# IWSA NEWSLETTER

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Cancer Detection Camp on 7th January, 2020 at Punjab Heritage Bhavan, CBD, Belapur


Annual Science Exhibition at IWSA Head Quarters on 17th and 18th January, 2020


Workshop on Lasers, Fibre Optics & Optical Communications and Fibre Sensors on 6th and 7th March, 2020

## BRANCHES

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


**Dr. Debjani Paul delivering lecture on Microfluidic Devices for Health Care at K.C. College, on 17th January 2020**

**Dr. Gouri Pandit delivering lecture on Air Quality Assessment at K.C. College, on 24th January, 2020**

**Dr. Sangeeta delivering lecture on World of Sensors at VES College, on 1st Fenruary, 2020**


**Dr. Sudhir Singh delivering lecture on Metabolic Engineering in Medicinal Plants at Ruia College, on 1st February 2020**

**Dr. Kamalesh Mashilkar delivering lecture on Artificial Intelligence at VESIT, on 5th February 2020**

**Dr. Arvind Ingle delivering lecture on Animals for Biomedical Research at SIES College, Sion on 11th February 2020**

**Dr. Sharada Sawant delivering lecture on Transmission Electron Microscopy at KBP College, on 17th February 2020**


**Dr. S K Sahu delivering lecture on Radioactivity in the Environment at SIES College, Nerul on 18th February 2020**

# From the Editor's Desk

**Dear IWSA Members,**

In this issue of Newsletter, you will find our regular features of reports regarding Popular Science Lectures, Workshops, Science Exhibition, Activities of various Branches etc. IWSA has conducted ten BRNS Popular Science Lectures during January and February 2020, of which nine lectures were held in various colleges in Mumbai and Navi Mumbai and the tenth lecture was organised by Bengaluru Branch. We bring you reports on other Science Awareness activities such as Science Exhibition for school and college students, Workshop on Lasers, Fibre Optics and Optical Communications, Workshop on Machine Learning and several activities of IWSA's Learning Garden. From the reports on Cancer Detection Camp and Scholarships Awarded to deserving students, one can gauge the commitment of IWSA for addressing the societal issues, encouraging girl students to pursue scientific career etc. During March and April 2020, IWSA could not organise any outdoor events due to COVID 19 lockdown. This however, did not dampen the spirit of IWSA, several online meetings were held among the members to carry on some of the activities like classes for ECCE teachers and Nursery children. IWSA members also attended several webinars to keep themselves updated on various topics.

This issue also brings the interesting activities held at IWSA Branches at Amravati, Baroda, Bengaluru, Hyderabad, Kalpakkam, Kolhapur, Nagpur and Roorkee. Dr. Gita Sharma, Former Professor of Microbiology from Osmania University has written a detailed article about Corona Virus and the Pandemic. We have reported about some of the women achievers like Padma Awardees, Women who are leading India in the fight against the current COVID crisis etc. We lost Dr. Sudha Gangal, former President of IWSA on 14th February, 2020 and one of our Founder Members, Dr. Kusum Arjungi passed away on 18th April, 2020. In this issue, we are paying our homage to these two great scientists, who were integral part of IWSA. 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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# President's Message

Dear Members,

The year 2020 started with intense activities at IWSA Head Quarters as well as its branches. There were two major events at HQ. The first was the Annual Science Exhibition ( with an outreach of 1200) on 17th and 18th January in collaboration with Department of Atomic Energy. The theme of this exhibition was "Novel and Smart materials", detailed report of which is given in this issue. The exhibition was open to school and college students. School students exhibited their projects on "Mendeleev's periodic table of elements and novel materials" on the second day. The last event that was organized in this period, before the lock down started, was the Workshop on Lasers, Fiber Optics & Optical Communications, Fiber Sensors on 6th and 7th March, 2020 (outreach of 100) in collaboration with National Academy of Sciences India (NASI). In between these two events, there have been many programs such as the Cancer Camp, BRNS supported lectures, Learning Garden lectures and educational visits of school and college students to IWSA.

The Activity Centers of IWSA at HQ, Vashi (Daycare, Nursery, ECCE classes, Science Nurture, Library, Health Centre) completely closed down from 27th March taking account of the orders issued by the Government of Maharashtra. The Hostel facility is working with minimum number of inmates, as most of the girls left for their home towns. This was sudden and a period of uncertainty for IWSA. Under this situation, providing the minimum comforts to hostel girls was becoming a challenge.

Here I would like to mention the attitude of zeal and courage displayed by the brave trio, our Hostel supervisors- Ms. Celine Almeida, Apoorva Kulkarni and Jaishri Khanolkar who took care of all our facilities. We would not have been able to go through this trying period of COVID pandemic without them.

Now, keeping up with the digital technology, IWSA has started lectures of Early Childhood Care Education ( ECCE) course and meetings of all committees on-line. Office staff and all of us are working from home.

Well, as they say, "This too will pass" and so, we are sure that, IWSA premises at Vashi, Navi Mumbai will come to its original active and buzzing form, soon.

Meanwhile, I urge all HQ and branch members to take advantage of digital platforms and arrange webinars and Popular Science lectures, student interactive sessions etc, on-line. This has the advantage of enhancing our outreach several-folds.

Best Wishes

**Lalitha Dhareshwar**
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# Reports from Head Quarters

## Science Awareness Programs

## A. IWSA – BRNS Popular Science Lectures

1. **BRNS Popular Science Lecture at the KC College, Churchgate, Mumbai on 17th January, 2020**

   **Dr. Debjani Paul**, Associate Professor, Biosciences and Bioengineering Dept, IITB, spoke on "Microfluidic devices for Health care". Microfluidics deals with controlling the flow of different fluids in networks of tiny micrometer-sized channels. It is a combination of technologies on a chip. This technology is used to develop "lab-on-a-chip" devices which are miniaturized laboratory platforms to perform rapid chemical and biological tests with much smaller sample volumes. Dr. Paul informed the students that her background in physics and her interest in biology together made her decide that she should develop microfluidics based diagnostic devices. She described in detail about physical properties of biological cells, such as, shape, deformability, etc. which have recently generated a lot of interest as potential biomarkers for different diseases. For example, red blood cells (RBCs) in circulation are normally biconcave and very deformable. But they become stiff when they are infected by malaria parasites. RBCs also become sickle-shaped and stiff in sickle cell anemia, leading to blockage of blood vessels. It is therefore possible to use"microfluidics" as a technology to probe cell size, shape and deformability to diagnose different blood-related disorders. Depending on the test to be developed, the size of the cells and channels are matched. The devices are made user friendly, with high throughput read outs and of low cost. Dr. Paul described one of the projects in her laboratory which deals with the development of a diagnostic test for sickle cell disease, an inherited disorder affecting the red blood cells. She informed how they have studied the shape of a sickle and normal RBC in the presence of oxygen scavengers and used the dynamics of the shape change to develop the diagnostic test with the help of a microscope made in their laboratory. They have taken this device out of the lab and tested it in remote areas of Maharashtra and Gujarat to check whether it works in places with minimal diagnostic facilities. Another project in Dr. Paul's laboratory deals with a paperfluidic device to monitor dental health at home. The common goal of these projects is to develop portable and affordable medical devices suitable for use in developing countries like India. Students (124) from Microbiology department who attended the lecture engaged Dr. Paul with a lot of questions. They were amazed at how laboratory experiments can be taken to the field for societal benefit.

At the beginning of the lecture, Dr. Sejal Rathod, HOD, Microbiology Department, welcomed the audience, Dr. Surekha Zingde, Trustee, IWSA, spoke about the different activities of IWSA. Dr. Paramjit Anthapan summarized the lecture and Dr. Rajitha from KC College delivered a vote of thanks at the conclusion of the program.

## 2. BRNS Popular Science Lecture at Kishinchand Chellaram College, Churchgate, Mumbai-400020 on 24th January, 2020

**Dr. (Smt.) Gouri Pandit**, Adjunct Professor in Environmental Science and Engineering Department, Indian Institute of Technology Bombay, Powai, Mumbai 400076 delivered a lecture on "Air Quality Assessment for Sustainable Environmental Management" at Kishinchand Chellaram College, Churchgate, Mumbai-400020 on 24th January, 2020.

Air pollution is a general term that covers a broad range of contaminants in the atmosphere. Pollution can occur from natural causes or from human activities. Air pollution, which is of major public concern, is currently the object of extensive scientific research. It affects human health, productivity and property. The cost of such pollution whether expressed in terms of direct biological consequences or in terms of economic impact is enormous. Air pollution (outer door/indoor) affects nearly millions of people, exposing them to possible health hazard. It harms the human respiratory system. Emphysema, asthma and other respiratory illnesses may result by chronic exposure to certain pollutants such as, carbon monoxide, nitrogen oxides, sulphur dioxide, hydrocarbon, suspended particulate matter etc.

Dr. Pandit described the various sources of air pollution, such as, automobiles, industries, burning of plastics, metal particles that are generated from incineration process etc. She explained how airborne particulate matter (PM) is not a single pollutant, but rather is a mixture of many subclasses of pollutants with each subclass containing many different chemical species. The size distribution and chemical composition of particulate matter emitted into the atmosphere depends on the source type and conditions of emission including temperature, relative humidity and wind speed. She emphasized the need for regular ambient air monitoring at various locations to assess the air quality.

The lecture was attended by about 95 students and 5 faculty members. Dr. Pandit answered the queries from the audience and further interacted with the students who had many more questions. Dr. Sheela Valecha, Head, Department of Chemistry, K.C. College welcomed the audience. Dr. Shyamala Bharadwaj, Member IWSA informed about the activities of IWSA

prior to the lecture and Mr. Karun Sodah of Department of Chemistry, K.C. College introduced the speaker. Dr. Dhanya Suresh, member IWSA summarized the lecture and initiated the question-answer session after the lecture. Dr. Charulata Chaturvedi of the Department of Chemistry, K.C. College, gave a vote of thanks.

3. **BRNS Popular Science Lecture at the Ruia College, Matunga, Mumbai on 1st February, 2020**

**Dr. Sudhir Singh**, Scientific Officer, Nuclear Agriculture & Biotechnology Division, BARC, delivered a lecture on Metabolic Engineering in Medicinal Plants. Dr. Singh first explained about primary and secondary metabolism in plants. He then informed the audience about metabolic engineering and how it can be used to obtain metabolites of interest in larger quanities. *Nothapodytes foetida* is an endangered medicinal plant in Western Ghats of India and is a rich source of the anti-leukemia and anti-tumoural compound camptothecin (CPT). Dr. Singh informed that in his laboratory a study to understand camptothecin biosynthesis in *N. foetida and the role* of different enzymes as well as regulatory factors involved in the pathway were being undertaken. Comparative transcriptomic analysis of roots (having highest CPT levels) and leaves (lower CPT level) revealed more than half a dozen putative candidate genes which may be involved in CPT biosynthesis in *N. foetida*. After validating the relative expression levels of these genes using quantitative RT-PCR, they could successfully clone full-length cDNA of two crucial genes, namely strictosidine synthase (*Nfstr*) and geraniol-10-hydroxylase (*G10H*). Further, *Nfstr* was transferred to *Ophiorrhiza rugosa* using *Agrobacterium*-mediated genetic transformation method. Transgenic plants over-expressing *STR* showed more than two-fold improved levels of CPT than control plants. The results showed a crucial role of *STR* in enhancing CPT levels in plants and may find applications in metabolic engineering of CPT biosynthesis in target plants to obtain larger amounts of the desired products.

The lecture was attended by 102 students and faculty. Dr.Singh answered the many questions from the the audience. Prior to the lecture, Dr. Jessy Pius, HOD of Botany Dept., Ruia College welcomed the audience and Ms. Tripta Tewari, Co-Convenor of IWSA, Science Awareness committee, informed the audience about the activities of IWSA. Dr. Bhavna Narula,faculty of Ruia college, introduced the speaker and at the end of the lecture thanked the audience and the speaker.

4. **BRNS Popular Science Lecture at Vivekanada Education Society's College of Arts, Science and Commerce, Chembur, Mumbai on 1st February, 2020.**

**Dr. Sangeeta**, Senior Scientist, Physics Group, Bhabha Atomic Research Centre, spoke on "World of Sensors" at Vivekanada Education Society's College of Arts, Science and Commerce, Chembur, Mumbai on 1st February, 2020.

Sensor is a device which detects or measures a physical or chemical property or parameter and actuates a response. It consists of an active element called DETECTOR, a transducer, which converts the measurement into an Electrical, Optical or any other type of Physical or Chemical signal, which can be processed by a hardware and then quantified by comparing with a calibrated database. Change in signal value beyond a certain threshold initiates a pre-set function through an actuator. Dr. Sangeeta explained how we are utilizing a variety of sensors in our everyday life such as gyroscope, ambient light sensor, proximity sensor and temperature sensor, which provide a centralized system for automatic control in Smartphones. Automatic opening of gates at the Malls, Smoke Alarm, Metal detectors etc. are other examples of commonly encountered sensors. She also gave examples of how sensors have penetrated in almost every walk of life as it has highest usage in consumer electronic products, followed by automotive, process engineering, IT, telecom, health care etc. Market survey predicts 9.5% growth in global Sensor demand in next five years. National programmes on Smart Cities, Smart Cultivation, Food Preservation, Transportation, Telemedicine, Environmental Monitoring, Disaster Management etc., puts a huge demand on sensor requirements within our country itself. Further she discussed about the miniaturization of sensing elements to nanoscale, Bio compatibility for medical applications, use of artificial intelligence (AI) and Internet of Things (IOT) which are very competitive areas for research and product development. In fact, the field of sensors is multidisciplinary, encompassing all areas of basic sciences and engineering disciplines, depending upon the type of sensors. Lot of opportunities therefore exist for entrepreneurship on sensor development, under the Make in India program. Selection of type of sensor, requirements on detection limits, specificity, packaging, certification, cost optimization, scope for product scaling, customisation, marketing, generation of financial, material and human resources and their sustenance are some the other important considerations for such an endeavour. All through her talk she also explained the basic concepts of sensors used in Thermal Imaging, Food Analysis, Drug delivery and Environmental monitoring.

The lecture was attended by about 86 students and 10 faculty members. Dr. Sangeeta answered the queries from the audience and further interacted with the students who had many more questions. In fact, after the lecture several students were seen discussing various aspects about the sensors with Dr. Sangeeta for a long time. Ms. Hemalatha Deshpande, Head, Department of Physics, VESASC, Chembur, welcomed the audience. Dr. Surekha Zingde, Trustee, IWSA made a presentation about the activities of IWSA prior to the lecture. Dr. Paramjit Anthappan, member IWSA summarized the lecture and initiated the question-answer session after the lecture. Besides Dr. Surekha Zingde and Dr. Paramjit Anthappan, other IWSA Members including Dr. Bakhtaver Mahajan, Trustee IWSA, Dr. Lalitha Dhareshwar, President IWSA and Dr. Shyamala Bharadwaj, Editor, IWSA Newsletter attended the lecture.

