



IWSA NEWSLETTER

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IWSA's XIII Triennial Conference on "Sustainable Development in India: Role of Science and Technology" 2 - 4 December 2016



Dr. Devaki Ramanathan, President IWSA, Dr. Shyam Asolekar, Chief Guest, Dr. Sudha Padhye, Founder Member, IWSA and Dr. Surekha Zingde, Convener of Conference at the Inauguration



Young delegates at their oral and poster presentations



Dr. Anil Kakodkar delivering the Evening lecture



Dr. Sanjay Deshmukh & some IWSA members at the Valedictory

BRANCHES

Roorkee 1979 . Hyderabad 1979 . Pune 1980 . Nagpur 1982 . Kolhapur 1982
Delhi 1987 . Kalpakkam 1987 . Baroda 1988 . Lucknow 1997 . Amravati 2010



Prof. Rita Mulherkar delivering a lecture on Gene Therapy at St. Xavier's College on 28th November, 2016



Prof. Arvind Lali delivering a lecture on Biofuels at Ruia College on 6th December, 2016



Proud Winners of the Science Exhibition organized by IWSA on 21st February, 2017 at the ICICI Multipurpose hall, IWSA Headquarters, Vashi, Navi Mumbai.



Cancer Detection Camp Organized by IWSA in collaboration with CIDCO's Manaswi Resource Centre for Women at Kalamboli, Navi Mumbai on 4th Feb 2017.

From the Editor's Desk



Dear IWSA Members,

In this issue of Newsletter, besides our regular features of reports regarding Popular Science Lectures, Workshops, Science Exhibition etc., we bring you the detailed report of the XIII Triennial National Conference on "Sustainability for Development in India: Role of Science and Technology" held at the IWSA Campus at Vashi, Navi Mumbai during December 2016.

Other interesting events during this quarter were Rainbow 2016, Cancer Detection Camp and Science Exhibition by School Children and reports on these events are also covered. Reports on the scientific and societal activities carried out by IWSA Branches at Kolhapur, Amravati, Kalpakkam and Roorkee are included.

During 13-15 February, 2017, five members of IWSA from Mumbai were invited to join those from Kolhapur branch to participate and witness the many activities carried out by members therein and in the nearby town Vengurle, Dist. Sindhudurg, Konkan. They have shared their experiences with us in the form of a short report that highlights the importance of Food Processing and waste free agriculture.

On 15 February 2017, ISRO launched 104 satellites in a single rocket ([PSLV-C37](#)) and created a world record. We find that women scientists and technologists have played significant role in the various successful projects of ISRO. We have highlighted the achievements of some of the star women scientists of ISRO.

I am sure that you will find the summary of the research carried out in the fields of Chemistry, Physics and Physiology that led to the Nobel Prizes for the year 2016 quite interesting and informative.

I hope that all of you will enjoy reading about these reports and the scientific information content of this Newsletter.

With best wishes

Shyamala Bharadwaj

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Dr. Dhanya Suresh
Dr. Susan Eapen
Dr. Smita Lele

President's Message



Dear IWSA Members,

The financial year 2016-17 is coming to conclusion. This issue will be the last quarterly for this year. One year has rolled on so fast. Your IWSA has been bubbling with so many activities that we can barely realize that the year is reaching to an end.

The triennial conference on 'Sustainable Development – the Role of Science & Technology' in December, 2016 was a grand event which is summed up in a report by the Convenor, Dr. Surekha Zingde and Co Convenor, Dr. Bakhtaver Mahajan in this issue. On the BRNS series of popular lectures there were 30 lectures arranged from November 2015 to December 2016 at IWSA headquarters and in different colleges of Mumbai and Navi Mumbai, by experts on all varied themes of Science & Technology.

The annual cancer detection camp for the underprivileged was held on 4th February, 2017 in collaboration with Manaswi – CIDCO, which was a great success. A short note is included in this issue on this event with photographs.

On the 21st February, Science Day celebration was conducted at IWSA headquarters by arranging a day long science projects exhibition by Navi Mumbai school children. The theme for these projects was also 'sustainability'. School children from VI to IX Std. participated and there were 31 exhibits from 20 Schools. A brief report on this event is included in this issue. The yearly Rainbow event followed this with its perennial interesting & innovative nursery teaching aids demo. Ms. Sushma Pradhan, Convenor has given a short brief on this event.

Conclusion of the 10 month long Science Nurture program took place in March 17, for class VII & VIII of Sainath English High School. The Principal of the school, Ms. Latha Pillai was the Chief Guest. Detailed report by the Convenor is included in this issue.

A very fruitful 4 day Bioinformatics workshop – 'RNA sequencing Data Analysis' was held from 13-16 February, 2017 at IWSA – ICICI Multipurpose hall in collaboration with Bencos Research Solutions Pvt. Ltd. The workshop was co-ordinated by Dr. Rita Mukhopadhyaya from BARC (IWSA Life member) and conducted by Dr. Konrad Foerstner (Institute of Molecular & Infection Biology, Wurzburg, Germany). A summary of this course is published in this issue.

A Wellness Unit of the IWSA Murali Laj Chugani Health Care Centre was inaugurated on 18th February, 2017. Fitness classes for seniors involving gym apparatus under supervision of the IWSA physiotherapist has commenced from March 1, 2017. This is also open to the hostel inmates.

A very scintillating and thought-provoking talk was arranged on the 27th March, 2017 by Mr. Gaurav Shorey on 'Foundations of sustainable development of a society & civilization. With theatrical dynamism, he illustrated the concept of the 5 Ds – Dialect, Diet, Dress, Dwellings & Dance & Songs – how these are linked to a sustainable development of a society and the relevance of their preservation. It would be very useful to run short term courses with his

help incorporating these ideas for young school students. Mr. Gaurav is ready to collaborate with IWSA.

All these events, coupled with the normal activities, have kept the office bearers and conveners on their toes from program-to-program. I congratulate and thank them all for making this year, specifically, this quarter, so eventful and purposeful in meeting our objectives.

On our branches side also, there have been many activities in Amravati, Kolhapur, Kalpakkam, Roorkee branches which are summarized in this issue.

Our biennial elections are on to usher in a new set of office bearers and EC members for 2017-19. The call for nominations and the AGBM notice have been sent to all members by post. The annual GBM is fixed for 20th May, 2017. Please note the date in your calendar, keep it free and attend in big numbers to showcase our strength.

I thank all my office bearers: Vice-President Dr. Surekha Zingde, Secretary Dr. Lalitha Dhareshwar, Jt. Secretaries Ms. Madhu Pahwa and Ms. Sushma Pradhan, Treasurer Ms. R. Bhuvaneshwari and all Conveners of sub-committees and EC members for supporting me in managing the affairs of IWSA for 2015-17. Special thanks to all our Trustees & Founder-advisor Dr. Sudha Padhye for encouraging us in all our endeavours with very useful and wise suggestions. I thank our IWSA staff members including the ayahs who have unrelentingly supported us through all our programs.

Thank you All !!

Dr. Devaki Ramanathan

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Reports from Head Quarters

IWSA Popular Science Lectures, Workshops and Exhibition

During November 2016 and March 2017, IWSA conducted four popular science lectures, two workshops and one science exhibition in Mumbai and Navi Mumbai to reach out to college students and to inculcate scientific temper in them. Three of the four popular science lectures were sponsored by BRNS.

1. **BRNS Sponsored IWSA Popular Science Lectures at St. Xavier's College, Mumbai on 28th November, 2016.**

A popular science lecture was conducted on 28th November, 2016 at St. Xavier's College, Mumbai. Dr. Rita Mulherkar, Former Senior Scientist, ACTREC, Navi Mumbai, delivered a lecture on "Gene Therapy - A New Modality Treatment"

Gene Therapy is a new form of treatment where DNA is used as a drug. It is a rapidly growing field and has been an experimental form of treatment for more than 3 decades. Like any other new drug it has to withstand the rigours of laboratory tests, animal tests and finally trials in human subjects before it can be sold as a drug in the market. However, unlike recombinant proteins and chemically synthesized drugs, the regulatory mechanisms for gene therapy are much more stringent.

Initially gene therapy was considered to be an ideal and permanent therapy for genetic disorders where a single gene defect is the cause of the disease. Using viral vectors, a copy of the wild type gene along with appropriate regulatory regions, is introduced into the patient's body. The gene then codes for the wild type protein and replaces the defective protein. After demonstrating this phenomenon in cells in culture and in animal models, in 1990 the first gene therapy trial was carried out for one such gene – Adenosine Deaminase (ADA) gene. Mutation in the ADA gene results in defective T cell function thereby leaving the patient immune-compromised and the disease is called Severe Combined Immuno-Deficiency Syndrome (SCID).

Since the first gene therapy trial in 1990, there are presently more than 2400 clinical trials worldwide and a few success stories. The journey of gene therapy from 1990 till date has been arduous, with many ups and downs, and is now finally delivering the goods. In the lecture these aspects were discussed with emphasis on cancer gene therapy.

