRNS Popular Science Lecture at Bharati Vidyapeeth College of Architecture, CBD Belapur on 13th July, 2018.

A popular science lecture titled "Rainwater conservation: Case studies" by Mr. Ulhas Paranjape, Trustee, Jalvardhini Prathishthan, Mumbai was organised at Bharati Vidyapeeth College of Architecture, CBD Belapur on 13th July, 2018. Mr. Ulhas Paranjape, shared his knowledge about rainwater conservation with the final year students of Architecture. Mr. Paranjape explained practical examples with some case studies. The Lecture enriched the participants knowledge on water conservation and rain water harvesting. Faculty members of the college, some members of IWSA and about 100 students attended the lecture and actively participated in the discussion.

6. BRNS Popular Science Lectures at St. Xavier's College (Autonomous), Fort, Mumbai, on 14th July, 2018.

On 14th July 2018, four popular science lectures on "Advances in Bio-medicine" were conducted at St. Xavier's College (Autonomous), Fort, Mumbai, where 160 students, researchers and faculty from 23 colleges and research institutions participated. During the welcome address, Dr. Susan Eapen, Member, Board of Trustees, IWSA spoke about the various activities of IWSA and different scientific programs conducted for inculcating scientific temper among students and teachers. Dr. Rajashree Katke, Guest of Honour and Dean of Cama Hospital, Fort, Mumbai praised IWSA's effort to popularize science and requested students to follow ethics in research and contribute to the development of the nation. Dr. Angelo Menezes, Principal of St. Xavier's College said such lectures are in tune with the theme of the college during the year and told the students to imbibe latest scientific knowledge from such lectures. Dr. Priya Sounderrajan welcomed the audience and Dr. Sangeeta Shetty compered the program. The four lectures delivered were:

(i) CRISPR-Cas Gene editing: Biomedical applications

Dr. Devashish Rath of Bhabha Atomic Research Centre, Mumbai spoke on the use of CRISPR and associated Cas-9 for genome editing which has been a major technological break-through making genome modification in cell and organisms faster, more efficient and robust.

CRISPR (Clustered Regularly Interspersed Short Palindromic Repeats)-Cas (CRISPR-associated) systems are microbial defense systems that provide immunity against foreign nucleic acids such as viruses and plasmids. These systems have been tailored for gene editing and gene silencing purposes. The rapidly emerging CRISPR-Cas toolbox has ushered in a revolution of sorts in genome engineering and synthetic biology. Innovative applications of this technology are continuously emerging. CRISPR-Cas tools complemented by next generation sequencing approaches, together, provide a very powerful combination in the hands of biologists for genome scale interrogation of structure and function. CRISPR-Cas approaches are now being exploited in food, medical and plant biotechnology. Some of the most challenging applications of this technology are envisaged in the biomedical field. Avenues like gene therapy in humans, development of new age anti-microbials, better diagnostics and vaccine development

are being explored with renewed vigor. The prospects of genome editing in human embryos with CRISPR-Cas have also sparked debate on ethical and safety concerns.

(ii) Clinical Applications of Stem Cell Therapy

Dr. Prathibha Shetty of Regenerative Medicine Group, Reliance Life Sciences Pvt. Ltd. spoke on stem cell therapy for treatment of various diseases.

Stem cells are characterized by their potential to self renew & to differentiate into several different lineages for the lifetime of an animal. These two properties of stem cells have made them very useful therapeutic tools for the restoration of a variety of organ functions. Stem cells can be derived from the blastocyst (embryonal stem cells), fetal tissue (fetal liver stem cells), new born infant (cord blood or cord tissue stem cells) or adult tissue (bone marrow stem cells, neuronal stem cells). All these stem cells have many potential applications in the field of regenerative medicine. Although the embryonal & fetal derived stem cells have the highest regenerative potential, they are dogged by many ethical concerns. Adult stem cells although having a limited self renewal potential are free from such concerns & therefore are rapidly finding their way into the clinic.

Of the different types of adult stem cells, hematopoietic stem cells and mesenchymal stem cells are the best studied stem cells. Many of our concepts about the characterization, isolation & function of different stem cells have developed from the study of hematopoietic stem cells. Bone marrow transplantation has been utilized as a therapeutic modality for many hematopoietic disorders. For example in the US, over 5000 unrelated bone marrow transplants have been carried out for acute leukemias, with a survival rate as high as 34%. Similarly for chronic myelogenous leukemia, more than 6000 unrelated marrow transplants have been performed with survival rates up to 43%.

Although bone marrow is a well-known source of hematopoietic stem cells, recently cord blood is being utilized as an alternative source of stem cells, to treat a variety of hematological disorders, which also includes hematological malignancies like leukemia, lymphoma, myeloma & neuroblastoma. The advantages of cord stem cells over bone marrow stem cells are: lesser risk of graft v/s host disease in partially mismatched transplants, non invasive collection procedure and lesser risk of transmission of viral diseases. However since cord blood has to be collected at the time of delivery, it has to be cryopreserved 'banked' for future use.

A current treatment for various degenerative disorders such Neurodegenerative, Cardiac, Vascular, Renal etc. rely on surgical interventions and drugs that modulate the system, but these have their own limitations when it comes to regeneration of damaged tissues and cells. To address this shortcoming, cell-based therapies are gaining importance. Among the different types of stem cells studied adult stem cells such as mesenchymal stem cells (MSCs) are most widely researched for their therapeutic applications. Adult stem cells have generated great amount of interest amongst the scientific community for their potential therapeutic applications for unmet medical needs. Mesenchymal stem cells as a choice for cell-based therapies in Regenerative medicine are becoming very clear. There is increasing amount of literature indicating its usefulness in clinical applications which is very encouraging. Mesenchymal Stem Cells thus represent a promising tool for potential therapeutic applications characterized by cell loss or cell degeneration.