5. **BRNS Popular Science Lecture at Vivekanada Education Society's Institute of Technology, Chembur, Mumbai on 5th February, 2020.**

**Mr. Kamlesh Mhashilkar**, Head, Data and Analytics Practice, Analytics and Insights Unit, Tata Consultancy Services, spoke on Artificial Intelligence and Industry Applications. Mr. Mhashilkar explained how decision making which is human centric is moving to machine centric. That is, strategic decisions are made by humans and operational activity is done by machine. This is the basis of Artificial Intelligence (AI). Different main activities of AI have matured. However, it is still not clear, how computers can copy social intelligence, computational creativity in arts and related and replace human consciousness.

Artificial intelligence has been in the industry for a while and has been used for range of industry applications involving Operational-Tactical-Strategic decision making and performing intelligent actions. Usually, the fabric of AI solutions has been yielding breakthrough in fields such as Agriculture, Consumer Experience, Medical Diagnosis, Lights-off Manufacturing Plants, Financial Crimes, Mining, Digital Supply Chain, Remote Sensing, Security & Surveillance. AI has enabled numerous cases of macro to micro scale across different industries. Its adoption has brought a change in the perspective of the industry while elevating the role of human being. The early adopters of AI have shown their differentiated abilities in Business 4.0. It has enabled them to envision the age of abundance instead of worrying about scarcity of opportunities in the world. It has opened up the ecosystems to derive exponential value, enable mass customizations and embrace higher risks with surgical precision.

The lecture was attended by 150 students and faculty. Prior to the lecture Ms. Priya R.L, Asst Prof, Department of Computer Engineering, welcomed the audience, Dr. Surekha Zingde, Trustee, IWSA, spoke about IWSA activities. Dr. Shyamala Bharadwaj, Editor, IWSA Newsletter and Ms. Nagambal, IWSA member attended the lecture.

6. **BRNS Popular Science Lecture at SIES College of Arts, Science and Commerce, Sion, Mumbai on 11th February, 2020.**

**Dr. Arvind Ingle,** Scientific Officer 'G' and Officer-in-Charge of Laboratory Animal Facility, ACTREC, Navi Mumbai delivered a lecture on **"Animals for Biomedical Research".**

Use of animals in research is essential for the development of new and more effective methods for diagnosis and treating diseases that affect both humans and animals.. Animals, such as rodents, birds, rabbits, guinea pigs, sheep, fish, frogs, pigs, dogs, cats and primates have their own expressible characteristics and that is the basis for their use for different purposes in biomedical research. If there are variations in these characteristics, there may be alterations in the outcome of experimental results.

Homozygosity and its heritability in laboratory rodents are important factors which are necessary for their use as model systems for biological research. This can be achieved by adopting defined system of laboratory animal breeding. The animal models may be infection free but genetic contamination may render them useless for experimentation. Therefore genetic and microbiological quality are important parameters for inbred animals which are to be used as model systems for different investigations. The lecture provided information about the characteristics of the animals and representative investigations which are being done to address different biological questions.

Judicious use and care of these animals is a prime duty of the researchers and technicians who use them. Regulatory bodies along with the Institutional Animal Ethics Committees (IAEC) has the responsibility to oversee the compliance and welfare of research animals. Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) was constituted by the Government of India in 1968 under chapter IV of the '*Prevention of Cruelty to Animals'* (PCA) *Act*, 1960 to oversee the animal experiments. In the year 1998, the rules were re-notified in the Gazette of India as a "Breeding of and Experiment on Animals (Control and Supervision) Rules", 1998 and CPCSEA was given a mandate to execute these 'Rules' scrupulously. Dr. Ingle explained all the above aspects of animal models, housing, breeding, quality control and regulations with a very interesting presentation.

The lecture was attended by 105 students including faculty. The lecture elicited several questions from the audience and there was good discussion between them and the speaker.

Prior to the lecture Dr. Satish Sarfare, Vice Principal, SIES college welcomed the audience and Dr. Surekha Zingde, spoke about the activities of IWSA. The student representatives introduced the speaker and Dr. Tara Menon, HOD of Biotechnology thanked the audience. Ms Tripta Tewari, Co-Convener of IWSA Science Awareness committee and Ms.Vijaya Tilak, Secretary, IWSA, Executive Committee, attended the lecture.

**7. BRNS Popular Science Lecture at Karmaveer Bhaurao Patil College, Vashi, Navi Mumbai on 17th February, 2020.**

**Dr. Sharda Sawant,** Scientific Officer 'F', Officer-In-Charge, Electron Microscopy Facility, Tata Memorial Centre, ACTREC, Kharghar, Navi Mumbai, spoke on **Transmission Electron Microscopy For Applications in Biology.** Dr. Sawant explained that Transmission Electron Microscopy (TEM) is the most powerful microscopic tool available to-date, capable of producing high-resolution, detailed images of <1 nanometer (nm) in size. The basic principle of TEM is shorter the wavelength, higher the resolution. The electron beams have very short wave length ~0.005nm. The high energy electrons accelerate to nearly the speed of light. The electron beam behaves like a wave-front with

wavelength about a million times shorter than light-waves which produces high-resolution (~0.1nm), two-dimensional images, allowing for a wide range of educational, scientific and industrial applications. TEM utilizes energetic electrons to provide morphologic, compositional and crystallographic information on samples. The presentation covered principles of transmission electron microscopy, electron versus light microscopy and high resolution image formation. Dr. Sawant described in brief the protocol for sample processing and special techniques (negative staining and immune-gold labeling). She showed slides showing the applications of TEM, for various biological uses including cancer diagnosis. Dr. Sawant circulated grids on which samples are placed and then introduced into a TEM. The students were very excited with this demonstration. They had many questions regarding different applications of TEM and Dr. Sawant addressed each of these patiently. The lecture was attended by 306 students and faculty. Dr. Shubhada Nayak, Vice Principal of the college welcomed the audience prior to the lecture, Dr. Surekha Zingde, Trustee, IWSA gave a brief on the activities of IWSA. Dr. Paramjit Anthappan summarized the lecture and elicited questions from the audience. Dr. Suparna Kamat, Jt Sceretary, IWSA, EC attended the lecture. Dr. Keshav Shinde, KBP college acknowledged the efforts of IWSA to take the best in science to the colleges and he also thanked the speaker for her interesting lecture.

8. **BRNS Popular Science Lecture at SIES College of Arts, Science and Commerce, Nerul, Navi Mumbai on 18th February, 2020**

**Dr. S. K. Sahu**, Scientific Officer, Environmental Monitoring & Assessment Division, Bhabha Atomic Research Centre, Mumbai spoke on “Radioactivity in the Environment” at SIES College of Arts, Science and Commerce, Nerul, Navi Mumbai on 18th February, 2020.

During the first half of his lecture, Dr. Sahu explained to the audience how radiation is a fact of life and how we live in a world in which radiation is naturally present everywhere. Every person, animal and object present on our planet earth is subjected to radiation from several sources. We cannot see it, smell it or feel it, but we are exposed to radiation throughout our life. He further explained about the nature and sources of various types of radiations.

Radioactivity is a part of nature. In the process of element formation by nuclear reactions taking place in stars, both stable and radioactive isotopes of elements are formed. The isotopic composition of elements is characterized by properties of nuclear reactions that led to the formation of the elements. Elemental composition of the planet Earth, thought to be about $4.5\times10^9$ years old, although not yet in chemical equilibrium, reflects the composition of the material from which it was formed. Therefore, we find

radionuclides in nature, having long half-lives (longer than the age of Earth) and there are also natural processes which continuously produce new radioisotopes. Dr. Sahu presented in detail the facts about the presence of radionuclides in nature and why they are not harmful to human beings or other forms of life on this earth. He brought out the precautions and guidelines followed by researchers handling higher doses of radiation for their scientific research. He further explained the strict regulations followed in monitoring the radiation environment around nuclear power plants and other nuclear installations to keep the level of radiation well within the ALARA (As Low As Reasonably Achievable) safety norms.

The lecture was attended by about 85 students and 5 faculty members. Dr. Sahu answered the queries from the audience and after the lecture several students interacted with him to know more about the environmental impacts of radiation and the career opportunities in this field. Dr. Jyoti Koliyar, Head, Department of Environmental Science, SIES (Nerul) College of Arts, Science and Commerce welcomed the audience and introduced the speaker. Dr. Surekha Zingde, Trustee IWSA informed about the activities of IWSA prior to the lecture. Dr. Shyamala Bharadwaj, Editor, IWSA Newsletter, summarized the lecture and initiated the question-answer session after the lecture. Other IWSA Members who attended the lecture were: Ms. Vijayalakshmi Tilak, Dr. Suparna Kamath, Dr. Paramjit Anthappan and Ms. Tripta Tewari. Ms. Kamini Thakur of Department of Environmental Science, SIES (Nerul) College, gave a vote of thanks.

**9. BRNS Popular Science Lecture at the BMS College of Engineering, Dept of Biotechnology,Bengaluru on 28th February, 2020**

**Dr Prathiba Ranganathan**, Professor, Centre for Human Genetics, Bangalore delivered a lecture on Cancer genes: From biology to therapy. The main objective of the talk was to make students understand about the mechanism of cancer genes, various targets for drug discovery and the recent advances in medicine towards cancer therapy. The speaker began her talk by introducing participants about the basic definition of cancer. She then elaborated on cell cycle check points and the various control mechanisms in a cell which ensure proper cell division has taken place. This was followed by an introduction to the main genes involved in cancer; Oncogenes and Tumour suppressors. Dr. Prathiba illustrated by giving examples on various mechanisms of oncogene activation and its role in cancer progression. Further she highlighted that by knowing about the alteration in the genes, potential targets for drug development could be identified.

A very recent phenomenon “Oncogene Addiction” was mentioned, which described that the survival of cancer cells depending on an activated oncogene or inactivation of tumor suppressor gene, and was regarded as the 'Achilles heel' of the successful molecular targeted therapies in cancer. She then discussed on classification of tumour suppressor genes as Caretaker, Gate keeper and Landscaper. She then spoke on a

very important tumour suppressor gene, p53 which is regarded as the guardian of genome. In addition, she explained the role of APC-Wnt signalling parthway that negatively regulates cell growth. Role of p53 in a rare childhood tumour retinoblastoma was also explained. She mentioned that it is a rare form of cancer that rapidly develops from the immature cells of retina, the light-detecting tissue of the eye. It is the most common primary malignant intraocular cancer in children, and it is almost exclusively found in young children. She finally mentioned the concept of "The Knudson hypothesis", also known as the two-hit hypothesis, which stated that most tumour suppressor genes require both alleles to be inactivated, either through mutations or through epigenetic silencing, to cause a phenotypic change.

The lecture was attended by about 100 students and faculty. The session was very interactive and very positive and satisfied responses were received from the participants.

Prior to the lecture, Prof. Savithri Bhat, Convenor of IWSA Bengaluru branch, welcomed the audience and Dr Prathiba Ranganathan. She also briefed the audience about IWSA and its activities. The lecture ended with a vote of thanks from Dr. Bhat.

10. **BRNS Popular Science Lecture at SIES College of Arts, Science and Commerce, Sion, Mumbai on 29th February, 2020**

**Prof. Sanjay Wategaonkar**, Senior Professor, Chemical Sciences, Tata Institute of Fundamental Research, Mumbai delivered a lecture on "Infrared Spectroscopy" at SIES College of Arts, Science and Commerce, Sion, Mumbai on 29th February, 2020.

In this lecture, Prof. Wategaonkar started with the basics of IR spectroscopy. He explained the origin of molecular vibrational levels, what information does it provide about the molecules, and how to go about obtaining IR spectrum etc. He discussed all the basic aspects of IR spectroscopy, such as the potential diagram, analytical expressions used to describe the energy levels and selection rules by giving suitable examples of simple diatomic molecules as well as complicated polyatomic molecules. He also brought in the quantum chemistry explanations and made it simple for the students by involving them in the discussions. The conventional and modern methods of obtaining IR spectra and interpretation of the data were explained to the students in an interactive mode.

In the final part of his lecture, Prof. Wategaonkar described about his own research program called **Supersonic Jet Spectroscopy** at the TIFR. At TIFR, he has been engaged in research on the interactions between molecules using the above technique in conjunction with laser spectroscopy. These interactions, namely, hydrogen bonding interactions play an important role in everyday life and most importantly in biological systems by lending the structure to proteins and enzymes which allow them to carry out various functions important for living. Thus, the students were exposed to the

recent research in the field of IR spectroscopy. Most of students were quite interested in this research and asked him several questions about its applications.

The lecture was attended by about 80 students and 6 faculty members. The interactions between Prof. Wategaonkar and the students continued for a long time after the lecture. Ms. Pearl Fernandes, a student from the Chemistry Department of SIES (Sion) College of Arts, Science and Commerce, welcomed the audience and introduced the speaker. Dr. Shyamala Bharadwaj, Editor, IWSA Newsletter, made a short presentation about the activities of IWSA prior to the lecture. Dr. Suparma Kamath and Ms. Deepti Yadav were the other IWSA Members who attended the lecture. Ms. Gayatri Sehgal, Head, Department of Chemistry, Dr. George Abraham, Ms. Mahalaxmi Nadar and Mr. Santosh Tiwari were some of the faculty members of Chemistry Department who attended the lecture and encouraged the students to interact with the speaker. Ms. Aswini Madnala one of the students from Department of Chemistry gave a vote of thanks.

## B. Science Exhibition on "Novel Materials and Smart Materials" on 17th and 18th January, 2020

IWSA celebrated its Annual Science Day event by organizing a Science Exhibition on the theme – **"Novel materials and smart materials"** on 17th and 18th January, 2020.

On this occasion, Department of Atomic Energy displayed the posters and models on various technologies developed at the various establishments of DAE, connected with the theme of the exhibition and the Indian Nuclear Programme.

DAE has done extensive research in frontier areas of science and technology, on **Novel and Smart materials** and the technology transfer has been done for commercial output. This exhibition was open to all schools and colleges of Navi Mumbai and to the public for two days-17th and 18th.January, 2020. This year the display by DAE was very meticulous and self-informative. It included a working model of a Pressurized Heavy Water Nuclear Reactor with the power generating system with an audio description of the various components and its working. The foot fall of visitors (students, faculty and public) on both the days was more than 1200. The DAE exhibition was inaugurated by the chief guests- Dr. Madangopal, Associate Director, Materials Group and Dr(Mrs). Balvinder. K. Sapra, Head, RPAD of BARC. The inaugural function commenced by a short welcome address and introduction to IWSA by Dr. Lalitha Dhareshwar, President, IWSA. This was followed by an address by Dr. Devaki Ramanathan, Member, Board of Trustees, IWSA and the convener of Science Awareness programs. She gave the background on the topic of the theme of the exhibition and the objective of this choice. The chief guests then addressed the audience comprising of college students, some of the senior officers from DAE and faculty from nearby colleges on Novel and Smart materials being developed at BARC. Dr. Pradip Bhattacharjee, CEO, BRIT was also present at the inauguration.