About 100 students attended this talk at Sr. Xavier's College. Dr. Susan Eapen, Member, Board of Trustees of IWSA spoke about the various activities being undertaken by IWSA.

2. BRNS Sponsored IWSA Popular Science Lectures at Ruia College, Matunga, on 6th December, 2016.

Prof. Arvind Lali, DBT - ICT Centre for Energy Biosciences, Institute of Chemical Technology, Mumbai spoke on "Biofuels and Beyond: The New Green Chemistry & Biology" at Ramnarain Ruia College, Matunga, Mumbai on 6th December 2016 at 9.00 am.

He said that the world has charted for itself an aggressive path towards (a) Reducing Carbon emissions, and (b) Reducing dependency on fossil sources. India has mandated a blend 5% of green biofuels into gasoline (petrol) and diesel through a National Biofuel Policy drafted in 2009. However, the country today has no diesel substitute of note while barely managing to achieve about 3% bioethanol blending in gasoline. Similar story repeats all over the world especially in a scenario where the first generation biofuels have failed to arrest carbon emissions. Major hurdles have been inadequate manufacturing capacity and non-availability of non-edible vegetable oils, corn and molasses for making biodiesel and bioethanol, respectively. Mankind must look towards second generation advanced biofuels to achieve the targets in the immediate and near future. For example, substantial and under-utilized non-fodder surplus agricultural wastes and piling Municipal Solid Wastes (MSW) in A-grade to C-grade cities put together have the potential to fully replace petroleum fuel requirements in India. Biomass residues alone amount to more than 250 million ton of surplus agri-residues which if collected can produce more than 75 million ton of biofuel equivalent to more than three times entire country's petrol consumption. Further, more than 150 million ton of MSW already collected in large to small cities also has the potential to produce more than 40 million ton of biofuel.

Besides biofuel molecules, the waste can be also converted to a range of chemicals and material precursors through use of modern synthetic chemistry and biology. It is being established that we need not look to produce new materials and chemicals to produce the products we have got used to. Thus, biomass derived sugars can be very well converted to polyethylenes, polyesters and similar products. The ability to design cell factories and novel synthetic catalysts have provided paths towards a new emerging future where pretty much everything could be derived from renewable sources such as agri-residues, forest residues, municipal & industrial wastes and gaseous wastes including carbon dioxide.

It is important to know the on-going efforts across the world and highlight how and what India can do in this highly competitive and challenging field of innovation in the field of chemical and microbial transformations and catalysis. Case studies were undertaken to elucidate how a smart combination of chemistry, biology and engineering together have been able to create highly impactful innovations at the DBT-ICT Centre of Energy Biosciences at the Institute of Chemical Technology in Mumbai, India.

About 120 students participated in the lecture and there was an active discussion. Dr. Susan Eapen, Member, Board of Trustees of IWSA spoke about the various activities being undertaken by IWSA. Dr. Jessy Pius welcomed the speaker and Dr. Shama Zaidi introduced the speaker.

3. BRNS Sponsored IWSA Lecture on 21st December, 2016 at K.J. Somaiya Institute of Management Studies and Research, Mumbai.

At the beginning of the program, Dr Devaki Ramanathan, President IWSA, explained to the audience about IWSA work culture and various activities carried out at the IWSA headquarters in Vashi. She explained that IWSA conducts series of popular science lectures sponsored by BRNS with a view of spreading knowledge of latest technologies, by inviting experts in all fields. The lectures are arranged at different colleges so that young generation is motivated and is made aware of the emerging areas in different fields of science..

The lecture on “Cloud computing- Transforming Enterprise Services”, was delivered by Ms Lalitha Mahajan, Program Manager in the Microsoft Cloud Services Team within Microsoft IT division at Microsoft. Dr Lalitha Dhaireswar introduced Lalitha Mahajan. Lalitha joined Microsoft in 2010 to deliver web scale tools to run in Microsoft data centers. She has extensive experience of how to migrate to cloud, especially to the Azure platform.

The lecture gave a brief explanation about what is cloud computing and explained about the paradigm shift that has occurred from personal computing-to internet-to cloud. Instead of maintaining large computing installations, a Corporate user can have provision for computing capabilities like the server time and network storage provided by cloud vendors such as Amazon, Microsoft, Google etc. Cloud can be used on different platforms like mobile phones, laptops, tablets and workstations. Provider’s computing resources are pooled to serve multiple consumers simultaneously by dynamically assigning and reassigning resources as per consumer demand. Resource usage can be monitored, controlled and reported, providing transparency to both provider and consumer.

Dr. Mahajan’s lecture was focused on Azure architecture. The speciality of Azure platform is its hybrid nature, which allows the consumer to migrate only part of services to cloud and keep the rest within the company premises. She also gave a very practical demonstration of using cloud services to automate the management of cows in a vast dairy farm. Each cow has a pedometer on its leg connected to others by WI-FI. This helps in detecting when the cow is ready to mate, which happens usually during night. The pedometer alerts the farmer about this situation by measuring the steps taken by cow. This leads to increasing the production by mating the cow at proper time. This is a very innovative use of cloud.

Next generation of cloud will focus on abstracting virtual infrastructure and managing that infrastructure. Machine learning will be made simpler. The shift is from big data analytics to deep learning, so that data scientists can focus on developing new applications by simply using APIs, without worrying about the underlying complex technologies like neural networks..

The lecture was aimed at Information Technology students of MCA and engineering. It was well attended by about 100 students from K. J. Somaiya Institute of Management Studies and Ruia College. It also generated a lot of questions from the audience and there was a good discussion between the students and the speaker. Dr Madhu Pahwa gave a vote of thanks to all.

4. Workshop on Mass Spectrometry: Principles and Applications at Ramnarain Ruia College, Matunga on 14th January, 2017

Indian Society for Mass Spectrometry (ISMAS) in collaboration with Indian Women Scientists' Association (IWSA) organised a Workshop on Mass Spectrometry at Ramnarain Ruia College, Matunga, Mumbai – 400019 on 14th January, 2017. In this workshop, which started at 10:00 hrs, there were two lectures by senior scientists from Bhabha Atomic Research Centre, Mumbai. The first lecture covered basic principles of mass spectrometry, its application, different ionization methods, mass analysers, ion detectors and interpretation of a mass spectrum. Dr. R.K. Vatsa from Chemistry Division discussed about the different ionization methods (such as electron impact, chemical, plasma, photoionization, MALDI, Electrospray etc.) and their use for particular application. He also explained with suitable examples about the problems in interpreting the mass spectra and the methods to solve them. The second lecture by Dr. V. Nataraju from Technical Physics Division covered the various mass analyzers such as, magnetic sector, quadrupole, time-of-flight etc. along with various detectors (Faraday Cup, Electron multiplier, Channeltron, Microchannel plates). Dr. Nataraju elaborated in detail about the important aspects of mass analysers with respect to the mass accuracy, resolution and sensitivity.

About 150 students attended the lectures and interacted with the lecturers to clarify their doubts in this subject. The lectures were followed by demonstration of a proto type quadrupole mass spectrometer which has been designed and fabricated at Technical Physics Division of Bhabha Atomic Research Centre. Dr. V. Nataraju and his colleagues carried out the demonstration session during 12:30 to 15:30 hrs at the Physics Laboratory of Ruia College, where different batches of 15-20 students could have a close look at various parts of the mass spectrometer and observe the mass spectrum generated by the instrument when the compound acetone was injected into the sample port. The students were more interactive during the demonstration session as they were in small numbers clustering around the instrument and watching the live experiment being conducted by the experts in mass spectrometry.

The entire workshop was video recorded for future use as an education tool.

5. Second Bioinformatics Workshop during February 13-16, 2017 at the ICICI Multipurpose hall, IWSA Headquarters, Vashi, Navi Mumbai.

The Computer committee organised the second Bioinformatics Workshop during February 13-16, 2017 at the ICICI Multipurpose hall, IWSA Headquarters, Vashi, Navi Mumbai in collaboration with Mumbai based Bencos Research Solutions Pvt Ltd, a next generation sequencing service provider. The workshop was titled 'Bioinformatics: RNA Sequence Data Analysis' and was advertised on the IWSA website, Vashi Times, and all national institutions in Mumbai. A total of 32 participants from ACTREC, BARC, NIRRH, NIV (Pune), S P Patkar College and D Y Patil University attended this advanced hands-on biocomputation course. The coordinator from IWSA was Dr Rita Mukhopadhyaya and the course was conducted by Dr. Konrad Forstner and Thorsten Bischler- visitors from the Institute of Molecular Infection Biology in Wurzburg, Germany. The four day workshop was divided into: 'Introduction to next generation sequencing platforms and file formats required for data storage and analysis' on

Day 1, 'Overview of READemption RNA Seq Analysis pipeline' on Day 2, 'Training on Linux command lines' on Day 3 and 'Shell scripting and data analysis' on the final day.