(iii) Porous Polymeric Biomaterials: Foundational Framework in Bioengineering

Dr. Anuj Tripathi of Bhabha Atomic Research Centre, Mumbai spoke on different polymeric biomaterials and how they formed foundational framework for biomedical applications.

One of the most exciting and rewarding areas of advanced materials science research involves the applications of biomaterials to biotechnology and healthcare, especially to reconstructive surgery. With the advent of new sciences and technologies, there has been a need of developing new polymers, materials and techniques to put the novel knowledge into biological applications. In recent years, the developments of novel functional polymeric biomaterials and their application to medical problems have dramatically improved. Undoubtedly, the most widely recognized applications of biomaterials involve bioseparation, immobilization of biomolecules, and regeneration of functional human tissues when a tissue or organ has suffered from some disease or conditions that has resulted in pain, malfunction or structural degeneration and which can only be alleviated by the replacement or augmentation of the affected part. In addition, various medical devices and diagnostic products that employ biomaterials are currently being used in various medical applications and the market is growing rapidly due to advanced instrumentation and miniaturization. Among many new polymeric materials, an important class includes macroporous polymeric biomaterials which have attracted increasing interest as carrier of chromatography, protein synthesis, drug delivery, tissue engineering and others. These macroporous polymeric biomaterials can be suitably designed to address bioengineering challenges like bio-separation and tissue engineering for reconstructive surgery. Recently various technologies have emerged as a potential approach to produce polymeric scaffolds. One of the attractive approach of producing super-macroporous hydrogels at sub-zero temperature is known as cryogelation, and the produced gel is coined 'cryogel'. These gels can be synthesized for specific application by using different type of synthetic or natural polymers. In particular, Cryogels based on natural polymers such as alginate, collagen, gelatin, agarose, chitosan etc, have been investigated for various biological and biomedical applications because of their good biocompatibility, biodegradability, low toxicity and other key advantages. Dr. Tripathy said that they have successfully demonstrated the use of porous cryogels in the development of *in vitro* neo-tissues, bio-fuel production, metal recovery, mosquitocidal formulations, nanoparticles production etc., which presents them a foundation of new generation biomaterials.

(iv) Genetics of Hematological Disorders and its Treatment

Dr. Anita Nadkarni, Deputy Director, National Institute of Immunohematology, KEM Hospital, Mumbai delivered a talk on different hematological disorders, their genetic basis and treatment.

There are thousands of genetic disorders, and they are defined as conditions in which an individual's genetic makeup has been altered in some way. The three main categories are single-gene disorders, chromosome disorders and multifactorial inheritance disorders. The prevalence of genetic disorders varies widely depending on the type. Genetic disorders occur as the result of defective genes that are passed to a child from the mother, the father, or both. Multifactorial genetic disorders are the result of a

combination of genetic and environmental factors. The emergence of DNA based carriers and prenatal testing have rendered most of these disorders manageable through early detection and diagnosis. In present medical diagnosis, molecular genetics plays an important role. With the evolution of the human genome project there is a rapid increase in the number of genetic disorders which have been identified. There are currently more than 10,000 genes characterized and 5000 different genetic disorders known that affect humans. Of these 400 genetic disorders are characterized at the molecular level. Any change in DNA sequence could be pathogenic if it has abnormal effect on biologic pathways within the cell. Characterization of the genetic basis of the disease is required for an accurate diagnosis. Over the last 4 decades; the genetic basis of an increasing number of diseases is becoming understood. Most genetic disorders, unfortunately, cannot be cured. The available treatments help manage the diseases caused by abnormal genes. Genetic researchers, however, are very optimistic about gene therapy which has shown promising results in clinical trials. Gene therapy is hoped to cure or improve treatment of genetic disorders by replacing the mutated or malfunctioned gene, manipulating or turning off the gene causing the disease.

After the end of each lecture there was an active discussion on the respective topic. Dr. Devashish Rath has also informed students about various career opportunities and details of joining BARC as a Scientific Officer through Training School, for doing Ph.D. in BARC and through K. S. Krishnan Fellowship. Students were served tea and refreshments. The response from the participants was very encouraging.



(L) Dr. Devashish Rath delivering lecture on CRISPR Cas Gene Editing.



(R) Dr. Pratibha Shetty who delivered the lecture on Stem Cell Therapy, being felicitated.



(L) Dr. Anuj Tripathi delivering lecture on Polymeric Biomaterials.



(R) Dr. Anita Nadkarni delivering lecture on Hematological Disorders.

5. BRNS Popular Science Lectures at Guru Nanak Khalsa College, Matunga, Mumbai on 8th August, 2018.

Two popular science lectures were organized at Guru Nanak Khalsa College of Arts, Science and Commerce, Matunga Mumbai on 8th August, 2018. Dr. Suvam Kulkarni, Department of Chemistry, Indian Institute of Technology, Bombay, Mumbai spoke on “Inside NMR Spectroscopy” at 10:30 hrs and Dr. Ruchi Anand, Department of Chemistry, Indian Institute of Technology, Bombay, Mumbai spoke on “Role of Metalloenzymes in Disease at 11:45 hrs. Before the start of the talks, Dr. Meeta Rakesh Head, Department of Chemistry of G N Khalsa College welcomed the audience and gave a brief description about the subject matter of the lectures. Dr. Kiran Mangaonkar, Principal of the College addressed the students and emphasized the fact that the BRNS Lectures organised by IWSA come under the E-3 (Enrich, Enhance and Excel) lecture series of Guru Nanak Khalsa College. He urged the students to interact with the expert speakers and gain maximum knowledge about the topics discussed during the lectures. Dr. Susan Eapen, Trustee, IWSA spoke on the various activities of IWSA and Dr. Shyamala Bharadwaj, Secretary, IWSA introduced the speakers. Dr. Dhanya Suresh and Dr. Suparna Kamat, were the other IWSA members who attended the lectures.

