

IWSA NEWSLETTER

The Official Publication of the Indian Women Scientists' Association

Volume 48

Issue No. 1

ISSN 0972-6195

January – March 2021

Webinars under the "Science and Our Life" Series INDIAN WOMEN SCIENTISTS' ASSOCIATION 费 Proudly presents 9thTalk under IWSA's "Science and Our Life" Lecture series 10thTalk under IWSA's "Science and Our Life" Lecture series The Adaptive and Maladaptive changes associated with early life stress **Aerospace Journey** 2 Do we adapt to stress and if so what his papers when we at are the changes that take place in the brain? In my tak entood about the effects of stress on the brain. Vidita Vaidya Dr. Tessy The Join atn of India On 13th February 2021 at 5pm on 23rd January 2021 at 9:30AM the change in timing of v begins at 9:30AM 13th February 2021 23rd January 2021 Drishi INDIAN WOMEN SCIENTISTS' ASSOCIATION ON THE OCCASION OF 11thTalk under IWSA's "Science and Our Life"Lecture Series "INTERNATIONAL DAY OF WOMEN IN SCIENCE "How do I protect my liver? DRISHTI FREE WEBINAR SERIES PRESENTS DR. AABHA NAGRAL **CREATING A SCIENTIFIC** TEMPERAMENT IN EDUCATION on 13th March 2021 at 5pm join https://meet.google.co . . . 13th March 2021 FEBRUARY 10TH, 5PM TO 6 PM Indian Women Scientists' Association (IWSA) Celebrates 'SCIENCE DAY' ONLINE Speaker : Dr. Lalitha Dhareshwar, President, IWSA Science Exhibition for school students of Class VII to XI ntara Dey Cho ram Manager-Theme: " Scientists, Technologists and Innovators-their discoveries, innovations" DATE: 26th and 27th February, 2021 There will be three categories - 1) Working models Dr. Lalitha Dhareshwar's talk 2) Presentations 3) Computer Apps REGISTERATION FEE IS Rs.100/- per project on 10th February 2021 on the Registration Link: https://tinyurl.com/iwsa-science-day-online **Occasion of "International Dav** LAST DATE for registration: 12th February, 2021 of Women in Science" Science Day Celebration on 26th and 27th February 2021

BRANCHES

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





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, Science Awareness Activiities, Activities regarding Early Childhood Education, Activities of various Branches etc. All the activities reported in this Newsletter have been conducted online due to COVID Pandemic. IWSA HQ has conducted seventeen BRNS Popular Science Lectures during January to March

2021 in various colleges of Mumbai, Navi Mumbai, Panvel, Ratnagiri, Ernakulam and Nizamabad. In our "Science and our Life" Lecture Series, three interesting lectures were held during the period of January to March 2021. One of the lectures in this series was by Dr. Tessy Thomas, the Missile Women of India. Under the "Member Enrichment Program" of IWSA, 6 lectures were held during this period and brief reports of the lectures are given in this Newsletter. Several Science Awareness activities like participation in Teachers' Conference, Internship Programs for college students and Science Day celebrations by conducting online competitions for students were conducted during this period. Several online and offline activities were conducted by Nursery & Education, Hostel & Day Care, Library, Health and Computer Committees. Scholarships were awarded to several deserving students. We are glad to report all these activities in this Newsletter.

This issue also brings the interesting online activities held at IWSA Branches at Amravati, Bengaluru, Delhi, Hyderabad, Kalpakkam, Kolhapur, Nagpur, Pune and Roorkee. IWSA Branches from Amravati, Bengaluru, Delhi, Hyderabad, Kolhapur, Nagpur, Pune and Roorkee conducted 25 BRNS Popular Science Lectures, besides their other activities. Prof. Deepa Khushalani of Tata Institute of Fundamental Research, Mumbai has written an interesting acticle about the role of Nanomaterials for harnessing Solar Energy, which is included in this issue. We have included an article written by our Librarian Ms. Arpita Salve about Savitri Bai Phule. We have reported about some of the women achievers and also about one of the IWSA member who has appeared in the list of notable Agricultural Scientist in the world. 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 shyamala.bharadwaj@gmail.com

Contents

From the Editor's Desk President's Message Reports from Headquarters Reports from other Branches Article on Nanomaterials for Harnessing Solar Energy Article on Savitri Bai Phule We Salute the Women Achievers

Editorial Board

- Dr. Shyamala Bharadwaj (Editor)
- Dr. Susan Eapen
- Dr. Surekha Zingde
- Dr. Dhanya Suresh
- Dr. Pushpa Rao
- Dr. Vijaya Chakravarty
- Dr. Paramjit Anthappan

President's Message



Dear IWSA Members

The first quarter of the year 2021 (Jan-Mar) has been one of the most productive periods of IWSA in terms of the various Science based activities. In all 17 BRNS lectures were organized by HQ, 20 by the branches. In addition to these there were 3 lectures under the "Science And Our Life " series, where some of the most well- known experts delivered the lectures. Among these lectures, we were honored to have had the lecture by Dr. Tessy Thomas, Distinguished Scientist, Director general, Aeronautical Systems, DRDO, famous by the name of 'The Missile Woman of India'. She delivered a most exciting talk on "Aerospace Journey" covered by our country in the last three decades. Further, the Learning Garden initiative organized 6 lectures under the Member Enrichment program. These lectures have attracted audience from all over the country and abroad too.

The online celebration of Science Day was celebrated on 26th February, by organizing an online Science exhibition, which gave a completely different experience. The theme was-"Scientists, Technologists and innovators- their discoveries and innovations", which was aligned with the DST theme- "Future of STI- impact on education, skills and work". Participation was under the three categories of online presentation on working models, presentation of the work by a scientist/technologist/innovator and development of a mobile App for scientific application. The enthusiasm and the effort to excel was palpable in all participants as well as their mentor teachers.

The new and significant program has been taken up by IWSA to promote Science Education. It is the "Online Internship Program for college students", which started on 26th Feb. The first batch of 51 interns were from SIES College of Management Studies (SIESCOM). The program was intensely packed with several orientation, discussion and presentation sessions. It was very professionally conducted under the able guidance of IWSA mentors. This initiative will soon be in demand at other colleges too. Several other colleges are lined up for the project. IWSA branches are also being encouraged to take up this, which will ensure a strong coupling between science/ Engineering colleges and IWSA, which in turn help IWSA to achieve its mandate of training students in the science stream. It will also help us in reaching out to Science/ Engineering colleges in the rural parts of India.

All this buzzling activity at IWSA-HQ and the branches was possible only due to the digital technology and its far reaching consequences to expand our outreach.

IWSA has many more surprises lined up for the aspiring youth and adults with a spirit of scientific enquiry. These would be covered in the next issue. Meanwhile, I urge readers to give their ideas for the upcoming IWSA- Golden Jubilee celebration from June 2022 to June 2023.

With Best Wishes

Lalitha Dhareshwar lj_dhareshwar@yahoo.com

Reports from Head Quarters

Science Awareness Programs

A. IWSA – BRNS Popular Science Lectures

1. Online BRNS Popular Science Lecture at Sunandan Divatia School of Science, NMIMS (Deemed-to-be) University, Vile Parle (W), Mumbai on 6th January, 2021

Indian Women Scientists' Association, (IWSA) in association Sunandan Divatia School of Science, NMIMS (Deemed-to-be) University, Vile Parle (W), Mumbai organized a webinar on "Computational Pharmaceutics: Can it help understand drug targeting?" on 6th January, 2021. This webinar was supported by Board of Research in Nuclear Sciences DAE (BRNS) and conducted through MS Teams platform. Prof. Vandana Patravale, Professor of Pharmaceutics at the Institute of Chemical Technology, Mumbai, discussed the importance of computational science in the field of drug discovery and how pharmaceutical science is impacted by the inclusion of numerous emerging concepts of Artificial Intelligence (AI). About 96 students and faculty from Sunandan Divatia School of Science and other pharmaceutical institutes attended the webinar.

Abstract: The advent of computers revolutionized the world but their entry in pharmaceutical science has uplifted its significance to another level. Artificial intelligence (AI) is on its way to break all barriers that were posed to humans through several centuries. Pharmaceutical science is equally and positively impacted by the inclusion of numerous emerging concepts based out of AI, in regular practice. The importance of computational science has been well established in the field of drug discovery and is a continually growing field, even today. However, use of computational tools in the field of formulation design and development is still a nascent but dynamic concept. Scientists are always on a lookout for tools which can aid in rational design of formulations but also curb the extensive loss of man and materials in the process. Computational tools can bridge this gap and offer a highly cost and time effective approach in this direction. These tools can be utilized right from pre-formulation up to in vivo activity prediction with a sound correlation if applied with prior knowledge of their key concepts. Study of molecular aspects of formulation and all of its components would help in understanding the formulation in simulation conditions. Excipients screening, drug excipient interactions, drug receptor interactions, solubility predictions, enzyme inhibition, protein-peptide interactions, biomembrane permeation, etc are some of the prime applications of these tools. The increasing market of biopharmaceuticals has driven this industry to take utmost interest in this upcoming computational trend.

4

2. Online BRNS Popular Science Lecture at the Karmaveer Bhaurao Patil College, Vashi, Navi Mumbai on 9th January, 2021

Indian Women Scientists' Association, (IWSA) in association with Karmaveer Bhaurao Patil College, Vashi, Navi Mumbai organized a webinar on "Advanced X-ray Imaging using Synchrotron Light Sources" on 9th January, 2021. This webinar was supported by Board of Research in Nuclear Sciences DAE (BRNS) and conducted through Google Meet platform. Dr. Yogesh Kashyap, Scientific officer, Bhabha Atomic Research Centre, Mumbai explained in detail in this webinar about the X-ray and neutron based imaging techniques and their broad applications. He discussed in detail about the use of synchrotron radiation based X-ray sources for the determination of materials structures and properties in physics, chemistry, biology and related disciplines such as X-ray imaging and materials science. The webinar was attended by 89 participants from IWSA, KBP College and other institutes.

Abstract: X-rays are especially important for investigating the properties of materials. Xrays are able to probe deeply and non-destructively in solid materials, their degree of penetration depending on their energy and on the electron density of the constituent elements that make up the sample under investigation. X-ray photons with energies of several keV have wavelengths comparable to those of typical atomic spacing in solid materials. Under certain conditions, crystalline arrays of atoms can there fore act as interference gratings for X-rays, which can therefore be diffracted. Since, their discovery in late 1895 by Wilhelm Roentgen, X-rays have played a pivotal role in society, particularly in medicine, pharmacy, physics and chemistry. Whereas research using X-rays was originally the dominion of physicists, X-rays are now a ubiquitous tool for research in almost all branches of scientific endeavors, from determining the internal architecture of cells and other biological structures, to the chemical composition, fabrication techniques and provenance of archaeological artefacts, to insights into the hidden earlier artistic efforts. This broad range of applications of X-rays has in the last two decades expressed itself in the diverse disciplines served and the broad palette of techniques now available at synchrotron facilities, which represent one of the principal examples of multi disciplinary research. Today, there are more than 70 facilities worldwide in operation or under construction, providing services for approximately 100000 users from virtually very discipline of the natural sciences. Synchrotron storage rings are very powerful sources of X-rays. Synchrotrons research facilities are now a days designed and dedicated to generate tunable beams of electromagnetic radiation from the far infrared to the hard x-ray regime with intensities many orders of magnitude greater than those produced by laboratory-based X-ray sources.

Online BRNS Popular Science Lecture at Department of Chemistry, Sophia College for Women, Bhulabhai Desai Road, Mumbai 400 026 on 23rd January 2021

An IWSA-BRNS Popular Science Lecture was held in association with Department of Chemistry, Sophia College for Women, Bhulabhai Desai Road, Mumbai on 23rd January 2021. Dr. Kinshuk Dasgupta, Senior Scientist, Bhabha Atomic Research Centre, Mumbai and Shanti Swarup Bhatnagar Awardee 2020, spoke on "Fascinating World of Carbon Nanomaterials". The webinar was conducted through Google Meet Platform.

About 86 participants consisting of students, faculty and IWSA members attended the webinar.

Abstract: Carbon is a wonderful material with wide range of structures and properties. Carbon nanomaterials are very attractive among researchers as the structures can be tailored based on the applications we need. Out of various carbon nanostructures, carbon nanotubes and graphene derivatives are on high demand. However, for practical use of these exotic materials, large-scale synthesis of these materials in an economical way is the need of the society. In this lecture, synthesis, characterization and applications of carbon nanomaterials covering the above aspect were dealt with.

4. Online BRNS Popular Science Lecture at Department of Chemical Engineering, Finolex Academy of Management & Technology, Ratnagiri on 30th January, 2021

An IWSA-BRNS Popular Science Lecture was held in association with Department of Chemical Engineeri ng, Finolex Academy of Management & Technology, Ratnagiri on 30th January 2021. Dr. Sk. Musharaf Ali, Senior Scientist, Bhabha Atomic Research Centre, Mumbai, spoke on "Laboratory Experiments Using Computational Modeling". The webinar was conducted through Google Meet Platform. About 50 participants consisting of students, faculty and IWSA members attended the webinar.

Abstract: The field of computational chemistry based molecular modeling is growing rapidly with the continuing development of computer power, new and robust algorithms, and the availability of scalable software. Computer simulations provide a direct route to generate macroscopic observable properties of molecular systems of experimental interest through microscopic information. Today computational molecular modelling can provide useful estimates of the properties and behaviour of materials even before they have been synthesized and evaluated through experiments and therefore nowadays coined as computer experiments. Computational modeling is widely adopted in all the field of science and engineering in order to assemble better materials, processes and systems for specific functions. This talk covered a lucid presentation about the basic of molecular dynamics simulations and how to apply it for computation of various thermophysical properties of existing and new molecular systems in order to interpret the experimental findings or planning the actual laboratory experiments.

5. Online BRNS Popular Science Lecture at Department of Microbiology, Jai Hind College, Churchgate, Mumbai on 30th January, 2021

An IWSA-BRNS Popular Science Lecture was held in association with the Department of Microbiology, Jai Hind College, Churchgate, Mumbai on 30th January 2021. Dr. Vikrant Bhor, spoke on "A Peep into the World of the Mighty Microbiome". The webinar was conducted through Google Meet Platform. About 113 participants consisting of students, faculty and IWSA members attended the webinar. Abstract: The word 'Microbiome' encompasses not only the microbial components (bacteria, archaea, viruses, fungi and protozoa) of a particular environmental niche but also the products of these microbes. Although studies on the microbial composition of a variety of environmental niches have been performed for decades using culture based methods, recent advances in sequencing technologies have revolutionized the field. The development of non-culture based approaches such as 'metagenomics', have expanded the knowledge base and led to a paradigm shift in understanding of the contribution of microorganisms to human, animal and environmental health. At present majority of the work is focused on, either cataloging microorganisms present in different environmental niches or on the development of tools which enable analysis and compilation of enormous data that is being churned out through use of 'Next generation sequencing (NGS)' technology. In parallel, there is also a move to explore the potential of the microbiome for a variety of applications including diagnosis and therapy of human and animal diseases as well as environmental remediation. The lecture was aimed to serve as an introduction to this recently developed branch of life sciences and provided an overview of the basic concepts, tools and techniques as well as current and potential applications of the microbiome.

6. Online BRNS Popular Science Lecture at Department of Physics, The Institute of Science, Dr. Homi Bhabha State University, Mumbai on 17th February, 2021

A webinar on "Solar System to Black Holes: A Retrospective of the New Astrophysics" was organised by Indian Women Scientists Association supported by BRNS-DAE and hosted by Department of Physics, The Institute of Science, Dr. Homi Bhabha State University, Mumbai on 17th February, 2021 through Google Meet platform. The resource person was Prof. Prajval Shastri, Retired Professor from Indian Institute of Astrophysics, Bangalore. The webinar was attended by 101 participants consisting of students, faculty and IWSA members.

Abstract: Astrophysicists attempt to understand what we observe in the cosmos using the laws of physics. Much of our exploration today uses cutting-edge technology, with which many of the mysteries of the universe have been unlocked, but more mysteries continue to present themselves. This talk gave glimpses of a few of the recent exciting developments.

You tube Link for Prof. Prajval Shashtri's Lecture:

https://youtu.be/zwkpMkO_E1s

7. Online BRNS Popular Science lecture at the Department of Botany and Centre for Research, St. Teresa's College, Ernakulam, Kerala on 27th February, 2021

An IWSA - BRNS Popular Science Lecture in association with Department of Botany and Centre for Research, St. Teresa's College, Ernakulam was conducted on 27th February, 2021. Dr. Annamma Odaneth, Associate Professor, DBT-ICT Centre for Energy

Biosciences, Institute of Chemical Technology, Mumbai spoke on "Bio based energy options from sustainable resources". The webinar was conducted through Google Meet platform and attended by 119 participants consisting of students faculty and IWSA members.

Abstract: One of the fundamental requirements for mankind in the 21st Century is sustainable resources for our daily energy needs. Energy is an important commodity to meet the aspirations of a developing nation. The current prosperity mankind has achieved is dependent on carbon positive fossil fuels, which have severe consequences. Therefore, replacing fossil fuels with sustainable and green fuel options has been a subject of intense research for governments across the globe. Waste streams: agricultural, municipal and industrial are the best resources for the generation of sustainable carbon-negative energy alternatives. Technologies to convert these need to be developed for fueling energy requirements of different forms, viz., gas, liquid and solid. Different generations of fuels from renewable resources are being worked on. There have been extensive debates on the use of some of these sources. Smart biological design combined with chemical and other engineering disciplines have to be integrated to achieve the technological enhancements for sustainable energy options for the future generations.

Popular science lecture (2021-02-26 at 21_09 GMT-8) (1).mp4 (393M) (Recording of the lecture available in google drive)

8.Online BRNS Popular Science Lecture at Bhavan's College, Andheri (W), Mumbai on 27th February, 2021

An IWSA-BRNS lecture was held in association with all Science Departments of Bhavan's College, Andheri (W), Mumbai on 27th February, 2021. Dr. Nagaraj Balasubramanian, Associate Professor, Biology Department, IISER, Pune spoke on "2D vs 3D: How cells tell the difference. Using microscopy to evaluate cellular behaviour in 3D micro environment". The webinar was conducted through Zoom platform. About 82 participants consisting of students, faculty and IWSA members attended the webinar.

Abstract: Life develops and evolves through several complex cellular interactions. These interactions are supported by a matrix in the cellular microenvironment. How is this matrix put together? How do cells bind and respond to it? Does it influence cell function in disease? Simply put, the ECM is a macro molecular mesh that wraps around and binds cells, like noodles seem to wrap themselves around veggies. his mesh allows cells to be held together as well as regulate multiple functions individually, and with other cells as part of a tissue. Studying the behaviour of cells in research labs has largely been done by growing cells in 2D glass/plastic bottom dishes. Cells in their physiological environment live and work in more complex 3D microenvironment. In this lecture, Dr. Nagaraj discussed about how cells are studied in a 3D environment, what kind of imaging tools allow us to do so and what have they revealed.