On the second day, i.e., 18th January, students of class VI to IX from nine schools exhibited 11 projects on the theme- **"Mendeleev's periodic table of elements and Novel materials"** (the theme included- Novel use of Metals, Ceramics, Bio-ceramics, polymers, new Bio-degradable materials etc, to make life on this planet sustainable). The exhibition was inaugurated by Dr. Debjani Dasgupta, Director, DY Patil School of Biotechnology and Bioinformatics. She delivered a very interesting talk on Novel materials in the field of Biotechnology and health. Three eminent judges evaluated the projects and three prizes were declared. The first prize was given to Modern School for their project-"Bio-degradable plastics". The second prize was won by New Horizon Public school for the project-" A holistic approach to rejuvenate our earth". The third prize was bagged by Vishwajyot High School for their project- "Wheels for the future: Hydrogen gas fuel". Two trophies were given to the top two winning schools. Books were given as individual prizes. All participating students received the Certificate of Participation, a periodic table and gift bag from the DAE.

The chief guest at the valedictory function was Dr. Radha Jayaram, Professor at ICT, who awarded the prizes. She gave beautiful narration on the life of Mendeleev who gave the basis for the arrangement of elements in the periodic table.

The two day event was covered by the Navi Mumbai TV and two very nice videos have been posted by them on the youtube. These videos have been passed on to the Public Awareness Division. On the first day, Dr. Madangopal, Dr. Sapra, Dr. Pradip Bhattacharjee and Shri. Ravishankar (Head, Public Awareness Division) spoke about the DAE exhibition. Dr. Lalitha Dhareshwar, President, IWSA spoke about the highlights and Dr. Devaki Ramanathan spoke in general about the importance of Periodic table and Novel Materials.

On the second day, NMTV interviewed the judges and some of the teachers present at the exhibition.

## C. Workshop on Lasers, Fibre Optics & Optical Communications and Fibre Sensors on 6th and 7th March, 2020

This workshop was organized by **Indian Women Scientists' Association (IWSA) in collaboration with the Mumbai Chapter of NASI** at IWSA premises, Vashi, Navi Mumbai.

The main objectives of the lecture workshop was to enhance the understanding of the basic concepts of - Lasers used for fiber optic communication, fiber optics, sensors and fiber optics communication Networks. Students at graduate and post graduate level of science stream as well as Telecommunication Engineering stream were introduced to some of these concepts and they also learnt fiber optics communication networks from the perspective of the technology.

The faculty of this workshop, who are pioneers in this field, were- Prof. Ajoy Ghatak (IITD and Chairman of NASI, Delhi Chapter), Dr. R. Vijaya (Professor, IITK), Prof. Deepa Venkitesh (IITK) and Mr. Hitesh Mehta (Chairman, Photonics Society India chapter, MD, Fiber Optika Technologies Pvt.Ltd). Prof. Ajoy Ghatak was advised by doctors not to travel to Mumbai due to Corona Virus. A live telecast of his talks from IIT Delhi was therefore organized. Prof. Ghatak introduced the subject of Fiber Optics in his first lecture and continued with the intricacies of light propagation through optical fibers and choice of optical fibers for various applications. Prof. Vijaya in her first lecture, spoke on Erbium and Semiconductor lasers and amplifiers which are generally used for Optical communication. She also spoke on various modulators and components for data transport. In her second lecture she spoke on instruments used- splicing machines, Optical Time Domain Reflectometer, spectrum analyzer and large bandwidth oscilloscopes etc in laboratory and Network setup.

In Prof. Deepa's talks, she covered an overall plan of the optical fibers distribution over the entire metro city right from the under- the- ocean trans-Atlantic & -Pacific Oceans communications to residential buildings, this was the highlight of her talks. She spoke in detail about the transmitters and trans receivers and the means to increase the communication bandwidth.

The lectures were covered in the pre-lunch sessions and hands on experiments by Mr. Hitesh Mehta of Fiber Optica with his team were conducted in the afternoon. Four practical sessions were conducted with different instruments as per details given below. Training Session was conducted on fiber optics related instruments and software which gave the practical application of fiber optics systems.

- **Light Runner**: Fiber optic communication bench top laboratory
- **LightSIM** which is a user friendly simulation tool, for understanding planar wave guides.
- **Splicing Machine** which is used for joining two optical fibers end-to-end with minimum transmission losses.
- **OPTICAL TIME DOMAIN REFLECTOMETER (OTDR)** which is useful for testing the integrity of fiber optic cables. In kilometres long optical fiber cables laid out for communication purpose, this instrument can accurately define the position of cable damage etc.
- **Fiber Optic Perimeter Intrusion Detection Sensor** (FOPIDS) systems are intrusion detection sensor system developed for the advanced perimeter security. Reliable and field tested distributed sensor for both underground and over ground deployments give it more area of applications.

Hundred and one participants registered for this workshop (including online and spot registrations), out of which 95 were present during the workshop on both the days. The participants consisted of faculty and students from 29 colleges and institutes, Bhabha Atomic Research Centre, Fortis Hospital of Navi Mumbai, National Centre for Nano sciences and Nano technology, Centre of Excellence in Basic Sciences (DAE- Mumbai Univ). It was admirable that there were four faculty members from Umanath Singh Institute of Engineering and Technology, VBS Purvanchal University, who came all the way from Jaunpur. One faculty member with her three students from a college from

Sinhudurg, Maharashtra also participated. Thus, though the workshop was for local students, out station participants were also present. All the participants interacted with the speakers during and after the lectures and have expressed their satisfaction regarding the overall arrangements. Certificates from NASI-Mumbai chapter and IWSA were given to all the participants who attended the workshop on both the days.

## D. IWSA's Learning Garden

1. Educational materials on the importance of plants were prepared by Dr. Rita Mukhopadyaya, Ms. Priya Jacob and Ms. Vijaya Chakravarty. In one of the posters, the connection between memory and fragrance is brought out by the connection Gurudev Rabindranath Tagore makes to the sweet smelling parijat flower and his mother who passed away when he was very young and how the memories of her are linked to the flower.

2. Learning Garden stall was set up during the Science Exhibition organised at the IWSA Headquarters on 17th and 18th January, 2020.

3. IWSA participated in the Friends of Trees Plant Show on Saturday 5th February and Sunday 6th February organised by Ruparel College, Mumbai. IWSA's Theme was Healthy Plants for a Healthy Planet which was suggested by Dr. Baktawar Mahajan. The concept map at the entrance to IWSA stall explained the concepts of Biodiversity, Medicine, Hunger, Climate change, desertification, water crisis etc were impacted by vegetation.

   Displays of Horticulture Therapy, Agro homeopathy and Bach Flower Remedies drew a lot of attention. There were several requests to Ms. Manashi Chakravorty and Ms. Anita Das to conduct workshops in these topics. Dr. Paramjit Anthappan, Ms. R. Bhuvaneswari, Ms. Snehlata Bhavsar, Ms. Ambika Janakiram and Ms. Dipti Yadav explained other sections of interest like the Ancient SIddha system of medicine, Indoor Air purifying plants, Culinary skills of Tanjore Marathas, Biblical Herb Gardens etc.
   Herbal health drinks were served to the visitors by Ms. Madhu Pahwa, Ms. Tripta Tiwari and Ms. Malathi Rao. Many college students were interested in learning and requested IWSA to hold wild food workshops. Two talks were delivered by Ms. Vijaya Chakravarty on 5th and 6th February, 2020. Her talk on "Healthy Plants for a Healthy Planet: What to Grow and What not to Grow" stressed the importance of recognising alien invasive plant species like subabul, Chromolaena odorata, Lantana camara etc which are harmful and the need to plant trees which have edible parts like drumstick, tamarind, Sesbania, Curry leaf etc. The leaves of these trees are edible and packed with nutrition and medicinal properties. The other talk on "Sustainable Home Gardening: Grow Your Own Beverages, Dyes, Food, Fuels and Medicines" showed how to reduce reliance on chemicals and instead use plants for various needs.

IWSA was awarded a special prize for the eye catching educational display which got more than a thousand footfalls in 2 days.

4. On 13th February, 2020 members of Inner Wheel , Thane visited the IWSA Garden . A small exhibition of posters and plants was set up in the corridor. Dr. Lalitha Dhareshwar introduced IWSA and spoke on the relevance of science and the scientists who started IWSA. Ms. Vijaya Chakravarty spoke about the women environmentalists like Vandana Shiva, Rachel Carson, Jane Goodall, Pheroza Godrej, Greta Thunberg and women led ecological movements—Chipko, Greenbelt and Navdanya movements. Vijaya drew a parallel between Inner wheel and IWSA philosophies through the words of St. Francis of Assisi who said "Start by doing what is necessary, then do what is possible and suddenly you are doing the impossible".

5. On 21st February, 2020, Mr. Chitta Dash, Country Manager, South West Asia, Llyods Register Asia visited IWSA Garden and was impressed by the different sections and the propagation of specimen plants.

6. On March 1st ,2nd and 3rd, miniature gardens were created in shallow containers and glass containers. These Dish gardens and Terrariums are miniature replicas of nature. Some of these miniature landscapes are---'Pakka Local ' using native Indian plants, 'Butterfly garden' with both caterpillar food plants / butterfly nectar plants, 'Ran Bhaji Udyan' [Edible wild plants] and 'Oushadhi Van' [Medicinal plants]. These models serve as teaching aids to introduce concepts of Biodiversity, Native species, Medicinal plants, Edible landscaping etc

7. Information stall was set up by the Garden team during the Workshop on Lasers, Fibre Optics & Optical Communications and Fibre Sensors which was held at IWSA Headquarters on 6th and 7th March, 2020.

8. Dr. Srirupa Mukherjee, Ms. Madhu Pahwa, Ms. Sukhvinder Sandhu and Ms. Priya Jacob planned Ecological Garden workshops for both adults and children to be held at IWSA Headquarters during the second week of March. This could not take place due to the outbreak of COVID 19 and subsequent lockdown conditions .

9. Under the guidance of Dr. Surekha M. Zingde, Trustee, IWSA and Dr. Gursimran Kaur Uppal [College Project Guide], Ms. Ankita Kharate and Ms. Poonam Pandey from G. N. Khalsa College have submitted their M.Sc. [Bioinformatics] dissertation projects on ''Database of Medicinal Plants at the Indian Women Scientists' Association'' in April 2020. The medicinal plants included for the study were *Bryophyllum pinnatum, Centella asiatica, Costus igneous, Hemidesmus indicus, Justicia adhatoda, Messua ferrea, Piper arboretum, Vinca rosea [Catharanthus roseus]* and *Vitex negundo K* by the former, and *Adenanthera pavonina, Aloe vera, Anacyclus pyrethrum, Canarium strictum, Cissus quadrangularis, Eclipta prostrate, Lawsonia inermis, Pereskia bleo* and *Tinospora cordifolia* by the latter. Besides both the students also studied the database of *Solanum nigrum*_from IWSA's Learning Garden.

# Nursery School and Education Committee

ECCE Students participated in Puppet show competition held at P.N. Doshi College, Ghatkopar on 24th January 2020 and won 3rd prize. The title of the puppet show was "Kabhi kah do bhi, Thank You".

Prize Distribution for ECCE's 2018-19 batch was held on 25th January 2020. Chief Guest, Dr. Smita Desai from Drishti gave away prizes to winners of various competitions and Academic Exellence award to Mrs. Kadambari Vinchhoo. Dr.Smita Desai's speech was truly inspirational for the students.

A workshop on Clay Moulding for Nursery children was conducted by Kores on 26th January 2020. Each child was given a clay moulding kit and trained to make clay models.

Early Childhood Association declared Teacher Development and Excellence Award to IWSA. A function to be held in this regard on 14th February 2020 at Kochi was postponed due to COVID19. Mrs. Shaheena Shaikh, Supervisor will receive the award on behalf of IWSA as and when it will be held.

Nutrition competition was held on 18th February 2020 for ECCE students.
Prizes were declared for best entries.

On 24th February 2020, ECCE students along with Mrs. Bhavsar and Mrs. Naseema visited Besant Montessori School, Juhu, Mumbai.

Science Day was celebrated by Nursery children on 28th February 2020. Children enjoyed the hands on experiments based on scientific principles. It was also a group lesson for ECCE students.

Nursery teacher, Mrs. Payal and assistant Mrs. Aparna attended workshop at Little Angels International School, Sion on 29th February, which was conducted by Lamia Bagasrawala on 'My Body'. It was very useful for them.

MOU between IWSA and Drishti was signed on 6th March 2020 for two short term courses for Shadow Teachers.

Rainbow 2020 was cancelled due to COVID19. It was very unfortunate as ECCE students had put in great efforts in making teaching aids. Nevertheless it was a good experience for them.

ECCE classes and Nursery school were also closed till further notice. S.N.D.T. University exams are also postponed.

Mrs. Payal conducted online classes for Nursery children via Google Duo. The children were divided into groups and sessions were conducted for 15-20 minutes for each group. She has covered the portion with online sessions. Mrs. Naseema attended the webinar on 'Global Impact of COVID19 on Early Childhood Education- Solutions and Way Ahead.' on 17th April 2020.

ECCE teachers have been using following online measures/methods to continue with the academic activities for students:

(i) You tube videos and soft copies of the notes are being sent by Mrs. Honey (Paper1) and Mrs. Tejaswini (Paper 3 and 4).

(ii) Through Zoom meeting, presentation was taken on the assigned topics of Paper 2 and Paper 5 by Mrs. Shaheena.

(iii) Practical work is being discussed and instructions given via Video Chat by Mrs. Bhavsar and Mrs. Naseema.

(iv) Through messages and Whatsapp, the momentum is being maintained to complete all pending work.

(v) Remaining lessons for the trainees is to be completed with Nursery children through Google Duo.

# IWSA's Murli Laj Chugani Health Care Centre

## Cancer Camp on 7th January 2020

IWSA's Health Care Centre organized a cancer screening camp in association with the MGM New Bombay College of Nursing (MGMNBCON), Kamothe, Navi Mumbai and Indian Cancer Society, Mumbai on 7th January 2020. The camp was held in Punjab Heritage Bhavan, Artists colony, Sector 8, CBD, Belapur.

The Nursing college faculty and students encouraged women of reproductive age who are residents of a lower socio economic community near Artists colony, CBD Belapur to attend the camp and avail of the free screening facility provided.

Ninety two women attended the camp and were screened by doctors of the Indian Cancer Society. They provided a complete oral examination for oral cancer, comprehensive gynaecological examination, clinical breast examination and PAP smear test by gynaecologists.

Nursing faculty and nursing students of MGMNBCON along with IWSA members, Ms. Madhu Pahwa, Ms. Priya Jacob, Ms Ambika Janakiraman, Ms. Manashi Chakraborty, Dr. Suparna Kamath, Dr. Surekha Zingde and Ms Sangita Chawan, and the Indian Cancer Society staff facilitated the program ensuring that it went on smoothly.

# IWSA's Satish Haware Computer Education Centre

## Machine Learning Workshop held at IWSA Headquarters from 3rd to 5th February, 2020

A workshop on Machine Learning was held at IWSA Headquarters during 3rd to 5th February, 2020 with resource persons from a reputed research institute. The target audience was research scholars, academicians and junior faculty who wished to broaden their field of knowledge. The resource persons were young scientists working in the field of machine learning. There were 11 registered participants and 6 resource persons.