The workshop was preceded by a short inaugural function presided over by IWSA executive committee members and other invitees. The Valedictory function on the final day was presided over by Dr. Sharmila Mande, TCS, Pune and other IWSA members. They listened to the feedback from participants who had also a written individual questionnaire that was submitted by all participants to Dr Konrad. The guest speaker delivered a lecture titled 'Microbiome and health management'.

All participants felt the workshop could have been extended to 6 days for complete satisfaction from the learning experience that was unique and skilfully challenging for all.

This workshop was self-sustaining as it was managed with the registration fee paid by the participants. Two undergraduate students were provided complimentary participation.

6. Science Exhibition organized by IWSA on 21st February, 2017 at the ICICI Multipurpose hall, IWSA Headquarters, Vashi, Navi Mumbai

Indian Women Scientists' Association (IWSA) has been engaged in nurturing the scientific and innovative talent amongst young students for the last several years. IWSA's Science Nurture Committee celebrated 'Science Day' by organizing a Science Exhibition- " Science for Learning, Science for Fun" on the theme of " Sustainability" on 21st February, 2017, at their campus at Vashi.

In the present day scenario of extremely fast scientific and technological developments in the world, there is a widely growing concern about 'Sustainability' issues. It is desired that young students are made aware of the need for protecting the environment and natural resources amidst the necessary development in all spheres. This exhibition was therefore organized on this theme to nurture innovative ideas from the younger generation. Projects on various topics such as- Renewable sources of energy, water conservation, good agricultural practices, food preservation, robotics in everyday life and healthy lifestyle were presented by fourteen schools from Navi Mumbai. There were a total of 42 projects by students from class VI to X from 15 schools of Navi Mumbai on the above theme.

The Science exhibition was inaugurated by Mr. Kalyanaraman, who is a well-known entrepreneur in the area of specialized transportation for Rocket Propellant Fuels for ISRO etc. Judges for the event were Ms. Anisbert K Sequeira, Ms. Lalitha Ramaswamy (eminent teachers of science who are recipients of the President's medal as best teachers) and Mr. Amit Modi, a young technology entrepreneur and an alumnus of IIT, Bombay, Mumbai.

The First Prize was won by Sacred Heart High School for their project "Integrated Farming" and the second prize by, Anjuman-I-Islam High School for "Smart City" and the third prize by Vashi English High School for "Aquaponics Water Cycle". All prize-winning students got individual prizes as books and the I and II prize schools won a trophy each.

About 100 students participated in the exhibition by setting up the projects. They were all presented with a medal and a participation certificate each. More than 300 students from different schools of Navi Mumbai visited the exhibition.

7. Popular Lecture by Mr. Gaurav Shorey on 27th March, 2017 at IWSA ICICI Multipurpose Hall, Vashi, Navi Mumbai.

Mr. Gaurav Shorey, Director, PSI Energy Pvt Ltd. and Founder member of NGO 5 Swaraj spoke on “Foundations of sustainable development of a society & civilization” at IWSA ICICI Multipurpose Hall, Vashi, Navi Mumbai.

Apart from the tangible factors such as- Renewable energy, green buildings, smart cities and clean technologies, what makes a society develop in a sustainable manner? Mr. Gaurav Shorey explained the concept of the five Ds, namely- Dialect, Diet, Dress, Dwellings and Dances -songs which have a long lasting effect on sustainable development of a society. He revealed in his lecture how humans are inherently instinctive to protect their society to be sustainable and it is the so called modern ‘Development’ which has alienated us from this capability. The lecture was attended by about 50-60 persons consisting of IWSA Members, Principals, Teachers and Students from colleges and Dignity Foundation Senior Citizens Club Members.

RAINBOW 2017

IWSA’s Teaching Aids’ Exhibition in Vashi – Rainbow 2017 was organized on 2nd and 3rd March, 2017; between 9.30 am to 5 pm. This was 21st year of the exhibition which was based on Learn Science the E-I-E-I-O way and was organized by our trainees of Diploma in Nursery / Creche which is affiliated to SNDT University.

This year’s theme was Science based- ‘Tinker Lab at your doorstep’ where each trainee was given a topic to put up a project. The judges awarded prizes for the best 3 projects. A moppet show ‘Tuntunpurke teen dost’ was enacted by the trainees to create awareness among children regarding clean city as a beautiful city and to pass on the message to throw all wastage only in dustbins to keep our surrounding clean.

2nd March 2017,

On day one, the IWSA Nursery and Day care children inaugurated the event. The program started with welcome song conducted by the Music team. This was followed by the Moppet show “Tuntunpurke teen dost” at 9.30 am. The schools that participated were **IWSA Nursery, IWSA Daycare, Anchorwala Education Society and St. Mary’s Multipurpose School, Vashi**

After the show, all teachers and children enjoyed seeing our 20 science exhibition projects and the teachers were especially very glad to see our display of journals and teaching aids.

The second moppet show was at 10.30 am and the participants were from **IWSA Day care, IES School, St. Mary’s Multipurpose School, Vashi, and Kidzee Corner, Sector 28, Vashi.**

The panel discussion on ‘Developing Scientific Temper in early Childhood’ started at 2:00 pm and the speakers were Dr Sherya Ghosh (student of Dr. Vidita Vaidya), Dr. Hemachandra Pradhan (Ex.HBCSE) and Dr. A. P. Jayraman (Ex.BARC). In the panel the

speakers discussed about teaching science in early childhood and the benefits of such science exhibition. The day ended with a brief meeting of TOT students with our teachers.

3rd March, 2017

On the second Day, the program started with a welcome song conducted by the Music team, which was followed by Moppet show “Tuntunpurke Teen Dost” at 9.30 am. The schools that participated in this show were **Anchorwala Education Society, St .Mary’s Multipurpose School, Vashi and Sainath School Education Society**. The 10.30 am show was performed by **Model School, Vashi**.

The schools that participated in the 11.30 am show were **Glory Kidzee and Nutan Balwadi, Vashi** and in the afternoon session at 3 pm, the last show was performed by **Father Agnel, Vashi**. The exhibition was open till 5 pm for all family members of TOT students.

About 1,800 children and teachers from schools in and around Vashi enjoyed the moppet show and the activity based science projects put up by the trainees. One can see the enthusiastic children in the following photographs.



RAINBOW 2017

Science Nurture Program

IWSA has been focusing on Science Education at the school level for the past several years. Students from the Std VI and VII from underprivileged segment from the neighbouring school, are inducted into this program. They are taught Science subjects in IWSA lab through hands on experiments. Science education is not complete without a thorough knowledge of Maths and effective communication through English language. This year it was decided to teach Maths and English besides Science to these students, using innovative methods.

There were totally 20 students from class VII and VIII who registered for the Science Nurture program. Ten numbers of honorary teachers, (all IWSA members) took upon themselves to teach the students throughout the academic year, Science, Maths and English by adopting innovative methods. It is heartening to see that there is an overall improvement of the performance of all these students in their gradation at the school exams. In the coming academic year, it has been decided to use one more interactive and innovative method of

teaching incorporating ONLINE-LABS in collaboration with the Centre for Development of Advanced Computing (CDAC).

The closing ceremony of the Science Nurture program took place on 17th March, 2017. Smt. Latha Pillai was the chief guest. The VII and VIII std Science Nurture students were divided into groups and they performed experiments on Physics, Chemistry and Biology in front of teachers and parents. It is observed that the overall performance of the Science Nurture Students has improved visibly at school. Parents are keen to continue to send their wards for the Science Nurture program. Students were awarded participation certificates.

CDAC Workshop on OLABS

IWSA in collaboration with Centre for Development for Advanced Computing (CDAC) conducted a half-day workshop for 'Online labs (Olabs) training' at Vashi on **22nd April 2017**. OLABS is a VIRTUAL Lab where students learn through hands on experiments simulated on computer.

Aligned with the “Digital India” initiative of the Government of India, Centre for Development for Advanced Computing (CDAC), Mumbai, a premier R&D organization of the Ministry of Electronics and Information Technology, has developed a number of technology interventions relevant to school education in India. One such significant initiative is Online Labs (OLabs). OLabs, which is based on the idea that simulated laboratory experiments accessible through the internet, significantly enhances the limited laboratory exposure that the students get, in a cost-effective way. CBSE and Kendriya Vidyalaya Sangathan have reviewed this initiative and endorsed it for adoption in the respective schools. Though the labs are fully CBSE compliant, they can be adopted easily by state boards and ICSE board too.

The main focus of the training was on Online Labs, participants were introduced to other school related tools developed by CDAC and available for free – 1) eBasta – School books to eBooks and 2) Assessment & Monitoring Framework (for CCE).

43 teachers from 12 CBSE and State Board Schools and 9 IWSA Members participated in the workshop and were extremely satisfied.



CDAC Workshop at IWSA Campus



Science Experiments at Heartfulness Institute

Science Experiments by IWSA Science Nurture Teachers at Heartfulness Institute Children's Camp

IWSA was invited to demonstrate Science experiments to children in the age group of 6 to 11 years at the Children's Summer Camp of Heartfulness Institute at New Panvel on 22nd April, 2017.