9.Online BRNS Popular Science Lecture at Physics Department.VES College of Arts, Science and Commerce, Mumbai on 27th February, 2021

An IWSA BRNS Lecture by Dr. Umashankari Kannan, Head , Reactor Physics Design Division Bhabha Atomic Research Centre, Mumbai, on "Power from Thorium" was hosted by Physics Department.VES College of Arts, Science and Commerce, Mumbai on 27th February, 2021. The webinar was conducted through Google Meet platform. About 71 participants consisting of students, faculty and IWSA Members attended the webinar.

Abstract: Fission physics fundamentals have presented the world with only one fissile species namely, Uranium-235. The potential of the atom can be further manifested by the conversion of fertile material to fissile material thereby increasing the energy produced per unit mass of the mined ore. Uranium-238 and Thorium-232 absorb a neutron and get converted to the fissile Pu-239 and fissile U-233 respectively which have superior properties for use in thermal neutron energy reactor systems. India has developed its strategy involving a gradual approach first by tapping its available U-235 in heavy water reactors and then using the bred Pu-239 in fast neutron spectrums and finally use of thorium. The basics neutron properties of uranium and thorium nuclides, nuclear cross sections, nuclear potential of the fissile species, essentials of nuclear reactor design and challenges in use of thorium were covered in this talk. Dr. Umashankari explained in detail how scientists and engineers at Bhabha Atomic Research Centre (BARC) are pursuing different reactor systems to utilize thorium effectively. The talk gave the participant an overview of the physics aspects of these reactors namely Advanced Heavy water Rector (AHWR), High Temperature Reactors (HTR) and Molten salt Breeder Reactor (MSBR). The AHWR is designed to maximize the power production from thorium. The AHWR is a 920 MWth, vertical pressure tube type thorium-based reactor cooled by boiling light water and moderated by heavy water. Dr. Umashankari discussed the technological challenges involved in the use of 233U fuel, its separation from irradiated thorium and fabricating newer fuel with the bred 233U. The talk also provided an insight into use of thorium in high temperature systems and molten salt reactors.

Online BRNS Popular Science Lecture at Department of Life Science, Sophia College (Autonomous) Bhulabhai Desai Road, Mumbai – 400026 on 1st March, 2021

An IWSA-BRNS Popular Science Lecture was held in association with the Department of Life Science, Sophia College for Women, Bhulabhai Desai Road, Mumbai on 1st March, 2021. Dr. Chandra Viswanathan, Former Director, Plasma Fractionation Centre & Former Head of Regeneration Medicine, Reliance Life Science, Mumbai, spoke on "Chasing Hope through Stem Cells". The webinar was conducted through Zoom Meeting. About 109 participants consisting of students, faculty and IWSA members attended the webinar.

Abstract: In the recent decade, 'Regenerative' based medicines are emerging at a fast pace in the field of medicine. Regenerative medicines are being researched in curing severe diseases, mainly through restoration of stem cells. The stem cells are unspecialized cells which have an infinite proliferation capacity and can differentiate into many types of cells. These properties of stem cells to regenerate the functions of the tissues and organs are used in stem cell therapy. The ability of stem cells to

regenerate and reconstruct the damaged tissue makes them an exciting candidate as a hope to treat hitherto untreatable diseases with no treatment option. The stem cell and cell-based products are therefore a favorite subject of medical researchers. The present talk focused on the basics of stem cells and dispelled some myths. Dr. Chandra discussed some facts and the progress made thus far in this field.

The talk can be viewed through the following link:

https://zoom.us/rec/share/u4iedH3tD2sKoqf0F6yTbmRVBxYsc1K6hX3CGCwz1BOjZbhu_jFfN ADWOKgBWgpV.iUwQeA5kGU93c6ND?startTime=1614577612000

11.Online BRNS Popular Science Lecture at Department of Chemistry, K J Somaiya College of Science & Commerce, Mumbai on 5th March, 2021

A webinar on "Catalysis, Surfactants & Green Chemistry - A perfect triangle of clean chemical processes" was organised by Indian Women Scientists Association supported by BRNS-DAE and hosted by, Department of Chemistry, K J Somaiya College of Science & Commerce, Mumbai, on 5th March, 2021 through the Zoom Meeting platform. The resource person was Dr. Radha Jayaram, Head, Department of Chemistry, Institute of Chemical Technology (ICT), Mumbai. About 109 participants consisting of students, faculty and IWSA members attended the webinar.

Abstract: Reduction in the quantity of waste produced, energy utilized and reagents and solvents consumed is the major goal of green chemistry. Catalysts that are known to enhance the rates of chemical reactions can also play a positive role in improving the selectivity, making reactions possible in benign solvents, reducing the number of process steps and production of waste. Hence, proper choice of a catalyst helps in achieving several green chemistry goals. Various types of catalytic processes are extensively used in both industrial and academic research. The commonly employed types include heterogeneous, homogenous, enzymatic and photo catalysis. Due to the extensive use of chemicals and chemical based products, novel avenues for catalyst science and technology continue to emerge. One such interesting and highly potential opportunity is the development and application of surfactant mediated catalysis. There is ample scope to explore the synergism of the characteristic features of surfactants and the concepts of catalysis systems multiple to design reaction with advantages. An appropriate choice of a surfactant mediated catalyst system can address multiple green chemistry objectives thereby making processes benign, clean and also cost effective.

The talk can be viewed through the following link:

https://somaiya-edu.zoom.us/rec/share/772Vtd2q6RtMtFKXS1H-T2oc1xf_VxNHcG5PgVGYXkBZv7axjm7pFL4DdzK3TVAx.AK0drwuT__U4V mZn Access Passcode: cyu2D+QT

10

12. Online BRNS Popular Science Lecture at Department of Applied Sciences, Mathematics and Humanities Pillai College of Engineering, New Panvel on 6th March, 2021

A webinar on "A Model Based Framework for Intelligent System Automation" was organised by Indian Women Scientists Association supported by BRNS-DAE and hosted by, Department of Chemistry, K J Somaiya College of Science & Commerce, Mumbai, on 6th March, 2021 through the Zoom Meeting platform. The resource person was Prof. S. C. Patwardhan, Professor, Department of Chemical Engineering, IIT Bombay. About 83 participants consisting of students, faculty and IWSA members attended the webinar.

Abstract: With significant advances in microprocessors and increased computing power, manufacturing and process plants are increasingly using on-line model based advanced control schemes for achieving economically optimal and safe operation. Such advanced control schemes involve use of mechanistic and data driven dynamic models which are used for online forecasting, fault and failure diagnosis, fault tolerant control and intelligent scheduling and planning of process operations. This talk gives an overview of model intelligent automation practiced in industry and future trends.

13. Online BRNS Popular Science Lecture at Department of Chemistry, UC College, Aluva, Kochi on 9th March, 2021

An IWSA - BRNS lecture was held in collaboration with the Department of Chemistry, UC College, Aluva, Kochi on the 9th March, 2021. Dr. Vivek Polshettiwar, Associate Professor, Department of Chemical Sciences, Tata Institute of Fundamental Research, Mumbai spoke on "Advanced Nanomaterials and Nanocatalysts to Combat Climate Change". The webinar was conducted through Google Meet platform. About 123 participants consisting of students, faculty and IWSA members attended the webinar.

Abstract: Energy and environment are two of our critical societal challenges. Climate change hits a giant weak spot in human history. Disproportionate use (or misuse) of natural resources, including fossil fuels, created an extreme imbalance on planet earth and the first priority of all of us to take on this challenge. *In this seminar*, Dr. Polshettiwar discussed some of his work in the Field of Catalysis & Nanotechnology, to Resolve Critical Challenges of Energy and Environment. He explained in detail about the synthesis of a new class of dendritic fibrous nano-silica (DFNS) based nano-catalysts. More than 150 groups worldwide are now using Dr. Pollshettiwar's patented DFNS for various applications such as catalysis, solarenergy harvesting, energy storage, self-cleaning antireflective coatings, surface plasmon resonance-based ultrasensitive sensors, CO₂ capture, and biomedical applications. Using the recent results on synthesis and application fibrous nano-silica (including single-atom catalysis, black gold, amorphous zeolites and defected silica) for fine chemical synthesis, solar energy harvesting, CO_2 capture-conversion and waste plastic to chemicals, in this seminar, he elaborated on how nanocatalysis can combat climate change and protect the environment.

You tube link for this webinar:

https://youtu.be/4q5P0YEnBbA

14. Online BRNS Popular Science Lecture at Sir Sitaram & Lady Shantabai Patkar College of Arts and Science, Mumbai on 10th March, 2021

An IWSA BRNS lecture was held in collaboration with the Department of Microbiology and Biotechnology Sir Sitaram & Lady Shantabai Patkar College of Arts and Science and V. P. Varde College of Commerce & Economics, An Autonomous College, Affiliated to University of Mumbai on 10th March, 2021. Dr. Raj Hirwani Emeritus Professor, AcSIR at CSIR-URDIP, Pune spoke on "Fundamentals of Patent". The webinar was conducted through Google Meet platform. About 72 participants consisting of students, faculty and IWSA members attended the webinar.

Abstract: In his presentation, Dr. Hirwani covered Fundamentals of Patents-Requirements of Patentability, Exceptions to Patentability of Inventions, Process Vs Product Patents, Inventorship Vs Ownership issues, Types of patents, Compulsory licensing, Foreign patents, Patent Prosecution and illustrated it with examples of Life Sciences.

You tube link for Dr. Raj Hirwani's Lecture

https://www.youtube.com/watch?v=6_PpPNFSa90

15. Online BRNS Popular Science Lecture at Department of Botany, Telangana University, Dichpally, Nizamabad – 503322 on 13th March, 2021

An IWSA - BRNS lecture was held in collaboration with the Department of Botany, Telangana University, Dichpally, Nizamabad 503322 on 13th March, 2021. Dr. Rohini Balakrishnan, Centre for Ecological Sciences, Indian Institute of Science, Bengaluru spoke on "From Crickets to Elephants: The behavioural ecology of Animal acoustic communication". The webinar was conducted through the Zoom Meeting platform. About 153 participants consisting of students, faculty and IWSA members attended the webinar.

Abstract: Many species on earth, including humans communicate using sounds. These range from small insects such as crickets, probably the first to evolve acoustical signalling, to birds and elephants. Insects typically use long-distance acoustic signals to attract mates from a distance as do many birds and mammals. The latter may however also use acoustic signals for territory maintenance, dominance or group cohesion. In this talk, Dr. Rohini explained the different approaches ranging from field observations and laboratory manipulations to theoretical modelling that can be used to study different aspects of communication. Problems of signal detection and localization in complex acoustic environments such as small choruses of calling crickets to a rain forest dusk chorus was also covered. Mechanisms to minimise acoustic interference, both behavioural and physiological were discussed in this talk. Functional significance of acoustic signals including that of birds and mammals too were highlighted.

You tube link for Dr. Rohini Balakrishnan's Lecture

https://youtu.be/3gdEKGPxpVk

16.Online BRNS Popular Science Lecture at Department of MCA Finolex Academy of Management and Technology, Ratnagiri on 18th March, 2021

An IWSA BRNS lecture was held in collaboration with the Department of MCA Finolex Academy of Management and Technology, Ratnagiri on 18th March, 2021. Dr. Anala Pandit, Associate Professor, Department of MCA, VJTI, Mumbai spoke on "Machine Learning Applications". The webinar was conducted through Zoom Meeting. About 142 participants consisting of students, faculty and IWSA members attended the webinar.

Abstract: Machine Learning is one of the thrust areas, declared by the Niti Aayog, for the students of Computer Science / Applications.

The talk introduced the students to the fundamentals of Machine Learning like

- 1. What is Machine Learning
- 2. Why do you need to use machine learning
- 3. Types of Machine Learning Algorithms
- 4. Various Machine Learning Algorithms
- 5. Factors affecting performance
- 6. When to use what type of Machine Learning Algorithms

You tube link for Dr. Anala Pandit's Lecture

https://www.youtube.com/watch?v=GEXOWmay5L0

17.Online BRNS Popular Science Lecture at Department of Mechanical Engineering, Finolex Academy of Management and Technology, Ratnagiri on 20th March, 2021

An IWSA -BRNS lecture was held in collaboration with the Department of Mechanical Engineering, Finolex Academy of Management and Technology, Ratnagiri on 20th March, 2021. Dr. C.P. Paul, Dean-Student Affairs, HBNI, and Head, Laser Additive Manufacturing, RRCAT, Indore spoke on "Unfolding the Potential of Additive Manufacturing". The webinar was conducted through Zoom Meeting. About 68 participants consisting of students, faculty and IWSA members attended the webinar.

Abstract: Additive Manufacturing (AM) brought a paradigm shift in the manufacturing sector by introducing "feature-based design and manufacturing" and it is one of the pillars of the fourth industrial revolution or Industry 4.0. The technology is bringing a transformation in the industrial manufacturing through "Metal Additive Manufacturing" (MAM), which allows the fabrication of metallic components having intricate/ complex shapes and designs that were not perceived previously through conventional manufacturing route. Laser, a tool of power and precision is the most commonly used energy source for MAM and thus the term "Laser Additive Manufacturing" (LAM) is coined. Considering the potential and the various freedoms offered by the technology, a dedicated research and development programme in the area of LAM was started in the year 2003 at Raja Ramanna Centre for Advanced Technology (RRCAT). In this talk, Dr. Paul discussed about the different AM technologies along with its advantages and limitations. He also explained the global and Indian scenario of the technology, along with discussions on the contributions of the technology towards Industry 4.0. Dr. Paul elaborated on the details of the LAM systems developed at RRCAT and some of the recent research works and engineering components developed at LAM lab, RRCAT. This talk was aimed at the beginners to appreciate this novel technology and an update for researchers in the field.

B "Science and Our Life" Series of Webinars

The following webinars were conducted through Google Meet platform during January to March 2021 under "Science and Our Life" Series.

1. "Aerospace Journey" by Dr. Tessy Thomas on 23rd January, 2021

The ninth lecture of the series on "Science and Our Life" was held on 23rd January, 2021 as an ON-LINE webinar, through Google Meet platform. Dr. Tessy Thomas, Distinguished Scientist, Director General, Aeronautical Systems, DRDO spoke on "Aerospace Journey".

Dr. Tessy Thomas covered the entire history of unmanned aerial vehicles (UAV), all developed indigenously at DRDO, for many of which she had played a pivotal role. She started with Lakshya- a remotely piloted high speed target drone system- first flight in 1985. It is a reusable high subsonic aerial target system powered by a gas turbine engine, radar-guided surface-to-air missile and air-to-air missile. Then came Nishant UAV with medium altitude long endurance (MALE). It was the first UAV indigenously made with multi-mission capability using 380 Kg payload at a velocity of 45 m/s. Rustom 1 & 2 have 250 kms range on line-of-sight with 200 kg payload. Rustom is useful in reconnaissance and surveillance operations. Agni missiles are long-range, surface-to-surface ballistic missiles, rocket propelled, self-guided strategic weapons system that follows a ballistic trajectory to deliver a payload from its launch site to a pre-determined target. It is named after one of the five elements of nature, fire. Agni III was introduced and tested in 2011 with an operational range of 3000 kms depending on its payload weight. It is a two-stage solid propellant missile deployed in rail-mobile mode. Agni IV is light weight, has two stages of solid propulsion and a payload with re-entry heat-shield.

Its operational range is 4000 kms. It's a long-range strategic surface-to-surface missile. Agni V is called as intercontinental ballistic missile with range of 5000 to 8000 kms. It is nuclear capable with a payload capacity of 1500 kg of high explosive warhead. It was developed using hypersonic technology, has three stage solid propulsion and tested in 2018 for operation.

Dr. Tessy Thomas explained about how this indigenous technology developed gave rise to development of shape memory alloys, composite structure materials, self-repairing special epoxy (microlevel cracks etc.).

Before Dr. Tessy Thomas's lecture, the participants were welcomed by IWSA President, Dr. Lalitha Dhareshwar. Dr. Devaki Ramanathan gave a brief introduction to IWSA and its objectives. She also explained the objective behind the series (Science and Our Life) of lectures and the relevance of this special lecture. Dr. Lalitha Dhareshwar introduced the speaker and thanked the distinguished speaker for sparing her valuable time to speak about the history of unmanned aerial vehicles (UAV) developed indigenously at DRDO. Dr. Smita Kekatpure compered the program and conducted the question – answer session. About 100 participants attended the webinar (Limit of Google Meet).

2. "The Adaptive and Maladaptive Changes Associated with Early Life Stress" by Dr. Vidita Vaidya on 13th February 2021

The tenth lecture of the series on "Science and Our Life" was held on 13th February 2021 as an ON-LINE webinar, through Google Meet platform. Dr. Vidita Vaidya, Neuroscientist and Professor at Tata Institute of Fundamental Research, Mumbai spoke on "The Adaptive and Maladaptive Changes Associated with Early Life Stress".

Stress is anything that disrupts the homeostatic balance in your body. Generally our body deals reasonably well with stress. This is a good adaptation. However, when the feedback mechanism of the stress hormone pathway spirals out of control such that the homeostasis of the body shifts to a new allostatic balance, many of the lifestyle diseases start to manifest. This tilt from adaptive to maladaptive stress varies within individuals. A major factor affecting this is the care the individual receives during his/her formative years. The better the maternal and societal care in early childhood the faster is the individual's switch back to normal from a stressed condition. Stressful experiences can leave longlasting marks. But are all stressful experiences the same? Do we adapt to stress and if so what happens when we cannot adapt to it? What are the changes that take place in the brain? In her talk, Dr. Vaidya discussed about all these aspects and what is understood about the effects of stress on the brain.

Before Dr. Vidita Vaidya's lecture, the participants were welcomed by IWSA Trustee Dr. Surekha Zingde. She also talked about SAOL and introduced the speaker. Dr. Suparna Kamath compered the program and conducted the question – answer session. About 29 participants attended the webinar.

3. "How Do I Protect My Liver?" by Dr. Aabha Nagral on 13th February 2021

The eleventh lecture of the series on "Science and Our Life" was held on 13th March 2021 as an ON-LINE webinar, through Google Meet platform. Dr. Aabha Nagral, Gastroenterologist, Apollo Hospital, Navi Mumbai and Jaslok Hospital, Mumbai spoke on "How do I Protect my Liver?"