NMR is a powerful tool to decipher the structure of organic compounds and also to understand the electronic environment in the molecule. In his lecture, Prof. Kulkarni discussed the origin of NMR spectroscopy and explained in detail about using this tool for solving the structure of molecules. He posed the following questions and systematically developed the subject to answer these questions: Why it is called as Nuclear Magnetic Resonance? How NMR spectra is generated? What is the role of deuterated solvents and internal standards? What is shimming and locking? Why different protons appear at different places? Why they show different multiplicity? And finally how do we put together all the information to come up with the structure of a molecule?

Ninety one students of T.Y.B.Sc Chemistry and 23 students of M.Sc Bioinformatics & MSc Microbiology attended the lecture. The students actively interacted during the lecture and had discussions with Prof. Kulkarni to clarify their concepts on NMR spectroscopy.

A third of the proteins that exist in nature carry metals as cofactors. For example, haemoglobin one of the most well studied protein, required to transport oxygen in our body is an iron containing enzyme. Another popular metal that frequently occurs in nature is zinc. Functions of metalloproteins in cell range from storage, to transport to signal transduction to transcription regulation. Several proteins key to onset of infection also contain an integral metal ion. The requirement of metals in biology essentially exists as they help catalyze reactions that are otherwise very difficult to achieve via simple organic chemistry transformations. In coordination chemistry, metals are coordinated by elements such as nitrogen, oxygen and sulphur. In proteins these metals are deeply buried in the protein and are generally coordinated via histidine, glutamic as well as cystine amino acids that harbour the above elements. In her talk, Prof. Ruchi Anand explained these phenomena with examples and discussed the coordination chemistry and role played by the metal ion in executing function.

Seventy five students of T.Y.B.Sc Chemistry and 38 students of M.Sc Bioinformatics & MSc Microbiology attended the lecture. The lecture was very much appreciated by the students and there were lively discussions during and after the lecture.

6. BRNS Popular Science Lecture at Sophia College for Women, Bhulabhai Desai Road, Mumbai on 11th August, 2018.

A popular science lecture titled “Food Adulteration and Their Detection” by Dr. Ajit Datar, Advisor, Shimadzu Analytical India Pvt. Ltd. was organised at Sophia College for Women, Bhulabhai Desai Road, Mumbai on 11th August, 2018.

Adulteration usually refers to mixing other matter of an inferior and sometimes harmful quality with food or drink intended to be sold. As a result of adulteration, food or drink becomes impure and unfit for human consumption. Dr. Datar discussed the causes of adulteration in detail. He also listed the different types of adulterants and their classification. He discussed the after effects of different adulterants on the health of human being. He explained the different tests, which are very simple for finding out adulterants in food, especially, products like milk, and milk products, edible oils, sugars and confectionaries, food grains and related products, spices and vegetables, etc. Dr. Datar explained in detail the laws regarding adulteration. He emphasized the fact that it is the duty of every individual to take proper precautions to look for quality of food that is being consumed to lead a healthy life.

Dr. Ignat Mendes, Head, Chemistry Department, Sophia College spoke to the students about how the BRNS talks organised by IWSA are beneficial to them and encourages them to take up scientific research as their career. Dr. Sunita Mahajan, Trustee, IWSA and Dr. Shyamala Bharadwaj, Secretary, IWSA spoke about the activities of IWSA. Dr. Mahajan’s talk was inspiring to the students, as she narrated how in earlier times, the women scientists were very few and had to struggle to prove their identity. Dr. Suparna Kamat was another IWSA member who attended the lecture. About 75 students attended the lecture.

7. BRNS Popular Science Lectures at KBP College, Vashi on 11th August, 2018.

A one day workshop on “Laser based instruments for measurements” was organized by Physics Department of Karmaveer Bhaurao Patil College, Vashi, in association with Indian Women Scientists’ Association and Laser & Plasma Technology Division of BARC on 11th August, 2018. The Laser instruments manufacturing company, Ms. Theta Controls also participated in this workshop.

The Workshop started with the welcome and brief introduction of the speakers and facilitators at the workshop by Prof. V.B. Pujari, Head of Physics Department of KBP college.

A brief introduction of IWSA was given by Dr. Niyati Bhattacharya, Chairperson of the Board of Trustees of IWSA and an introduction to the workshop by Dr. Lalitha Dhareshwar, Vice President, IWSA.

Shri. A.S. Rawat from L&PTD, BARC, delivered the first lecture giving an overview on lasers and their special properties which make them a special source for several measurements such as – velocity, diameter of objects, surface roughness, flow visualization etc. He discussed about the various classification of lasers based on their output power and their safety requirements.

Shri. Nitin Kawade from L&PTD, BARC covered the basics of measurement instruments and their associated electronics. The choices of various parameters that affect spatial and temporal resolution were discussed in a very lucid manner.

The third lecture by Shri. A.S. Rawat was on the details of Roughness measurements of surfaces to an accuracy of sub-micron in a non-destructive manner. This was followed by the details of the optical set up, electronics instrumentation and computer software for flow visualization.

The lectures were supported by BRNS and about 200 students of FYBSc, SYBSc, TYBSc and MSc attended..

In the afternoon post lunch session, engineers of Ms. Theta Controls gave a brief description of the various instruments, systems manufactured by them and in particular, the Laser Scan Instrument, which measures the diameter of objects to a high degree of accuracy and the Velocity measuring instrument.