Machine learning workshop dealt with writing programs which modified themselves to correct the errors and get better performance. It discussed Neural network algorithms like deep learning, reinforced, unsupervised learning, convolutional and recurrent neural networks. During the three day workshop, the lecturers explained the theory and solved many examples. There were two lectures from renowned academicians Dr. Anala Pandit and Ms. Sanjivani Phatak. Dr. Pandit talked about machine learning concepts and its uses. Ms. Phatak discussed scope of machine learning and its effects on human life. She covered both good and bad effects and presented a balanced view. Both lectures were well appreciated by the audience.

The participants were satisfied with the course content and their feedback indicated that they benefitted quite a lot from the detailed discussions about neural network algorithms. They suggested that next workshop should be held for longer duration.

# IWSA's Hostel and Day Care Committee

1. Hostel Day was celebrated on the 11th of January 2020. Girls made rangolis on the hostel side and near the hall. Vice President of IWSA, Dr. Rita Mukhopadhyaya lighted the lamp followed by hostel committee members. Ganesh Aarthi was performed by Ms. Trisha Kaushik. There were songs by Ms. Jasvir Kaur, Karabi Sarkar and Shreeja Nair. Group Dance was also performed by girls. Games were conducted for the girls in December 2019 itself. Three- legged race, Sack race, Lemon & spoon, Hand & foot print, Balancing the balloon, etc. were conducted for the girls by our hostel supervisors. Prizes were given to all participants of the event, prize winner of the games and well kept rooms in the categories –Dormitory, single, double and guest rooms.

2. Drama on cleanliness in daily life was performed in the Multipurpose Hall during the 1st week of January 2020 by Day Care Children. The value and importance of handwashing, clean nails, daily bath etc. was made interesting and appealing to the youngsters through this drama.

3. A picnic for the Day Care Children was organised at the Rock garden, Nerul on 22nd February, 2020. The children were fascinated and curious to see so many statues. Today, most children spend over 90% of their time indoors leading to nature deficit disorders. At IWSA, we encourage children to play outdoors in the courtyard and garden. The children loved outdoor play and the tasty titbits served to them.

4. A Tepee for outdoor play was erected for the Day Care Children with a help of Learning garden team for outdoor role play activities. Children imagined they were in desert tents, forest huts. It led to a lot of imaginative play.

# IWSA's Pirojsha Godrej Foundation Library

The library committee members have reviewed and shortlisted some healthy practices prevalent at other public libraries in Mumbai including Maharashtra State Women's Council Library, The People's Free Reading Library, Maharashtra Mitra Mandal Library and Nehru Centre Library for adoption into our library at IWSA campus to enhance its functioning and footfalls.

Ms. Jayashree Bhosle [M.Lib. Sc.], has been selected and appointed as librarian wef 16th March, 2020. However, after the lockdown due to COVID pandemic was announced, the library was closed from 20/03/2020 for safety precautions. She was requested to resume duties post lockdown. Ms Nisha Patil working on ad-hoc appointment will be relieved from 1st April, 2020.

Two CCTV cameras have been installed to monitor the library activities.

Library inspection was done in the month of January, 2020. Ms. Tripta Tiwari and Ms. Vijaya B. Tilak met the visiting officials.

Suggestions of the readers from the library suggestion box were implemented.

# IWSA Scholarships

The Annual Scholarships/awards event of IWSA for 2019 was held on the 29th February, 2020 at IWSA's ICICI multipurpose hall at Vashi, Navi Mumbai.

Prof. Sugra Chunawala, Dean, HBCSE, was the Chief Guest. Dr. Vibhav Sansgiri, Vice-President and now on the Board of Hindustan Lever Ltd., who is a prominent donor for a PhD award, was present with his wife, Dr. Padma Sansgiri. Dr Jayant Kelkar from Reliance Ltd. (husband of Ms. Chhaya Kelkar, IWSA's EC member) who has instituted a new award from this year, was also present.

Dr. Devaki Ramanathan, Convener, Scholarships & Awards Committee, welcomed all the dignitaries, invitees, scholarship awardees and the audience consisting of family and friends of the awardees and IWSA members. Dr. Lalitha Dhareshwar. President, IWSA spoke about IWSA and its varied activities. She elaborated about the programs aimed to empower women and women scientists. This was followed by a brief introduction to the Chief Guest Prof. Sugra Chunawala by Dr. Srirupa Mukherjee and felicitation of the Chief Guest.

Dr. Ramanathan gave a detailed account of all the 20 awards/scholarships grouped under 10 categories and given to girl students pursuing science education at different levels. . She spoke about the applications received, the stringent criteria applied to select the deserving candidates based on performance details, family economic conditions and family background of awardees. Most of awardees were selected on merit cum means basis. The PhD awardees have been critically evaluated based on their actual work, the level of progress, importance and relevance of the topic, publications (if any), besides the economic criteria.

Many of our scholarships are named after distinguished scientists and teachers who have contributed significantly to science and education. The awards have been instituted by their families or students by way of handsome corpus. As the awards were presented, a brief description/history of those distinguished scientists and teachers were presented. This was done to inspire the awardees, so that they could emulate these personalities in their life.

Prof. Chunawala distributed the scholarships, starting from the PhD levels. The prestigious PhD Award: Dr. S.K. Mahajan-IWSA award which had been instituted by his student Dr. Vibhav Sansgiri, was presented to the awardee by Dr. Sansgiri who also spoke briefly on his memoires of Dr. Mahajan. He remembered that Dr. Mahajan was a task master and had compelled his students to do library referencing on their PhD topics before taking up their research work. This is very important but conveniently skipped by many students.

This year, a new idea was conceived to give an opportunity at the event to the PhD awardees, to present a brief account of their work. Only two out of the three awardees were present and they gave a good presentation

Dr. Jayant Kelkar, who had instituted a new award from this year (for a girl student topping in the XII std. in 2019 and pursuing higher studies in the Engineering course) gave away the award to Ms. Pallavi Pandey (from Sainath High School) studying IT Engineering from Shah and Anchor Engineering College, Deonar, Mumbai. Dr Kelkar had instituted this award in the name of his father, Prof. V.K. Kelkar, who was an educationalist throughout his life. Prof. V.K. Kelkar was a Mechanical Engineer, Principal of College of Engineering. Pune, and was responsible for establishing the Walchand College of Engineering, Sangli. This award was instituted to honour his zeal for higher education in Science and Engineering.

There was another new award this year – a one-time award—given away by IWSA Trustee Dr Sudha Rao for a physically challenged girl-student: Ms Anupama Dattatray for meritorious completion of M.Sc in I.T. Ms Dattatray is 100% hearing impaired.

Prof. Sugra Chunawala addressed the gathering after the distribution of awards. She emphasized the fact that, while the enrolment of girls in schools and higher levels of education has been improving rapidly, the representation of women in the various Science Academies of the country and across the Globe is dismal. She congratulated IWSA on the commendable work done to support meritorious girls in Science and Technology. She was confident that these awardees will carry the message of IWSA far and wide.

Dr. Nootan Bhakkal, Secretary, Scholarship sub-committee, delivered a vote of thanks. Besides thanking all the awardees and dignitaries present, she expressed a sincere thanks to all the different members of the committee who have put in all efforts to evaluate the applications and decide on the final selection.

# Reports from Branches

## Amravati Branch

### Lectures on "River Conservation and Social Awareness" and "Organize your Mind" on 9th January, 2020

IWSA, Amravati Branch in collaboration with Brijlal Biyani Science College, Amravati arranged two guest lectures in the special camp of NSS at village Dadhi (Pedhi) in Amravati District on 9th January, 2020. IWSA, Amravati Branch members Dr. Daya Pande, Head Department of Sociology and Dr. Reena Lahariya, Assistant Prof., Department of Zoology delivered lectures on "River Cleaning and Conservation" and "Organize Your Mind" respectively.

Dr. Daya, in her lecture said that though clean rivers are important for our own existence, people pollute the rivers during social and religious practices, celebrations of festivals. The same river water is used for drinking, irrigation and cleaning. She appealed that while fostering religious, cultural and personal feelings it is important to take care of our environment. The coming generations will not condone us for this great loss of nature. Following some rules and changing our habits will help to conserve our rivers.

Dr. Reena in her motivational speech advised students to set a goal of their life. One should be strong and clear about his/her goal and the steps to be taken to achieve the set goal. Use energy barrels wisely while dealing with life and its problems with open mind. Consistency, practice and concentration help to excel in the life. Try to be creative as it

maintains the excitement in the life. She also emphasised on the importance of communication to deal with negative thoughts and fear.

Dr. Reena Lahariya, member of IWSA, Amravati Branch took efforts to organize this activity. About 60 students and villagers were present for these two guest lectures.

# Baroda Branch

### National Seminar on Science and Technology for Rural Development on 11th February, 2020

A One day seminar was organised by Indian Science Congress Association (Baroda Chapter) in collaboration with The Maharaja Sayajirao University of Baroda, Vadodara and Neotech college of Applied Science and Research, with support of Indian Society of Geomatics (Vadodara Chapter) and Indian Women Scientists' Association (Baroda Branch) on the topic of "SCIENCE AND TECHNOLOGY FOR RURAL DEVELOPMENT" at Neotech college of Applied Science and Research, Harni-Virod Road, Vadodara, Gujarat on Tuesday, 11th February, 2020. This seminar was attended by eminent experts in different fields of Science and Technology, academicians, undergraduates and master's students and research scholars from different universities and research institutes. The aim of the workshop was to spread awareness about various aspects of Science and Technology for upliftment of rural areas.

The first session of Seminar started with Welcoming and Inauguration Ceremony. Prof. Haribhai Kataria, Dean, Faculty of Science, The M.S. University of Baroda welcomed all the guests and speakers with his cordial welcome speech. Prof. G. Sandhya Kiran, Convener, IWSA and ISCA-VC, introduced the theme of the seminar by highlighting the role of Science and Technology for the upliftment of rural areas and she also explained the need of development of rural areas for the progress of the country. The audience were informed about how the National body like ISCA is contributing in various fields of rural development through innovation in Science and technology by Prof. Vijaya Laxmi Saxena, President, ISCA during her address as a Chief Guest of the seminar. Dr. Ashok Kumar Saxena presided as a Guest of Honour and encouraged all to join their hands for the betterment of Rural areas by becoming a member of ISCA. Prof. (Dr.) Pankajray V Patel, Director, Gujarat Technological University, delivered the Presidential Remarks at the seminar and highlighted the contributions of GTU in the field of Science and Technology especially for the rural development. During the function, the Invitees of Honour were welcomed with the token memento. At last Dr. Maunik Jani, Principal, Neotech college of Applied Science and Research delivered vote of thanks.

**List of speakers with their topics:**

| Name of Speaker | Title |
|---|---|
| Dr. GAURAV MISHRA<br>(Director Sardar Patel Renewable Energy Research Institute (SPRERI) | **"Role of renewable energy in sustainable development"** |
| Dr. ANAMIKA DEY<br>(CEO, Gujarat Grassroot Innovation) | **"Transforming Rural Aspirations through Grassroot Innovations"** |
| Dr. P. S. THAKKAR<br>(Ex-Scientist Space Application Centre ISRO, Ahmedabad) | **"Remote Sensing and Rural Development"** |
| Prof. MINOO PARABIA<br>Prof and Ex-Head, Department of Life Sciences, VNSGU, Surat | **"Medicinal Plants : A Bioresource for Rural Develoopment"** |
| Shri. ANIL PUROHIT<br>Ex-Director Gujarat Energy Development Agency (GEDA)Vadodara | **"Renewable energy scenario : Gujarat State"** |
| Dr. P. N. SHAH<br>Ex-Director, Regional Remote Sensing Centre Lucknow | **"Geospatial Technology for rural development"** |
| Mr. Nikhil V. Suthar<br>(OSD)- Gujarat Technological University, Regional Coordinator GTU innovation & Startup Centre (GISC) Vadodara) | **"Startup: Idea to Implementation"** |

There were two technical sessions organised after the Inaugural Sessions. Eminent professionals in the fields of Energy Sector, Innovation & Skill development, Space Science and Medicinal plants spoke on various topics as shown above. About 100 students and 50 other professionals had enrolled for the seminar. All the participants appreciated the talks delivered by different speakers. The seminar concluded with panel discussion and valedictory function.

# Bengaluru Branch

## 1. 6th National Conference on Women in Science, Technology and Management on 25th February, 2020

Women Empowerment Cell of Kristu Jayanti College, Bangalore in association with Indian Women Scientists' Association (IWSA), Bangalore Chapter organized a one-day National Conference on 25th, February, 2020 which inspired and empowered women of all ages and abilities. It served as a platform to incorporate the diverse expression of women's voices, concerns and expertise. It also gave opportunity to discuss the key approaches of research and challenges faced by women in nurturing a career. The conference was inaugurated by Ms. Annapurna, Founder and CEO, Emotionalytics and Rev.Fr. Josekutty P D, Principal, Kristu Jayanti College. Dr. Savithri Bhat, Convener, Indian Women Scientist Association, Bangalore Chapter, briefed on the challenges faced by women in science in her session. She gave a detailed insight into victory and remarkable lifelong collaboration with scientific research and inspired the participants with her achievements.

Ms. Jennifer Rajan, Founder and CEO, Leanonme Counseling Services Private Limited, Bangalore, in her session – Women and Leadership, emphasized on three aspects, i.e., Believe in yourself, Make your partner a real partner, Don't leave before you leave.

Post noon, there were two paper presentation tracks where researchers presented their work on various themes of the conference. The chief guest for the valedictory was Ms. Priya B Prasad, Director, PwC India (Advisory). She highlighted the fact that women need not be empowered by others. It is her inner strength which pushes her beyond her capabilities. About 175 participants attended the conference.

## 2. One Day Hands on Workshop entitled "Applications of Biostatistics" on 26th February, 2020

The workshop was organised on 26th February, 2020 by Department of Biotechnology, Dayananda Sagar College of Engineering and BMS College of Engineering in association with Indian Women Scientists' association (IWSA), Bengaluru. The workshop aimed at enhancing the knowledge and skill of researchers, teaching faculty and other members of research community. The session was inaugurated by the President of IWSA, Bengaluru Prof. Savithri Bhat by welcoming the resource person Prof. N. Raghavendra (Faculty of Statistics, Jain Group of Institutions, Bengaluru). She then addressed the importance of such workshops in promoting research. More than 60 participants from different faculty domains participated in workshop.

The speaker began his morning session by introducing participants about the basic concepts of statistics. He began his talk by briefing on concept in sampling that includes population, sampling designs and its need, sampling frame, process of sampling and factors affecting sampling. Additionally, he explained different sampling techniques that included simple random sampling, systematic sampling, stratified sampling and cluster

sampling. He then deliberated on the concepts of testing a hypothesis that included null hypothesis and alternate hypothesis. He also provided the conceptual knowledge about how to test hypothesis using a practical biological research problem. Two types of errors; Type I and Type II error were also briefed. A very important concept of P value and power of test was mentioned in the talk. He then concluded his theoretical session by discussing the various steps included in hypothesis test procedure.