Dr. Aabha described the various functions of the liver which is a complex, versatile and vital organ. The important function of liver varies from clearing all the ingested toxins to a store-house for all nutrients and production of proteins and clotting factors. This important organ is vulnerable to alcohol, viruses, medications and certain autoimmune and genetic disorders. However, the emerging major culprit affecting people all over the globe and India is "fat" in the liver which has become a silent epidemic. She then described fatty liver, its prevalence and progression of the fatty liver disease. The only way to prevent this was to reduce weight slowly with no shortcuts and suggested ways to do so in a gainful manner. She depicted diagrammatically how weight loss dramatically improves liver health. She then described all the five types of hepatits viruses, their spread and preventive measures and briefly explained alcoholic liver disease. Finally, she explained how people with liver disease are more vulnerable when infected with the Covid -19 virus.

Before Dr. Aabha Nagral's lecture, the participants were welcomed by IWSA Member Ms. Sukhvinder Sandhu. She also gave a brief introduction of IWSA and SAOL. The speaker was introduced by Dr. Lalitha Dhareshwar, President IWSA. Ms. Sukhvinder Sandhu also compered the program and conducted the question – answer session. About 49 participants attended the webinar.

C. Popular Science Lecture on "Technology Development, Case Study of Tele-ECG" on 16th January 2021

A Popular Science Lecture on "Technology Development, Case Study of Tele-ECG" webinar was arranged by Indian Women Scientists' Association (IWSA), Vashi in collaboration with Department of Physics, Rayat Shikshan Sanstha's Karmaveer Bhaurao Patil College, Vashi, Navi Mumbai on 16th January 2021.

The speaker, Shri Vineet Sinha is Scientific Officer with Electronics Division, Bhabha Atomic Research Centre, Mumbai. He has carried out the following developments in last 20 years:

Medical Analyzer Cardiac Output Monitor Holter Monitor Saturation Percentage of Oxygen (SPO2) Non-Invasive Blood Pressure Monitor Beat-to-Beat Blood Pressure Monitor Tele-Distress Alarm Device – "NIRBHAYA" Peripheral Pulse Analyzer (PPA) 12-Channel Handheld Tele-ECG on Mobile Phone Tele-Spirometer

Development of a technology is a multiple step activity and requires effort and time. It becomes even more tedious and expensive if right approach is not taken from the beginning. In this talk, Shri. Vineet Sinha highlighted the approach of a technology developer that leads to the development of a successful technology. A case study of Tele ECG was taken up to explain the multiple stages of technology development.

Dr. Archana Chavan, Assistant Professor, Department of Physics, welcomed the participants and Dr. Lalitha Dhareshwar, president IWSA Vashi, talked about the various activities of IWSA, emphasizing the fact the COVID pandemic has not dampened the spirit of IWSA as can be seen by various online activities taken up during the past several months. Dr. Archana Chavan, introduced the speaker Mr. Vineet Sinha. This webinar was attended by 77 participants from IWSA, KBP College and other institutes. The vote of thanks was given by Dr. Paresh Gaikar.

D."Science Utsav Teachers' Conference" on 6th,

February 2021

Navi Mumbai Science Foundation (NMSF) organized a one day "Science Utsav Teachers' Conference" in association with Homi Bhabha Centre for Science Education online on 6th February, 2021. The main theme was, "Developing an online interactive environment for science teaching and learning" and its sub-themes were - 1. Tools for Interaction in the Online Mode, 2. Planning and Designing for Online Science Teaching, 3. Scientific Temper in the Online Class, 4. Challenges in Teaching Science in the Online Mode, 5. Science Experiments and Online Teaching.

The following six papers and a poster were submitted by IWSA members at the NMSF Teachers' conference.

- 1. Nurturing the Scientific Temper through Online Classes- Authors- Devaki Ramanathan, Lalitha Dhareshwar, Madhu Pahwa, Manashi Chakraborty, Rama Prasad, Smita Kekatpure, Srirupa Mukherjee, Sukhvinder Sandhu, Suparna Kamath, Tripta Tewari, Vijayalakshmi Tilak-Presented by Ms. Tripta Tewari
- 2. Online Basic Botany Experiments: Microgreens Cultivation- Authors- Smita Kekatpure, Priya Jacob, Madhu Pahwa, Sukhvinder Sandhu-Presented by Dr. Smita Kekatpure
- 3. Teaching Computer Science with Special Reference to Fractals in the Garden-Authors- Sushma Lehri and Sukhvinder Sandhu
- 4. Learning Garden An Avenue to Science-Authors- Sweedle Cerejo-Shivkar, Ambika Janakiraman, Srirupa Mukherjee, Tripta Tewari, Vijaya Chakravarty
- 5. Fibonacci sequence and golden ratio: teaching science and maths in a garden-Authors- Manashi Chakraborty and Sakina Gadiwala

- 6. IWSA Model of Rainforest Ecosystem (a poster)- Authors- Priya Jacob, Smita Kekatpure, Kalpana Sathe, Sweedle Cerejo-Shivkar, Sushma Lehri, Paramjit Anthappan-Presented by Ms. Priya Jacob
- 7. Teaching through a Virtual tour -an online module of the Learning Garden at IWSA-Suparna Kamath, Anita Dash, Sneha Bhavsar, Jyotsna Singh, Maitrayee Paul, Vijaya Chakravarty.

Two papers and a poster from IWSA were selected to be presented at the conference. All the above papers were e-published by Navi Mumbai Science Federation, NMSF, in their conference proceedings.

The session II, "Managing teaching in online mode" was chaired by President, IWSA. This session had two invited talks and 5 oral presentations. In all 4 invited talks and 10 oral presentations were included in the conference.

E..International Day of Women in Science on 10th February 2021

Dr. Lalitha Dhareshwar, President, IWSA, delivered a lecture on "Creating a Scientific temperament in education", at the webinar organized by DRISHTI on 10th February, 2021.She defined 'Scientific temper' as a way of life in which the individual and social process of thinking and acting is based on a scientific method of questioning, keen observation, testing, hypothesizing, analyzing and communicating. This was how Jawaharlal Nehru defined the scientific temperament. He further said that the elements of fairness, equality and democracy are the result of the scientific temper in a society. Scientific temper is also an individual's attitude for logical and rational thinking— a state of mind which does not accept anything but the truth. Growth and advancement of society is linked to not only education of the people but also to the rational and scientific temper of its people.

The most important and basic tools required for a scientific temper are- wonder, curiosity, and observation. The National Education Policy 2020 (NEP 2020) has laid a great stress on igniting the scientific temper in children from the very young age when 85% of the development of their brain takes place.

What can be done to promote and inculcate Scientific Temper? It is to be achieved at all levels of education - on an individual level it is to be initiated by Parents/ teachers/ society. It is imperative for education to be enquiry based not by rote learning. Students are to be taught to think and implement. Hands- on learning by making models is also an effective way.

Students can participate and learn science through science exhibitions, science camps, writing essays/ elocution/ poster competitions, Science Clubs, science shows, science toys, visits to science centers, museums, biodiversity parks etc. IWSA is engaged in these very activities for the past several years.

Dr. Dhareshwar also paid tribute to the great women scientists of India, starting from Dr. Anandi Bai Joshi and many of the contemporary scientists. She then presented in a nutshell, the various activities aligned with IWSA's mandate of taking science to the society and bringing a scientific temper.

F.IWSA-SIESCOMS ONLINE INTERNSHIP PROGRAMME, 22nd – 28th FEBRUARY 2021

The SIES-College of Management Sciences (SIESCOMS) has a program wherein their students are required to undergo an internship at an NGO. SIESCOMS requested IWSA to host 51 students with an internship program. The **salient features** of the aforesaid programme are given below.

1. IWSA members conceptualised the program with the following **Aims and Objectives**:

- a) To **sensitize** and encourage **volunteering service** amongst the current generation of **students** towards the vision and mission of IWSA's mandate as an NGO.
- b) To impress on the interns how the **mandates** initiated by the **founder** members need to be nurtured and **enhanced for generations to come.**
- c) To attract **CSR funding** based on the qualitative and quantitative outcomes generated through Quality Assured Programmes and the number of volunteering hours invested by those associated with IWSA.
- d) To gainfully **explore** the possibility of the **initiatives** of the **new education policy** for learning institutes link up with **effective NGOs** for Internship Programmes.

2. **SIESCOMS** has an **ISR** [Institutional Social Responsibility] Programme prevalent at the institute and it is located fairly close to IWSA. SIESCOMS has previous volunteering experience at IWSA for ECCE activity. IWSA sent a letter of intent for the Internship Programme after IWSA EC approval. A core team was formed to pursue the same.

IWSA Mentor empowerment **team** preparation was initiated on 29th January 2021.

4. **Official response** from **SIESCOMS ISR** Head was received during the first week of Feb. 2021 along with the student profiles of **51 interns** for pursuing the online internship at IWSA in accordance with our broad areas of interest.

5. To facilitate **smooth conduct of the internship**, a dedicated **common email id** was formed besides team wise whatsapp **communication groups** of IWSA mentors and core team coordinators. This also enabled transparency, decorum, effective documentation, disciplined and fair internal judicious decisions. 6. An online induction programme to officially initiate the Internship was conducted on 18th Feb 2021 on SIESCOMS MS teams at 11 am, wherein the lead **IWSA mentors** presented the concept along with guidelines and expected time schedule of each of the **10 internship projects.**

7. Almost all teams had an introductory round of meetings on 21st Feb 2021 on IWSA online platforms followed by daily meets to monitor progression.

8. A midterm review of the draft presentations of the 10 team projects was conducted on MS Teams platform on 25th Feb 2021. Useful inputs and suggestions were shared by **IWSA invited reviewers, Dr. Kanika Khurana, Dr. Shweta Naik and Mr. Abhishek Naik** for incorporation into the projects.

9. Further for post review value additions, **invited talks** were arranged by **IWSA** on CSR Funding requirements, effective advertisement, video making and impact oral presentation tips. These talks were given by experts **Ms. Manjuvani Nayani, Mr. Udeerna Karanam** and **Mrs. Shobha Pakala** respectively to enable the interns to successfully complete their projects.

10. Final project presentations by the intern teams was conducted on 4th March 2021 for evaluation by external experts, **Dr. Sangeeta Makkad, Dr. Maya Murdeshwar** and **Ms. Deepti Shekar.**

11. Post internship period, a **review meeting of IWSA Mentors** was conducted for sharing their experience and feedback.

12. The project reports of the 10 teams were submitted online for internal review and approval for finalization jointly by IWSA Mentors and ISR Head of SIESCOMS.

G.Science Day Celebration 2021 at IWSA on 26th February 2021

Every year National Science Day is celebrated at IWSA in the month of February by way of Exhibition or contest on an important scientific and topical subject. This year, with the pandemic enforcing a new normal at all levels, this event was also to be made online. The Science awareness Committee in collaboration with the Computer Committee decided to hold a three- pronged contest under the title: "Scientists, Technologists and Innovators- their discoveries and innovations." This topic was aligned with the theme of Science day by **DST-: Future of STI: Impacts on Education, Skills and Work**". At IWSA we focused on-

- Skill in Science
- Science for the 21st Century

A virtual platform for the young scientists from Std 7 to Std 11 was provided to innovate and exhibit their creations and their knowledge. The three categories under which entries were invited were:

I category- Take an idea and design a working model- a video for 5 minutes to be submitted.

II category- Presentation on their favourite scientist/ Technologists/ innovators and their work as a PPT/video for not more than 5 minutes.

III category- Build a mobile app based on a scientific concept

(A) Find the scientist and his discovery/invention

(B) Science is fun- a game-based concept of science

The flyer was sent to all the schools whose contacts were available- in Mumbai and Navi Mumbai.

The last date for receipt of the entries was 12th February. A nominal fee of Rs. 100/per entry was charged to make it a commitment. Mr. Amit Modi, CEO of WitBlox Robotic School has made impressive advertisements on his app for this contest. He invited entries therein. IWSA thanks him for his efforts.

We received more than 50 entries from 14 schools across the city, from Andheri, Bandra to Dombivli, Vasind (Shahpur) & Panvel. Three groups of judges were appointed for evaluating the different categories. The judges were as follows-

Category I	Category II	Category III
Dr. Devaki Ramanathan	Dr. Srirupa Mukherjee	Ms. Sukhvinder Sandhu
Dr. Lalitha Dhareshwar	Ms. Madhu Pahwa	Dr. Sunita Mahajan
Ms. Tripta Tewari	Dr. Smita Kekatpure	Ms. Akhila Mahadevan
Ms. Manashi Chakraborthy		Ms. Shalini

The actual Science Day celebration and the culmination event for the contest took place on the 26th Feb. 2021 online from 2-4 PM. All participants were sent invitations for attendance and also e-certificate of participation. All IWSA committee members were also invited.

The program flow was as follows- Dr. Devaki Ramanathan, convenor, Science Awareness Committee, gave a brief introduction to the National Science Day celebration and invited Dr. Sunita Mahajan, Chairperson, Board of Trustees, to inaugurate the Event by cutting the ribbon. Dr. Mahajan gave a short speech. It was followed by a brief summary of the details of the contest by Dr. Lalitha Dhareshwar, President, IWSA. Next, IES Chandrakant Patkar Vidyalaya's Principal, Mrs. Namrata Tawde, who was invited to the Guest of Honor spoke about her school and how she

encourages her students to take part in extra-curricular activities, especially during the Covid times.

Two short video clippings were then shown to the children to motivate them on learning Science.

- 1. Ms. Vandana Nayak, ex-principal IES Chandrakant Patkar Vidyalaya
- 2. Ms. Malti Kelkar , Director of Quest , Pune

Both were science teachers. They spoke on the importance of science and emphasized on learning the concepts through hands-on experience and to get inspired through role models like Dr. Tessy Thomas.

The winners in the different categories were announced. One judge from each category – Ms. Tripta Tewari from category I made the announcement for her section, Dr. Smita Kekatpure for Category II and Ms. Sukhvinder Sandhu for category III. After each name the prize winning entry was played as a video and the winner gave a minute long talk on his/her motivation from the selected topic.

Some schools had participated in a big way- for eg., IES Chandrakant Patkar Vidyalaya had given 14 entries, in category II and 3 in category I. Empyrean School, Kharghar, had given 7 entries in the category 1 and 3 in Category II. It was very impressive and interesting for the judges to sit and watch the performances but an arduous task to grade them, in order of merit but the judges' decisions were final.

Following table shows the list of prize winners and school names and their respective projects in the order of merit.

Category 3- Name of Student	Name of School	Std	Position	Project name
Aditeiya Pillai, Maya Nair & Aagam Malde	Euroschool Airoli	Std 6 & 7	First	Guardian Angel App
Hitarrth Chedda, Ved Kanabar, Vyom Kanabar	Euroschool Airoli	Std 9	Second	Nanosponges
Suhani Gupta	Apeejay Nerul	Std 8	Third	Scientifically
Category 2- Name of Student				
Avani Birwatkar	IES Chandrakant Patkar	Std 8	First	Rohini Godbole
Arush Rathod	Empyrean School, Kharghar	std 6	Second	Nikola Tesla
Swarali Kumbhar	IES Chandrakant Patkar	Std 8	Third	E.K. Janaki Ammal
Siddhi Anap	IES Chandrakant Patkar	Std 7	Consolatio	Tessy Thomas
Atharva Bhagat	IES Chandrakant Patkar	Std 7	Special	C.V. Raman
Category 1- Name of Student				
Siddharth Bhuin	Empyrean School, Kharghar	Std 7	First	Application of Electric Current (Working Model of Washing Machine)
Avadhoot Patil	IES Chandrakant Patkar	Std 8	Second	Earthquake Alaram
Om Pratap Bobhate & Shamani Paul	ST MARY'S MULTIPURPOSE H	Std 7	Third	COLOURS OF LIFE
Arnav Karanjekar	Empyrean School, Kharghar	Std 6	THird	Lemon Battery
Kaustubh Sharma	Empyrean school	Std 7	Consolatio	THe HUman Excretory system
Manya Shetty, Shezad Quamar, Sarvagya Tiw	New Horizon Public School,P	Std 11	Special	Sanjeevani Yantra/Dialysis machine

Dr. Suparna Kamath, Secretary, Science Awareness Committee concluded with a vote of thanks to all- Mr. Amit Modi, the judges, the children, schools, mentors and parents. The winners were informed to come to IWSA campus any day after 3rd March and collect their prizes and winners' certificates from the IWSA Hostel staff.

H. IWSA's Learning Garden

Under the aegis of "Member Enrichment Program", IWSA's Learning Garden Members continued the organisation of lecture series during the period from January to March, 2021. A brief report of the webinars conducted through Google Meet platform under this program is given below. Most of these lectures can be viewed in "Indian Women Scientists' Association You Tube Channel"

- 1. On 13th January, 2021, Shri Jayant Joshi, a microbiologist, presented an informative and interesting talk on "Terrace Gardening". This 32nd webinar was attended by 34 participants. The speaker took the audience through a visual journey of beautifully captured photographs from his terrace garden while lucidly addressing questions like 'Why should we plant the greens?', 'Who should go for gardening?' and 'What are the precautions for kitchen and terrace gardening?' The highlight of the session included an annual calendar chart of useful guidelines depicting the ideal month wise period for sowing, cultivation and harvest of exemplary plants according to the congenial climatic requirements of their growth cycle and inclusion of the significance and integral role of all biotic entities like birds, insects, microbes, etc. in the gardening process for a successful outcome. Finally the dos and don'ts were elaborately shared. The session concluded with an interactive discussion of queries from participants. The program was compered by Priya Jacob.
- 2. On 27th January, 2021, Dr. Sweedle Cerejo-Shivkar, a botanist, shared her knowledge and expertise on the 'Wonderful World of Orchids'. The young scientist mesmerised the 43 participants with rapt attention through her crisp visual layout of well crafted slides coupled with enriched delivery of lucid explanations relevant to the webinar topic. The salient features of the talk included a vivid introduction to the beautiful botanical family of ORCHIDACEAE, touching upon its history, geography and ecology, besides acquainting the audience with wild orchids growing in and around Mumbai to promote awareness and generate interest and appreciation for these gifts from nature's basket. The presentation was appreciated by all and this session was compered by Dr Suparna Kamath.
- 3. On 10th February, 2021, Dr Parvish Pandya, Director, Science and Conservation, Sanctuary Nature Foundation and Retired Associate Prof. of Zoology, Bhavan's College, presented in a unique style the 'Learning Lessons from Nature' with incorporation of his passionate exemplary captures of photographs pertaining to the topic. The idea of tagging descriptive attributes highlighting the identification traits of appearance or behavioural patterns associated with the prevalent fauna in their natural

environments for their growth and survival, enthralled the 40 participants with attention and interest throughout the entire session. To cite a few examples the linkage of Adaptability to changes, Analytical skills, Communication Skills, Dependability, Management ability, Organic Lifestyle, Punctuality and Time budgeting with Larva of Tiger butterfly feeding on poisonous milk weed, Brown headed Gulls [Ladakh] adaptation to air temperatures, Ghost Crab, Tiger Siesta, Sea horse Fish brood pouch, Spoonbill feeding, Painted Grasshopper and Cotton bugs feeding on silk cotton during life cycle respectively, were indeed noteworthy. Besides the animal kingdom, the example of *Asteracantha longifolia* plant for its Tact and Diplomacy, was also shared. In conclusion the take home suggestions offered by the eminent speaker included a quadrifold activity life style Outdoor Nature Play daily, Nature exploration weekly, monthly visit to Nature parks and an annual International trip or tour into the wilderness to imbibe the abundance of lessons offered by Nature. This session was compered by Dr. Sweedle Cerejo-Shivkar while Dr Paramjit D. Anthappan gave the welcome address.