The one hour session started with a Science Quiz session. This was followed by demonstration of about 10 science experiments by the five Science Nurture teachers of IWSA- Dr. Devaki Ramanthan, Dr. Lalitha Dhareshwar, Ms. Madhu Pahwa, Ms. Tripta Tiwari and Ms. Malathi Rao. The children thoroughly enjoyed this practical demonstration and science quiz while they learnt the principles underlying the experiments.

Activities conducted by the IWSA's Murli Laj Chugani Health Care Centre

Cancer Detection Camp

A cancer detection camp was organized by IWSA in collaboration with CIDCO's Manaswi Resource Centre for Women at Kalamboli, Navi Mumbai on 4th Feb 2017. The camp was financed by Ms Vinita Mantri in memory of her mother late Dr. Jayshree Nadkarni who was also a very senior member of IWSA and Chairperson of the IWSA Board of Trustees. This camp was facilitated with support from Dr. Vrushali Magdum, of the Stree Mukti Sanghatana, Navi Mumbai. Hundred ladies were given a thorough check up by the team of doctors from Indian Cancer Society. All those who came for the check up were very happy that they got this opportunity.

Wellness Unit in the Health Care Centre

A Wellness Unit was inaugurated by Dr. Anita Roy, on 18th February, 2017 at IWSA Health care centre. This unit has a treadmill, an elliptical cycle and a static cycle. Growing adults and young hostel girls are utilizing this facility. Those interested in joining this unit may contact IWSA Office on phone (27661806) or through email: iwsahq@gmail.com.

Free eye camp by Vasani Eye Care, Vashi on Women's day , 8th March 2017 at IWSA

Members of Vasani Eye Care, examined 31 women at IWSA for eye related ailments. They had also arranged for blood pressure, blood sugar, and bone density measurements.

Report on the XIII Triennial Conference of IWSA on “Sustainable Development in India: Role of Science and Technology” 2- 4 December, 2016

Today and in the years to come, India faces huge challenges as it attempts to provide its nearly one billion burgeoning population with clean water, food security, habitats, jobs, along with developing its infrastructure in cities and rural areas, and meeting the health, education and energy demands of its citizens in a *fair* manner. Sustainability is the buzz word these days in the context of development of a country and the world at large. It is expected that "...sustainable development (SD) meets the needs of the present without compromising the ability of future generations to meet their own needs"—(<http://www.un-documents.net/ocf-02.htm#!>). To do this and more, it would be advantageous to follow, the seventeen Sustainable Development Goals (SDGs) defined by the world community of scientific, economic and political leaders in 2015-16. These goals could well change the developmental paradigm. In this entire exercise, Science and Technology's (S&T's) role is central.

The XIII Triennial National Conference of Indian Women Scientists' Association (IWSA) was held in Vashi, Navi Mumbai, Maharashtra (2-4 December, 2016) to bring together experts in the field who can define the way forward for sustainable development in the context of S & T. The conference aimed to bring our members across the country and other young and established scientists and students on a common platform on which they can showcase their work. The conference themes were such that they could make them to think deeply about their research, both basic and applied, and in turn should contribute to the development of the country in a sustainable manner.

The focus of the conference were the three sustainability goals: **water, food/agriculture and energy**. The conference highlighted the strong linkages of S & T to sustainable development. Participants immediately note the close inter-linkages and overlaps among these and other SD goals. On the last day of the conference there was a special session dedicated to the work of different NGOs contributing to preserving our ecosystems, which is the key to sustainable development.

Conference Themes and Subthemes

Water: Resources, Water Availability, Water Quality, Water purification, Desalination, Use and conservation, Recycling and reuse technologies,

Food and Agriculture: Efficient agricultural production, agri-smart innovative techniques, efficient genetic varieties of crops and livestock, agriculture and nutrition, efficient use of land, soil, fertilizers and pesticides, agriculture and balance with the ecosystem, synergy between crops, livestock, forestry and fisheries, agriculture and climate change, agriculture-food and nutrition, food system-efficient storage, packaging, and distribution.,

Energy: Renewable and non-renewable sources of energy, cleaner and efficient coal technologies, hydrogen energy, biofuel energy, nuclear energy, efficient lighting, efficient

transportation, energy efficient agricultural technologies, Efficient use of energy, Energy from waste, energy storage, rural energy, smart grids.

Role of NGO's in Sustainable Development

Inauguration

The XIII Triennial National Conference (2- 4 December 2016) of Indian Women Scientists' Association (IWSA) on "Sustainable Development in India: Role of Science and Technology" was a grand success. The conference was attended by nearly 200 delegates, including a large number of students, research scholars, and women scientists forming the bulk, along with participants from Industry.

The Conference was inaugurated by Prof. Shyam Asolekar, of IITB, a well known authority on sustainable development and environment. Prof. Asolekar, in an impassioned talk, warned the audience about the many challenges which lay ahead and cautioned about blindly aping the West; he emphasized on Frugal engineering—jugaad and sustainable consumption, S&T with Innovation, Preventive environmental management and Incremental development, as we move up the economic ladder..

President IWSA, Dr. Devaki Ramanathan welcomed the participants and Dr. Surekha Zingde, the Convenor of the conference and Vice President, IWSA, gave a short brief about the importance of the themes and the conference.

The IWSA Newsletter for September - December, 2016 containing the abstracts of the speakers was released by the above dignitaries and the guest of honour, Dr.Sudha Padhye, a very active founder member of IWSA – an octogenarian – whom IWSA felicitated. Dr. B. S. Mahajan, co-Convenor of the conference and Trustee of IWSA, recalled Dr. Padhye's long sojourn and her yeoman contributions to IWSA leading to its current standing.

Evening Talk

A special open Evening Talk on 2nd December, 2016, by Dr. Anil Kakodkar, currently Chairman, TIFAC [Technology Information, Forecasting and Assessment Council] and former Secretary, Department of Atomic Energy, on "Snapshot of India 2035—A Technology Vision", evoked great interest. He covered the status of technology development in India, its shortcomings and improvements needed, especially in education, and to extend the development/research to a viable commercial model.

Sessions on Energy, Water, Food & Agriculture and NGOs and Citizen Participation

Over three days, there were *three key note addresses*, one for each strand, *25 invited talks*, *16 contributory papers* and *23 poster presentations*. Each of the key note speakers (Dr. Rangan Banerjee, IIT B spoke on “Sustainable energy for the future: Challenges for India”, Dr. P. P. Majumdar, Institute of Science, Bangalore, on “Sustainable Water Management in India: Implications of Climate Change”; and Dr. C. Bhadsavle, Saguna Baug, the recent recipient of WatSave Award 2016 and Earth Care Award, 2016) set the ball rolling for their respective sessions by first giving an overall view of their respective strands and then focusing on their respective work.

The *invited talks* by equally eminent speakers consisted of a variety of topics spanning the many aspects of Scientific Developments. Some of the speakers were: Dr. Chetan Solanki (IITB)—Solar Electricity in Rural Areas, Dr. Mahua Mukherjee (IIT Roorkee)—Urban Resource Conservation to Save Energy; Dr. Umashankari of BARC—Power from Thorium for India; Dr. Mahesh Zingde (ex-NIO RC, Mumbai) –Consequences of Human-Induced Alterations to Marine Environment in India; Dr. R.B. Patil (ex-CIPHET, Ludhiana)—Post Harvest Technology Innovations for Increasing Farmers’ Income; Dr. Janjiri Jasani (CERE, Mumbai)—Carbon Management; Dr. J. Phadnis (VES College, Mumbai)—The Way Forward to SD; Richa Chaturvedi of CHINTAN—Environmental Research and Action Group, etc.

The complete list of invited speakers, contributory papers from selected delegates and their lecture titles are given in the time table in the Abstract book available on the IWSA website under Publications.

In brief, the speakers cautioned the audience about the negative effects of our anthropogenic activities over the centuries, ushering a human induced era called as Anthropocene era; air, water, soil, food and all our natural resources are threatened leading to rapid extinction of different life forms; water sources are greatly polluted and, countries like India need to innovate in tackling its water sources and supply; water foot prints, in addition to carbon footprints need to be monitored for all human activities; innovative food storage and production techniques need to be employed, etc. The conference provided a common platform for young college students and scientists, who discussed their work via posters and talks.

Panel Discussion on the Way Forward

A *panel discussion* on the “Way Forward” by college principals and an expert from Atomic Energy Department highlighted some of the new ideas about sustainable waste management and lowering our carbon footprints. Dr. Sanjay Deshmukh, Vice Chancellor, University of Mumbai also participated in this discussion. As pointed out by one of the experts, all our human activities need to be monitored and assessed in terms of carbon /water footprints (the building structure and materials used, energy used at all stages., etc.) In this context, a Sustainable Balance Unit or Green Audit of different structures and infrastructure projects need to be enforced, as suggested by Dr. A. P. Jayaraman of DAE.