Post lunch, the speaker provided hands-on training on the various tests to be adopted for qualitative and quantitative biological data and explained when and where to apply the exact statistical techniques namely correlation, regression, chi square, t- test and ANOVA. He mentioned about the factors that influence sample size like the objectives, the outcomes, the research design, the research subject. and the factors influencing sample size calculation. Classic approaches to apply the relevant formula for calculation was also explained during the practical session. The speaker finally concluded his talk by explaining the applications of biostatistics using real time practical examples. The workshop ended with the thanks giving speech by Dr. Radha Gupta, Workshop coordinator. The feedback obtained from the participants revealed a positive and satisfied response.

# Hyderabad Branch

## 1. IUPAC Global Women's Breakfast 2020 (GWB2020) on 12th February, 2020

The overall purpose of GWB2020 is to establish an on-going virtual network where women in the chemical and related sciences can connect with each other in a meaningful way to support their professional aspirations.
The theme for GWB2020 was "Building bonds to create future leaders" with a focus on leadership development. Women and men from all types of educational and scientific organizations from high schools to universities, to scientific societies, government and industry organizations were invited to organize breakfast events.

The meeting was hosted by CSIR-Indian Institute of Chemical Technology (IICT), Hyderabad in collaboration with Indian Women Scientists' Association (IWSA), Hyderabad branch and Atal Incubation Centre (AIC) Hyderabad. There were 20 participants from various academic and research institutions. After a brief introduction of the participants, the purpose of the event was explained by Dr. Shailaja, IICT and the meeting was opened for discussions.

The following points emerged from the meeting:

a. Generation of interest in science among students through various ways which include lab tours, group discussions, flash talks, debates, etc. was discussed
b. Stress was given on supporting students for enhancing their communication skills and professional skill development activities
c. Mentor-mentee programme for nurturing students
d. Collaborative activities to be taken up
e. Science communication to be given active support

f. Encouraging students for discussions with seniors and teaching
g. Support from seniors in guiding students to reach the targets
h. Volunteering sessions by senior scientists
i. Provide a platform to generate awareness among students regarding the existing opportunities for a career in science
j. The various activities of IICT, AIC, Hyderabad university, CCMB and other organisations for skill development were discussed and it was suggested to develop a flyer and circulate to all institutions for spreading awareness among students
k. A portal for discussions and support was also suggested to be developed.
l. A calendar of activities to be planned, to be conducted by scientists

The breakfast meeting ended on a high positive note with all the participants showing great interest to continue this kind of interaction and extending their support for the above discussion points to be taken forward.

2. **National Science Day, 28th February, 2020**

On the occasion of National Science Day, many members of IWSA-Hyderabad branch participated in a number of events for promotion of science.

(i) To celebrate National Science Day, All India Radio Hyderabad conducted a series of programs on "Women in Science", the theme for this year 2020. The first program was aired on 26th February, 2020 as a live interactive session in Telugu, in which Dr. Sri Padmavathi from School of Mathematics and Statistics, University of Hyderabad and Dr.K.Ratna, on behalf of IWSA-H, were invited to express their views and inform viewers about the opportunities for women in science. It was aired on FM Rainbow channel. It was also broadcast in English News on 28th February, 2020.

(ii) IWSA-H in collaboration with Dr. K.V. Rao Scientific Society has arranged two sessions of Science storytelling by Dr. Rohini Chintha, a science communicator, in two schools on 27th February, 2020. One was at Government School, Ameerpet, Hyderabad from 9 am to 10 am and second event at Little Scholar School, Hyderabad (11 am to 12 noon). Both the sessions went off well. More than 300 students from the Government School and 50 students from Little Scholar School participated. Dr. Rohini told stories of how earth was formed, types of rocks and their formation and the story of shape of earth. The children enjoyed a lot and were reluctant to let her go.

3. **International Women's Day, 8th March, 2020**

On the occasion of International Women's day, many scientists in their capacity as members of IWSA-Hyderabad were invited as guests and to present talks on various forums. These include Dr. Mahtab Bamji, Dr. Gita Sharma, Dr. Yamuna Rani, Dr.Kaiser Jamil, Dr. R. Subasri, Dr. Meena Ravindran, Dr. Kalpana Sastry, Dr. Ratna, Dr. Shailaja, Dr. Anjali Devi, Dr. Roja Rani among others.

(i) Dr. Mahtab Bamji delivered a talk at ICRISAT

(ii) Dr. Gita Sharma presented a talk at ARCI, Balapur, Hyderabad
(iii) Dr. Yamuna Rani was interviewed by a TV Channel
(iv) Dr.Kaiser Jamil was felicitated by Dr. Roja Rani at University College for Women , Koti
(v) Dr. Shailaja was felicitated by Hyderabad Police
(vi) Dr. Anjali Devi conducted the International Women's day in her colony

# Kalpakkam Branch

## 1. Science Day Celebrations by IWSA, Kalpakkam Branch on 18th January and 28th February, 2020

IWSA (K), in association with Heavy water board (HWB), Mumbai, celebrated Science day on 18th January 2020 at GSO Auditorium, Kalpakkam Township. To celebrate science day, science essay competition was conducted for class 8, 9 and 10th students of Atomic Energy Central School 1, 2 & 3 and Kendriya Vidyalaya 1 & 2, Anupuram and Kalpakkam, DAE Townships on 30th November 2019. Topics for the essay competition were: Role of science in conservation of natural resources, India's lunar mission, Internet - advantages and disadvantages and scientific solutions to air pollution.

This was followed by a valedictory function on 18th January 2020. Dr. U Kamachi Mudali, DS, Chairman and Chief executive, Heavy Water Board, DAE Mumbai was the chief guest of the program. He highlighted the importance of conducting such programs and appreciated IWSA team for organising this program. His motivational lecture was enjoyed by all the students. Dr. U Kamachi Mudali, distributed the prizes to all the winners as well as to participants. This was followed by the Lecture-cum- demonstration using Liquid Nitrogen “A peek in to Low Temperatures” which was presented by Dr. K. Gireesan, senior scientist, Materials Science Group, IGCAR. This demonstration was enjoyed by all the students and was appreciated by teachers. Total of 150 students and teachers participated in the celebrations.

IWSA, Kalpakkam conducted its 2nd part of the International Science Day celebrations on 28th February at GHSS, Vayalur. Science essay competitions in Tamil were conducted for the students of five village schools. The winners and participants of the science essay competition from different village schools and the students of Vayalur GHSS (total of 130) participated in the programme. Dr. Amritha Pandiyan (MSD, IGCAR) gave an interesting speech mentioning the contributions of Dr. C. V. Raman to the science. Dr. Christopher David (MSD) distributed the prizes and certificates to the winners. Dr. K. Gireesan (MSD) and Team demonstrated experiments on the topic "Below the melting point of Ice". Total of 175 students and teachers participated in the programme.

## 2. Technical Talk on PUREX Process on 6th February, 2020

**Smt. P. Karthikayini**, Scientific Officer at KARP, Kalpakkam delivered an interesting talk on the topic “Reductants in PUREX Process & Uranium Reconversion Process at KARP” on 6th February 2020 at WSCD Seminar Hall, IGCAR, Kalpakkam.

The talk started with an elaborate introduction to the closed fuel cycle and the importance of reprocessing in our country. Then it progressed to an overview of the PUREX process and the important step in this process namely the separation of Uranium and Plutonium. The different reductants used for this purpose were listed and the importance of Uranous nitrate was stressed upon. Further the speaker discussed about the high instability of Uranous and why hydrazine nitrate is used as a stabilizer in the electrolytic production of uranous nitrate. Her presentation also focused on the various operations involved in the reconversion process that led to the production of Ammonium Di Uranate at KARP. The talk concluded with the details of the storage method followed for the final product Uranium oxide and how it would be used for future nuclear strategic programs of India. The talk was well received by the audience and a long and purposeful interactive session followed the talk. Total of 60 participants consisting of IWSA (K) members, scientists and research scholars attended the lecture.

### 3. Felicitation of IWSA (K) Members on their Superannuation on 19th and 26th February, 2020

Felicitation Function was held on 19th February 2020 for **Smt. Nalini,** Scientific Officer, Chemistry Group and former treasurer of IWSA on her superannuation. Similarly, felicitation function was held on 26th February 2020 for **Smt. T. Ezhilarasi,** Scientific Officer, Metallurgy and Materials Group and IWSA member on account of her superannuation. About fifty IWSA (K) members attended the function.

### 4. IWSA (K) COVID-19 Relief work

Words are less to thank all those who came forward to support 140 families at Kokilamedu fishermen Colony and 25 families at Ilayanar Kuppam. Some of the IWSA EC members collected provisions from cooperative stores, visited Kokilamedu colony along with volunteers of Helping Hands Kalpakkam on 25th April, 2020, and distributed rice and other essential groceries. With exceptional support from IWSA members, IWSA (K) relief fund was left with a balance amount. Hence, when the requirement came from Ilayanar Kuppam to support another 25 families, immediately money was utilised to buy the provisions from Sakthi stores and distributed on 1st May, 2020.

## Kolhapur Branch

### 1. One Day State Level Workshop on Innovative Gardening Skills on 18th January, 2020

One Day State Level Workshop on Innovative Gardening Skills was organized by IWSA, Kolhapur branch at Sangola in collaboration with Department of Botany, Vidnyan Mahavidyalaya, Sangola on 18th January, 2020. In this workshop, five different demonstrations were carried out as follows:

1. Dish Garden : By Pallavi Kulkarni

2. Terrarium : By Dipali Taywade-Patil
3. Floral Drinks : By Neeta Shinde
4. Flower Arrangement and Bouquet : By Kalpana Sawant
5. Waste Management : By Dr. Dhanshree Patil

Dr. Seema Gaikwad, Co-convener, IWSA Kolhapur Branch coordinated this event along with Dr. R.S. Suryavanshi, Head, Department of Botany and the staff of Vidnyan Mahavidyalaya, Sangola. About 117 participants attended the workshop.

### 2. One Day Workshop on "Tools and Techniques in Life Sciences" on 22nd February, 2020

One Day Workshop on "Tools and Techniques in Life Sciences" was organized by IWSA Kolhapur Branch in association with Department of Botany, Shivaji University Kolhapur on 22nd February, 2020. The inaugural session of workshop was presided by Prof. (Dr.) S. S. Kamble, Head, Department of Botany, Shivaji University, Kolhapur. Prof. (Dr.) Niranjana Chavan, Convenor, IWSA Kolhpaur Branch briefed about the workshop and IWSA.
Dr. M. S. Nimbalkar, Coordinator of workshop gave a brief introduction of all instruments/equipments used as tools in life sciences. Presidential remarks were given by Prof. (Dr.) S. S. Kamble. Total 35 participants were present from two colleges i.e. D. R. Mane Mahavidyalaya, Kagal and Vivikanand College, Kolhapur. Working demonstration of SEM was given by Mr. Ruturaj Patil. Working demonstration of different instruments viz. HPLC, PCR, Spectrophotometer, etc. was given by Miss. Komal Walvekar. Introduction to plant tissue culture techniques and pre-requisite information was given by Mr. Mahesh Mane. After that live demonstration of tissue culturel techniques was also shown. Demonstrations were conducted forming four groups. Specifically HPLC, SEM, Spectrophotometric techniques were thoroughly stressed to understand the functioning and working of the instruments. It was a full day practical orientation workshop to introduce the tools and techniques for undergraduate students. The programme was finally concluded with feedback from the students. After feedback from the participants, certificates were distributed to all participants.

### 3. Online International Conference on Mangroves, Climate Change and Sustainable management on 24th April, 2020

Report not provided due to COVID lockdown related issues.

## Nagpur Branch

### 1. National Science Day on 1st March, 2020

On the occasion of National Science Day, some IWSA members visited Aura Park (Ayurvan's Aura Park located at Bazargaon) which is a home to more than 500 Medicinal Plants. The story of how India spread the ancient knowledge of Medicine as a Gift of Nature is very well depicted at the Aura Park. Many species are now on the verge of extinction due to lack of proper knowledge of Medicinal plants in Medical Science. It was informed at the Park that efforts are being made by them to **"Conserve and Nurture Rare**

**Medicinal Plants,"**. It was also informed that each plant has a different story and that each one may bring up an Industry and may also provide a Research Topic to the curious Academicians. This park is not merely a collection of Medicinal plants for Academicians; it is a place where the biodiversity appears in its enjoyable moods. IWSA members took keen interest in observing the plants and discussing their doubts with the concerned authorities. IWSA members suggested incorporating some plants which were not there in the Park such as Ashwagandha, Calatropis, Kanthakari, Vajradanti, Neem, Giloy Rose, Hibiscus etc. The members gained knowledge which may be useful in day to day life. About 40 participants visited the Park.

### 2. Women's Day Celebration on 8th March, 2020

Women's Day is an Annual Event celebrated by IWSA Nagpur Branch. This year also we had planned to celebrate the Women's day but due to the unforeseen lockdown situation arising out of the COVID 2019 Pandemic, the same had to be postponed. Hence an initiative was taken to conduct an online survey on the subject "**Today's Woman and her Perceptions"**. The members were requested to fill up the Online Proforma and submit the same. The Data was to be presented at a program to be arranged at a suitable time after the Lockdown situation became normal.
The response received from the members was overwhelming. Since the Lockdown is being continued and it is not possible to conduct the programs and make the actual presentation of the Data, the date of filling the Proformas has been extended to 31st May, 2020. The remaining part of the Project would be completed when the situation gets normal.

## Roorkee Branch

### 1. Lecture cum Interactive Session on "Life in the Universe" held on 24th January, 2020

Indian Women Scientists' Association Roorkee Branch feels delighted to share the success of a unique event which was organized for the first time in the Haridwar district exclusively for the school children. Lecture cum Interactive session on 'Life in the Universe' by Dr Siddharth Pandey was held on January 24, 2020, at the Institution of Engineers IIT Roorkee. Dr Pandey is the Project Coordinator, NASA Spaceward Bound India; Director, Mars Society Australia; Head, Centre for Excellence in Astrobiology, Amity University Mumbai; Head, Amity Space Centre, Amity University, Uttar Pradesh. IWSA Roorkee branch decided to invite two students from each of the class 8th, 9th and 11th, i.e. only six students from each school participating in VAMMO-04. All the schools actively participated in the session with a total participation of 200 students along with their coordinators from 28 schools of Haridwar and Roorkee.

Dr Siddharth explained various space missions searching for life on other worlds. He also discussed his ongoing experiments in Mars-like regions in India and even now in Space. He was amazed at the response and found the students are very bright and curious. The

quality of questions asked by children was so good that he couldn't stop himself encouraging the students to carry on pondering and questioning about the Universe. He suggested each one to keep in touch with their passion for exploring. Dr Siddharth briefly introduced his journey from school to becoming a Space Researcher. Also highlighted the importance of understanding and acknowledging our place in the Universe. He stated, "Space serves to remind us that we are one human species who need to survive our selves on this planet and work together to answer some of the mysteries of this Universe". He conveyed thanks to IWSA Roorkee for honouring him with the opportunity to interact with the students and wished them the best of luck for future events. All the students with full enthusiasm participated in the session actively with provocative questions to Dr Pandey. Certificate of Inspiration, signed by Dr Pandey, was given to all the students who attended the lecture cum interactive session on 'Life in the Universe'. They walked home with new answers and dreams to peruse, making this event a big success.