This was followed by the demonstration of the working of these above instruments in the laboratory, attended by about 50-60 students of Final year BSc and MSc students.



(L) Shri. A.S. Rawat delivering lecture on Overview of Laser Based Instrumentation.

(R) Shri. Nitin Kawade delivering lecture on Photo Detectors and Optics for Laser based Instruments.



Students listening to lectures with rapt attention and learning the working of the laser instruments from the demonstrations.

B.Science Academies' Lecture Workshop

Science Academies Lecture Workshop on Neurosciences: Biology to Disease Management at IWSA Campus during 3rd and 4th August, 2018.

IWSA proposed to conduct a **Lecture Workshop on Neurosciences: Biology to Disease Management** for the students from (1st /2nd year MSc, MBBS, TYBSc, 3rd year BTech, MTech, PhD, BSc and MSc Nursing) pursuing any program in biological sciences as the subject was part of the syllabus of some of the courses. Science Academies' Joint Education Panel, approved our proposal and provided financial support for conducting the lecture workshop.

Common neurological disorders include, stroke, migraine, brain tumors, epilepsy, Parkinson's disease, dementia, multiple sclerosis and those arising from infections and trauma of the CNS. Due to changes in life styles leading to stress and due to an increase in average life span, young and aged suffer from these disorders. There is need for increasing awareness of the biology of the disorders and measures for their treatment and rehabilitation through continuing education. This lecture workshop was planned to update the students in this area of science.

The course included lectures on selected topics in Neurosciences such as brain development, neurobiology of emotions, neural circuitry, cargo transport in neurons and protein misfolding in neurodegenerative diseases. The second part was clinical neurosciences which included information on a neurological condition and cancer of the brain. The lectures were on clinical aspects, molecular markers for disease management, regenerative neurobiology, brain imaging and rehabilitation.

We contacted a large number of faculty from different colleges with the flier sent by email and WhatsApp. In response we received 284 registrations. Due to the overwhelming response we closed the registration after this number. We short listed **143 applicants from 18 different colleges for the lecture workshop.**

DAY 1: Inaugural address and lectures on the Biology of the brain and its function.

Dr. Surekha Zingde, Course Coordinator and President, IWSA welcomed the participants, speakers and guests. She gave an overview about the activities of IWSA.

Dr. Vidita Vaidya, Course Convener, FINSa and Professor, TIFR, Mumbai, briefed the audience about the Course and its objectives.

Dr. Sunil Pandya, Senior Consultant & Neurosurgeon, delivered the Inaugural address with a presentation on ***"Women in Neurosciences"***. He gave an overview of how both clinical and basic neuroscience were developed in this country.

Dr. Shubha Tole, FINSa, FNAS, FIAS, Professor, TIFR, Mumbai, gave a presentation on ***"Outside in-how we perceive the world"***. She spoke on how we perceive objects both with reference to sight and sound.

Dr. Vidita Vaidya, then delivered her lecture on ***"Early life and programming to psychiatric vulnerability"***. She explained the effect of early childhood nurturing which have effects later in life.

Dr. Aurnab Ghosh, Associate Professor, IISER, Pune spoke on **“Mechanics of wiring up the brain”**. He described how information transfer from the receptors on the growth cone at the tip of the axon sense chemosensory cues in the environment of the growing embryo.

Dr. Sandhya Koushika, Associate Professor, TIFR, Mumbai spoke on **“Traffic jams-regulate cargo flow in healthy neurons”**. She explained how the small molecules transfer information from the cell body of the neuron, down the axon to the synapse which are the connecting points between two neurons.

Dr. Samir Maji, Associate Professor, IITB, Mumbai, spoke on **“Cytotoxic alpha synuclien: Potential linkage with Parkinson’s disease pathogenesis”**. He described what are prions and how amyloid proteins are generated.

DAY 2: Disease Management

Dr. Pawan Ojha, Head Neurology, Hiranandani Fortis Hospital, Vashi, Navi Mumbai, spoke on **“Brain Stroke and its management: Recent developments”**.

Dr. Bhaskar Saha, Assistant Professor, St Xaviers College, Mumbai gave a lecture on **“Neural stem cell: Its role in regenerative neurobiology”**.

Dr. Neelam Shirsat, Professor, ACTREC, Tata Memorial Centre, Navi Mumbai, spoke on **“Genomics bringing a revolution in brain tumor diagnosis and treatment”**.

Dr. Jayant S. Goda, Associate Professor and Clinician Scientist, Radiation Oncology, ACTREC, Tata Memorial Centre, Navi Mumbai, spoke on **“Imaging for brain tumors and implications for treatment planning”**. Dr Goda’s presentation complemented that of Dr Shirsat’s.

Dr. Anuradha Sovani, Professor, SNDT Women’s University, Mumbai spoke on **“Not like Us”- (Severe and chronic mental illness and the wonder of behavioural interventions)**.

Representatives from the Tata Consultancy Services interacted with the students and informed them the job opportunities after obtaining a basic science degree.

All the students informed us that they got a totally new and wide perspective about the brain and its functioning and further how neurological disorders are managed.

C.Technology Day Celebration on 5th May, 2018 .

National Technology Day is observed every year on 11th of May in India, in the memory of ‘Shakti’. Shakti is the Pokhran nuclear test which was conducted on 11th of May, 1998. This was a matter of pride for all the citizens of India. The day highlights the important role of Science & Technology in our daily lives and encourages students to embrace Science as a career option. Various events are organized in schools, different technical institutes and engineering colleges to mark the day.

Here at IWSA, we constantly encourage students of schools and colleges to embark on careers in Science and Technology by organizing various events such as- Science exhibitions, workshops, Training programs etc.