- 4. On 17th February, 2021, Ms. Neha Trivedi [Project Consultant] & Ms. Poonam Deokar [Consulting Special Educator] from Xavier's Resource Centre for Visually Challenged, St. Xavier's College, Mumbai, enlightened 32 participants on the role and significance of 'Pictures and Visuals in the world of Persons with Blindness and Low Vision'. The session was initiated by Neha Trivedi with a thought provoking question to the online audience – 'Does the thought of painter with blindness or knowing that a civil engineer and a marine biologist whose expertise lie in studying of shells cannot see surprise you'? This was followed with the revelation that the surprise may have its place in the social environment we live in where our expectations and our imaginations are often curtailed by the myths and misconceptions that society bestows upon us. Fact is that the world of images, pictures, visuals is not unknown to persons with blindness and low vision. Only their method of accessing the same is different. Thus the talk was aimed to give an insight to participants on the practical know how to convey visual low persons with blindness and vision and highlight the concepts to methodology/guidelines involved for producers of visual content as to how they can create material that is accessible for all especially in inclusive education as per the new government policy initiation at national level. During the talk the participants were not only enriched with the theoretical aspects and factual knowledge of the topic but also sensitised with practical exercises to understand the concepts involved. Also the practical models created at the institute of speakers were showcased with comprehensive addressal of queries for clarity and future need based implementation of inclusive garden based learning models at IWSA. The session was compered by Dr Paramjit D. Anthappan, while Dr Rita Mukhopadhyaya, Vice President, IWSA, gave the introductory welcome address.
- 5. On 24th February, 2021, Mrs Suniti Deshmukh [Nature lover and Bonsai Master] presented the 36th Webinar on 'Bonsai' with meticulous explanations from basics to applications, to 33 interested participants. Bonsai a tree grown in a shallow container, is an elegant work of art which brings great pleasure and peace to a human mind. It is an art of patience for conservation of plant species in very creative way. Small is

beautiful. Shrinking gardens during urbanization, can be beautified with systematic approach using the knowledge and skills of nurturing Bonsai plants. Many plant species can be grown in small, flat pots i.e.Bon. The art of Bonsai making is spreading all over the World. In India many enthusiastic gardeners are making bonsai to conserve tropical plant species. There are rules and proper methods of making Bonsai. Good bonsai artists require the right training to understand the various types and techniques of making Bonsai and the talk highlighted the principles involved along with the tools and techniques employed for effective outcomes and attractive appeal. This session was compered by Vijaya Chakravarty and Sneha Bhavsar gave the welcome address.

On 10th March 2021, Ms. Meenakshi Boopathi [Food Enthusiast] enriched 29 6. participants on 'Forgotten Foods Around You' with her passionate presentation. The young speaker with her core beliefs and inner drive to spread awareness for forgotten foods and promote their nutritional and medical benefits, has been impacting masses, sponsorship support and media coverage, besides being approached by agro industries for recipes and innovative products. The participants enjoyed the interactive session of knowledge with quiz activities and interesting pictorial share of the natural food ingredients [leaves, stems, roots and fruits] with captions of their beneficial uses. The speaker enlightened the audience that Forgotten Foods are overlooked most of the time because of ignorance and stressed how knowledge is essential to make the right choice of food for enhancing healing process or building immunity. Constant connection with our body requirements and its management with ease is necessary. The talk helped the participants to identify, understand and initiate the implementation of a new dimension of consumption as per body calling. The expected target outcome of the session was to ensure body healing capacity along with an improved lifestyle as per the current need. This program was compered by by Dr. Sweedle Cerejo-Shivkar while Dr Sunita Mahajan, Chairperson, Board of Trustees, IWSA, presented the introductory address.

I. Gardening Skill Development Program in February 2021

The program was conducted under the aegis of the Learning Garden, Science Awareness Committee, IWSA with In-house Trainers. The Skill Development Team comprised of Vijaya Chakravarty, Sakina Gadiwala, Ambika Janakiraman and Snehalata Bhavsar

The venture was an attempt to provide new skills for women with primary and middle school education who were working as ayahs in day care and in the cleaning of office premises. Seven female workers and one male trainee from IWSA, participated in this course. They were in the age group 40 to 55 years. Following eight trainees attended the course: Ms. Mamta Pandere. Ms. Anita Kerlekar, Ms. Shyamal Bhuvad, Ms. Namrata Bhadwalkar, Ms. Meena Zade, Ms. Harsha Kotwal, Ms. Jaya Gaikwad and Mr. Munshi Das

Onsite lectures, demonstrations and practical sessions were conducted at the IWSA's Learning Garden by several trainers. Training in growing vegetables from seeds, preparation of vegetable beds, growing microgreens, identification of ornamental, indoor and medicinal plants, planting vegetation to attract butterflies, preservation of edible flowers and leaves to prepare beverages and chutneys was demonstrated. The trainees were also taught potting, repotting, pruning and watering of potted plants as well as plantation in the ground. Training in nursery development [propagation in polybags], potting, keeping premises clean, composting of garden waste and aesthetic display of plants. A session was also conducted in the soft skills required for gainful employment.

Following theory and practical sessions were conducted.

- 1. Vegetable Growing: 3 Sessions in February 2021. Trainer: Ms Sakina Gadiwala
- 2. Theory and Practical Class in Microgreens cultivation class. Trainer: Dr. Smita Kekatpure, member, IWSA HQ,Vashi, 1st February, 2021
- Preservation by Drying and use of Dried Plant Parts to Prepare Plant based Beverages [sherbets] and Chutney powder Trainer: Ms. Vijaya Chakravarty, IWSA HQ on 6th February, 2021
- How to attract Butterflies into the Garden Trainer: Ms. Tripta Tewari, IWSA HQ 15th February, 2021
- 5. The top 10 required soft skills for IWSA trainees. Trainer: Dr. Paramjit Anthappan , IWSA HQ
- Practical Sessions in Plant Identification, Potting and Repotting, Pruning and Cleaning of Plants, Care of Indoor Plants, Nursery Development and Display of Plants - February to mid March 2021. Trainers: Ms. Vijaya Chakravarty, Ms. Madhu Pahwa and Dr. Srirupa Mukherjee

The Trainees were given practical training in basic gardening skills. How to water potted plants and those in the ground was demonstrated. They were taught to prepare potted plants and also reporting of root bound plants and shifting them to larger pots. Cleaning and pruning of plants was demonstrated. Nursery development of ornamental, medicinal, indoor and wild edible plants using poly bags was taught. Also soil preparation was shown and they were taught how to prepare the potting mixture, fill the bags and plant cuttings. Grouping and arranging them in batches was shown to them. They were also taught how to display plants on stands aesthetically. A tool kit, a small stipend and a certificate was issued to the participants after successful completion of the program.

Nursery School and Education Committee

- 1. IWSA in collaboration with "Vigyan Prasar" has initiated the launch of a short term 30 hours online course "Shikshan Setu" for Pre Primary and Primary Teachers with effect from the forthcoming academic year. Six modules of the course content are being prepared by IWSA ECCE teachers.
- 2. The online classes continued to be conducted by Nursery teacher, Ms. Payal twice a week, during the period January to March 2021. During this period all events, and festivals like Republic Day, Holi etc. were celebrated virtually with their parents. The response received from children and their parents was overwhelming.
- 3. Nursery and ECCE teachers continued attending webinars and lectures during the lockdown period to develop their professional skills.

- 4. Unit test 2 for ECCE students was held from 18th January to 22nd January 2021 at ICICI Multipurpose hall, IWSA. 5 girls appeared online as they were not able to attend at IWSA.
- 5. Results of last year batch ie. 2019-20 has been declared. All students have passed. Six students passed with distinction, four students obtained first class and two students obtained second class.
- 6. ECCE students organised a group lesson for Nursery children on 13th February 2021 on the theme "Eat colourful, be Cheerful" They presented a skit and a song followed by a game related to Healthy foods and Healthy eating habits.
- 7. Ms. Vineeta Rajput and Ms. Shaheena Shaikh participated as mentors to IWSA-SIESCOMS Internship team project entitled "ECCE Advertising and Marketing" for post graduate students, during the period 22nd to 28th February, 2021. The intern team was awarded certificate of appreciation for effective understanding of concepts and of alumni interaction while carrying out the project.
- Drishti courses: Two students have taken admission for ADHD and LD and one student for Shadow teacher training course. Next batch will start from 10th March 2021.

IWSA's Hostel and Day Care Committee

1. Celebration of Hostel Day on 9th January 2021

Hostel Day was celebrated on the 9th January2021 from 6 pm to 7 pm. The celebration started with traditional lighting of the lamp by hostel committee members, followed by Ganesh Aarthi and speeches by Ms. Jasvir Kaur and K. Rajishri. Although the number of girls were less this year, they put up a good show of dance and song. There was a video show of few women social workers who had done tremendous work in helping the needy and underprivileged people. The Hostel girls had decorated the premise with beautiful and eye catching rangolis. Sports events were conducted one week earlier, to the Hostel Day and the Prize were given to all the participants.

2. Celebration of Republic Day on 26th January 2021

Republic Day was celebrated on the 26th January 2021. After the Flag Hoisting and singing of National Anthem, a program in which the renowned social worker, 93 years old, Padmabhushan Krishnammal Jagannathan, addressed and wished all the IWSA Members through the Zoom meeting platform. Then her full recorded talk was played online, which inspired the IWSA members. Her selfless service to the society motivated and created a long - lasting impression in the minds of the audience.

3. Participation in IWSA-SIESCOM Internship Project

Ms. Snehlata Bhavsar, Ms. Manisha Sarkar, Ms. Manisha Chand and Ms. Sudha Mehta along with Ms. Vijaya Chakravarty, participated as mentors to IWSA-SIESCOMS Internship team project entitled "Day Care Lesson Plans" for post graduate students, during the period 22nd to 28th February, 2021. This project bagged the **Best Project Presentation Gold Award** on 4th March 2021.

IWSA's Murli Laj Chugani Health Care Centre

The physiotherapy unit of the Health Care Centre was successfully reopened on 25th February 2021 and the clinic functioned smoothly till 27th March, 2021, with all guidelines in place. Only 2-3 patients were treated at a time to ensure the safety of all. The physiotherapist, Dr. Nabha Deshpande dutifully treated the patients to their satisfaction. The unit received good feedback from patients during this short span. Ms. Sangita Chavan, assistant to the doctor reported on time and carried out her duties with alertness. All equipment were checked by experts. HCC members visited the clinic to overall monitor the clinic protocols and to keep track of the stock.

IWSA's Satish Haware Computer Education Centre

CEC has been awarded renewal as an Authorised Learning Centre (ALC) for conducting MSCIT Courses from MKCL in February, 2021. Under the aegis of National Science Day celebrations, in February 2021, CEC actively participated in collaboration with Science Awareness Committee for the organization of an onlineScience Exhibition cum competition themed "Scientists, Technologists and Innovators- their discoveries and innovations" for school students from Class VI to XI (Details in Section G). There were three open categories for the participants to make their selection choice.

1. Working Models 2. Power Point Presentation 3. Computer App The third category that is Computer Apps, was planned by computer center of IWSA. Students were expected to develop Apps for innovative games or learning scientific concepts or discoveries by scientists. There were 7 participants in all and 8 projects from students of 6th to 10th Std. The four judges namely Dr. Sunita Mahajan, Mrs. Shalini Mittal, Mrs. Akhila Mahesh and Mrs. Sukhvinder Sandhu judged the projects using selection criteria including Content, Structure, Navigation, Visual design and Functionality.

At the **IWSA SIESCOMS online internship conducted** from 22^{nd} to 28^{th} February 2021 (Details in Section F), two CEC Projects entitled 'IWSA Life Membership data digitalization and structuring for intended need based applications' and 'Digital Marketing of MSCIT Course at IWSA ALC', were undertaken by SIESCOMS Team No 4 comprising of Deepak Sahu, Siddharth Nair, Girdhar Sodani, Divyesh Gehalot, Roma Harkude and Yadnesh Patil. These were mentored by Ms Akhila Mahesh and co mentored by Dr Sunita Mahajan, Dr Rita Mukhopadhyaya and Dr Paramjit Anthappan. The draft review and final presentations of the aforesaid projects were made on 25th February 2021 and 4th March 2021 respectively. Useful inputs and suggestions were shared by reviewers, Dr. Kanika Khurana, Dr. Shweta Naik and Mr. Abhishek Naik. Post review value additions suggestions were shared by experts Ms. Manjuvani Nayani, Mr. Udeerna Karanam and Ms. Shobha Pakala. Based on these suggestions, CSR Funding requirements, effective advertisement, video making and impact oral presentation tips were incorporated into the final report. The team was awarded a certificate of appreciation for effective inputs, innovation and time management while executing their projects. The valuable outcome for CEC of IWSA through carrying out these

internship projects include:

Digitalisation of structured data of IWSA Life members of the 20th century along with creation of an unique UID for need based retrieval and application, a preliminary app for online enrolment of new life members, a Power point presentation of 27 slides with salient features of the internship projects, a soft copy of the final project report, a quantitative two phase survey to map prospective learners for MHCIT Course at IWSA ALC, an e - brochure for digital marketing of MHCIT Course at IWSA and a video advertisement for marketing MHCIT Course at IWSA.

IWSA's Pirojsha Godrej Foundation Library

Our newly recruited, enthusiastic librarian Ms Arpita Salvi, has been making appreciative and noteworthy efforts to compose, compile and share with members, articles on personalities/significant days, under the aegis of **IWSA Library online celebrations Activity**, during the period from January to March, 2021. These include the following articles

- 1. **Savitribai Phule** on 3rd January, 2021, in English and Marathi, along with library reference books on her, as a befitting tribute to her profile in being a philanthropist, educationist and Marathi writer.
- 2. **Swami Vivekanand & Rajmata Jijabai** on 12th January, 2021, in English and Marathi along with library reference books available.
- **3. Netaji Subhash Chandra Bose & Balasaheb Thakre** on 23rd January, 2021, in English, Hindi and Marathi including library booklist.
- **4.** Significance and importance of **72nd Republic Day**, 26th January, 2021, in above 3 languages along with the list of 24 Marathi books available for reading in the library with details of titles and accession numbers.
- 5. Chatrapati Shivaji Maharaj on 19th February, in 3 languages and library reference books.

- 6. **National Science Day,** 28th February, 2021, highlighting the history, objectives and annual themes in form of an article in 3 languages along with a Power Point Presentation and available books in the library.
- 7. **Women's Day** on 8th March, 2021 along with a PowerPoint Presentation on Women in Science and their achievements.

Her article on Savitribai Phule is included in this Newsletter.

IWSA Scholarship Awards

The annual IWSA Scholarships and Awards Event for the year 2020 was organised online on 19th March 2021, wherein a number of girl student Awardees from VII standard to PhD levels, pursuing Science Education, on merit-cum-means basis, were felicitated. These awards are made possible because of our benevolent donors who have reposed faith in the IWSA's mandates. The awards are given mostly from the interest accrued from the corpus donations. A couple of scholarship funds are received annually.

The applications for the 2020 Awards were invited from colleges of Mumbai and Navi Mumbai, with a cut-off date for receipt of applications filled in the format provided, complete with all details and documents. Twenty-one applications for B.Sc., seven for M.Sc. and eight applications for Ph.D. were received. The PhD applications were scrutinized by Dr. B.S. Mahajan, Dr. Rita Mukhopadhyaya and Dr. Paramiit Anthappan. Dr. Devaki Ramanathan and Dr Nootan Bhakal scrutinized all other applications, including BSc and MSc forms. The Scholarship Disbursement Event for 2020 was held virtually on the 19th March 2021 at 4 pm. Dr Smita Mahale, former Director, ICMR-NIRRH was the Chief Dr. Devaki Ramanathan, Convener, Scholarships and Awards Guest. Committee, gave details of this years' program. Dr. Surekha Zingde, Past President and Member Board of Trustees, briefed about IWSA and introduced the Chief Guest. Dr. Smita Mahale addressed the awardees, spoke about the importance of Scientific Research and motivated them to pursue higher studies in Science and Technology. Dr. Devaki Ramanathan with Dr Nootan Bhakal and Dr Paramjit Anthappan announced all the Awards for 2020 with a brief description of the names associated with each of the awards. A total of 18 awards were announced: 3,Ph.D., 4, M.Sc., and 7, B.Sc. and 3, ECCE students. The Leela Bansia award was given to a differently abled student who passed X standard creditably. Dr Nootan Bhakal, Secretary, Scholarship committee, gave the concluding vote of thanks and announced that the cheques and certificates will be handed over personally at IWSA on 26th March 2021 from 3-5pm as the Awardees had to sign vouchers for the same. There were 50 attendees for the online function.

Reports from Branches

Amaravati Branch

1. BRNS Popular Science Lecture on "Wondrous World of Chemistry" on 27th February, 2021

IWSA, Amravati Branch organised a webinar on 'Wondrous World Of Chemistry' under BRNS-DAE supported "Popular Science Lecture" series. The webinar was arranged on the occasion of National Science Day-2021 by IWSA, Amravati Branch in association with the Science Faculty of Bharatiya Mahavidyalaya, Amravati. Owing to the current situation of the Covid-19 Pandemic an online lecture of Dr. Prakash Wadgaonkar, Emeritus Scientist, Polymer Science and Engineering Division, CSIR-National Chemical Laboratory, Pune was arranged. The program was attended by about 80 participants on Zoom platform and YouTube link was also provided.

The program was conducted by Ms. Meena Doibale, IWSA, Amravati Branch member. Dr. Aradhana Vaidya, Principal, Bharatiya Mahavidyalaya, welcomed the participants. Convener of IWSA, Amravati Branch, Dr. Deeplaxmi Kulkarni introduced about IWSA and the BRNS-DAE lecture series. She also gave a brief introduction of the speaker Dr. Prakash Wadgaonkar. In her speech, Dr. Deeplaxmi narrated the motto of BRNS lecture series and the various activities organized by IWSA, Amravati Branch in the last few years.