## 2.The Award function of VAMMO–4 (2020) on 25th January, 2020

Prize distribution function of the event VAMMO-4 (2020) Mathematics Olympiad, was organized on **25th January, 2020,** in the auditorium of the Department of Biotechnology, IIT Roorkee. Dr Siddharth Pandey, Project coordinator, NASA Spaceward Bound India, Mars Society Australia; Head, Centre of Excellence in Astrobiology, Amity University Mumbai was the chief guest of the function. Prof R.C. Agarwala, Professor (Retd.) IIT Roorkee was the Guest of Honor for the function.

The awards were mainly to encourage students. Efforts were made to give away prizes which in some form or the other will encourage the young students. The following prizes were given to the participants:

First prize: Rs. 3000/- cash + Medal + Certificate
Second prize: Rs. 2000/- cash + Medal + Certificate
Third prize: Rs. 1500/- cash + Medal + Certificate
Merit 1 ( Consolation) : Rs. 500/- + Certificate
Merit 2 ( Consolation) : Rs. 500/- + Certificate

VAMMO participants getting the same score were awarded separately, i.e., prize money was not shared. A separate prize was given. A total of 29 awards, instead of 20 were given. All coordinators were felicitated with certificates and memento. As VAMMO has completed four years, so IWSA Roorkee started STAR PERFORMANCE AWARD this year. Accordingly, student(s) getting an award in all four consecutive years will be declared Star Performer. Two students were awarded this year with Star Performance Award. Also, one school each from Haridwar and Roorkee was recognized for maximum participation. A few schools get the customary prizes of 1st, 2nd, 3rd etc. The highest scorer of each class of each school was also given a certificate and a memento. The students getting more than the average marks were also inspired with the certificate. The last two prizes, however, could not be accommodated in the award function. These were given to the school principals for onward distribution.

Prof. R. C. Agarwala conveyed Dr Vijaya Agarwala's message 'the work speaks not the words" to the prize winners. Dr Pandey, the Chief Guest, appreciated the community living of Roorkee, the small town. He encouraged the award winners. He told them to recognize their passion and be passionate about the projects. The award function turned out to be a big success.

A book on Skill Maths by Dr Rama Mehta was also released. It was a pleasant surprise for everyone.

# Articles

## Biology of Corona Virus and the Pandemic

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**Introduction**

The initial cases of novel coronavirus (2019-nCoV) infected pneumonia (NCIP) occurred in Wuhan, Hubei Province, China, in December 2019 and January 2020. Data on the first 425 confirmed cases in Wuhan were analyzed to determine the epidemiologic characteristics of NCIP. On the basis of this information, there is evidence that human-to-human transmission has occurred among close contacts since the middle of December 2019. Considerable efforts to reduce transmission will be required to control out breaks if similar dynamics apply elsewhere. Measures to prevent or reduce transmission should be implemented in populations at risk. In this context one needs to understand some basic facts regarding viruses and also understand certain critical concerns regarding whether or not the present novel corona virus (2019-nCoV) is a consequence of natural evolution or is due to a laboratory research outcome.

**Viruses**

Any being that can procreate itself is considered as living, so viruses are living as they multiply and create millions and millions like themselves. Yet, intriguing as it may sound, when they are outside a living host cell they are just physical entities. Viruses are small obligate intracellular parasites, thereby are pathogenic. They all have a high degree of species specificity (a viral strain infecting human being cannot infect dog, cat etc.),and narrow host range (different strains infect different hosts, eg. Influenza has a strain infecting humans, another infecting pigs and another infecting fowl etc.). They exhibit tissue tropism, which means the virus infecting the respiratory system does not infect gut etc. Further a phenomenon called shift and drift occur in some

viruses due to mutations and reassortment resulting in emergence of novel strains of viruses. This happens when like in the case of fowl flu and human flu which co-infect pigs generating a virus that can infect humans. For swine flu and fowl flu the dynamics are unique. They spread by contact, air droplets, water etc.

Viruses, by definition contain either a RNA or DNA as genome (genetic material) surrounded by a protective, virus-coded (information to make this is present in virus and is inherited) protein coat. For propagation, viruses depend on their host cell's complex metabolic and biosynthetic machinery. A complete virus particle is called a Virion. The main function of a virion is to deliver its DNA or RNA genome into the host cell so that the genome can be expressed (transcribed and translated) by the host cell as a consequence of it sabotaging the cellular metabolic machinery to its advantage. The viral genome, often with associated basic proteins, is packaged inside a symmetric protein complex called capsid. The nucleic acid-associated protein, called nucleoprotein, together with the genome, forms the nucleo-capsid. Some viruses have in addition a protective envelop like in case of enveloped viruses,(eg CORONA) the nucleo-capsid is surrounded by a lipid bi-layer derived from the modified host cell membrane and studded with an outer layer of virus envelope glycoproteins. Based on the type of nucleic acid the virus has, they are grouped into seven categories (See the Table given below).

## Baltimore Classification Of Seven Categories Of Viruses

| class | Description of genome & replication strategy | Example of bacterial virus | Example of Animal virus |
|---|---|---|---|
| I | Double stranded DNA genome | Lambda & T4 | Herpes ,Pox |
| II | Single stranded DNA genome | Phi X174 | Chicken anemia |
| III | Double stranded RNA genome | Phi 6 | Reo |
| IV | Single stranded RNA plus strand genome | MS2 | Polio |
| V | Single stranded RNA negative genome | -- | Influenza.Rabies ,Corona |
| VI | Single stranded RNA genome with DNA intermediate | - | Retroviruses |
| VII | Double stranded DNA genome with RNA intermediate | - | Hepatitis |
| As per wikepedia | | | |

*NOTE : DNA Deoxyribonucleotide acid (DNA) is universally the genetic material. It is present as poly nucleotide strand and there are two complementary strands that are wound in an helical form. The sequence of nucleotides in the strand and*

*the length of it are unique for every species (virus to man). There are 4 types of nucleotides A = Adenine,T = Thymine C = Cytosine & G=Guanine. Adenine bonds with Thymine by 2 hydrogen bonds, Guanine with cytosine with a triple H bond. This pairing is unique so the presence of A means a T on the opposite strand, the presence of a G means a C opposite to it. However what follows one another can be any one of the 4 nucleotide. It is this sequence that is unique for each species or organism. Any change in this sequence does occur very rarely and this process is called mutation. The changed nucleotide may result in an altered function or may not even be noticed when it is called a silent mutation.*

*RNA- ribonucleotide universally functions as a go between from DNA to Protein. A RNA is copied from the DNA by a process called transcription, this poly ribonucleotide strand is translated into an amino acid polymer which in turn folds over to form a protein. In RNA, the sugar is a ribose sugar as against a deoxy ribose sugar in DNA also instead of thymine we have another base called Uracil.*

*However in some Viruses the RNA acts as the genetic material. The central dogma of biology is that DNA makes RNA which in turn makes protein.*

*The RNA that can directly make protein is called positive strand, so viruses having RNA as genetic material that can directly make protein are called Positive strand viruses.*

*Those viruses that have RNA as genetic material and need to make a complementary RNA strand to make its protein are called negative strand viruses.*

*A very brief explanation of this is given as more details is beyond the present scope.*

**Typical process after virus collides with host cell**

- Infection: Surface proteins of the virus interact with specific receptors on the target cell surface. These may be specialized proteins with limited distribution or molecules that are more widely distributed on tissues throughout the body. The presence of a virus-specific receptor is necessary but not sufficient for viruses to infect cells and complete the replicative (reproduction ) cycle.
- Penetration: Enveloped viruses (e.g., HIV, influenza virus corona viruses) penetrate cells through fusion of the viral envelope with the host cell membrane. Non-enveloped viruses penetrate cells by translocation of the virion across the host cell membrane or receptor mediated endocytosis (a process where cell forms an arm around the virus and takes it in ) of the virion in clathrin coated pits with accumulation of viruses in cytoplasmic vesicles.
- Uncoating (disassembly): A complex process which differs by taxonomic class and is not fully understood for many agents. This process makes the nucleic acid available for transcription to permit multiplication of the virus.
- Transcription and Translation: The key to understanding the genomic expression of viruses is noting the fact that viruses must use host cellular machinery to replicate and make functional and structural proteins.

- ❖ Assembly and Release: The process of virion assembly involves bringing together newly formed viral nucleic acid and the structural proteins to form the nucleocapsid of the virus.

There are basically three strategies that viruses employ:

1. Nonenveloped viruses exhibit full maturation in the cytoplasm (e.g., picornaviruses) or the nucleus (e.g., adenoviruses) with disintegration of the cell and release of virions.

2. For enveloped viruses, including the (-) strand RNA viruses, the (+) strand togaviruses and the retroviruses, final maturation of the virion takes place as the virion exits the cell. Viral proteins are inserted into the host cell membrane. Nucleocapsids bind to the regions of the host cell membranes with these inserted proteins and bud into the extracellular space. Further cleavage and maturation of proteins may occur after viral extrusion to impart full infectivity on the virion. Viruses in this group differ in their degree of cytolytic activity.

3.Herpesviruses, which are enveloped viruses, assemble their nucleocapsids in the nuclei of infected cells and mature at the inner lamella of the nuclear membrane. Virions accumulate in this region, in the endoplasmic reticulum and in vesicles protected from the cytoplasm. Release of virions from the cell surface is associated with cytolysis.

Typically, this cycle (infection replication release of new virus reinfection) which is “infection ,replication or multiplication, forming more viruses release of more viruses from infected cell again infecting more cells “goes on causing various patho physiological consequences in the host.

**CORONA VIRUS**

Coronaviruses (CoV) are single-stranded positive-sense RNA viruses that infect animals and humans. The SARS-CoV genome usually encodes four structural proteins: the spike protein (S), envelope protein (E), membrane protein (M), and nucleocapsid protein (N). Among them, the S protein is a trimeric, cell-surface glycoprotein that on viral infections cleaves into two subunits (S1 and S2). The S1 subunit is responsible for receptor binding and S2 for membrane fusion. Variations in the S protein, to a large extent, are responsible for the tissue tropism and host ranges of different CoVs.

Corona Viruses are classified into 4 genera based on their host specificity: Alphacoronavirus, Betacoronavirus, Deltacoronavirus and Gammacoronavirus.

There are seven known types of CoVs that includes 229E and NL63 (Genus Alphacoronavirus), OC43, HKU1, MERS and SARS (Genus Betacoronavirus). While 229E, NL63, OC43, and HKU1 commonly infect humans, the SARS and MERS outbreak in 2002 and 2012 respectively occurred when the virus crossed-over from animals to humans causing significant mortality. In December 2019,

another outbreak of coronavirus was reported from Wuhan, China that was also transmitted from animals to humans. This new virus has been temporarily termed as 2019-novel Coronavirus (2019-nCoV) by the World Health Organization (WHO). While there are several hypotheses about the origin of 2019-nCoV, the source of this ongoing outbreak remains elusive.

The transmission patterns of 2019-nCoV is similar to patterns of transmission documented in the previous outbreaks including by body or aerosol contact with persons infected with the virus. Cases of mild to severe illness, and death from the infection have been reported from Wuhan. This outbreak has spread rapidly to distant nations including France, Australia and USA among others. The number of cases within and outside China are increasing steeply. Current understanding is limited to the virus genome sequences and modest epidemiological and clinical data. Comprehensive analysis of the available 2019-nCoV sequences may provide important clues that may help advance our current understanding to manage the ongoing outbreak. For this reason, the spike proteins represent the most extensively studied among corona viruses. Therefore, scientists sought to investigate the spike glycoprotein of the 2019-nCoV to understand its evolution, novel sequence features, structural features and its relationship to all known corona viruses, using computational tools. Dendrograms, sequence alignments, amino acid alignments and relatedness coefficients were established. The analysis of the spike glycoprotein of 2019-nCoV revealed several interesting findings: First, it was identified that four unique inserts in the 2019-nCoV spike glycoprotein that were not present in any other corona virus reported till date. Surprisingly, all the four inserts in the 2019-nCoV mapped to short segments of amino acids in the HIV-1 gp120 and Gag among all annotated virus proteins in the NCBI database. This uncanny similarity of novel inserts in the 2019- nCoV spike protein to HIV-1 gp120 and Gag is unlikely to be fortuitous. Further, 3D modelling suggested that at least three of the unique inserts which are non-contiguous in the primary protein sequence of the 2019-nCoV spike glycoprotein converge to constitute the key components of the receptor binding site Further, all the four inserts had pI values of around 10 that may facilitate virus-host interactions. Taken together, these findings suggest unconventional evolution of 2019-nCoV that warrants further investigation. These reports highlight novel evolutionary aspects of the 2019-nCoV and has implications on the pathogenesis and diagnosis of this virus. This raises queries on the mechanism by which host specificities were altered in such a short duration. The above narrative enables us to understand what is well documented and we now need to understand the more critical aspect, that is the way forward.

**Immunity may be discussed in terms of :**

- Immunity: Individual /Herd Immunity
- Individual Immunity: Natural Passive /Active Immunity
- Vaccination: Artificial Passive (antibody transfer) /Active (Immunization or vaccination).

Immunity is the state of protection against infectious disease conferred either through an immune response generated by immunization or previous infection, or by other non-immunological factors. There are two ways to acquire active resistance against invading microbes/eg CORONA virus: active natural and active artificial.

Naturally acquired active immunity occurs when the person is exposed to a live pathogen, develops the disease, and becomes immune as a result of the primary immune response. Once a microbe penetrates the body's skin, mucous membranes, or other primary defences, it interacts with the immune system. B-cells in the body produce antibodies that help to fight against the invading microbes. The adaptive immune response generated against the pathogen takes days or weeks to develop but may be long-lasting, or even lifelong. In a similar manner, administration of a vaccine generates an acquired active immune response leading to long-lasting (possibly lifelong) protection.

Immunization (commonly referred to as vaccination) is the deliberate induction of an immune response and represents the single most effective manipulation of the immune system that scientists have developed. Immunizations are successful because they utilize the immune system's natural specificity as well as its inducibility. The principle behind immunization is to introduce an antigen, derived from a disease-causing organism, that stimulates the immune system to develop protective immunity against that organism, but which does not itself cause the pathogenic effects of that organism.

Innate Immunity is immunity which is not intrinsically affected by prior contact with the antigen. It is an an immunity not directly mediated by lymphocytes.

Natural Passive Immunity is the transfer of active humoral immunity from one individual to another in the form of custom-made antibodies or what is now called plasma therapy. In this therapy, the naturally exposed person develops the disease but recovers due to his immunity and has circulating antibodies available in the plasma. However while using the plasma from these individuals, care needs to be taken to avoid anaphylactic shock if there is a mismatch due to plasma carrying neglibile amount of cell debris from donors due to improper purification.