This is the first year when IWSA celebrated Technology Day on 5th May, between 10 am and 1 pm. An exhibition of projects on- “Robotics, 3D printing and Electronics” were organized in collaboration with Techshiksha. Students of nearby schools and colleges were encouraged to visit the exhibition, get hands on experience of building and operating various robots. Participants were asked to burst balloons blind folded with the help of IR sensor.

On this occasion, Dr. G. S. Rautela, former Director General of the National Council of Science Museums (NCSM) was the chief guest. He delivered a talk on- “ The Wonderful world of Nanotechnology” at IWSA’s ICICI Multipurpose Hall at Plot no 20, sector 10A, Vashi.

From 5th of May, TechShiksha had free Robotics sessions for one month at IWSA, to encourage students to attend the Robotics sessions throughout the year.

D. Inauguration of Science Nurture Program for the Academic Year 2018-19 on 6th July, 2018.

Inauguration of Science Nurture Classes was held on 6th July 2018. About 40 students of 7th, 8th and 9th Std. from Sainath school participated. A science based skit and presentation of cleanliness drive was shown by 'ASAN VIGYAN GROUP' an NGO on the recommendation of Mr. Amit Modi. Science Nurture teachers conducted a quiz for the identification of plants from leaves. Last year, 7th and 8th Std. students were attending the Science Nurture classes. This year 8th and 9th Std. students were enrolled. Regular classes for 8th and 9th Std. students started from 9th July onwards. Number of students for 8th Std. are 15 and the number of students for 9th Std. are 7. 9th Std. students also attend the computer classes conducted by Ms. Ruchi Sood.

E. Participation at the 29th Mid-year Meeting of Indian Academy of Sciences at Mysuru during 28th to 30th June, 2018.

Considering the efforts by IWSA in organising 3 Refresher Courses and 4 Lecture Workshops during the past 6 years, Dr. Rita Mukhopadhyaya and Dr. Lalitha Dhareshwar were invited to participate in the Science Education Panel Symposium for invited teachers on 28th June, 2018 and the 29th Mid-year Meeting of Indian Academy of Sciences on 29th and 30th June, 2018, which were held at Infosys Leadership Institute, Mysore Development Centre, Mysuru.

Dr. Lalitha Dhareshwar presented a feedback on the workshops and refresher courses organised by IWSA at the Teacher’s Symposium. The feedback session was followed by three lectures by well-known scientists.

During the 29th Mid-year Meeting on 29th and 30th June, 2018, there were several lectures by Fellows of the Academy on various topics. The special invitee was Dr. Upinder Singh from University of Delhi (Dr. Manmohan Singh’s daughter), who gave a public lecture on- “Politics and violence: Ancient debates on a perennial problem”. Dr. Lalitha Dhareshwar appraised her about the activities of IWSA, which impressed her

very much and she expressed her desire to visit IWSA during one of her visits to Mumbai.

Dr. Lalitha Dhareshwar took this opportunity to meet the newly formed Bengaluru branch members. The meeting took place in presence of Dr. Rohini Godbole on the 26th June, 2018 afternoon at her office in the High Energy Physics Department at the Indian Institute of Science. Dr. Rohini is an IWSA member for the past several years and she was also a member of the Women in Science Panel of the Science Academy. Thus this meeting benefitted the young members of Bengaluru Branch. Dr. Susan Eapen, who happened to be at Bengaluru on that day also attended the meeting. Nine members of IWSA met at the office of Dr. Rohini. In this meeting, Dr. Rohini spoke about the various programs that IWSA Bengaluru branch could conduct. She suggested to the members that they must try to focus on Women Scientists from various colleges and institutes and invite them to give lectures at various colleges. She was of the opinion that a lecture series could be held on one or two days. She also suggested that later they could organize a conference on “Women in Science”.

Nursery School and Education Committee

The paper correction for the SNDT University examination of the Diploma in Nursery /Creche teacher training was done by our teachers at SNDT, Churchgate, on 3rd and 4th of May 2018.

The 23rd Batch of TOT for Diploma in Early Childhood Care and Education affiliated to SNDT University was inaugurated on 22nd June 2018. At present there are 26 students. Regular classes began from 26th June 2018.

The SNDT, LIC members Dr. Rohini Sudhakar and Dr. Kirti Pathak visited IWSA on 28th June 2018. This visit is done before the university grants us the affiliation for the year. A crayoning workshop was conducted for the TOT students on 6th July 2018 by Ms. Aruna Joshi.

The TOT teachers attended a one day workshop conducted by SNDT, Churchgate on 23rd July, 2018 to understand the new syllabus and examination pattern.

A half day workshop on “Understanding Impact of Brain Development on Curriculum and Behaviour Management in Pre-schoolers” was held on 23rd August, 2018, in association with Early Childhood Association at IWSA’s Multipurpose Hall. The speaker was Dr. Swati Popat Vats – President of Early Childhood Association. About 70 participants attended the workshop. It was mainly held for the trainees of teacher training programme conducted at IWSA.

The TOT students visited Udayachal School (Godrej Pre-primary School, Vikroli) on 30th August, 2018 and observed the working and teaching methods of the school.

The results of the 2017-2018 Batch are as follows: 3 students passed with Distinction and 13 students obtained First Class, while one student passed with Second Class.

Nursery School reopened on 18th June 2018. Number of students are 22. Orientation for the parents was conducted by Ms. Shaheena Shaikh on 7th July 2018.

IWSA's Murli Laj Chugani Health Care Centre

The health care centre rendered the following services during May to August 2018.

Dentist: Dr Leena Garg came in as locum during the absence of regular dentist Dr. Raichel Thomas during 23rd June to 4th July, 2018. Between them, they treated 80 patients.