IWSA with its expertise could provide a workforce for this and other green activities, which could be the way forward for IWSA, as suggested by Dr. L. Dhareshwar, Secretary, IWSA.

Dr. Jayashree Phadnis, Principal, VES College, Mumbai suggested creating awareness among masses by: 1. Including Sustainability in the high school and college curriculums; 2. Involving students in waste management at the school, college and housing society level and encouraging them to spread the word about reducing waste; 3. Collaboration with municipal bodies to ensure implementation of legislations for waste management at household level; 4. Encouraging industry through their CSR level to provide multiple bins for waste segregation and 5. Undertake research to address issues of management of solid and liquid waste. Dr. Shubhada Nayak, Vice Principal, KBP College, Vashi, Navi Mumbai, informed about how their college has followed a systematic approach by having environment committees including students and teachers to look after energy conservation, rain water harvesting, reducing waste to make 'Zero Waste' by adopting several measures. She briefed the audience about the Ecofont for computer printers to reduce ink by 27% and other e-waste in line with 'Sampoorna Earth' project. She also informed about a small treatment plant to take care of the chemical waste and their work with Stree Mukti Sanghatana for kitchen waste management. These are some of the approaches which could be publicized. Amongst the audience, Dr. B.S. Mahajan mentioned that as a first step, we must prepare the sustainability balance sheet for IWSA with the help of KBP college.

In summary, it was impressed upon the audience that each one of us has to make special efforts to contribute to the principle of recycle, reuse and reduce and in turn to Sustainability at all levels.

Valedictory Function

Dr. Sanjay Deshmukh, VC of University of Mumbai was the Chief Guest for the *valedictory function*. He urged for educational reforms at all levels, including development of varied skills so that the country can avail of the advantages of its young population. He praised IWSA for taking up this important subject of Sustainability for discussion and encouraged its members to take active part in nation building activities.

The three day conference came to a grand finale, with Dr. Sudha Rao, the Conference Secretary and a Trustee member of IWSA, giving a vote of thanks to all who had contributed to the success of the conference.

Abstracts of the lectures and poster presentation are in the Sep-Dec 2016 IWSA Newsletter which is available on www.iwsa.net under Publications

ACKNOWLEDGEMENT: IWSA received funds for the conference from CSIR, BRNS, DBT and SERB for which we thank the agencies for their support.

Glimpses of the Conference
ENERGY SESSIONS



Dr. Rangan Banerjee



Dr. Annama Anil



Dr. Chetan Solanki



Dr. Janhavi Biwllakar



Dr. Mahua Mukherjee



Dr. Umasankari

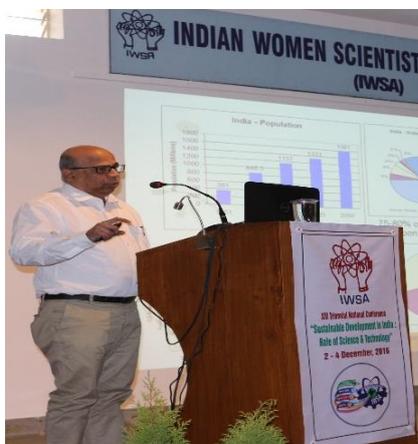


Dr. Shyamala Bharadwaj



Dr. Bala G Tilak

WATER SESSIONS



Dr. P.P Mujumdar



Dr. Pushpito Ghosh



Dr. Saly Pannicker



Dr. Anjali Parasnis



Dr. Mahesh Zingde



Ms. Annie Thomas

FOOD & AGRICULTURE SESSIONS



Dr. Sharad Kale



Dr. Srinivasu P



Dr. Archana Mukherjee



Dr. Seema Mishra



Dr. Rambhau Patil



Dr. Smita Lele



Dr. P.V. Naryanan



Dr. G. Sandhya Kiran

ASIMA CHATTERJEE (1917-2006)

- She was the second woman after Janaki Ammal to be conferred Doctorate of Science by an Indian University, the University of Calcutta in 1944.
- In 1960, she was elected a Fellow of the Indian National Science Academy, New Delhi.
- In 1961, she received the Shanti Swarup Bhatnagar Award in chemical science, in the process **becoming the first female recipient of this award.**
- In 1975, she was conferred the prestigious Padma Bhushan and became **the first lady scientist to be elected as the General President of the Indian Science Congress Association.**
- She was conferred the D Sc (Honoris causa) degree by a number of universities.
- She was nominated by the President of India as a Member of the Rajya Sabha from February 1982 to May 1990.

This year marks her Birth Centenary

NGO SESSION



Dr. C. Bhadsavle



Dr. Jayashree Phadnis



Dr. J. Mhapsekar



Dr. Janjri Jasani



Dr. Richa Chaturvedi

United Nations Declares 2017 as the International Year of Sustainable Tourism for Development

The United Nations (UN) General Assembly has approved the adoption of 2017 as the International Year of Sustainable Tourism for Development. The resolution, adopted on 4th December, 2016 recognizes “the importance of international tourism, and particularly of the designation of an international year of sustainable tourism for development, in fostering better understanding among peoples everywhere, in leading to a greater awareness of the rich heritage of various civilizations and in bringing about a better appreciation of the inherent values of different cultures, thereby contributing to the strengthening of peace in the world”.

PANEL DISCUSSION AND VALEDICTORY SESSIONS



Dr. J Phadnis, Dr. S. Nayak, Dr. Deshmukh,
Dr. Jayaraman and Dr. L. Dhreshwar



Dr. Sudha Rao, Dr. Deshmukh,
Dr. D. Ramanathan



Dr. Sudha Rao



Dr. Deshmukh &
Dr. M. Gurav



Dr. V. Manakapure &
Dr. Deshmukh



Dr. Deshmukh &
Mr. A. Singh

MARIE CURIE (1867-1934)

Marie Curie was the first woman to win a Nobel Prize, the first person to win two Nobel Prizes, the only woman to win in two fields, and the only person to win in multiple sciences.

This year marks her 150th Birth Anniversary

Some of her famous Quotes:

Have no fear of perfection; you'll never reach it.

Nothing in life is to be feared; it is only to be understood.

Be less curious about people and more curious about ideas.

One never notices what has been done; one can only see what remains to be done.

I was taught that the way of progress was neither swift nor easy.

I am one of those who think like Nobel, that humanity will draw more good than evil from new discoveries.

All my life through, the new sights of Nature made me rejoice like a child.

Reports from Branches

Excellent work by IWSA members of Kolhapur and Vengurle

On 13-15 February, 2017, five members of IWSA from Mumbai were invited to join those from Kolhapur branch to participate and witness the many activities carried out by members therein and in nearby Vengurle, District Sindhudurg,, Konkan. After nearly four hour drive from Kolhapur, through the lush Western Ghats slopes, we arrived at Vengurle, to be welcomed by Dr. Dhanashree, Associate Professor at Balasaheb Khardekar College, an active former convenor of the branch, and one who is driving the many activities in this beautiful seaside town and in Kolhapur in collaboration with different members (Kalpana Sawant, Dr Niranjana Chawan, etc) and Institutes. On the first day, a visit to the ICAR's Food Processing Centre Laboratory was a great learning experience. In a brief, it was informed that since the region receives good rains and has fertile soil, there is bumper crop of certain fruit and vegetable items, such as Kokam (*Garcinia indica*), nutmeg (*Myristicafragrans*), cinnamom or dalchini (Cinnamomsp), variety of mangoes, cashew, coconuts, etc. To add value to these food items, this food processing laboratory is now breeding better and superior mangoes and cashew along with other fruits, in addition to processing different items for secondary products, like candies from nutmeg, juice from kokum, etc. Soil testing, pathology and entomology laboratories were shown to us, in addition to different machines used for food processing. Of course, fresh kokum juice and candies were served first to welcome us.

A detailed tour of the estate of this Food Processing Laboratory was equally interesting. Different breeding/crossing techniques for mangoes, cashews, bananas, etc, were shown, in addition to a plot of medicinal plants, palms, etc. Remarkably, most of the agricultural waste was used around the plants as mulch/fertiliser and there was little for disposal.

Approaching late evening, we were taken to the Vengurle beachside which was extremely clean, and were treated to a delicious feast of fresh sea food, etc. A cultural program by the students of Vengurle's Balasaheb Khardekar College on *Dashavatar* brought the long day to a close.