Immunity is transferred through the placenta to a child from the mother in the form of antibodies, mainly IgG and IgA . Natural passive immunity can also be transferred through breast milk. Natural passive immunity is short-lived after the birth of the child.

The most common form of artificial immunity is classified as active and comes in the form of vaccinations, typically given to children and young adults.

The passive form of artificial immunity involves introducing an antibody into the system once a person has already been infected with a disease, ultimately relieving the present symptoms of the sickness and preventing re-occurrence.

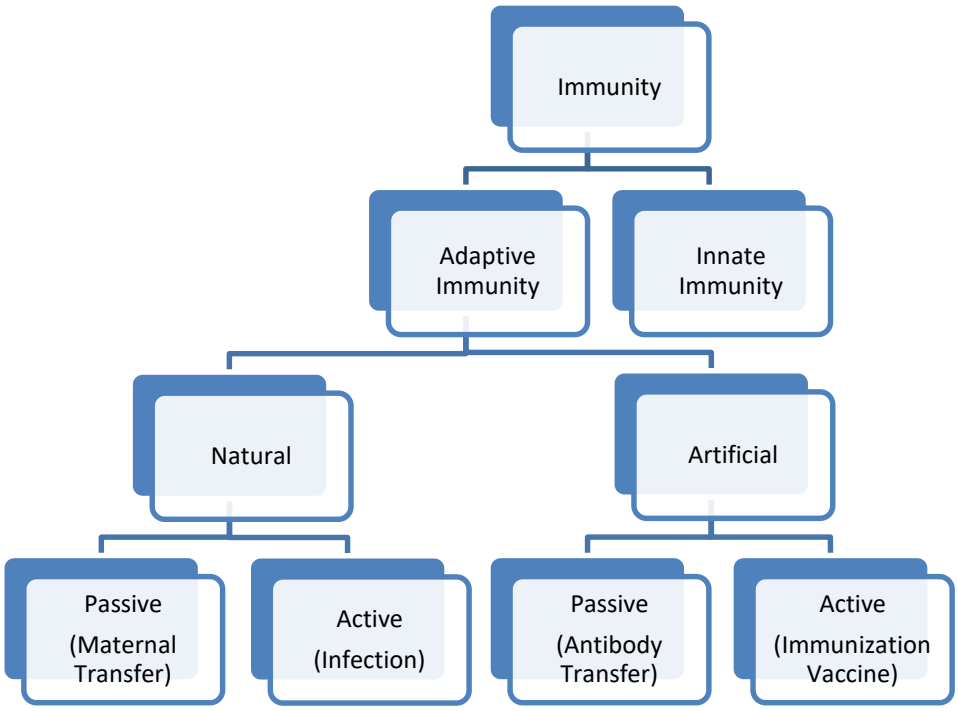
Herd immunity is the protection given to a community against an epidemic of a contagious disease when sufficient number of people in the population are immunised or otherwise develop immunity to it.

After an overview of salient features of immunity, let us understand the current situation of Corona Virus and COVID.

The disease COVID is a consequence when the infection has triumphed over the body's immune response. Unfortunately, there is no vaccine for COVID as of today. A race is on, by all vaccine companies globally. The proof of concept, even if one uses latest technologies and narrow down to a vaccine candidate within insilico/invitro technologies, would take a minimum of 2-3 months and another 6-9 months will be required for in vivo experimentation. This should be followed by clinical studies and regulatory approvals. Alternately, approvals are being sought for testing of vaccines developed for other closely related vaccines. Plasma therapy also is on the anvil, but this is not a blanket remedy, as the donor plasma needs to be matched to that of recipient to avoid anaphylactic shock. There are no antiviral agents either and a race is on to find one. As of now a repurposing is going on which means, molecules which are in use for another patho-physiological condition and are found safe are being

considered for treatment of COVID. .As the COVID too is expressing some of these symptoms it is being used, hopefully with informed consent. In principle no medication should be used without a proper clinical study establishing its efficacy and safety.

Basic aspects of Immunity is depicted schematically in the diagram below.




**Summary**

The virus switched host from Bat to Human because of alteration of the glycoprotein on the virus spikes.

The cycle of events ending in disease:

- ❖ virus adsorption on host cell by glycoprotein on virus spikes
- ❖ Entry into cell
- ❖ Its replication by sabotaging host cellular machinery
- ❖ Assembly of newly synthesized viral components
- ❖ Release of more viral particles.
- ❖ Overcoming cellular Immune response
- ❖ Ability to infect all cells as ACE receptors are present in all types of cells in the human body .This is not found in any virus as of date .Viruses are tissue specific a phenomenon called tissue tropism.

The points of concern bubbles down to

- how has host specificity and tissue tropism alteration resulted??? Is it indeed a result of gain of function?.
- How did so many simultaneous mutations having such great impact on global public health and Economy come about.
- Can such gain of function research be funded at all ??!!

The reality is we do have a global pandemic with NO vaccine or an antiviral drug.

So efforts for drug can be:

Blocking any one or more of the above steps resulting in the disease can lead to a therapeutic outcome .

The easiest and logical way would be to identify proteins in this path, project them in silico and design molecules that interfere or inhibit the progression of this path This is the novel and critical path.

Once a molecule is identified, a well-drawn path of solubility /shelf life, stability/trans-membrane transport/safety toxicity dosage /half-life etc. as per regulatory norms is enunciated and finally manufacturing feasibility and costing /approvals are worked out. Finally, the medicine hits the market. This complete process would take anywhere from one to two years at least or even more.

Or of course with a vaccine .

Until then Hope is eternal and Tomorrow is yet another day.

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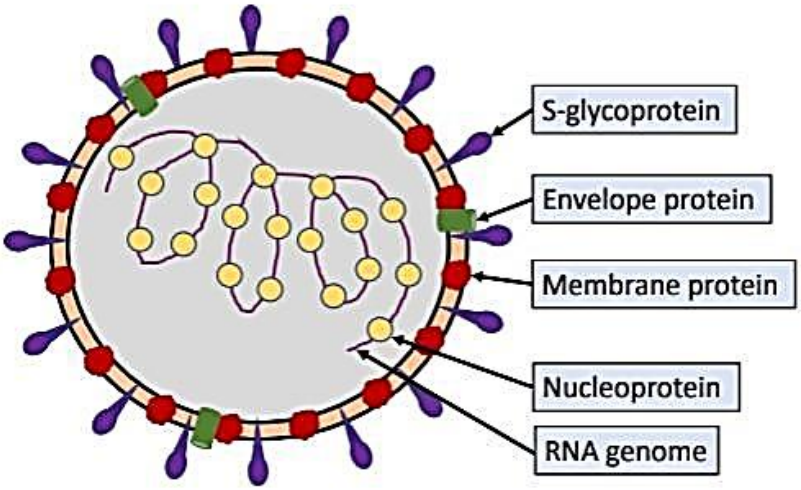


Figure 1

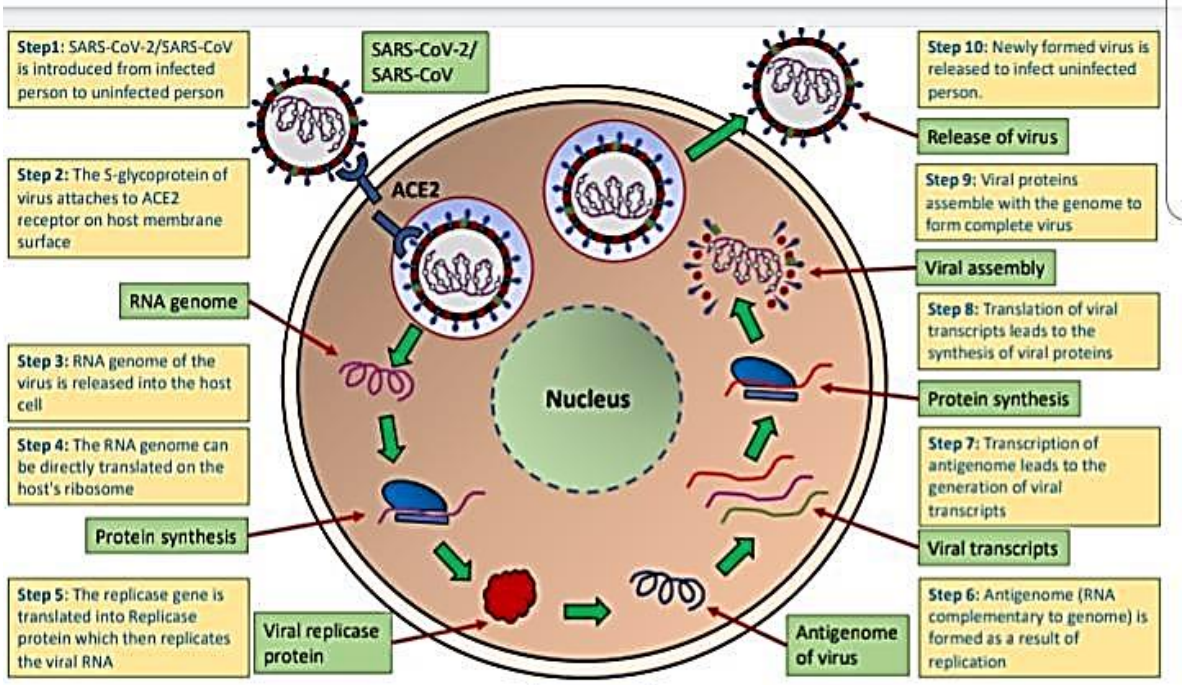


Figure 2

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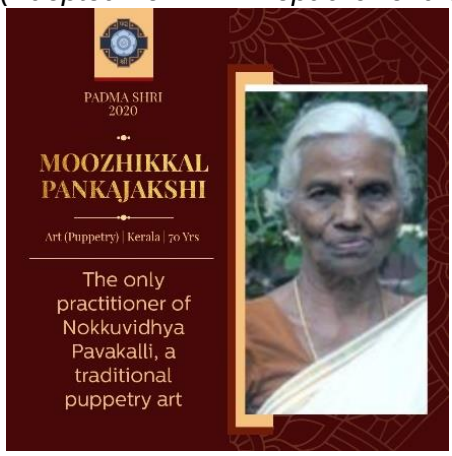
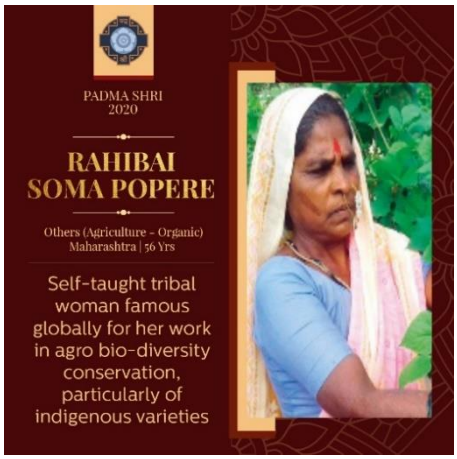
# Women Padma Awadees 2020

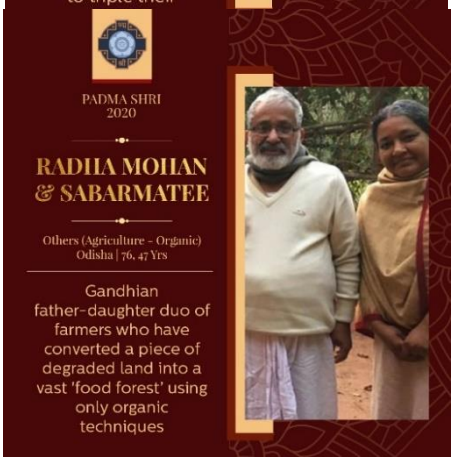
Out of 141 Padma awardees this year, 34 are women. Given below are pictures of some of the ordinary women, who have won Padma Award for their extraordinary work.

*(Adopted from www.republicworld.com)*

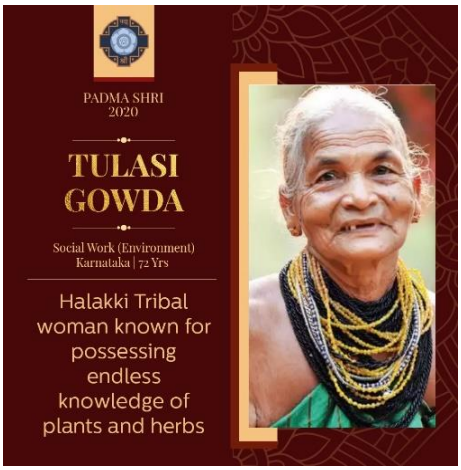










# We Salute these Women Achievers

## Women Leading the COVID 19 Fight in India

*(Abridged from https://theprint.in/india/governance/why-you-should-know-these-5-women-among-those-leading-efforts-to-tackle-covid-19-in-india/395533/)*

As the world reels from the impact of the Covid-19 crisis, which has also induced an economic recession, there are many working tirelessly at the forefront to tackle the challenge. In India, several women are working round-the-clock, seven days a week, to ensure the smooth functioning of key departments — administration, diagnosis, prevention, research and cure. The challenging work done by some of these women is given below:.

**Ms. Preeti Sudan,** Secretary at the Ministry of Health and Family Welfare, has been working on aligning all departments to execute the Narendra Modi government's policies to prevent the spread of the disease.
**Dr. Nivedita Gupta,** Senior Scientist at Indian Council of Medical Research (ICMR), is busy designing the treatment and testing protocols for the country.
**Dr. Renu Swarup,** Secretary, Department of Biotechnology, is spending her time trying to find a vaccine.
**Dr. Priya Abraham,** Director of National Institute of Virology, Pune, has made a significant medical breakthrough by isolating the deadly coronavirus. This helps in understanding the disease better and finding treatment regimens.
**Dr. Beela Rajesh,** Health Secretary of Tamil Nadu, has been proactive in engaging with citizens through her department and Twitter. The State is fighting Covid 19 with large number of active cases.

More details about these women achievers:

**Ms. Preeti Sudan**

A 1983 batch IAS officer from the Andhra Pradesh cadre, Sudan is usually seen leaving her office at Nirman Bhawan late at night. An M.Phil. in Economics and postgraduate in Social Policy and Planning from the London School of Economics, Sudan also served the World Bank in Washington as a consultant. Her ministry is the nodal agency for fighting the present coronavirus challenge. Sudan, along with Union Health Minister Harsh Vardhan, coordinates with sister departments in the central and state government. The two conduct regular reviews of the evolving situation. She is also involved in the regular review of preparedness with the states and union territories. Also, she is the first point of contact for any query arising from Prime Minister Narendra Modi's office or from the office of Union Minister. She played a major role in the evacuation of the 645 students from Wuhan, China. Among her cadre, Sudan has a distinguished track record of serving in finance, disaster management, tourism and agriculture.