Physiotherapist Dr. Anjali Ratnakar treated 64 patients. **Homeopathy:** Dr. Varsha Varma treated 78 patients.

International Yoga Day Celebration at IWSA Campus on 23rd June, 2018.

International Yoga Day was celebrated at IWSA on 23rd June, 2018. Ms. Neha Kerure and Ms. Tanvi Waman of Arogyam, Vashi, conducted a Yoga session on "Yoga for Health and Peace" at the IWSA Multipurpose Hall, IWSA Campus, Vashi. About 50 participants took part in the session. Before starting the session, Ms. Kekure gave a brief introduction about yoga for health and peace. She also talked about the Ashtanga Yoga described in Patanjali Yoga Sutra and explained how the practice of Ashtanga Yoga helps an individual to attain health and peace in a systematic manner by following the steps described therein. The participants were given instructions by Ms. Kekure and demonstration by Ms. Waman to practice, several simple yogic postures and pranayams.



Ms. Kekure and Ms. Waman conducting Yoga Session at IWSA Headquarters.

IWSA's Satish Haware Computer Education Centre

Ten students of IX std. from Sainath High School have joined the special computer training and these classes are held every Monday between 1 to 3 pm.

One student for Programming and another for MS Office course have enrolled. Five students appeared for MSCIT examination and all of them have passed.

There are three students for Scratch, one for C++ and two for Java undergoing the courses in the Computer Centre.

IWSA's Hostel and Day Care Committee

Day Care children celebrated the Environment Day and Fancy Dress on the 5th of June, 2018. A work shop was conducted by Ms. Rati Bhosekar, Principal, Bal Bhavan Thane, for the Day Care Helpers on 8th July, 2018. Hostel Girls celebrated Independence Day on 15th August, 2018 and the Day Care Children celebrated Independence day on 18th August, 2018.

IWSA's Pirojsha Godrej Foundation Library

Library Day was celebrated on Saturday, 18th August, 2018 at 4.00 p.m. at IWSA's Multipurpose Hall, Vashi, Navi Mumbai in the memory of Dr. Ranganathan, who was the pioneer in starting the library science courses in different universities. Ms. Chhaya Kelkar spoke about the contributions of Dr. Ranganathan. Day Care children enacted a skit about library directed by Ms. Snehalata Bavsar. A fun quiz was conducted and prizes were given to the winners.

IWSA's Garden for Learning

Learning Garden at IWSA' was initiated by the generous donations of Ms Goloo Katrak, Dr. Lalitha Dhareshwar, Dr. Surekha Zingde, Dr Susan Eapen, Mr. Mehta along with several members and friends of IWSA.

Environment Day was celebrated on 5th June, 2018, along with Friends of Trees (FOT). A power point presentation was given by Vijaya Chakravarty titled, "Children's Learning Gardens: What Kind of Children are we Leaving behind on our Planet?" This was followed by a skit on plants by Day Care Children. Over 150 persons attended the program and planted saplings.

The garden is divided into several bioregional (Rainforest, Western Ghats, Deccan Plateau, Wild Food Plants, Medicinal etc) and sensory (sight, sound, touch, smell & taste) sections with IWSA members taking up the role of Guardian Angels for every section.

Plants were initially procured from the local nurseries and later members visited the Native Plant Nursery at Hinjewadi and specialist nurseries selling orchids, ferns, bromeliads etc at Somathne and Lonavala.

IWSA members made educational trips to Tata's Walvan garden and BARC's Trombay garden. This was a novel experience to most of our members. Several office staff also joined the visits. Both Dr. C.Salunkhe of BARC and Mr. Rao of Tatas briefed us and personally gave guided tours. Tatas gifted IWSA with native plants and a book on the orchids of N W Ghats. Thanks to Dr Rita Mukhopadhyay and Dr. Sudha Rao, we learnt about irradiation of food and the 'Dwarf Rice', which can withstand cyclonic weather while enjoying the culinary delights offered by BARC's Experimental kitchen.

A series of presentations related to plants were made by several of our members and children. Dr. Srirupa spoke about "Perfumes: Extraction and Uses". Ms. Vijaya Tilak

displayed several varieties of jasmine and stimulated our sense of smell and sight. Ms Tripta Tiwari conducted a quiz on aromatic leaves. Dr. Suparna Kamath showed us how to preserve flowers in bottles. These presentations were held on 28th June, 2018.

Lecture by Dr. Sushma Lahiri on " Photography of Flora and Fauna" on 16th July, 2018, created a lot of enthusiasm among members. The digital and photography skills of IWSA members improved considerably after this lecture and they are keeping photographic records of the garden development. The lectures are also attended by our science nurture students.

Dr Susan Eapen spoke on " Medicinal Plants and Secondary Metabolites" on 7th August, 2018, which was highly informative and educated the members on this topic.

Ms Manasi Chakravarty talked about "Agro-Homeopathy and it's application for plants " on 13th August, 2018. She also spoke on Bach Flower Remedies and the medicinal tree, Terminalia arjuna. After Ms. Chakravarty's talk, Day Care children, Shreshta and Pari introduced us to Shami and Fig trees.

Ms Tripta Tiwari and Ms. Vijaya Chakravarty jointly presented a paper at CUBE (Collaborative Understanding of Biological Education) monsoon meet held at HBSCE on 29th July, 2018. The title was: "IWSA's Learning Garden: A Platform to Question and Understand the Why's and How's of Nature." The presentation was well received by the audience.

Day Care, Nursery School and Science Nurture children actively participated in the garden development. They planted seeds, saplings, watered plants, studied fruit trees, mushrooms etc under the guidance of Ms Madhu Pahwa, Ms Tripta Tiwari, Ms. Vijaya Tilak and Ms Chhaya Kelkar. Children created garden ornaments, performed skits related to plants and painted pots under the direction of Ms. Snehalata Bhavsar. By participating and making presentations themselves, the children are learning the art of communication, use of digital media and protocol for conducting programs.