The programme of the next day was at the auditorium of the Food Processing Laboratory, where members of the Kolhapur Garden and Bonsai Club and IWSA exhibited their beautiful bonsai and flower arrangements in different containers. We were greeted by the assembled 100 students, women entrepreneurs, members of the above clubs and IWSA, and the scientific staff of the Laboratory. First, there were short speeches by Dr. Dhanashree, Dr. B. S. Mahajan, Trustee, IWSA and Dr. P. Haldawnekar, Director of the Laboratory, about the importance of development of different skills, especially in areas where one has strengths and where the environment can also assist the entrepreneur. In this context, bonsai, kitchen gardens, appropriate soil preparation and development, flower arrangement, etc. being developed by IWSA Kolhapur members was appreciated and stressed. Further, it was emphasised that scientific concepts behind these skills need to be emphasised for better

outcomes. These skills have potential to spin off other enterprises too, such as wire netting, different types of containers, soil and manure preparation, organic farming, eco-tourism, nurseries, etc. Bonsai demonstration by Sujata Desai and flower arrangement via a slide show by the very active Kalpana Sawant were next demonstrated and the day's program came to an end.

Next day, back at Kolhapur, the day was spent meeting different faculty members of the botany department of the Shivaji University. First, around the extensive botanical gardens where rare gymnosperms, palms, mangroves, medicinal plants, etc and the attempts to propagate and conserve the many endangered and rare species, mangrove types were shown in the Lead Garden developed by the Botany dept of the University and supported by the Ministry of Environment and Forests, GOI. The work carried out in Lead Garden and the associated laboratories (seed and gene bank of plants being developed by Prof. Niranjana Chawan, co-convenor of IWSA's Kolhapur branch) assumes great importance in view of the rich biodiversity of Western Ghats which is fast changing/disappearing due to a variety of factors (climate change, development, or ignorance).

A visit to a relatively nearby sacred grove--Devrai-- in the forests was a natural next step of our hectic tour. Another two hour car drive to Amba, and we were greeted by the 'green soldier', Pramod Mali. Sacred groves are natural treasure troves of biodiversity for rare, endangered and threatened (RET) species. According to Pramod, even these groves deep into jungles and around temples are facing threats from developers and poachers. Akin to a loved guru, Pramod takes us around the grove pointing out rare plants and regaling us with stories about his journey in these forests and his attempts to document the rich flora and fauna therein and also study the behaviour of great Indian hornbill fowl. Approaching late evening, it was time for us to leave this lovely mini forest with promise of returning soon.

Visiting Team: V. Tilak, V Chakraborty, M. Pahwa, T. Tiwari, B. S Mahajan

Amravati Branch

Vidya Bharati Mahavidyalaya, Amravati organized a poster competition in collaboration with IWSA, Amravati branch on **26th August 2016**. Fifty eight student participants drew very meaningful and appealing sketches on the theme given, "Save Girl Child". Dr. S.R Aakarte, Dr. V.R. Deshmukh, Mr. S.H Rathod, Mrs. Rajani Gabhe and IWSA members Dr. V. Wankhade, Dr. Mithilesh Rathor were present on the occasion. Ms. Diksha Ingole, Ms. Ashwini Gondane and Mr. Ravi Gawali helped for the success of the programme.

Indian Women Scientists Association (IWSA), Amravati Branch in association with Director Leprosy office, Amravati, organized a Leprosy Awareness Program on **19th January 2017**, in the conference hall of Bharatiya Mahavidyalaya, Amravati. Dr. Deeplaxmi S. Kulkarni, Convener, IWSA Amravati, introduced the guests and presented a brief about working of IWSA. Dr. T. M. Aulkar, Assistant Director, Medical services (Leprosy) appealed to the students to spread awareness about prevention of leprosy. Dr. Ankush Sirsat, Medical officer (leprosy) explained the signs, symptoms and prophylaxis of leprosy. He also pointed out the social stigma associated with the disease and sufferings of the patients. He conducted a short quiz competition in which the students participated enthusiastically. Dr. Anju Damodar,

Medical Officer gave an oath of leprosy awareness in the society to the staff and students present on the occasion. Dr. A.J. Gadewar, Principal chaired the function. Dr. S.V. Kulkarni, General Secretary, Bharatiya Vidya Mandir, Amravati, Dr. A.G. Vaidya, Treasurer, Bharatiya Vidya Mandir were the guests of Honour. Dr. S. S. Kulkarni, Dr.D.S.Pande, Ms. Vidya Patharkar, Dr. Mangala Dhoran, Dr.Rekha Maggirwar, Dr. S.R. Katke, IWSA members and about 80 students and staff were present on the occasion. Dr. Rachana Sirsat, IWSA member organized the programme.

A rally on "**Female Foeticide**" was jointly arranged by IWSA, Amravati Branch and Pratibha Women's Studies Center of Vidya Bharati Mahavidyalaya, Amravati at village Karala, dist. Amravati on **6th February, 2017**. Students who participated in the rally conveyed the message to the village people about importance of girls and also made them aware about the disturbing ratio of boys and girls in India. They also pointed out that Female Foeticide and Sex Determination Test is illegal in India through slogans and banners in hand. Around 50 students participated in the rally. The rally was successfully carried out under the supervision of Dr. V. R. Wankhade, Dr. M. M. Rathod, Dr. N. R. Thorat, Dr. Y.D. Akhare, Dr. P.G. Bansod and Mr. S.H. Rathod

Kalpakkam Branch

A water conservation essay competition was organised by IWSA for the year 2016 for the Kalpakkam/ Anupuram township residents. The aim of the program is to appreciate the importance of water conservation and the measures to be taken to conserve water by everyone at home. More than 100 women and men participated. The competition was conducted in English, Hindi and Tamil. A panel of judges comprising of IWSA members selected 3 recipients for prizes in each language.

The award function was held at the NESCO open auditorium on **18th July, 2016**. The program started with the welcome address by Convener, Smt. T. Jayanthi. "Seema & Group, Kalpakkam" performed a dance-cum-drama on the title "Save Girl Child". Dr. Jayanthashri Balakrishnan, a well known TV personality and renowned speaker was invited on that day as the Chief Guest. She had delivered a lecture titled "Harmony in human relationships". She made the talk very interesting by correlating Human Relations and Water Scarcity. The prizes were distributed to the awardees at the end of talk. All the participants were also awarded with eco friendly plants as prizes. The program was loved by one and all and was considered as one of the outstanding events conducted by IWSA-Kalpakkam Chapter.

A Technical Talk was arranged on **22nd February, 2017** at MDL Seminar Hall, IGCAR. The lecture was delivered by Ms. Sudha Uthaman, Senior Research Fellow, Satyabama University, who is presently guided by Dr. Rani George, Head, SMCS, CSTD. Ms. Sudha delivered a talk on the "**Development of modified concrete with enhanced concrete properties and durability for seawater application**". The speaker explained the four types of concrete mix namely fly ash concrete, fly ash concrete modified with TiO₂, with CaCO₃ and with TiO₂ + CaCO₃. She explained that after 28 days of curing, specimens were exposed to sea water and at different time interval samples were collected to compare the

pH, concrete/ durability properties, corrosion measurement analysis & microstructural analysis. The speaker elaborated her results to the audience. Her talk invited lot of discussion among the scientists present. On behalf of IWSA, Dr. Vijayalakshmi, Senior member of IWSA-K presented a memento to the speaker as a token of appreciation.

Another Technical Talk was arranged by IWSA, Kalpakkam Chapter at MDL Seminar Hall, IGCAR on **6th April 2017**. The lecture was delivered by Ms. S. Jagathamani, Junior Research Fellow, Homi Bhabha National Institute (HBNI), who is presently guided by Dr. M. T. Jose, Head, RSS, RSD. Ms. S. Jagathamani delivered a talk on the “**Retrosopic Dosimetry Techniques**”. The speaker explained about TLD, which is used for routine dose assessment of workers. She explained about the different forms of dosimeters available like chest, ring, wrist and eye. She explained about the different types of radiological as well as nuclear accidents and how it was difficult to estimate the dose to the public in case of accidents. She explained that emergency dosimetry is concerned with dose above 2 Gy and retrospective dosimetry with low doses. In case of retrosopic dosimeter the dose reconstruction is difficult as the information about the exposure condition is not known and therefore computational methods cannot be used. She explained that in such cases glass display of mobiles can be used to obtain the dose through luminence technique. EPR technique using the CO²⁻ radical formed in the tooth enamel which contains Carbon Calcium Hydroxyapatite can also be used. She also explained that when people are exposed to doses above 0.2 Gy biodosimetry techniques like Premature Chromosome condensation (PCC), dicentric formation in the chromosome and FISH technique can also be used to find the exposure. The speaker informed the audience that she is concentrating on establishing the response of samples like resistances, capacitances etc from mobile and watches to gamma radiation, as apart of her study. Her talk was very informative and invited lot of queries from the audience. On behalf of IWSA, Dr. Kalavathi, EC member, IWSA-K presented a memento to the speaker as a token of appreciation.

Roorkee Branch

IWSA Roorkee conducted the Prof. Vijaya Agarwala Memorial Mathematics Olympiad, VAMMO-2017 in the memory of founder member Prof (Dr) Vijaya Agarwala of Roorkee branch. The competition was organized for the children of classes 6th, 7th and 8th to enhance the scientific temper in the society.

Total 625 students from 14 schools participated in the event. The competition was conducted on **5th February, 2017** at the Green Way School, Roorkee. A number of volunteers from different organizations such as, CSIR-CBRI, IIT-Roorkee, teachers of various schools etc. extended their help for conducting the event.