Dr. Wadgaonkar explained the significance of chemistry in human life. During the approximately two centuries that chemical science has been practiced on an everincreasing scale, it has enabled the production of a wide variety of goods that are valued by humans. These include pharmaceuticals that have improved health and extended life, fertilizers that have greatly increased food productivity, and semiconductors that have made possible computers and other electronic devices. Without the persistent efforts of chemists and the enormous productivity of the chemical industry, nothing approaching the high standard of living enjoyed in modern industrialized societies would be possible. The issue of how to unlock the true potential of Chemistry in India was discussed in detail.

Vote of thanks was presented by Ms. Doibole. Certificate of participation was given to all the participants. Dr. Deeplaxmi Kulkarni, Convener, IWSA, Amravati Branch and Branch members Ms. Doibale, Dr. Chinchamalatpure, Dr. Kadu, Dr. Amrapali, Dr. Pallavi and all the science faculty members took efforts in the organisation of the lecture. Dr. Kalyamwar, Dr. N.S. Kadu and Dr. Warghat provided the technical support for this activity.

2. BRNS Popular Science Lecture on ""Biophysical Chemistry in Drug Design: Impact Challenges and Opportunity" on 9th March, 2021

IWSA, Amravati Branch organised a webinar under BRNS-DAE supported "Popular Science Lecture" series. Speaker for the lecture was Dr. Manoj Munde (Assistant Professor, Biochemical Chemistry Lab, Department of Physical Science, Jawaharlal Nehru University, New Delhi and the topic was "Biophysical Chemistry in Drug Design: Impact, Challenges and Opportunity". The webinar was arranged on the occasion of National Science Day-2021 by IWSA, Amravati Branch in association with Vidya Bharati Mahavidyalaya, Amravati.

Dr. Mithilesh Rathod, Secretary, IWSA, Amravati Branch introduced IWSA and BRNS-DAE lecture series. She also gave a brief introduction of the speaker Dr. Manoj Munde. In her introductory speech, Dr. Mithilesh Rathod narrated the motto of BRNS lecture series and the various activities organized by IWSA, Amravati Branch in the last few years.

Dr. Manoj Munde, in his informative lecture enlightened the students with various impacts and challenges of biophysical chemistry and also various opportunities in this field. The role of Biophysical Chemistry in Drug Discovery is to guide new techniques and approaches to identifying and characterizing small molecules in early drug discovery. Drug development, from the initial discovery of a promising target to the final medication, is a highly laborious, expensive and lengthy process. Also, due to the challenges posed by existing as well as new upcoming complicated diseases, it is imperative that we must come up with novel ideas to fast-track drug discovery processes. Biophysical research is reasserting its utility in drug discovery, and many academic institutions and multinational pharmaceutical companies have set up a biophysical research department as part of their R & D efforts with an increased focus on the more nuanced characterization of small molecule drugs. In his presentation, Dr. Munde discussed about the current affairs in the field of drug discovery and explained how interdisciplinary research; especially biophysical research would be a key to making steadfast progress in the discovery of novel drugs with several examples.

The program was attended by over 150 students and 23 faculty members on Cisco Webex platform. Certificate of participation was given to the participants who were linked for the complete lecture.

3. Lecture on Importance of Health in Women Empowerment on the Occasion of International Women's Day on 9th March 2021

On International Women's Day 2021 a lecture was arranged by IWSA, Amravati Branch (Online on Zoom and You Tube) in association with Bharatiya Mahavidyalaya, Amravati on 9th March 2021.The topic of the lecture was **'Importance of Health in Women Empowerment'.** The speaker was Dr. Sumedha Pandhrikar (M.D. Gyn.).

Dr. Sumedha explained the importance of good health for women empowerment. She elaborately discussed various health problems of women from the age of 20-60 years. She insisted that women should maintain vaginal hygiene during menstrual cycle and eat nutritious food for good health. She described the Gynaecological Health problems like PCOD, Pregnancy Issues, etc. Three of the most common cancers affecting women are breast, ovary, and cervical cancers. The speaker explained the probable reasons and symptoms to diagnose these cancers. Dr. Sumedha said that tests like Pap smear test could help in early diagnosis.

Around 50 students, staff and IWSA members were benefitted by this lecture. This programme was presided over by Dr. Aradhana Vaidya, Principal Bharatiya Mahavidyalaya, Amaravati. The lecture was conducted by Prof. Dr. Daya Pande, Head, Department of Sociology and member, IWSA, Amravati Branch. Dr. Deeplaxmi Kulkarni, Head Department of Zoology and Convener IWSA, Amravati Branch presented vote of thanks.

Bengaluru Branch

1. BRNS Popular Science Lecture on "Antimicrobial Peptides (AMP): A Plethora of Roles and Applications" on 2nd March 2021

IWSA, Bengaluru Branch organised webinar in association with Department of Biotechnology, B.M.S. College of Engineering, Bengaluru, under BRNS-DAE supported "Popular Science Lecture" series on 2nd March, 2021. Dr. Sravanti Vaidya, Project Scientist, CSIR-Center for Cellular and Molecular Biology, Hyderabad spoke on "Antimicrobial Peptides (AMP): A Plethora of Roles and Applications". About 50 participants both faculty and students from various colleges, Padmashree Institutes, MSRUS, BMSCE, DSCE and CCMB, attended the talk through Google Meet.

In the host cell, most AMPs are produced as large multi-peptide precursor form with single/multiple signal peptide and pro-peptide, which maintain the antimicrobial peptide in an inactive form. Several mechanisms of maturation of precursor AMP form exist. Every family of AMP seem to have evolved an unique maturation mechanism, which needs to be deciphered. In recent years, AMPs have garnered great interest as potential alternatives for antibiotics as the world is approaching a "post-antibiotic era". AMPs also have a broad range of applications such as peptide therapeutics, biological warfare agents, anti-biofilm agents, AMP based polymeric systems for drug delivery, vaccine adjuvants, aquaculture, food industry, agriculture, animal husbandry, probes in biosensors and cosmetics. After elaborating on all these aspects of AMP, Dr Sravanti spoke about her research on analysing the AMP sequences, predicting the secondary and tertiary structures of Ant and Silkworm AMPs. She concluded her session with career opportunities in academic and non-academic sector for Biotechnology graduates.

The lecture ended with the vote of thanks by Prof. Savithri Bhat. The session was very interactive. Positive and satisfied responses were received from all the participants.

2. Celebration of International Women's Day on 8th March 2021

Indian Women Scientists' Association, Bengaluru Branch celebrated International Women's Day on 8th March, 2021 by organizing the following lectures:

- 1. Dr. Sravanti Vaidya, Project Scientist, CSIR, Hyderabad, spoke about "Women in Science & Technology". Dr. Vaidya spoke about women achievers and about the positions presently held by women in science and Technology. She highlighted the challenges faced by women in such positions and the methodology to overcome those challenges. She listed the opportunities available for women who are ambitious to achieve greater heights in their career.
- 2. Dr. S. Shylaja, Principal, Government First Grade College, Peenya, Bengaluru, spoke on "Women Empowerment". Dr. Shylaja spoke about the challenges faced by women during the current pandemic situation and discussed about the plans for implementing programs for empowering young women students.
- Dr. M. Anuradha, Principal Padmshree Institute of management and sciences, Bengaluru spoke on "Role of Women in Self - Empowerment & Leadership". She highlighted about the qualities of Women Leaders, namely, coaching and mentoring, inspirational leadership, conflict management, organizational awareness, adaptability and teamwork.
- 4. Students also participated in this celebration by giving speeches, presenting posters and reciting poems.
- 5. The above program was conducted through Zoom platform and about 200 participants attended the lectures.

3. BRNS Popular Science Lecture on "Models and Genomic Measures of Psychiatric Disorders" on 20th March 2021

IWSA, Bengaluru Branch organised a webinar in association with Department of Genetics, Indian Academy Degree College – Autonomous, Bengaluru, under BRNS-DAE supported "Popular Science Lecture" series on 20th March, 2021. Dr. Reeteka Sud, Research Coordinator, Accelerator in Brain Disorders using Stem Cells Laboratory, National Institute of Mental Health (NIMHANS) delivered a lecture on "Models and Genomic Measures of Psychiatric Disorders". The session was held through Zoom and also live telecast was on in the Indian Academy Degree College You Tube Channel (https://youtu.be/3NhXFnQjuNs). 288 participants registered for the webinar. There were 124 members on You Tube and others were watching through the college Facebook link. 119 members had given feedback form.

Dr. Reetika Sud started her discussion with the models for studying psychiatric disorders, with special emphasis on stem cell models. She then elaborated on the genetic and genomic architecture of these disorders and about the enigma of mental illness. She discussed about the effect of variants (genetic mutations or SNPs) in causing a Mendelian disease like Alzheimers, Schizophrenia, Bipolar disorder or OCD. The variants which can be rare or common as detected by SNP Arrays or

NGS can be plotted in a Manhattan plot, and statistically the occurrence of the disease can be identified in an individual. She then briefly described about how the genetics behind psychiatric diseases can be traced by family, twin or adoption studies, linkage studies, candidate gene studies or Genome wide Associations (GWAS). She concluded with how, from the variants, the genes can be found out, and from that the network it affects can be figured out. This webinar provided valuable information that helped the students to enhance their knowledge.

Delhi Branch

1. BRNS Popular Science Lecture on "Impact of Pandemic on Women's Work Life" on 8th March 2021

A popular science lecture supported by BRNS-DAE was organised by Indian Women Scientists' Association, Delhi Branch as part of the Women's day celebration in collaboration with Amity Institute of Nanotechnology on 8th March 2021. The Women's Day Celebration and the BRNS lecture were conducted on line through Zoom platform. About 90 participants consisting of IWSA members, scientists from National Physical Laboratory, students and faculty from Amity Institute of Nanotechnology and others from various other institutes.

The program was started with introductory remarks by Dr. Richa Krishna, followed by welcome address by Prof. O. P. Sinha, Acting Director and Head, Amity Institute of Nanotechnology, Amity University Uttar Pradesh. A brief introduction about Indian Women Scientist Association (IWSA) and its mandates was given by Dr. Rina Sharma, Principal Scientist, National Physical Laboratory and Convenor of IWSA, Delhi Chapter.

Honorable Vice Chancellor of Amity University Uttar Pradesh Prof. Balvinder Shukla talked about the broadening of gender bias during the Covid pandemic. Thereafter, Dr. Purnima Rupal, Director, Indo French Centre for the promotion of Advanced research, New Delhi delivered the BRNS Lecture on "Effect of Pandemic on Women's work life".

The talk covered the difficulty in maintaining the work life balance experienced by most women during the pandemic. She also appreciated the role of women in India as front-line workers. She discussed about the positive and negative effects of COVID- 19 on work and studies of women and their mental well-being.

Dr. Sunita Rattan, Dean, Science and Technology Domain, addressed the audience and talked about the strength of women and their capabilities. Dr. Ritu Srivastava, senior principal scientist at National Physical laboratory (and also the treasurer of IWSA, Delhi Branch) gave her concluding remarks. The program ended with the vote of thanks by Dr. Richa Krishna.
2. BRNS Popular Science Lecture on "Role of Women in Biodiversity Conservation" on 16th March 2021

A popular science lecture supported by BRNS-DAE was organised by Indian Women Scientists' Association, Delhi Branch in collaboration with Department of Physics (MMV Section), Banaras Hindu University, Varanasi on 16th March 2021. The webinar was conducted on line through Google Meet platform. About 147 students registered for the webinar, out of which 91 attended the lecture on Google meet and many others watched the same on YouTube.

Prof Neelam Srivastava (Coordinator of event) welcomed the gathering and informed that special efforts were being made to motivate young female students to actively participate in biodiversity conservation. The lecture was attended by Prof Indu Mehta (Principal, MMV) who discussed the efforts of institution to encourage the students to actively participate in such webinars by reserving the last period of Saturday for lectures by eminent scientists.

Dr. Rina Sharma (Convenor, IWSA- Delhi Branch) discussed the goals of IWSA and activities of IWSA-Delhi Branch. Dr. Nishi Kumari (Professor, Department of Botany, MMV Section, BHU) introduced the speaker Prof Madhoolika Agarwal (Professor of Botany, Institute of Science, BHU, Varanasi).

Professor Madhoolika Agarwal discussed how the village women were preserving some special seeds and culture which is leading to conservation of biodiversity. She told that although they were doing a good job, they can do this job better and also earn some money if trained properly. Prof Agarwal also discussed about eminent female personalities who were coming up as role model for biodiversity conservation. Dr. Ritu Srivastava (treasurer, IWSA- Delhi Branch) proposed a formal vote of thanks on behalf of IWSA.

Hyderabad Branch

BRNS Popular Science Lecture on "Trace Elements as Contaminants and Nutrients" on 17th February 2021

Popular Science Lecture webinar supported by BRNS-DAE was organized by Indian Women Scientists' Association- Hyderabad, in association with Department of Microbiology, St.Pious X Degree and PG College for Women on 17th February 2021. Prof. M.N.V. Prasad, Emeritus Professor, School of Life Sciences, University of Hyderabad, spoke on the topic "Trace Elements as Contaminants and Nutrients". The webinar was conducted online on "Zoom" platform and about 113 participants from various colleges and universities spread across Telangana attended.

Rev. Sr. B. Velangini Kumari, Principal, St.Pious X Degree and PG College for Women addressed the virtual audience about the importance of the webinar and thanked IWSA members for collaborating with the college. Dr. K. Ratna, President, IWSA, Hyderabad Branch in her speech introduced about IWSA, and its activities, its members pan India, the regional chapters and the various training – orientation programmes, seminars, webinars aimed at encouraging and providing knowledge to the students.

Prof. M.N.V. Prasad began his lecture by giving an account of how the trace elements, such as selenium, iron, zinc, and calcium etc. are essential for human as well as animal health. Nutritionally important trace elements are deficient in soils in many regions of the world. Health problems associated with excess/deficiency or uneven distribution of these essential trace elements in soils have become major public health issues in many developing countries. Therefore, the development of "foods and animal feeds" with fortified essential nutrients has been one of the most attractive research fields globally. Several of the trace elements serve as constituents of biomolecules as a cofactor for various enzymes and in a variety of metabolic functions. Trace elements are implicated in healing function and neurochemical transmission, for example, Zn on synaptic transmission. Cr and Mn can be correlated with therapeutic properties against diabetic and cardiovascular diseases. Certain transition group elements regulate hepatic synthesis of cholesterol. Prof. Prasad also explained the difference between the positive and negative impact of various essential nutrients in terms of human health and climate change. He described various experiments and research towards these topics and how the issues can be mitigated with sustainable approach.

The webinar session was followed by queries where the speaker interacted with the participants and answered their questions. The attendees were awarded with E-certificates.

Kalpakkam Branch

1. Doctor's Talk on "COVID – 19 Challenges at Home and Workplace" on 30th January 2021

Dr. Archana Toppo delivered the Doctor's Talk on "COVID-19 Challenges at Home and Workplace" on 30th January 2021. The talk was held through Google Meet and about 40 participants attended.

2. Felicitation to Mrs. T. Jayanthi on 19th February 2021

IWSA Kalpakkam Branch organised a felicitation function to Mrs.T.Jayanthi, Exconvener, IWSA, Kalpakkam on 19th February 2021. Mrs.T.Jayanthi, Group Director, EIG, IGCAR gave a technical lecture. The function was held through Vi Meet and about 45 participants attended.

3. National Science Day Celebration on 27th February 2021

Online science elocution competition for students of class 6th to 12th was held. About 86 students participated in the science elocution competition. The winners announced on National Science Day Program which was held through Google Meet

on 27th February 2021 which was attended by 63 participants. Later, Certificates, Trophies and Science Books were given to the winners.

4. International Women's Day Celebration on 22nd March 2021

The following two lectures were organized as part of the International Women's Day Celebration on 22nd March 2021.

Advocate Mrs. Adhilakshmi Logamurthy, High Court, Chennai spoke about "Awareness of Laws and Accessibility of the Courts to Women in India".

Dr. Jemima Kingsley, Director, Orbito Asia Diagnostics, Coimbatore talked about "Courage or Comfort – Choice is Yours"

The talks were held through Cisco-Webex and about 160 participants attended.

Kolhapur Branch

1. World Wetland Day on 2nd February 2021

Three online guest lectures were organized on 2nd February 2021 by the Department of Botany, Shivaji University, Kolhapur and IWSA Kolhapur Branch to celebrate the World Wetlands Day.

A lecture on "Environment Crisis and Probable Solutions" was delivered by Mr. Nitin Doiphode. Mr. Mohammed Shaikh, Managing Trustee of "SAMYANTAK" spoke on "World Heritage Walk and Visual Trip Dhamapur". Prof. S.R. Yadav, Senior INSA Scientist spoke on "Wetlands and their Importance"

A poster competition was held for M.Sc. Students.

More details about this event could not be obtained, as the Convenor of Kolhapur Branch could not access her computer in her University due to the lockdown conditions in Kolhapur.

2. BRNS Popular Science Lecture on "Plant Intelligence" on 13th February 2021

Popular Science Lecture webinar supported by BRNS-DAE was organized by Indian Women Scientists' Association, Kolhapur Branch in association with Department of Botany, Shivaji University, Kolhapur on 13th February 2021. The webinar was conducted online through Google Meet platform and about 81 participants consisting of students, faculty and IWSA members attended. The lecture was delivered by Dr. Nilesh Pawar, Professor, Department of Botany, The New College, Kolhapur-416012 on 'Plant Intelligence'

Abstract: Artificial intelligence (AI) refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. The

term may also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving. Researchers from the Europe developed a deep learning algorithm to automatically identify plant specimens that have been pressed, dried and mounted on herbarium sheets. According to the researchers, this is the first attempt to use deep learning to tackle the difficult taxonomic task of identifying species in natural-history collections. There are some apps also which helps us to identify plant and animals by using AI, the purpose behind this is to allow users to identify unknown specimens and making science more accessible to everyone. Along with AI, machine learning helps plant science turn over a new leaf, botanists can track the traits, or phenotypes, of hundreds or thousands of plants much more quickly, with automated camera systems. The study, published in *Plant Physiology* may help scientists to quantify how plants respond to climate change, genetic mutations or other factors. Artificial Intelligence takes root, helping farmers identify diseased plants. Scientists have developed an app that helps one detect diseases in plants, using Deep Learning for Image-Based Plant Disease Crop diseases are a major threat to food security, but their rapid Detection. identification remains difficult in many parts of the world due to the lack of the necessary infrastructure. The combination of increasing global smartphone penetration and AI made possible by deep learning has paved the way for smartphone-assisted disease diagnosis. In future, AI will help in disease diagnosis, weather forecasting, intelligent spraying, soil and crop monitoring, crop yield forecasting etc.