There has been a tremendous enthusiasm for self- learning among the members. IWSA library is being used extensively for referring to books regarding information about the garden plants.

IWSA's gardener, Krishna has also started enjoying his work more. The garden project has also created increased comradery amongst IWSA members.

GOCOES (Science of growing, cooking & eating) initiated by Dr. Surekha Zingde, Dr Lalitha Dhareshwar and Ms Madhu Pahwa has taken off with innovative culinary experiments utilising IWSA's garden produce. The Wild Food Section is in great demand! In this section, we have wild plants which are nutritional as well as medicinal.

Dr. Suparna Kamath has done the commendable job labelling the plants and is always ready to provide instant information regarding the plants. Ms. Malathi Rao meticulously maintains the garden accounts.

The Learning garden has developed under the able guidance of Ms.Vijaya Chakravarty along with the members of the IWSA Garden Nurturers.

Reports from Branches

Bengaluru Branch

World Environment Day- 5th June, 2018

A workshop on Seed Balls preparation was organized as part of World Environment Day on 5th June, 2018 from 10 AM to 2 PM by the Department of Biotechnology, BMS College of Engineering, Bangalore, in association with Indian Women Scientist's Association (IWSA), Bangalore Branch. The Resource Persons were Faculties from Department of Biotechnology, B.M.S.C.E.

Objectives of the Workshop were: **1.** To create awareness about the environment pollution among the young minds. **2.** To teach students the science behind the seed balls and involve them in the preparation of seed balls. Motivate them to make seed balls in future and participate in protecting the environment. **3.** Encourage students to come out with ideas to reduce plastic pollution.

There were 27 participants who registered for the workshop. The workshop started with discussion on various problems related to environmental pollution, global statistics of environmental pollution and its impacts, how an individual can take up the responsibility and focus on changing their habits to protect environment. The participants were then taught about the science behind the development of plants from seed balls. The participants were given hands on training wherein they enthusiastically learnt the technique of preparation of seed balls. This was again followed with interactions on how to beat plastic pollution and save environment.



Workshop on Seed Balls Preparation on World Environment Day
5th June, 2018.

Hyderabad Branch

1. Talk on Naturopathy and Yoga Interventions for Women's Health

The first event was conducted on 29th June, 2018 after the new Committee was constituted. Dr. Malati Shyamala, Director, Vemana Yoga Research Centre, Hyderabad, delivered a very useful and interesting talk on "Naturopathy and Yoga Interventions for Women Health". She informed about the process of well-being through naturopathy and yoga, the myths and truths about the two systems. Laced with day-to-day examples, the talk was truly useful and relevant to all.

There were nine participants for this event and all those present learned a great deal and each one showed their interest to change their life style to achieve better health. The talk ended with a 10 minute film on "Yoga for executives - a 10 minute workout".

2. Visit to Dangoria Charitable Trust

Members of IWSA, Hyderabad visited the Dangoria Charitable Trust in Narsapur, Medak District, Telangana on 20th July, 2018. The spirit and dedication of two senior ladies in their efforts to provide health services and empowerment to the villagers in a remote village of Narsapur in Medak District in the outskirts of Hyderabad motivated the members to support them and take up many more such noble causes. The members expressed their sincere thanks to Dr. Mehtab Bamji and Dr. Devayani Dangoria for giving them a glimpse of the work that they are doing in the village of Narsapur. The members were also highly appreciative of Mrs and Mr. Murthy who are working for the Trust with complete dedication.



Members (L) attending the lecture by Dr. Malati, (R) at Dangoria Charitable Trust with Dr. Bamji.

Kalpakkam Branch

1. Technical Talk on "Dental Treatment Procedures: Clinicians versus Clients" and AGBM of IWSA (Kalpakkam Branch)

AGBM of the IWSA Kalpakkam branch was organized on 19 July 2018 at 15.30 at Raja Ramanna Auditorium, IGCAR, Kalpakkam. AGBM was preceded by a technical talk by Dr. S. Subedha, Dental Surgeon, DAE hospital, Kalpakkam. Her talk on "Dental

Treatment Procedures: Clinicians versus Clients” was both interesting and enlightening. The talk was followed by an active interaction of the audience with the speaker and the other senior women dental surgeons from DAE hospital, Kalpakkam present for the talk. The AGBM then started with a welcome note by Dr. S. Kalavathi, Convener, IWSA (K) and followed by the Secretary’s report by Dr. Anita Toppo, Secretary, IWSA (K). AGBM was attended by more than 70 members of IWSA Kalpakkam branch. Dr. Kalavathi elaborated about the activities of IWSA and future plans. She also highlighted a few activities such as a technical talk by an eye specialist, awareness program for pregnant women in Kalpakkam township, radiation awareness program for Kalpakkam township residents, Science Day competitions and career guidance seminars for children in village schools in and around Kalpakkam as well as in township schools. She urged the members of IWSA to get associated with one or more activities of IWSA and welcomed their feedback and suggestions. The members expressed their satisfaction on the overall functioning of IWSA and also suggested that quiz or essay competitions can be held along with awareness programs and also the programs can be held in regional language as well for the benefit of local community.