Prize distribution function of the event was organized on **11th of March 2017** in the auditorium of the Department of Biotechnology, IIT Roorkee. Ten attractive cash prizes, with certificate and mementos in each category were distributed to the students. In addition, consolation prizes and participation certificates were also given to the students.

All the children who received prizes were invited with their parents. Mrs Mona Verma famous author and skill Trainer from Dehradun was the Chief Guest of the function. Prof R.C. Agarwala from IIT Roorkee was the Guest of Honor for the function. Prof. Indu

Mahrotra , President IWSA Roorkee welcomed the guests and Dr. Neeta Mittal, Secretary informed the audience about the objectives of IWSA. Dr. Rama Mehta Scientist NIH (Retd), event co-ordinator explained about the competition and Dr Maya Nair, Prof. IITR co-ordinated the prize distribution and stage arrangement. Mrs Kiran Handa introduced the chief guest. In the end Dr. Rashmi Gaur, professor, IITR gave the vote of thanks. The event was a grand success and it received excellent media coverage.

Tribute to Dr.Vijaya Agarwala

(24.08.1949 to 06.08.2016)



IWSA Roorkee lost an important founder member Dr.Vijaya Agarwala on 6th August 2016.

Vijaya was born in a family who had highly valued education and honesty.

Vijaya's association with IWSA was very strong as she was one of the founder members of the IWSA Roorkee Branch. She was a source of inspiration for other WSA members. She was the Convener of IWSA Roorkee branch for about 12 years and was associated with IWSA Roorkee from 1981 to 2016. She was the back bone of several scientific projects and published more than 430 scientific papers. She has guided several Ph.D. Students and attended a large number of conferences both national and international.

Professionally she was very active and was a pioneer in electroless coating. With her abundant knowledge and pleasing personality, she influenced and motivated many of her relatives and friends.

We pray for her soul to rest in peace.

Women Scientists of ISRO

(Abridged from https://en.wikipedia.org/wiki/Indian_Space_Research_Organization)

The **Indian Space Research Organisation (ISRO)**, is the space agency of the Government of India with its headquarters in the city of Bengaluru. Its vision is to "harness space technology for national development", while pursuing space science research and planetary exploration.

Formed in 1969, ISRO superseded the erstwhile Indian National Committee for Space Research (INCOSPAR) established in 1962 by the efforts of independent India's first Prime Minister, Jawaharlal Nehru, and his close aide and scientist Vikram Sarabhai. The establishment of ISRO thus institutionalized space activities in India. It is managed by the Department of Space, which reports to the Prime Minister of The Republic of India.

ISRO built India's first satellite, Aryabhata, which was launched by the Soviet Union on 19th April 1975. It was named after the Mathematician Aryabhata. In 1980, Rohini became the first satellite to be placed in orbit by an Indian-made launch vehicle, SLV-3. ISRO subsequently developed two other rockets: the Polar Satellite Launch Vehicle (PSLV) for launching satellites into polar orbits and the Geosynchronous Satellite Launch Vehicle (GSLV) for placing satellites into geostationary orbits. These rockets have launched numerous communications satellites and earth observation satellites. Satellite navigation systems like GAGAN and IRNSS have been deployed. In January 2014, ISRO successfully used an indigenous cryogenic engine in a GSLV-D5 launch of the GSAT-14.

ISRO sent one lunar orbiter, Chandrayaan-1, on 22 October 2008 and one Mars orbiter, which successfully entered Mars orbit on 24 September 2014, making India the first nation to succeed on its first attempt, and ISRO the fourth space agency in the world as well as the first space agency in Asia to successfully reach Mars orbit. Future plans include the development of GSLV Mk III (for the launch of heavier satellites), ULV, development of a reusable launch vehicle, human spaceflight, further lunar exploration, interplanetary probes, a solar spacecraft mission, etc. On 18 June 2016 ISRO successfully set a record with a launch of 20 satellites in a single payload, one being a satellite from Google. On 15 February 2017, ISRO launched 104 satellites in a single rocket (PSLV-C37) and created a world record.

As a token of our appreciation for the Women Scientists of ISRO, who have significantly contributed to the success of ISRO projects, we are highlighting some of the achievements of Star Women Scientists of ISRO.

Women Stars of ISRO Projects

1. Ritu Karidhal, mother of two worked on most weekends, brainstorming with ISRO engineers



2. Moumita Dutta - read about the Chandrayaan mission as a student, now works as a Project Manager for the Mars Mission



3. Nandini Harinath - her first job was at ISRO and 20 years later there is no looking back



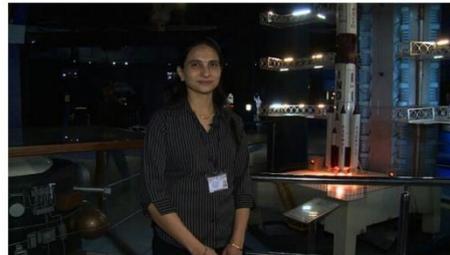
4. Anuradha TK - As a Geosat Programme Director, she is the senior-most woman officer at ISRO



5. N Valarmathi - led the launch of India's first indigenously developed the radar imaging satellite, the RISAT-1



6. Minal Sampath, worked 18 hours a day for the Mars Orbital Mission



7. Kriti Faujdar - computer scientist who works at the Master Control Facility, keeping satellites in their proper orbits



Nobel Prizes 2016

(Abridged from https://www.nobelprize.org/nobel_prizes)

The Nobel Prize in CHEMISTRY: French scientist **Jean-Pierre Sauvage**, British-born **Sir J. Fraser Stoddart** and Dutch Scientist **Bernard L. Feringa** for their design and production of molecular machines that scientists say can lead to new computer chips, batteries and energy storage systems.

They developed the world's smallest machines

A tiny lift, artificial muscles and minuscule motors. They have developed molecules with controllable movements, which can perform a task when energy is added. The development of computing demonstrates how the miniaturisation of technology can lead to a revolution.

The first step towards a molecular machine was taken by Jean-Pierre Sauvage in 1983, when he succeeded in linking two ring-shaped molecules together to form a chain, called a *catenane*. Normally, molecules are joined by strong covalent bonds in which the atoms share electrons, but in the chain they were instead linked by a freer *mechanical bond*. For a machine to be able to perform a task it must consist of parts that can move relative to each other. The two interlocked rings fulfilled exactly this requirement.

The second step was taken by Fraser Stoddart in 1991, when he developed a *rotaxane*. He threaded a molecular ring onto a thin molecular axle and demonstrated that the ring was able to move along the axle. Among his developments based on rotaxanes are a molecular lift, a molecular muscle and a molecule-based computer chip.

Bernard Feringa was the first person to develop a molecular motor; in 1999 he got a molecular rotor blade to spin continually in the same direction. Using molecular motors, he has rotated a glass cylinder that is 10,000 times bigger than the motor and also designed a nanocar.

2016's Nobel Laureates in Chemistry have taken molecular systems out of equilibrium's stalemate and into energy-filled states in which their movements can be controlled. In terms of development, the molecular motor is at the same stage as the electric motor was in the 1830s, when scientists displayed various spinning cranks and wheels, unaware that they would lead to washing machines, fans and food processors. Molecular machines will most likely be used in the development of things such as new materials, sensors and energy storage systems.

The Nobel Prize in PHYSICS: British-born scientists **David Thouless**, **Duncan Haldane** and **Michael Kosterlitz** for research on superconductors and other unusual states of matter, which could pave the way for developments in electronics and quantum computers.

They revealed the secrets of exotic matter

This year's Laureates opened the door on an unknown world where matter can assume strange states. They have used advanced mathematical methods to study unusual phases, or states, of matter, such as superconductors, superfluids or thin magnetic films. Thanks to

their pioneering work, the hunt is now on for new and exotic phases of matter. Many people are hopeful of future applications in both materials science and electronics.

The three Laureates' use of topological concepts in physics was decisive for their discoveries. Topology is a branch of mathematics that describes properties that only change step-wise. Using topology as a tool, they were able to astound the experts. In the early 1970s, *Michael Kosterlitz* and *David Thouless* overturned the then current theory that superconductivity or suprafluidity could not occur in thin layers. They demonstrated that superconductivity could occur at low temperatures and also explained the mechanism, phase transition that makes superconductivity disappear at higher temperatures.

In the 1980s, Thouless was able to explain a previous experiment with very thin electrically conducting layers in which conductance was precisely measured as integer steps. He showed that these integers were topological in their nature. At around the same time, *Duncan Haldane* discovered how topological concepts can be used to understand the properties of chains of small magnets found in some materials.

We now know of many topological phases, not only in thin layers and threads, but also in ordinary three-dimensional materials. Over the last decade, this area has boosted frontline research in condensed matter physics, not least because of the hope that topological materials could be used in new generations of electronics and superconductors, or in future quantum computers. Current research is revealing the secrets of matter in the exotic worlds discovered by this year's Nobel Laureates.