3. BRNS Popular Science Lecture on "Biodiversity and Tribes of Andaman and Nicobar Islands" on 16th March 2021

Popular Science Lecture webinar supported by BRNS-DAE was organized by Indian Women Scientists' Association, Kolhapur Branch in association with Department of Botany, Karmveer Bhaurao Patil Mahavidhyalaya, Urun Islampur on 16th March 2021. The webinar was conducted online through Zoom platform. About 52 students from remote areas attended this talk and actively participated in discussion. The lecture was delivered by Dr. Rajendra Suryavanshi, Associate Professor, Department of Botany, Vidnyan Mahavidyalaya, Sangola on "Biodiversity and Tribes of Andaman and Nicobar Islands"

Abstract: Andaman and Nicobar Islands are known for the cellular jail wherein freedom fighters were imprisoned. Now, it is famous for many indigenous plants, biodiversity and the evergreen forest. Andaman and Nicobar Islands are a group of approximately 75 Islands. Some of these islands have Nomadic tribes. In this lecture, Dr. Suryavanshi discussed about the floral biodiversity of plants, animals, reptiles, birds and fishes. He also dealt with the culture of Nomadic tribes from Andaman and Nicobar Islands.

4. BRNS Popular Science Lecture on "Ecology and Economics" on 17th March 2021

Popular Science Lecture webinar supported by BRNS-DAE was organized by Indian Women Scientists' Association, Kolhapur Branch in association with Department of Botany, Karmveer Bhaurao Patil Mahavidyalaya, Pandarpur on 17th March 2021. The webinar was conducted online through Zoom platform. About 40 students attended this talk and actively participated in discussion. The lecture was delivered by Dr. Ajit Telave, Vice Principal, Tuljaram Chaturchand College, Baramati on "Ecology and Economics".

Abstract: Ecological studies in relation with economic development for sustainable livelihood is an emerging need in today's world. Human beings on this planet extract the available natural resources in large quantities without knowing the importance of the natural resources. Economic developments are essential for promoting the national capital income, but the use of natural resources for economic development are causing disasters. Construction of road, urbanization, industrialization, dams are some of the priorities identified for economic development whereas, these developmental activities are creating habitat fragmentation and releasing waste in the atmosphere which have severe adverse effect on the ecology of the earth. To minimize the impacts, one should think on the line of ecolonomics, which helps us to identify the possible ways for sustainable development. Therefore, it is the need of the hour to think about the economic developments and also give sufficient importance to ecology.

5. BRNS Popular Science Lecture on "Surangi: a New Fragrance in the Livelihood of Tribals" on 18th March 2021

Popular Science Lecture webinar supported by BRNS-DAE was organized by Indian Women Scientists' Association, Kolhapur Branch in association with Department of Botany and Department of Rural Development, Br. Balasaheb Khardekar College, Vengurla on 18th March 2021. The webinar was conducted online through Google Meet platform. About 91 students attended this talk and actively participated in the discussion. The lecture was delivered by Dr. M.S. Nimbalkar, Assistant Professor, Department of Botany, Shivaji University, Kolhapur on "Surangi: a New Fragrance in the Livelihood of Tribals".

Abstract: Mamea suriga is a flowering tree in coastal zone, locally known as "Surangi". Flowers have fragrance and has great market in perfume industry. Many trees are found in sacred groves in the villages of Sindhudurg district where people are trained to gather flowers buds, dry and sell them. Garlands also sell at high rates. Plant is slow growing with a height of 10 meters and above. Tissue culture methods can be set to develop dwarf varieties. Apart from perfume industry it has other potential products like Timber, dyes and medicinal value as well as substitute for Nagkeshar. Species conservation as well as propagation and product

development are great challenges through which economic development as well ecological aspects can be considered. As it is a slow growing plant, it takes many years to mature, blooms only once in the year and flowers last for several weeks. It is monogamous ie male and female flowers are on different plants. It is difficult to grow this plant. Proper research has to be done for its cultivation. Criteria such as a dwarf variety, year-round blooming and male-female identification, should be considered for growing this plant.

6. BRNS Popular Science Lecture on "Starch – Industrial Applications and Mangrove Starch: As a Novel Source" on 20th March 2021

Popular Science Lecture webinar supported by BRNS-DAE was organized by Indian Women Scientists' Association, Kolhapur Branch in association with Department of Botany, Vidnyan Mahavidyalaya, Sangola on 20th March 2021. The webinar was conducted online through Google Meet platform. About 26 students attended this talk and actively participated in discussion. The lecture was delivered by Dr. Priya Patil, Assistant Professor, Vivekananda College, Kolhapur on "Starch – Industrial Applications and Mangrove Starch: As a Novel Source".

Abstract: Starch is an important polysaccharide present in higher plants. lt is renewable and biodegradable natural resource. It is produced in abundance at low cost and has wide industrial applications. Starch is the only qualitatively important digestible polysaccharide and has been regarded as nutritionally superior to low molecular weight carbohydrate or sugars. Starch can be readily converted chemically and biologically into many useful and diverse products such as paper, textiles, adhesive, beverages, confectionaries, pharmaceutics and plastics. The diverse industrial usage of starch is based on its availability at low cost, high calorific value and inherent physico-chemical properties. The physicochemical properties of starch and its use depend largely on its biological origin and source. Mangrove trees have a variety of morphological, physiological and reproductive adaptations in common that enable them to grow in a tropical and subtropical coastline marine The members of family Rhizophoraceae show viviparous mode of environment. germination. Vivipary demonstrates the ability of mangrove seeds to germinate within their fruit while remaining attached to the parent plant. The hypocotyl is the embryonic stem, which grows downwards during germination inside the fruit, known as viviparous propagules (seedlings). The purpose of investigation is to explore mangrove starch isolated from hypocotyls and to study various properties of mangrove starches. With the development of society and technology, the conventional starches from corn, rice, potato, wheat, and their derivatives have not been sufficient to satisfy people's demand. Therefore, identification of new starch sources with novel properties is of great importance, in order to select the most adequate starch for specific applications. Based on various functional properties, mangrove starches can serve as a novel source for various applications.

Nagpur Branch

1. BRNS Popular Science Lecture on "Post COVID Challenges with Special References to Women's Health" on 11th February 2021

Popular Science Lecture webinar supported by BRNS-DAE was organized by Indian Women Scientists' Association, Nagpur Branch in association with Nikalas Mahila Mahavidyalaya, Nagpur on 11th February 2021. The webinar was conducted online through Zoom platform. About 85 students attended this talk and actively participated in the discussion. The lecture was delivered by Dr. Anuja Bhalerao, Professor and HOD, Department of Obstetrics and Gynaecology, NKP Salve Institute of Medical Sciences, Nagpur on "Post COVID Challenges with Special References to Women's Health".

Abstract::The talk dealt with the Socio Psychological perspective of women during the COVID period, Unplanned pregnancies, Abortions, Domestic Violence, Depression and Mental Health of Women. The talk also included problems related to PCOS, Menstrual Hygiene, Thyroid Disorder, Balanced Diet and Various issues of Sexuality. She beautifully explained how to keep a perfect balance between food and exercise. She gave a mantra for Ageing gracefully for elderly women.

2. BRNS Popular Science Lecture on "Microbial Food Safety Issues" on 26th February 2021

Popular Science Lecture webinar supported by BRNS-DAE was organized by Indian Women Scientists' Association, Nagpur Branch in association with Seth Kesarimal Porwal College of Arts, Science and Commerce, Kamptee, Nagpur on 26th February 2021. The webinar was conducted online through Zoom platform. About 80 students attended this talk and actively participated in the discussion. The lecture was delivered by Dr Rita Israni, former Scientist at Central Agmark Laboratory, Nagpur, Scientific Panel Member (Species and Culinary Herbs) FSSAI, New Delhi on "Microbial Food Safety Issues".

Abstract: Access to sufficient amounts of safe and nutritious food is key to sustaining life and promoting good health. Food safety is of great concern for the consumer and a challenge to the scientists and the regulatory authorities. The contamination of food by microbial agents is a worldwide public health concern. According to World Health Organisation (WHO), unsafe food containing harmful bacteria, viruses, parasites or chemical substances can cause more than 200 different diseases – ranging from diarrhoea to cancer. Diseases of the

gastrointestinal tract in the form of diarrhoea are a major problem in all countries of the world, though they can also produce neurological, gynaecological and immunological symptoms. These diseases contribute significantly to the global burden of disease and mortality. Around the world, an estimated 600 million - almost 1 in 10 people – fall ill after eating contaminated food each year, resulting in 4,20,000 deaths and the loss of 33 million healthy life years (DALYs). A critical issue in improving the level of food safety is an integrated approach of controlling the safety of food during the entire food chain i.e. right through farm to the factory to the consumer's table. Around the world, the majority of laws about food safety are based on the concepts: HACCP, good agricultural practices, good manufacturing practices, good hygiene practices, which have ensured greater food safety. The increased demand for safer food has led to the introduction and development of new food safety regulations and standards to reach a goal of higher level of food safety. Food borne diseases and food borne pathogens vary widely within regions. Food safety is related to the presence of all food borne hazards: biological, chemical or physical including allergens, food additives, mycotoxins etc. which make food unsafe to consume and injurious to health. In the present talk, principles of food hygiene, foods that are most prone to bacterial infections, common foodborne pathogens ie Salmonella, Campylobacter, Enterohaemorrhagic, Escherichia coli, Listeria, Vibrio cholerae and the diseases caused by these organisms along with the symptoms of diseases were covered. Additionally, golden rules of food safety, eating habits to stay fit was also considered. Moreover, the types of foods which are more prone to microbial contamination like organic foods and its comparison with the conventional foods and the recommendations of Food and Agriculture Organisation (FAO) as to the choice of foods was discussed in the light of willingness of the present day consumer to pay even higher prices for safer foods.

3. BRNS Popular Science Lectures on "Treasure Foods for Healthy Living" and "Nutrition Beats Pandemic" on 1st March 2021

Two Popular Science Lectures supported by BRNS-DAE were organized by Indian Women Scientists' Association, Nagpur Branch in association with Women's Technical Education and Research, Smt. Ratni Devi Purohit Institute, Nagpur on 1st March 2021. The lectures were conducted online through Zoom platform. About 70 students attended these two lectures and actively participated in the discussion. The lecture on "Treasure Foods for Healthy Living" was delivered by Dr. Renuka Mainde, Nutritionist and Educator, Women's Technical Education and Research, Smt Ratni Devi Purohit Institute, Nagpur and the lecture on "Nutrition Beats Pandemic" was delivered by Dr. Kavita Bakshi, Nutritionist and Educator of the same Institute.

Abstract of Treasure Foods for Healthy Living: Lifestyle diseases share risk factors similar to prolonged exposure to three changeable lifestyle habits - smoking, unhealthy diet, and physical inactivity and result in the growth of chronic diseases, especially heart disease, stroke, diabetes, obesity, metabolic syndrome, chronic obstructive pulmonary disease, and some types of cancer. Chronic diseases can result in loss of independence, years of disability, or death, and impose a considerable economic burden on health. Today, chronic diseases are a major public health problem worldwide. World Health Organization (WHO) estimated that 61 per cent of all deaths and the global burden of disease are attributable to chronic

diseases. By 2030, the proportion of total global deaths due to chronic diseases is expected to increase to 70 per cent.

Food is one of the foremost strategies used to reduce the risk of chronic lifestylerelated diseases such as diabetes, dyslipidemia, hypertension, obesity, etc. Functional foods offer great potential to improve health and to some extent help prevent certain diseases when taken as part of a balanced diet and healthy lifestyle. Functional foods are one of the fastest-growing segments of the food industry. In some countries, functional foods have already become part of the dietary landscape. Functional food constituents may be perceived to enhance short-term well-being, the benefits are generally related to the long-term mitigation of certain diseases. Functional foods perform through its bioactive compounds which are found in plants and animal origins. Bioactive compounds are diverse types of chemicals present in small amounts in plants and animal sources (which include fruits, greens, nuts, oils, whole grains, fatty fish to name a few). They have been studied for the prevention of cancer, heart disease, and different diseases. Examples of some of the bioactive compounds are lycopene, resveratrol, lignan, tannins, and indoles. Certain foods, like oats, sprouted fenugreek seeds, vegetarian sources of proteins, beans, lentils, kidney beans, chickpea etc should be included in the diet and also cruciferous vegetables, leafy vegetables, nuts and oils seeds like flax seeds, chia seeds etc. She concluded her lecture by emphasizing the fact that the health and wellness of human beings largely depends upon general lifestyle and the consumption of nutritious foods.

Abstract of Nutrition Beats Pandemic: Entire mankind across the globe is facing a threat due to COVID-19 outbreak as there is no cure yet. We can try to focus on prevention through nutrition in our kitchen by enhancing the body's immune system. Traditional food with full of nutrients that boost our immune system were explained in this lecture.

Proteins, on which our immune system powerhouses such as anti-bodies and immune system cells rely are available from eggs, fish, chicken, mutton, pulses, beans, legumes, nuts and oil seeds, soybeans, cereals and sprouted pulses like mothbean, chickpea mung etc.

Fats, a low fat diet can reduce the development of disease by maintaining normal immune responses. We can consume about 10 gms of pure ghee every day. Oil (rice bran, groundnut) can be consumed up to 500 ml to 700 ml /person /month. Omega-3 Fatty acids-Omega-3 PUFA possess the most potent immunomodulatory activities.

Soluble fiber boosts production of the protein interleukin-4 which stimulates the body infection-fighting cells. Fiber recommended is 25-40 gms/day. A high salt diet is not only bad for one's blood pressure but also for the immune system. WHO recommends about 5 gms a day/per person

Antioxidants are cell damaging free radical scavengers which play significant role in boosting the immune system by formation of antibodies viz. vitamins A,E,C carotenoid which are present in yellow, green fruits and vegetables like papaya,

orange, mango, carrots, spinach etc. Green vegetables like fenugreek, cowpea, chiwal, drumstick leaves, ghol, cauliflower leaves, raddish leaves etc. are also greatly beneficial to immune system.

Local and seasonal foods should be consumed to enhance the immune system. Berries, singahda, guava, amla, jamun, soyabean, masoor dal, whole moong, val, banana, drumstick leaves, fenugreek leaves, ginger, garlic, green chilly, fresh curry leaves, barley, jowar, bajra, matki, rajma, papaya, beetroot, fresh peas, groundnut, pistachio, til seeds, flax seeds, fish, meat, poultry, eggs, milk and milk products, should be included to fulfil the requirements of vitamins and minerals.

Probiotics and Prebiotics help to reinforce the immune system, increase immune responses and promote specific immune signaling. These are curds, yoghurt, fermented food products, garlic, onion, banana, barley, oats, apple, flax seeds and wheat bran. Herbs, condiments and spices are immune boosters possessing antiviral/antimicrobial activity which help to fight infections. These include: ginger, tulsi, neem, lemon grass, turmeric, garlic, pepper, ajwain, cloves, fenugreek seeds, mint, cinnamon, kalonji, star anise etc. Water can do wonders for your body and it also works as an immune system booster.

4. BRNS Popular Science Lecture on "Vaccine Development: The Current Pandemic Scenario" on 5th March 2021

Popular Science Lecture webinar supported by BRNS-DAE was organized by Indian Women Scientists' Association, Nagpur Branch in association with Science Faculty, Kamla Nehru Mahavidyalaya, Nagpur on 5th March 2021. The webinar was conducted online through Zoom platform. About 100 students attended this talk and actively participated in discussion. The lecture was delivered by Dr. Shalini Chahande, Assistant Professor, Department of Biochemistry, S.K. Porwal College, Kamptee, Nagpur on "Vaccine Development: The Current Pandemic Scenario".

Abstract: The world cannot return to normal without safe and effective vaccines against the SARS-CoV-2 coronavirus along with a coordinated global vaccination program. A vaccine prepares a person to fight the infection by training the immune system. Therefore, it is useful to know how the immune system works in order to understand why vaccines are important, and why we were all waiting for one against the novel coronavirus (SARS-CoV-2). Herd immunity comes when majority of the population has been vaccinated against a disease, there will be few people left to whom the infection can spread. This protects the few who have not been vaccinated. The development of a vaccine against COVID-19 has taken place in an unparallel pace. Usually such a process takes years, but the scope of the pandemic triggered round-the-clock work by thousands of researchers working on over 100 different forms of the vaccine. Storage condition of the vaccines is of critical importance. India's drug regulator has given the green signal to Covishield (the local name for the Oxford-AstraZeneca vaccine developed in the UK) and Covaxin, locally made by pharma company Bharat Biotech. COVAX acts as a platform that will support the

research & development and manufacturing of a wide range of COVID-19 vaccine candidates and will negotiate the pricing. By joining COVAX, all participating countries and economies - regardless of their ability to pay - will have access to a portfolio of COVID-19 vaccines. India aims to vaccinate 3 crore healthcare and frontline workers in the first phase.

Pune Branch

1. BRNS Popular Science Lecture on "Radiopharmaceuticals for healthcare" on 6th February 2021

Popular Science Lecture webinar supported by BRNS-DAE was organized by Indian Women Scientists' Association, Pune Branch in association with Chemistry Department of M. E. Society's Nowrosjee Wadia College, Pune on 6th February 2021. The webinar was conducted online through Google Meet platform. About 100 students (limit of Google Meet) attended this talk and actively participated in discussion. The lecture was delivered by Dr. (Mrs.) N. S. Rajurkar, Former Head, Chemistry and Environmental Science Department, Savitri Phule Pune University, Pune on "Radiopharmaceuticals for healthcare".

Abstract: Dr. Rajurkar briefly described the historical background of radioactivity and different units used in the measurements of radiation. She highlighted the progress of nuclear medicines in India. There are 349 AERB approved nuclear medicine centres in India out of which 49 are in Maharashtra and 9 in Pune region. Radiopharmaceuticals are radioactive compounds used in nuclear medicines for diagnosis and therapy of various diseases. General principles for their use, production of Tc-99m which is a work horse of nuclear medicines were discussed. This was followed by description of in-vivo and in-vitro methods of diagnosis using radiopharmaceuticals which included positron emission Tomography, thyroiditis and renogram. The underlying principle for each one of them was also explained. Application of Co-60 and I-125 for radiation therapy in the treatment of cancer were discussed at length. The work carried out by her research group on thyroiditis and development of I-125 radiation source was described. Dr. Rajurkar also talked about precautions to be taken by the patients during diagnosis/treatment and probable effects of radiation therapy. She encouraged the students to consider a career in this novel field. The lecture was very much appreciated by the participants mentioning in their feedback that the lecture was excellent, helpful, precise and informative. Some of them mentioned the lecture encouraged and motivated them towards undertaking research.