**Dr. Subedha (L)
and the audience**



Kolhapur Branch

Celebration of World Environment Day 5th June, 2018

World Environment day was celebrated on 5th June, 2018 by organizing an event on “Conservation of Mangrove species in local gardens” at Maharashtra Udyan of Kolhapur city by IWSA members and Gardens Club of Kolhapur. One and half year old saplings of mangrove species were selected for plantation, as mangroves are important coastal resources which are vital to socio economic development. Six different species of mangroves were selected to conserve in Maharashtra Udyan. These species require less salinity. Therefore, following mangrove species were chosen for the theme ‘Mangroves in garden’. The species selected were: *Heritiera littoralis* (सुंदरी), *Xylocarpus granatum*, (समुद्रफल), *Bruguiera gymnorrhiza*, (कांदळ), *Cerbera odollum*, (सुकाणू), *Cynometra irirpa* (इरापू), *Dolicandrone spathecia*. (समुद्राशिंगी). The number of participants were 36, consisting of, school children, IWSA members, Gardens club members, local people and industrialists. The event was initiated by welcome and introduction by Dr. Dhanashri Patil, President of Gardens Club. This was followed by a talk on Importance of mangroves and conservation by Prof. Niranjana Chavan, Convener, IWSA, Kolhapur Branch.

There was another activity on 'Beat Plastic'. President of Gardens Club, Dr. Dhanashri gave a speech on how to avoid plastic. Gardens club team members presented and distributed home made bags to all members. Issues related to use of plastic and avoiding plastic were discussed.



World Environment Day Celebration by IWSA Kolhapur Branch.

Women Achievers

1. Marga Faulstich - a celebrated glass chemist



Marga Faulstich was a celebrated German glass chemist who worked on more than 300 types of optical glasses. Born in Weimar, Germany, on June 16, 1915, she made a lifetime contribution to international glass manufacturing company Schott AG, where she worked for 44 years. In 1973, Faulstich received the IR100 award from American Industrial Research Council for inventing SF64 lightweight lens. She went on to earn 40 patents in her name. Faulstich also became the first woman executive at Schott AG. After retiring, she took to travelling and giving lectures at glass conferences. She died at the age of 82 in Mainz on February 01, 1998..

(Abridged from <https://economicstimes.indiatimes.com>)

2. Woman of Many Firsts: India's First and Oldest Cardiologist



Dr. Sivaramakrishna Iyer Padmavati, who turns 101 this year, and still goes to the National Heart Institute in Delhi every day, which she founded in 1977. Born in 1917, Dr Padmavati fled with her family from Burma to Coimbatore in 1941 during World War II. With the passion to make a difference, she studied medicine at Johns Hopkins Hospital and Harvard Medical College in the USA with cardiology pioneers Dr Helen Taussig and Dr Paul Dudley White, respectively. She has been the face behind several firsts:

- The establishment of the first cardiac clinic and cath lab at the Lady Hardinge Medical College, Delhi.
- The initiation of India's first Doctorate of Medicine in Cardiology.
- Setting up cardiology departments at the prestigious Maulana Azad Medical College, GB Pant Hospital, etc.
- Founding the All India Heart Foundation, Delhi.

The list goes on. She accomplished all this in an era when cardiology was an unknown territory for most Indians, let alone for a woman. She was honoured with the Padma Bhushan in 1967 and the Padma Vibhushan in 1992 for her contributions to the field. (Abridged from <https://www.thebetterindia.com>)

3. Dr. Gita Gopinath – Appointed as Chief Economist of IMF



The Indian-American economist **Gita Gopinath** (born 8 December 1971) is the John Zwaanstra Professor of International Studies and Economics at Harvard University. In October 2018 she has been appointed as chief economist at the International Monetary Fund. She will take over as Chief Economist of IMF from Dr. Maurice Obstfeld in January 2019. She is a co-director

of the International Finance and Macroeconomics program at the National Bureau of Economic Research. Her research focuses on International Finance and Macroeconomics. She was the Economic Adviser to the Chief Minister of Kerala.

She has been a visiting scholar at the Federal Reserve Bank of Boston, a member of the economic advisory panel of the Federal Reserve Bank of New York, a co-editor at the American Economic Review, co-editor of the current Handbook of International Economics and was managing editor of the Review of Economic Studies. In 2018, she was elected a fellow of the American Academy of Arts and Sciences. In 2017, she received the Distinguished Alumnus Award from the University of Washington. She was named one of the top 25 economists under 45 by the International Monetary Fund in 2014 and was chosen as a Young Global Leader by the World Economic Forum in 2011. (Abridged from <https://en.wikipedia.org>)

OFFICE BEARERS OF IWSA BRANCHES



Amravati Branch L to R: Dr. Vasudha Wankhade (Tantarpale), Dr. Rekha Maggirwar, Dr. Mithilesh Rathore, Dr. Sujata Kale, Dr. Deeplaxmi Kulkarni (Convener), Dr. Ambika Jaiswal.



Baroda Branch : Standing L to R : Dr. Shilpa Gupta , Prof. Neelima Kulkarni, Ms. Bharti Pamnani, Dr. Deepa Kandpal, Dr. C. Ratna Prabha, Prof. Susy Albert, Dr. Sonal Shah. Sitting: L to R: Hemlata Pavaghadi, Prof. Nalini Purohit, Prof. G. Sandhya Kiran (Convener), Mrs. Meera Jani.



Bengaluru Branch: L to R: Dr. K. Prashanthi, Dr. Prathibha. N, Dr. Savithri Bhat, (Convener).



Hyderabad Branch: Standing L to R : Dr. Satya Vani and K. Ratna (Convener). Sitting L to R: Dr. Padmaja Rambabu, Dr. Vijayalakshmi Venkateshan, Dr. C.B. Lakshmi and Dr. Vijaya Khader.



Kalpakkam Branch: L to R: Dr. S.C. Vanitha Kumari, Dr. Anita Toppo, Dr. S. Kalavathi, (Convener), Dr. Padma S. Kumar, Dr.M. Manohari.



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Dr. Sunita Mahajan,
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