**Dr Nivedita Gupta**

Working in the Division of Epidemiology & Communicable Diseases, and in-charge of viral

diseases at the country's apex health research department, Dr Gupta's primary responsibility is building testing and treatment protocols in India. She was also the primary scientist involved in the investigations and containment of the Nipah virus outbreak in Kerala last year. An MBBS from Lady Hardinge Medical College, Dr Gupta is the key person to augment the Covid-19 diagnostic capacity all across the country. In the short time span of two months, over 130 laboratories in the government sector and 52 laboratories in the private sector were roped in to diagnose coronavirus cases. Gupta has a PhD in molecular medicine from Jawaharlal Nehru University and has been instrumental in setting up the virus research and diagnostic laboratory network of ICMR. This network was established subsequent to the 2009 pandemic influenza outbreak. The Virus Research and Diagnostic Laboratory (VRDL) network of 106 laboratories is largely considered as the backbone of the nation, and has ensured the capacity to detect the virus in almost all parts of the country. Dr Gupta has aggressively investigated the viral outbreaks such as enteroviruses, arboviruses (dengue, chikungunya, Japanese encephalitis & Zika), influenza, measles and rubella among others. She was part of the team that worked extensively on deciphering the aetiology, and developed management guidelines, for the acute encephalitis syndrome in different parts of India.

**Dr. Renu Swarup**

Dr. Renu Swarup has been working at the Ministry of Science and Technology's Department of Biotechnology (DBT) for the past 30 years. She held the position of Scientist 'H' — which denotes an outstanding scientist — until April 2018, when she was appointed as Secretary. A key person in the formulation of the Biotechnology Vision in 2001, the National Biotechnology Development Strategy in 2007 and Strategy II in 2015-20, Swarup is now involved in the crucial research to develop a coronavirus vaccine. Her ministry has asked all IIT incubators to focus on research and development of portable ventilators, genome sequencing and isolation of the strain of the novel coronavirus from blood samples. A PhD in Genetics and Plant Breeding, Swarup is known for promoting women in science, and was a member of the Task Force on Women in Science, which was constituted by the Scientific Advisory Committee to the Prime Minister.

**Dr. Priya Abraham**

Dr. Priya Abraham leads the backbone of the country right now — the National Institute of Virology (NIV), Pune, which is affiliated to the ICMR. The NIV was initially the only testing centre in the country for Covid-19. As the number of cases spike on a daily basis, the NIV has succeeded in reducing the testing time of Covid-19 samples to just four hours a sample from 12-14 hours. The NIV had confirmed the first three positive Covid-19 cases in India. The institute had initially done all the testing, but ICMR subsequently increased the number of laboratories, anticipating a jump in cases. Under Abraham's leadership, the NIV helped these labs with troubleshooting, and ensured reagent supplies to the network of labs. Abraham holds an MBBS, MD (Medical Microbiology) and PhD from Christian Medical College in Vellore, where she was also the former head of the department of Clinical Virology at CMC Vellore. She is also a fellow of the Royal College of Pathologists and Royal Society of Tropical Medicine and Hygiene. On invitation from the Medical Council of India, Abraham also drafted the syllabus for the Doctor of Medicine (DM) in Virology. Her achievements also include being a key member of the WHO's Guidelines Development Working Group Meeting for Hepatitis and HIV in 2012, and for Hepatitis B in 2014. In 2017, she served as WHO consultant in Myanmar to formulate the National Hepatitis Testing.

## Dr. Beela Rajesh

As the Health Secretary of Tamil Nadu, Dr. Beela Rajesh has been at the forefront of tackling the challenge in her State. A 1997 batch IAS officer, she is known as a media-friendly bureaucrat and is very active on Twitter. "Virus can affect anyone, let's be gentle and sensitive towards each other and wage a coordinated battle against Covid19," she posted recently. Apart from sharing her thoughts, she also responds to queries directed at her or her department. An MBBS graduate from Madras Medical College, Dr. Beela Rajesh earlier served as sub-collector of Chengalpattu, commissioner of Fisheries and commissioner of Town and Country Planning in Tamil Nadu. She was also the commissioner of Indian Medicine and Homeopathy before being transferred as the Health Secretary in 2019. Tamil Nadu ranks third among all Indian states in the NITI Aayog Health Index given its vastly improved health outcomes. Under Dr. Beela Rajesh, the Tamil Nadu Health System Reform Program was set up with the state government, Centre and World Bank signing a $287 million loan agreement in June 2019. The program aims to improve the quality of health care, reduce the burden of noncommunicable diseases (NCDs), and fill equity gaps in reproductive and child health services in Tamil Nadu.

**Dr. Preeti Sudan**

**Dr. Nivedita Gupta**

**Dr. Renu Swarup**

**Dr. Priya Abraham**


**Dr. Beela Rajesh**

**Ms. Minal Bhosle**

# Coronavirus: The woman behind India's first testing kit-------Ms. Meenal Bhosle

*(Abridged from https://www.bbc.com/news/world-asia-india-52064427)*

India has been criticised for its poor record of testing people in the battle against coronavirus. That, however, is set to change, thanks in large part to the efforts of one virologist, who delivered on a working test kit, just hours before delivering her baby. On 26th March, 2020, the first made-in-India coronavirus testing kits reached the market, raising hopes of an increase in screening of patients with flu symptoms to confirm or rule out the Covid-19 infection.

Mylab Discovery, in the western city of Pune, became the first Indian firm to get full approval to make and sell testing kits. It shipped the first batch of 150 to diagnostic labs in Pune, Mumbai, Delhi, Goa and Bengaluru in the last week of March 2020. The molecular diagnostic company, which also makes testing kits for HIV and Hepatitis B and C, and other diseases, says it can supply up to 100,000 Covid-19 testing kits a week and can produce up to 200,000 if needed. Each Mylab kit can test 100 samples and costs 1,200 rupees - that's about a quarter of the 4,500 rupees that India pays to import Covid-19 testing kits from abroad.

"Our kit gives the diagnosis in two and a half hours while the imported testing kits take six-seven hours," says virologist Minal Dakhave Bhosale, Mylab's research and development chief. Ms Bhosale, who headed the team that designed the coronavirus testing kit called Patho Detect, said it was done "in record time" - six weeks instead of three or four months. The scientist was battling with her own deadline too. On 19th March, 2020, she gave birth to a baby girl - and only began work on the programme in February, just days after leaving hospital with a pregnancy complication.

"It was an emergency, so I took this on as a challenge. I have to serve my nation," she says, adding that her team of 10 worked "very hard" to make the project a success. In the end, she submitted the kit for evaluation by the National Institute of Virology (NIV) on 18th March, 2020, just a day before delivering her daughter.

That same evening, just an hour before she was taken to hospital ahead of her Caesarean, she submitted the proposal to the Indian FDA and the drugs control authority CDSCO for commercial approval. "We were running against time," says Dr Wankhede, Mylab's director for medical affairs. "Our reputation was at stake, we had to get everything right on the first go, and Minal was leading our efforts from the front." Before submitting the kits for evaluation, the team had to check and re-check all the parameters to ensure its results that were precise, and accurate. "If you carry out 10 tests on the same sample, all 10 results should be same," said Ms Bhosale. "And we achieved that. Our kit was perfect. "The government-run Indian Council for Medical Research (ICMR), under which NIV operates, agreed. It said Mylab was the only Indian company to achieve 100% results.

# Eleven Chairs in the Names of Women Scientists to be Established by Ministry of Science and Technology

https://economictimes.indiatimes.com/industry/services/education/11-chairs-in-names-of-women-scientists-to-be-established-at-institutes-across…

https://timesofindia.indiatimes.com/india/in-a-first-11-chairs-named-after-indian-women-scientists-to-be-filled-by-women/articleshow/74431957.cms

https://theprint.in/science/these-are-the-11-indian-women-scientists-the-new-stem-chairs-are-named-after/374077/

Eleven chairs in the names of women scientists, including renowned anthropologist Iravati Karve, will be established at institutes across the country to honour their contribution in the field of science, Women and Child Development Minister Smriti Irani informed, in a series of tweets. She said, the decision has been made on the occasion of the National Science Day. Smriti Irani said these 11 chairs will not only honour and recognise women scientists' contribution to the field of science but also inspire women and encourage greater participation of young girls in STEM (Science, Technology, Engineering and Mathematics).

The Ministries of Science and Technology and Women and Child Development have identified 11 early 20th-century women scientists in whose honour chairs will be set up in institutes across the country. The range of fields is wide — from cytogenetics to organic chemistry to social sciences. Only women researchers will take up positions and could get research fund up to Rs 1 crore.

The 11 eminent women scientists are -- cytogeneticist Archana Sharma, botanist Janaki Ammal, organic scientist Darshan Ranganatham, chemist Asima Chatterjee, doctor Kadambini Ganguly, anthropologist Iravati Karve, meteorologist Anna Mani, engineer Rajeshwari Chatterjee, mathematician Raman Parimala, physicist Bibha Chowdhuri and biomedical researcher Kamal Ranadive.

We at IWSA are proud that **Padma Bhushan Late Dr Kamal Ranadive** was a pioneer in the field of cancer research, and also in creating, shaping and leading organisations of great repute, like the *Indian Cancer Research Centre* (ICRC) and the *Indian Women Scientists' Association* (IWSA). In 1973, along with the other 11 founder members she established IWSA, which is now a pivotal organisation that continues to serve women in the field of science and technology in India

# Obituaries

## 1. Late Dr. Kusum Arjungi (1928-2020)

One of our Founder Members Dr. Kusum Arjungi, passed away on 18th April, 2020 in the US where she was with her family.

Dr. Arjungi was an active member of the Indian Women Scientists' Association and has contributed immensely for the initiation and development of the IWSA campus at Vashi Dr. Arjungi was a Senior Research Fellow at the Bombay University Department of Chemical Technology (BUDCT) where she worked with Dr. B.D. Tilak, the then Director of BUDCT. She completed her PhD under his guidance as a joint student of BUDCT and NCL in 1969 when he moved to National Chemical Laboratories as Director. She has done well acknowledged work on synthesis of Nitrogen Heterocyclics. In 1976 Dr. Arjungi went to the German Cancer Centre, Heidelberg, where worked on detection of nitrosamines and other indirect alkylating agents. On her return Dr. Arjungi worked at the Cancer Research Institute, Parel, Mumbai with two of IWSA's founder members. She was associated with Dr. Sumati Bhide on the effect of urethane on nucleic acid biosynthesis and its tumorigenicity and anti cancer properties. She also worked on Organ culture as a system for rapid carcinogenicity screening of tobacco extracts with Dr. Kamal Ranadive.

## 2. Late Dr. Sudha Gangal (1934-2020)

Celebrating the grand life of Dr. Sudha G. Gangal.
President IWSA (1991-93) & Member, Board of Trustee (1999-2003), Sudha was a MSc, PhD, FNA, FASc, FMAS. She will be remembered as one of the founders of Cancer Immunology in India. All throughout her career spanning over 58 years she held her head high with confidence in the subjects she commanded, imbibed and ventured into towards the end. She remained the finest tumour immunologist in the country. A model teacher and mentor, she enthralled audiences in national and international forums and deeply influenced many. Till November 2019 she attended immunology meetings and was always welcomed with standing ovations. She was focussed, disciplined, uninhibited, perceptive and full of life; a fire brand of a women scientist many of us longed to become. This zest of her life could be silenced only by death on February 14, 2020. She had lost her life partner Mr.Gajanan Gangal, who was a commercial artist, some years back. Theirs was an amicable and supportive relationship.

The Immunology Division and Laboratory for Hybridoma Technology at the Cancer Research Institute, Tata Memorial Centre, Parel, was established by her and she remained its Head, till superannuation in August 1994. She was the research Director at Jerbai Wadia Childrens' Hospital, Parel where she established the Genetics Unit for prenatal diagnosis of Thalassemia. Next, she became Vice President of the Moving Academy of Medicine and Biomedicine, Pune followed by Emeritus professorship at the Rajiv Gandhi Institute of Biotechnology, Bharati Vidyapeeth University, Pune. It was during this time her interests moved towards understanding the science of Ayurveda. She had authored two books titled ‘Principles and Practice of Animal Tissue Culture’ and ‘Text Book of Basic and Clinical Immunology’ besides >150 publications of her research work. Her lab contributed to the national health emergencies of the time by reporting India's first case of HIV, antibody screening for survivors of Bhopal MIC gas leakage, to generating monoclonal antibodies for targeting oral cancers and the anti-leprosy vaccine project. She lives on in the hearts of friends, family, students and internet lecture videos.

**Workshop on Machine Learning at IWSA Headquarters, 3rd -5th , February 2020**

**Scholarship Awards Function at IWSA Headquarters on 29th February, 2020**


**Prof. Sanjay Wategaonkar delivering lecture on Infrared Spectroscopy at SIES College, Sion on 29th February 2020**

**IWSA participated in the Friends of Trees Plant Show on 5th and 6th February, 2020 at Ruparel College, Mumbai.**

**ECCE Students participated in Puppet show competition held at P.N. Doshi College, Ghatkopar on 24th January 2020 and won 3rd prize.**

**Science Day Celebration by Nursery Childrenon 28th February, 2020**

**MOU sighned between IWSA and Drishti on 6th March, 2020 for two short term courses for Shadow Teachers (Left)**

**Picnic to Rock Garden, Nerul for Daycare Children on 22nd February, 2020 (Right)**

# Activities from Branches

**Felicitation of Dr. Daya Pande and Dr. Reena Lahariya, IWSA, Amravati Branch Members at NSS Special Camp of Brijlal Biyani Science College, Amravati after their lecture on 9th January, 2020**

**National Seminar on Science and Technology for Rural Development on 11th February, 2020 Baroda Branch**

**One Day Hands on Workshop on Applications of Biostatistics on 26th February, 2020 Bengaluru Branch**


**BRNS Popular Science Lecture on Cancer Genes: Biology to Therapy on 28th February, 2020 by Dr. Prathiba. Bengaluru Branch**

**Participants of the Global Women's Breakfast 2020 (GWB 2020) Meet on February 12th , 2020 Hyderabad Branch**

**Dr. Ratna and Dr. Padmavathi Radio Talk on Women in Science organized by All India Radio, Hyderabad on 26th February, 2020. Hyderabad Branch**


**Dr. Mahtab Bamji delivered a talk at ICRISAT on 8th March, 2020 on the occasion of International Women's Day. Hyderabad Branch**

**Science day Celebration with Kendriya Vidhyalaya Students on 18th January 2020. Kalpakkam Branch**

**IWSA (K) EC Members distributing provisions to families in fishermen colony at Kalpakkam as part of COVID 19 relief work on 25thApril, 2020. Kalpakkam Branch**


**One Day State Level Workshop on Innovative Gardening Skills on 18th January, 2020. Kolhapur Branch**


**One Day Workshop on Tools and Techniques in Life Sciences on 22nd February, 2020. Kolhapur Branch**


**National Science Day was celebrated by IWSA Nagpur Branch, by visiting Aura Park, a home to more than 500 Medicinal Plants on 1st March, 2020.**

# BOOK POST

Regd. No.N.R.24208/74
ISSN 0972-6195

**VAMMO-4 Award Function and Release of Book on Maths Skills on 25th January, 2020 Roorkee Branch**

**Lecture on Life in the Universe by Dr. Siddharth Pandey for school students on 24th January, 2020. Roorkee Branch**

**To**

**From**

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