Dr.(Mrs.) R.P. Bhadane, Associate professor from Chemistry Department of Wadia College welcomed the participants, introduced the speaker and handled the question –answer session. Dr. Karishma Pardesi, Convener of IWSA, Pune branch gave information about IWSA and briefly explained the activities carried out by IWSA, Pune branch. She appealed the students and staff to be a member of IWSA and participate in various activities. Dr. (Mrs.) D.R. Saxena from Wadia College proposed the vote of thanks mentioning special thanks to IWSA headquarters and IWSA, Pune branch. E-certificates were given to all the participants.

2. BRNS Popular Science Lecture on "Human Pulse Detection System and Pulse Analysis" on 4th March 2021

Popular Science Lecture webinar supported by BRNS-DAE was organized by Indian Women Scientists' Association, Pune Branch in association with Computer Science Department of M. E. Society's Abasaheb Garware College, Pune on 4th March 2021. The webinar was conducted online through Zoom platform. About 200 students attended this talk and actively participated in discussion. The speaker was Dr. S.A.Gangal, former Head, Electronic Science and Instrumentation Science Department, Savitri Phule Pune University. She delivered a lecture on the topic "Human Pulse Detection System and Pulse Analysis".

Abstract: Dr. Gangal described the need for the development of a pulse detection and analysis system and explained relation between the *Tridoshas and Nadi* according to *Ayurveda*. She discussed the relation between this concept and modern Science. Development and characterization of the sensor along with the process of fabrication, characterization and packaging of the sensor was briefed. The signal conditioning circuit, lab view based data acquisition system were explained and the importance of analysis of this data was discussed. The data was validated with the help of *Vaidya*. She mentioned that overall system development requires an interdisciplinary approach. There is a lot of scope for future developments.

Lecture was very much appreciated by the participants and motivated them towards research in this field. Dr. (Mrs.) Neha R. Deshpande, Associate Professor from Computer Science Department of Abasaheb Garware College welcomed the participants, anchored the event and handled the question –answer session. Principal, Dr. P. B. Buchade addressed the gathering, Dr. Karishma Pardesi, Convener of IWSA, Pune branch gave information about IWSA and briefly explained the activities carried out by IWSA, Pune branch. Dr. Nilima Rajurkar, coordinator of popular science lecture series, introduced the speaker. Mrs. Saee Joshi from Abasaheb Garware college proposed the vote of thanks. Certificates of participation were sent to all the participants by e-mail.

3. One-day webinar on "Technology and Life Style in 2021" on 8th March 2021

Indian Women Scientists' Association (IWSA), Pune Branch in association with Skill Development Centre, Savitribai Phule Pune University and Department of Microbiology, Savitribai Phule Pune University had arranged a one-day webinar entitled "Technology and Life style in 2021" on Monday, 8 March 2021. The event was coordinated by Dr. Pooja More, and other EC members of IWSA Pune Branch shared responsibilities. The flyers for the webinar were prepared and circulated to all IWSA members, circulated in college groups including IWSA HQ whatsapp group as well as floated on the university webpage. The webinar was arranged using an online Zoom platform. Around 140 participants from various colleges and research institutes

in and around Pune registered for the event. On an average around 60 -70 participants both men and women were present for each session.

Inaugural Session

• Dr. Pooja More from Skill Development Centre, SPPU welcomed the participants, and anchored the complete event.

• Dr. Nilima Rajurkar, IWSA Pune Branch explained about IWSA and its activities.

• Dr. Karishma Pardesi, Convener, IWSA Pune Branch gave and overview about the theme of the webinar topic and the sequence of talks scheduled for the day.

• IWSA, Pune branch felicitated the IWSA Women Scientists who received awards and honors in 2019- 20 and 2020-21. Dr. Vaishali Ladde, EC Member, IWSA Pune Branch announced the honors or awards received by the women scientists for which they were being felicitated. Following are the scientists who were feliciatated.

Year 2019-2020

✓ Dr. Nilima Rajurkar, elected as President of Marthi Vidnyan Parishad

 \checkmark Mrs. Manisha Bora, Associate Professor, received the best Oral Presentation award at the National Symposium organized by S P College, Pune.

✓ Dr. Aparna Gunjal, Assistant Professor, DY Patil College for being recognized as "The Environmentalists 2019" by the Scire Science in the International Conference of SciCon Series on - In Sync-With Next Generation Biosciences (INGB)-2019 held at Goa.

✓ Dr. Karishma Pardesi –2019-20 Best Oral and Best Poster presentation awards at the National Conference on "Phage-A Boon in Disguise" organized by Abeda Inamdar College Pune Jan. 2020.

Year 2020-2021

✓ Dr. Shweta Jagtap, Assistant Professor, Department of Instrumentation Science, SPPU – elected as " Young Associate " of Maharashtra Academy of Sciences in the year 2020.

 \checkmark Ms. Vijeta Sharma- received the DST- AWSAR award among top 100 research stories selected at national level.

 \checkmark **Dr**. **Karishma Pardesi –** Worked as a Covid Warrior from June - October 2020 at the Covid testing Lab at IISER Pune.

• **Dr. Ameeta Ravikumar**, Head Department of Microbiology, SPPU was the Chief Guest at the inaugural session. She spoke about Angela Merkel the first female Chancellor of Germany in 2005, her Leadership and how she steered the economy. She covered innovation, Industry 4.0 etc. She motivated the women's attendance and urged women scientist to work in science and technology as there is gender disparity.

• Dr. Karishma Pardesi proposed the vote of thanks.

All Invited Talks were coordinated by Dr. Pooja More from Skill Development Centre, SPPU who welcomed each Speaker, gave a short introduction, anchored the event and handled the question – answer session.

Talk 1 - Waste Management by Dr. Ashish Polkade, Bharat Eco Solutions and Technologies (BEST).

Dr Ashish Polkade spoke on developing technologies for microbes for Waste Management. He emphasized different characteristics of Waste. He gave ideas for composting at individual and society level. He showed the different machined designed for Compost and described its advantages and operation. He has number of technology transfer to his credit which he explained. He gave a very strong message as to "Change of attitude towards waste, educate students regarding waste segregation, and save Mother Earth". He asked all to follow the rules and regulations laid by Government as there is lot of waste collected and a lot of pressure on Earth. He also emphasized on number of employment opportunities in Waste management.

Talk 2- Internet of Things in Agriculture by Dr. Varsha Bapat, Asst Professor, Modern College, GK, Pune.

Dr Varsha Bapat explained how on **Internet of Things** (IoT) in Agriculture has come up as a second wave of green revolution. With the exponential growth of world population, according to the UN Food and Agriculture Organization, the world will need to produce 70% more food in 2050, shrinking agricultural lands, and depletion of finite natural resources, the need to enhance farm yield has become critical. Smart farming based on IoT technologies enables growers and farmers to reduce waste and enhance productivity. IoT smart farming solutions is a system that is built for monitoring the crop field with the help of sensors (light, humidity, temperature, soil moisture, crop health, etc.) and automating the irrigation system. The farmers can monitor the field conditions from anywhere. Technology assisted systems including Sensors, Drones, controllers, actuators and Internet connectivity is the driving force for increasing production. Thus, using IoT in agriculture has a big promising future as a driving force of efficiency, sustainability, and scalability in this industry.

Talk 3- Artificial Intelligence in Health by Dr. Vijeta Sharma C-DAC, Innovation Park, Pune

Dr Vijeta Sharma's session was immediately after lunch. She spoke on Power of Al in Health diagnosis for various problems. Al in health care is a boon. Al model can be used in the diagnosis of asymptomatic COVID-19.

Talk 4- Genomics in Women Health, Dr. Amol Raut, CEO, Gene Support and Director, GenOmbio Technologies Pvt. Ltd

Dr Amol Raut discussed Women health issues and the genetic makeup related to it. He emphasized on Obesity, Nutritional deficiencies, PCOS/PCOD, Cancer, Skin Infertility the causes and remedies for it. He educated all the participants on genes. He had put "You are what you Eat". His talk was very informative and interesting as it was related to every woman present there.

Valedictory Session 3.30 - 4.00 pm

• The valedictory session began with a feedback from the participants – MSc students from Department of Microbiology, SPPU- Bilwa Chandekar, Pragati Kadam, and Pratiksha Pansambal expressed that the webinar was very informative, topics covered were different and gave them directions of choosing different career paths. Faculty from college- Ms. Sudhya Adya, Assistant Professor, HV Desai College, Pune and Dr. Aparna Gunjal, Assistant Professor, DY Patil College, Pune also appreciated the overall organization of the workshop and the theme chosen.

• The overview of the workshop was given by Dr. S. A. Gangal.

• Dr. (Capt.) Chitale, Director, Skill Development Centre was the Chief Guest at the session. He spoke on Women Empowerment.

Vote of thanks were presented by Dr. Karishma Pardesi.

Certificates and Feedback forms

e-Certificates made by Dr. Vaishali Ladde which were generated after filling the online google form. Certificates of participation were sent to all the participants by e-mail. Lectures and coordination were very much appreciated by the participants mentioning in their feedback that the lectures were excellent, very helpful, precise and informative and thought provoking. Some of them mentioned the lecture encouraged and motivated them towards employability and expected to have more such seminars.

4. BRNS Popular Science Lecture on "Water Quality – Need of Hour" on 10th March 2021

Popular Science Lecture webinar supported by BRNS-DAE was organized by Indian Women Scientists' Association, Pune Branch in association with Department of Chemistry, Anantrao Thopte College. Bhor, Pune on 10th March 2021. The webinar was conducted online through Google Meet platform. About 100 students (Limit of Google Meet) attended this talk and actively participated in discussion. The speaker was Dr. (Mrs.) Ranjana Badave, Former Senior Chemist, Ground Water Survey and Development Agency. She delivered a lecture on the topic "Water Quality – Need of Hour".

Abstract: Dr. Ranjana Badve discussed the importance of water and its worldwide distribution in the beginning. Then she briefly described about the important points such as classification of water and major water quality issues which covered rural and municipal issues, water management and major water pollutants. Along with drinking water and irrigation water standards she focused on health effects of

contaminants in drinking water. At the end, she discussed about the integrated approach for mitigatory measures towards water quality management. Participants asked several questions about solution for water pollution related to rural areas. The lecture encouraged the students and motivated them to do more research in mitigating water pollution.

Dr. S. K. Nikam, Assistant Professor, Department of Chemistry welcomed the participants and gave information about college infrastructure. Dr. Dhananjay Borkar, Associate Professor and Head, Department of Chemistry, Coordinated the webinar and talked about the purpose of arranging the webinar on water utilization in rural and urban area. Dr. Mohini Gupte, Executive Committee Member, IWSA, Pune branch gave information about Indian Women Scientists Association and briefly explained the activities carried by IWSA, Pune branch. Dr. (Mrs.) N. S. Rajurkar, Former Head, Chemistry and Environmental Science Department, SPPU introduced the speaker. Dr. Prassanakumar Deshmukh, Principal, Anantrao Thopte College in his speech appreciated the IWSA initiative in organizing such wonderful social awareness activity in association with college. He also motivated the students to take up career in this important field. Miss. Komal Shete, Lecturer, Department of Chemistry, conducted the question –answer session. Dr. P.B. Kamble, (Convenor) In-charge, Science Faculty proposed the vote of thanks.

5. BRNS Popular Science Lecture on "Small Changes Big Rewards: Some Case Studies" on 15th March 2021

Popular Science Lecture webinar supported by BRNS-DAE was organized by Indian Women Scientists' Association, Pune Branch in association with Department of Microbiology, Savitribai Phule Pune University, PES Modern College, Shivajinagar and PES Modern College, Ganeshkhind on 15th March 2021. The webinar was conducted online through Google Meet platform. About 100 students (Limit of Google Meet) attended this talk and actively participated in discussion. The speaker was Prof. Smita Zinjarde Director, Institute of Bioinformatics and Biotechnology, Savitribai Phule Pune University, Pune. She delivered a lecture on the topic "Small Changes Big Rewards: Some Case Studies".

Abstract: Prof. Zinjarde briefly described the reasons for focusing on marine microorganisms for various studies. Case studies were focused on a marine microbe *Yerrowia lipolytica*. She encouraged the students to work on simple aspects instead of getting discouraged due to lack of facilities. She emphasized on how small changes i.e. manipulating culture conditions like varied hydrophobic substrate for growth can give big rewards like Novel dimorphic behavior displayed by *Y.lipolytica*. She elaborated on different experiments like biofilm formation, transformation of TNT, cloning and expressing tyrosinase gene in *Y.lipolytica*, magnetic modification for effective chromium ion removal, gold nanoparticle synthesis etc. displayed by the marine yeast. Similarly manipulations like growing *Y.lipolytica* in presence of selenium gave selenium enriched biomass which is used as aquaculture feed. The lecture encouraged the students and motivated them towards research field.

Dr. Rajendra Zunjarrao, Principal of PES Modern college, Shivajinagar welcomed the participants and encouraged students to benefit from the session. Dr. Nilima Rajurkar, EC member of IWSA, Pune branch gave information about IWSA and briefly explained the activities carried out by IWSA, Pune branch. Dr. Ekta Kamble introduced the speaker. Ms. Vanashree Sahasrabudhe was host of the program and handled the question –answer session. Dr. Shilpa Mujumdar from PES Modern college, Shivajinagar proposed the vote of thanks.

6. BRNS Popular Science Lecture on "A Journey of Swayam: Innovation and Startup Cell" on 17th March 2021

Popular Science Lecture webinar supported by BRNS-DAE was organized by Indian Women Scientists' Association, Pune Branch in association with SKN Sinhgad Institute of Technology & Science, Kusgaon (Bk.), Lonavala-410401 on 17th March 2021. The webinar was conducted online through Microsoft Teams platform. About 155 students attended this talk and actively participated in discussion. The speaker was Dr. Manisha Khaladkar, Associate Professor of Chemistry, College of Engineering, Pune. She delivered a lecture on the topic "A Journey of Swayam: Innovation and Startup Cell".

Abstract: Dr. Manisha Khaladkar described how the journey of Swayam satellite was started by College of Engineering Pune (COEP) students in their college. She also explained the specification, goals and objectives of the project. This was India's first passively stabilized pico-satellite of 990 gm weight, made by COEP students. She also explained about the timeline of the project from the initiation of satellite project idea by COEP students in 2009 till the launching of the satellite in 2016. She highlighted the role of faculty and management to make this project successful. She briefly discussed how Swayam satellite is communicating with ground stations. In this mission 176 students from COEP were involved. Now, they are working on their next mission - Solar Sails. The success story of "swayam" was very much encouraging for the students and motivated them to undertake such projects during their graduation, as was reflected in their feedback forms.

Dr. Vaishali Ladde, Head of Innovation and Start up Cell, SKNSITS welcomed all the participants, coordinated the program and handled the question answer session. Dr. M. S, Rohokale, Principal, SKNSITS welcomed the participants and encouraged students to benefit from such sessions. Dr.Nilima Rajurkar, EC member of IWSA, Pune branch and coordinator of 'popular Science lecture series' gave information about Indian Women Scientists' Association and briefly explained the activities carried out by IWSA, Pune Branch. She also introduced the speaker, Dr. Manisha Khaladkar. Dr. Shenbagalakshmi from SKNSITS, proposed the vote of thanks.

52

Roorkee Branch

1. BRNS Popular Science Lecture on "Earthquake Safety – Overview and Challenges" on 20th February 2021

Popular Science Lecture webinar supported by BRNS-DAE was organized by Indian Women Scientists' Association, Roorkee Branch in association with Department of Civil Engineering College of Engineering, Roorkee, Roorkee on 20th February 2021. The webinar was conducted online through Microsoft Teams platform. About 87 students, faculty and IWSA Members attended this talk and actively participated in discussion. The speaker was Dr (Mrs.) Pratima Rani Bose, Head, Engineering and Disaster Management Division & Associate Director, DDF Consultants Pvt. Ltd., Delhi. She delivered a lecture on the topic "Earthquake Safety – Overview and Challenges".

The lecture focused on the importance of earthquake engineering for the structures built-inactive seismic prone areas. The speaker showed the critical role architects and engineers play in every stage of a building project from conceiving to commissioning, including site selection, preparation of conceptual layouts, structural design, seismic detailing, construction, and engineering non-structural elements. The necessity of a strong and resilient infrastructure was also demonstrated to avoid the built environment's poor seismic performance during earthquakes. The lecture also discussed the basics of engineering seismology and elaborated its application in earthquake-resistant structures.

2. BRNS Popular Science Lecture on "38th Indian Scientific Expedition to Antarctica" on 6th March 2021

Popular Science Lecture webinar supported by BRNS-DAE was organized by Indian Women Scientists' Association, Roorkee Branch in association with Department of Chemistry, S.S.D.P.C. Girls (PG) College, Roorkee, Uttarakhand on 6th March 2021. The webinar was conducted online through Google Meet platform. About 101 students, faculty and IWSA Members attended this talk and actively participated in discussion (Number of registered participants were 219). The speaker was Dr. Shweta Sharma, Scientist 'SF', Space Application Centre (ISRO), Ahmedabad, Gujarat. She delivered an exciting lecture on "38th Indian Scientific Expedition to Antarctica (ISEA)".

The Indian Antarctic program was initiated in 1981 with the first Indian expedition to Antarctica. Since then, expeditions have been launched every year and currently 40th scientific expedition is going on. It is controlled by the National Centre for Polar and Ocean Research (NCPOR), Ministry of Earth Sciences, Government of India. Women scientists of ISRO have visited Antarctica under various expeditions and were involved in various scientific activities in and around two Indian permanent stations Maitri and Bharati. Dr. Shweta Sharma was part of 38th ISEA from SAC-

ISRO during 2018-2019 and worked for the establishment of first permanent SAR calibration site at Antarctica along with the successful completion of other scientific objectives. Harsh environment of Antarctica, such as high katabatic winds, blizzards, snowfall, dry atmosphere and low temperature make it difficult to work over there and poses many challenges. In this lecture, Dr. Sharma focused on the work carried out at Antarctica during the 38th ISEA and the memories as well as the challenges faced by the team members during the expedition.

3. BRNS Popular Science Lecture on "Space Explorations in the Search for Life" on 9th March 2021

Popular Science Lecture webinar supported by BRNS-DAE was organized by Indian Women Scientists' Association, Roorkee Branch in association with Chinmaya Degree College, Haridwar, Uttarakhand on 9th March 2021. The webinar was conducted online through Zoom platform. About 100 students, faculty and IWSA Members attended this talk through Zoom and another 100 students attended by watching the webinar from their classroom on the screen and actively participated in discussion. The speaker was Dr Siddharth Pandey, Head, Centre for Excellence in Astrobiology, Amity University Mumbai and Head, Amity Space Centre, Amity University, Uttar Pradesh. He delivered a lecture on "Space Explorations in the Search for Life".