The Nobel Prize in MEDICINE: Japanese scientist **Yoshinori Ohsumi** for discoveries related to autophagy, the "self-eating" process that lets a cell break down and recycle some of its contents. Breakdowns in the autophagy process have been linked to a number of grave diseases including Parkinson's, diabetes and cancer. This year's Nobel Laureate discovered and elucidated mechanisms underlying *autophagy*, a fundamental process for degrading and recycling cellular components.

The word *autophagy* originates from the Greek words *auto-*, meaning "self", and *phagein*, meaning "to eat". Thus, autophagy denotes "self eating". This concept emerged during the 1960's, when researchers first observed that the cell could destroy its own contents by enclosing it in membranes, forming sack-like vesicles that were transported to a recycling compartment, called the *lysosome*, for degradation. Difficulties in studying the phenomenon meant that little was known until, in a series of brilliant experiments in the early 1990's, Yoshinori Ohsumi used baker's yeast to identify genes essential for autophagy. He then went on to elucidate the underlying mechanisms for autophagy in yeast and showed that similar sophisticated machinery is used in our cells.

Ohsumi's discoveries led to a new paradigm in our understanding of how the cell recycles its content. His discoveries opened the path to understanding the fundamental importance of autophagy in many physiological processes, such as in the adaptation to starvation or response to infection. Mutations in autophagy genes can cause disease, and the autophagic process is involved in several conditions including cancer and neurological disease.

Autophagy – an essential mechanism in our cells

After the identification of the machinery for autophagy in yeast, a key question remained. Was there a corresponding mechanism to control this process in other organisms? Soon it became clear that virtually identical mechanisms operate in our own cells. The research tools required to investigate the importance of autophagy in humans were now available.

Thanks to Ohsumi and others following in his footsteps, we now know that autophagy controls important physiological functions where cellular components need to be degraded and recycled. Autophagy can rapidly provide fuel for energy and building blocks for renewal of cellular components, and is therefore essential for the cellular response to starvation and other types of stress. After infection, autophagy can eliminate invading intracellular bacteria and viruses. Autophagy contributes to embryo development and cell differentiation. Cells also use autophagy to eliminate damaged proteins and organelles, a quality control mechanism that is critical for counteracting the negative consequences of aging.

Disrupted autophagy has been linked to Parkinson's disease, type 2 diabetes and other disorders that appear in the elderly. Mutations in autophagy genes can cause genetic disease. Disturbances in the autophagic machinery have also been linked to cancer. Intense research is now ongoing to develop drugs that can target autophagy in various diseases.

Autophagy has been known for over 50 years but its fundamental importance in physiology and medicine was only recognized after Yoshinori Ohsumi's paradigm-shifting research in the 1990's. For his discoveries, he is awarded this year's Nobel Prize in physiology or medicine.

AN APPEAL TO ALL IWSA LIFE MEMBERS OF MUMBAI/NAVI MUMBAI

Dear IWSA Members,
IWSA wishes to issue Membership Cards to all the Life Members. Hence, we need the following updates from you:

1. Permanent contact address
2. Working/Retired; If working, the current designation and affiliation.
3. Phone no
4. Mobile No
5. Email address
6. A soft copy of your latest photograph in passport size.

Kindly send these details at the earliest to: **iwsahq@gmail.com**

Applications Invited for Annual IWSA Awards : 2017-18

- **1. Dr. Shantoo Gurnani "Merit-cum-Means" Award:** For female students at the graduate levels --science stream only.

Eligibility: Females pursuing B.Sc. in any science stream (from first to third year). Students with family income of less than Rs 3.00 lakhs/ annum can apply.

2.Chetan Memorial Trust Award: For girl students at the post graduate level – Science Stream only.

Eligibility: Girls pursuing M.Sc. in any science stream. Students, with family income of less than Rs. 3.0 lakhs p.a. can apply

- **3.'Param Udhav Gurnani' Travel Support:** For attending IWSA scientific conferences (actuals, not exceeding Rs. 2,000/-).

Eligibility: Should be presenting a paper (oral or poster). Award will be based on quality of abstract and financial status.

- **4.'Param Udhav Gurnani' Best Paper Awards:** For female students --best posters/papers during IWSA conferences.

- **5. Nanik Gurnani 'Innovation Award':** For an IWSA member who has done innovative research in applied S&T. The application must be sent with detailed bio-data, along with details of research.

6*. "Late Dr. Jayshree Daoo Award": This award is instituted by Major Vikrant Daoo in memory of his mother. It is for a bright young woman pursuing Ph.D. in the field of Science.

Eligibility: Students in their second year of their Ph.D. program are eligible. They should submit a two- page write up of their research proposal. The annual family income should not exceed Rs. 3lakhs.

7*. "Late Dr. Sumati and Mr. Vasudeo Bhide Award": This award is instituted by Prof. Amar Bhide in memory of his parents. It is for a bright young woman pursuing Ph.D. in the field of Science.

Eligibility: Students in their second year of their Ph.D. program are eligible. They should submit a two- page write up of their research proposal. The annual family income should not exceed Rs. 3lakhs.

- **8. "Dr. Suresh K. Mahajan Memorial Scholarship":** This Scholarship has been instituted at IWSA, 2016, by Dr. Mahajan's student, Dr. V. Sanzgiri.

Eligibility: The scholarship will be given to a bright girl student pursuing a Ph.D. in any discipline of life sciences and in the second year of their program. The annual family income should not exceed Rs. 3lakhs. This Scholarship of Rs. 50,000/ will also carry a citation and a trophy. The applicants must submit a two-page summary of their research proposal.

- **9. "Mrs Leela Bansiya Award":** This award is instituted by Mr. Jagdish Bansiya in the name of his mother. It is for the bright young girl student who is topper in the HSC Exam (science stream) of the year of the award.

*** Committee will decide which award is to be given to the selected applicants.**

In addition, there are several other awards instituted by generous donors, well wishers and IWSA members. These are for students attending different courses in IWSA.

Please Note: (i) **Last date for receiving applications: 22nd July, 2017.** (ii) Applications and supporting documents to be sent to: Convenor, Scholarship Committee, IWSA, with a soft copy to iwsahq@gmail.com. (iii) All the applicants should be authenticated by college authorities.



IAS, Bangalore



INSA, New Delhi



NASI, Allahabad

Science Academies' Lecture Workshop on "OMICS: Basics and Applications" Conducted by Indian Women Scientists' Association, Vashi, Navi Mumbai.

A two day lecture workshop on selected topics on Genomics, Proteomics, Metabolomics and Instrumentation will be conducted as under.

Venue:

IWSA's ICICI Multipurpose Hall,
Sector 10-A, Dr. Mar Theophilus Marg, Vashi, Navi Mumbai - 400703.
Phone: 022 27661806

Date: 8 - 9 July, 2017

Time: 0900 hrs to 1730 hrs

Who all can attend?

Young researchers, Teachers, Ph. D students, Undergraduate and Postgraduate students in Life Science/Biotechnology/Bioinformatics/Biophysics and allied fields from Mumbai, Navi Mumbai and adjoining areas.

Free Registration

The application forms can be downloaded from IWSA website www.iwsa.net. Application should include name, affiliation, position, name of institution, contact details etc. and a small write-up on how you consider you will benefit from this workshop and the same is to be forwarded to: The Co-ordinator, OMICS Workshop at iwsahq@gmail.com. Last date of receiving the application will be 30th June, 2017.

For more details please contact **Dr. Susan Eapen** (91 9004428381, eapenhome@yahoo.com)

The selected candidates will be informed on first come first served basis by 4th July, 2017.

Dr. Rita Mulherkar
Convener,
IWSA OMICS Lecture Workshop.

Dr. Susan Eapen
Co-ordinator,
IWSA OMICS Lecture Workshop.



Indian Women Scientists' Association (IWSA) - www.iwsa.net - Phone: 022 27661806



Visit of IWSA Team from Headquarters, Vashi, Navi Mumbai to Kolhapur Branch during 13-15 February, 2017. Members are seen at the mini forest, Devgiri amidst the rich flora and fauna.



Dr. V. Nataraju speaking on “Fundamentals and Applications of Mass Spectrometry” at the Workshop on Mass Spectrometry held at Ruia College, Mumbai on 14th January, 2017.



Students watching the demonstration of the Mass Spectrometer with rapt attention.



Closing Ceremony of Science Nurture Program on 17th March 2017



Poster Competition on “Save Girl Child” campaign (26th August 2016) and Dr. Ankush Sirsat speaking at the Leprosy Awareness Camp (19th January 2017) -- programs organized by IWSA’s Amravati Branch.



Women’s Day Celebration on 14th March 2017 at Kalpakkam Branch



Prof. Vijaya Agarwala Memorial Mathematics Olympiad. VAMMO-2017 conducted by Roorkee Branch on 5th February, 2017

To

From

IWSA Head Office

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