Dr Siddharth Pandey explained about his journey in space research which encompasses several research specializations. His journey started as an Aerospace Engineer and has worked in several space organizations in different countries, including NASA. In his talk, the focus was on, "Is there life in Space? If so, where is it present"? The other questions that he addressed - "How are humans searching for life on other planets? What are the main challenges faced when embarking on such a venture?" The talk's objective was to make the students understand the harsh environments faced by spacecraft as they look for life. He explained the space experiments through simulations and real-time experiments. There are some places on earth like Ladakh in India, which is similar to Mars. Research & Training projects are going on to train personnel to carry out Space research. The stay on other planets cannot be for a more extended period. The training, therefore, helps to achieve more in less time. At the end of the lecture, the students asked several interesting questions about their career in space science, food for astronauts, life in anaerobic conditions and many more. Some of the students wanted to be part of the Space Project in progress at Ladakh, India.

4. BRNS Popular Science Lecture on "Brain Mapping for Goal Mastery" on 13th March 2021

Popular Science Lecture webinar supported by BRNS-DAE was organized by Indian Women Scientists' Association, Roorkee Branch in association with Kanahiya Lal

D.A.V. (P.G.) College, Roorkee on 13th March 2021. The webinar was conducted online through Google Meet platform. About 80 students, faculty and IWSA

Members attended the lecture and actively participated in discussion. The speaker was Dr. Rama Mehta, Retired Scientist D, National Institute of Hydrology, Roorkee,

Brain Energizer & NLP Life Coach, Roorkee. She delivered a lecture on "Brain Mapping for Goal Mastery". Dr. Rama Mehta started her talk emphasizing on goal setting, which is the first step towards the success in life. She said one should keep the GOAL of his or her life to be as high as what one thinks. For achievement of goals, she focused on high thinking skills, without getting disappointed and to work hard to achieve it. It is better to have short term goals and achieve them one by one. Once one of the short term goals is attained, one must celebrate those moments to energize oneself to proceed further. The powers of conscious and subconscious minds were discussed in detail. She explained how the universe supports us in reaching our target if we have higher positive thoughts. She also mentioned that the belief system of a person should be strong, one should always be time bound in order to activate the subconscious mind to execute things perfectly. There should be a coordination between goal, soul and intellects. Towards the end she kept a visualization session to generate the power of self-belief. The lecture was highly informative and it was a wonderful session from the point of view of young aspirants.

BOARD OF TRUSTEES

Dr. Sunita Mahajan Dr.Bakhtaver S. Mahajan Dr. V. Sudha Rao Dr. Devaki Ramanathan Dr.Surekha Zingde

Chairperson Secretary Treasurer Member Member

Articles

Nanomaterials for Harnessing Solar Energy

Prof. Deepa Khushalani Materials Chemistry Group, Dept. of Chemical Sciences, Tata Institute of Fundamental Research, Colaba, Mumbai <u>khushalani@tifr.res.in</u>

Introduction

It is well accepted now that concurrent to the increase in population, India's rapid economic growth has forced us to recognize the challenge of energy supply as nation's top priority. Over last two centuries, most of our energy needs have been fulfilled by fossil fuel sources - initially coal and then natural gas and petroleum [1]. However, the adverse environmental effects arising from carbon dioxide and other pollutants that are released due to fossil fuel sources. Several alternate sources of energy such as wind, solar, hydro and biomass have been explored over the last several decades [2]. Among all these unconventional energy sources, solar energy has emerged as one of the most practical alternatives to conventional non-renewable sources. This is mainly due to the fact that solar energy reaching the earth from sun is massive, i.e. 3×10^{24} J per year or *ca.* is 10^4 times more than what the entire human population currently consumes annually [3].

In terms of effectively exploiting solar energy, there are in fact two main, industrially applicable routes available through which this solar energy can be converted into viable forms of energy suitable for human consumption (there are other ways that are however still in the nascent stage of research and will not be highlighted here, such as thermoelectric behavior). The easiest way of looking at this problem is to think of it as an energy conversion problem - one option is to approach this problem as converting solar energy to an electrical impulse (i.e. electricity) using devices referred to as solar cells [4]. This allows for immediate use of the solar energy in a manner that is conventional and familiar to society at large. Solar cells are devices consisting of multiple chemical layers and the main functioning is based on the photovoltaic effect which is closely related to the photoelectric effect. The principle driving all the solar cells (1st, 2nd and 3rd generation of these devices) stem from absorption of a photon of energy to obtain an excited electron and a hole (charge carriers). The sole aim of the solar cell is to ensure that these excited species do not recombine but instead are separated effectively without loss of energy and are viably extracted from the device (via opposite electrodes) generating electricity [5].

Another popular direction is converting solar energy into some form of stored energy, a technique referred to as photocatalysis [6]. This stored energy is commonly thought

of being stored inside chemical bonds. As such, a molecule is synthesized using the solar energy and this energy is effectively converted into chemical energy yielding 'solar fuels'. The molecule can subsequently be combusted (or participate in another chemical reaction) at a later date to release the energy. One of the main advantages of such route is that the captured energy is stored and can be used at will and perhaps at a different location from where it was captured. Currently, the formation of some of the most common types of solar fuels being researched are hydrogen, methane and methanol [7]. Furthermore, these molecules can not only be used for transport and electricity generation, but also as feedstock in (the chemical) industry.

For the aforementioned applications (Photovoltaics (PV) and Photocatalysts (PC)), nanomaterials have become pervasive components that could contribute substantially to improving the efficacy of these fields. Before proceeding with PV and PC's details, provided below are some basics of Nanostructures that the reader needs to be aware of.

Nanomaterials - Basics

It is commonly known that nanostructures are so versatile exclusively because of their size. The size, which is on the order of 10⁻⁹ meter, lends these structures to have a large surface area. It needs to be clarified however that it is the surface to volume ratio that dramatically increases when you decrease the size. This aspect is clarified in Figure 1 and it can be seen that the absolute value of the surface area is also high for bulk materials, but the amount of material that is exposed to external environment and its' ratio with the "bulk" embedded material (buried inside the particle) increases substantially. So what are the ramifications of this? The main crux of the answer is rooted in the fact that surface species (i.e. surface atoms, surface molecules, surface facets etc.) are not thermodynamically stable. These can be considered to be defects, they are metastable and have high surface energy. Hence because of this instability, the physical and chemical properties of the surface entities are vastly different from the bulk entities. As such, when the particle size gets smaller, the physical and/or chemical properties of the surface species come to forefront (and the bulk properties are suppressed) and the entire nanostructure now showcases new behavior. This behavior is also size dependent - that is to say the properties are tunable with size. Properties of a 50 nm particle will show different physical and chemical behavior when compared to, say, a 5 nm particle of the same stoichiometry. Some popular properties that are well known are e.g. the color of Au nanoparticles varies with size (bulk gold is yellow whereas nanoparticles of gold vary have shades of purple), the color of very small semi-conductors also vary (this due to quantum effects where the band gap of a semi-conductor can be altered at will depending on its size). Nanostructures also show tunable mechanical properties (e.g. stiffness, strength, ductility, hardness, toughness, etc.), physical properties (e.g. density, magnetic susceptibility, thermal conductivity, etc.), chemical properties (e.g.

reactivity, corrosion resistance in various environments *etc.*) and manufacturing properties (*e.g.* formability, machinability, ease of joining, *etc.*) Since all these can be tuned, it has allowed researchers the incredible flexibility to maintain a certain

preferred stoichiometry and simply change the size of the material to alter their behavior.



Figure 1. For particles, surface area values *vs.* volume are depicted showing how the percentage of the surface atoms dramatically increases when particle is size is decreased to nanometer level.

Nanostructures for Solar Energy Harvesting

As mentioned above, there are two popular ways of exploiting sun's energy effectively. The first such application is in the area of Photovoltaic. Solar cells are devices consisting of multiple chemical layers and the main functioning is based on the photovoltaic effect which is closely related to the photoelectric effect. The principle driving all the solar cells stems from absorption of a photon of energy to obtain an excited electron and a hole (charge carriers). The sole aim of the solar cell is to ensure that these excited species do not recombine but instead are separated effectively without loss of energy and are viably extracted from the device (via opposite electrodes) generating electricity. A conventional solar cell consists of multiple layers and main function of these layers are to (1) Absorb as much of the sunlight as possible (b) convert that absorbed photon into and excited electron/hole free carrier (c) transfer this 'excited state' out of the absorber layer and transfer it out of the device via the electrodes (excited electron goes to anode and the hole goes to the cathode) and this all needs to be done spontaneously, without loss of too much of the energy that has been captured. Therefore, nanostructures contribute to this functioning substantially as (a) the nanostructures (with their tuneable absorption), allow a large of part of sunlight to be absorbed easily, (b) the different layers (electron transport layer and hole transport layer) are normally made of nanometre thickness so that the carriers can easily travel the short distance and be transferred out (without recombining), (c) when a material is made on a nanoscale, aspects such

ľ

as crystallinity, work function, charge carrier density, charge carrier mobility/lifetime, electronic structure (direct/indirect band), and band alignments for a heterojunction system can be manipulated so that the efficiency of the solar cell improves (d) the surface roughness at a nanometre level allow for increased internal scattering of light

that allows for further improvement in absorption of photons, and finally (e) The entire device needs only small amounts of materials, so that it is relatively cheap to make.

With respect to photocatalysis, this application derives its inspiration from photosynthesis, where sunlight is used to convert CO_2 to glucose and H_2O , Eq. 1a. In PC, a catalyst (akin to chlorophyll) is used to drive a chemical reaction such as splitting of water to from H_2 (a popular solar fuel), Eq. 1b. Note the similarities between these two equations as both are endothermic reactions (i.e. they need energy) and both convert benign chemicals into chemicals that 'store' energy.

 $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$ (1a)

 $2H_2O \rightarrow 2H_2 + O_2$ (1b)

As the name intimates, a photocatalyst is a material that is able to increase the rate of a reaction, however, only when specifically activated by either UV or visible electromagnetic radiation [8]. Two important aspects underlay the central tenet in photocatalysis: the catalyst must be able to absorb photons (preferably with a large range of energies) and also must be able to adsorb reactants onto its surface. Therefore, light absorbing structures such porphyrins, dyes, semi-conductors, conjugated polymers etc. have been exploited for this purpose. The rationale behind this is that, when light absorbing molecules or a large band-gap semi-conductor absorbs photon, the system undergoes a transition, whereby electrons from a filled valence band (or HOMO) are promoted to an empty conduction band (or LUMO). Although this is applicable to a large variety of materials, the crux of the principle lays in the fact that (1) the carriers generated (electrons and holes) must not recombine, (2) the chemical potential of these carriers must be commensurate with the chemical reactions that are to be eventually initiated (excited electrons participate in reduction and excited holes participate in the oxidation reactions), and (3) as such, the carriers must be prevented from recombining (usually a fast process), and instead be allowed to diffuse to the surface (usually a slower process) where a subsequent generation of crucial reactive radicals are formed. Fig. 2 displays the components in splitting of water when a solid-state semi-conductor is used.

It can be appreciated hopefully by now by the reader that nanostructures can offer substantial properties to improve the rates of photocatalysis. The main aspect is that properties can be tuned once a semiconductor has been decided upon. The ensuing material needs to have a suitable thermodynamic potential for water splitting, a sufficiently narrow band gap to harvest visible photons, the diffusion of the excited carriers (electrons and holes) must be substantial and commensurate with each other, recombination or trapping of these species must not occur and stability against photo corrosion is necessary. All of these can be altered by simply changing the size. Hence for PC, Nano catalysts have become pervasive and continue to drive this field in very exciting new directions.

Conclusion

In summary, regardless of the directions that researchers are currently pursuing, it behoves us, the society, to at least realize and appreciate that the creation of a clean and affordable energy supply is paramount to the survival of our species and as such the development of efficient and cheap photovoltaics and photocatalytic water splitting systems is imperative. These methods for harnessing and converting solar energy should be a major objective for the current and future generations and currently to do this under ambient conditions is one of the greatest challenges facing scientists in the twenty-first century.



Fig. 2 Use of a solid state semi-conductor for photocatalytic splitting of water [9]. Reprinted with permission from Reference 9. Copyright 2021 American Chemical Society.

References

- 1. R Singh, Energy sufficiency aspirations of India and the role of renewable resources: Scenarios for future. *Renewable & Sustainable Energy Reviews*, Vol. 81 No. 2, 2783-2795, 2018.
- 2. S. Jebaraj and S. Iniyan, A review of energy models. *Renewable & Sustainable Energy Reviews,* Vol. 10 No. 4, 281-311, 2006.
- 3. Y. Chu. Review and Comparison of Different Solar Energy Technologies. Global Energy Network Institute, 2011.

- 4. A. Goetzberger, C. Hebling, H.W. Schock, Photovoltaic materials, history, status and outlook, *Materials Science & Engineering R-Reports*, Vol. 40 No. 1, 1-46, 2003.
- 5. M. Gratzel, Solar energy conversion by dye-sensitized photovoltaic cells, *Inorganic Chemistry*, Vol. 44 No. 20, 6841-6851, 2005.
- 6. D. Gust, T.A. Moore, A.L. Moore, Solar Fuels via Artificial Photosynthesis, *Accounts of Chemical Research*, Vol. 42 No. 12, 1890-1898, 2009.
- 7. N.S. Lewis, D. G. Nocera, Powering the planet: Chemical challenges in solar energy utilization, *PNAS*, Vol. 103 No. 43, 15729-15735, 2006.
- 8. I. Roger, M. A. Shipman, M. D. Symes, MD Earth-abundant catalysts for electrochemical and photoelectrochemical water splitting, *Nature Reviews Chemistry*, Vol. 1 No. 1, 2017.
- 9. K. Maeda and K. Domen, Photocatalytic Water Splitting: Recent Progress and Future Challenges, *J. Phys. Chem. Lett.* Vol. 1, 2655–2661, 2010.



Dr. Deepa Khushalani is a Materials Chemist and her area of expertise involves synthesis, characterization and application of a variety of inorganic structures such that (1) the morphology, phase, and size are carefully manipulated so that there is precise control over homogeneity and compositional purity, (2) the ensuing materials are applied in areas exploiting alternate sources of clean energy involving photovolatics and energy storage devices. Her group also works on drug delivery devices, photocatalysis and electrocatalysis. She has been

extensively involved in Science Outreach and actively promoted basic sciences within rural and economically deprived areas of India. She has given several workshops/lectures and mentoring sessions

Savitri Bai Phule (3 January 1831 – 10 March 1897)

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

by Ms. Arpita Salvi, Librarian, IWSA Library

Savitri Bai Phule was an Indian social reformer, educationalist, and poet from Maharashtra. She is regarded as the first female teacher of India. Along with her husband, Jyotirao Phule, she played an important and vital role in improving women's rights in India. She is regarded as the mother of Indian feminism. Phule and her husband founded one of the first Indian girls' school in Pune, at Bhide wada in 1848. She worked to abolish the discrimination and unfair treatment of people based on caste and gender. She is regarded as an important figure of the social reform movement in Maharashtra. A philanthropist and an educationist, Phule was also a prolific Marathi writer.

Early life: Savitribai Phule was born on 3 January 1831 in the village of Naigaon in Satara District, Maharashtra. Her birthplace was about five kilo meters from Shirval

and about 50 kilo meters from Pune. Savitribai Phule was the eldest daughter of Lakshmi and Khandoji Nevase Patil, both of whom belonged to the Mali Community. Savitribai and Jotirao had no children of their own. It is said that they adopted Yashawantrao, a son born to a Brahmin widow. However, there is no original evidence available yet to support this.

<u>Education</u>: At the time of her marriage Savitribai was an illiterate. Jyotirao educated Savitribai at their home. After completing her primary education with Jyotirao, her further education was the responsibility of his friends, Sakharam Yeshwant Paranjpe and Keshav Shivram Bhavalkar. She also enrolled herself in two teacher's training programs. The first was at institution run by an American missionary, Cynthia Farrar, in Ahmednagar. The second course was at a normal School in Pune. Given her training, Savitribai may have been the first Indian woman teacher and headmistress. Savitribai's birthdate, 3 January, is celebrated as Balika Din in the whole of Maharashtra, especially in Girl's Schools.

Career : After completing her teacher's education, Savitribai Phule started teaching girls at the Maharwada in Pune. She did so alongside Sagunabai who was a revolutionary feminist as well as a mentor to Jyotirao. Not long after beginning to teach with Sagunabai, Savitribai and Jyotirao Phule along with Sagunabai started their own school at Bhide Wada. Bhide Wada was the home of Tatya Saheb Bhide, who was inspired by the work that the trio was doing. The curriculum at Bhide Wada included traditional western curriculum of mathematics, science, and social studies. By the end of 1851, Savitribai and Jyotirao Phule were running three different schools for girls in Pune. Combined, the three schools had approximately one hundred and fifty students enrolled. Like the curriculum, the teaching methods employed by the three schools differed from those used in government schools. The author, Divya Kandukuri believes that the Phule methods were regarded as being superior to those used by government schools. As a result of this reputation, the number of girls receiving their education at the Phule's schools outnumbered the number of boys enrolled in government schools.

Unfortunately, Savitribai and Jyotirao Phule's success came with much resistance from the local community with conservative views. Kandukuri states that Savitribai often travelled to her school carrying an extra sari because she would be assailed by her conservative opposition with stones, dung, and verbal abuse. The Phules faced such strong opposition because of the conservative (Brahmin) and marginalized caste to which they belonged. The <u>Sudra</u> community had been denied education for thousands of years. For this reason, many Brahmins began to oppose Jyotirao and Savitribai's work and labeled it as "evil". This uproar was always instigated by the upper castes. Up until 1849, Savitribai and Jyotirao Phule were living at Jyotirao's father's home. However, in 1849, Jyotirao's father asked the couple to leave his home because their work was considered a sin as per the Brahmanical texts.

<u>Death</u>: Savitribai and her adopted son, Yashwant, opened a clinic to treat those affected by the worldwide Third Pandemic of the bubonic plague when it appeared in the area around Nalasopara in 1897. The clinic was established at stern outskirts of Pune, in an area free of infection. Savitribai died a heroic death trying to save the son of Pandurang Babaji Gaekwad. Upon learning that Gaekwad's son had contracted the Plague in the Mahar settlement outside of Mundhwa, Savitribai Phule rushed to his side and carried him on her back to the hospital. In the process, Savitribai Phule caught the Plague and died at 9:00 pm on 10 March 1897.

iii.

Poetry and other work: Savitribai Phule was also a prolific author and poet. She published Kavya Phule in 1854 and Bavan Kashi Subodh Ratnakar in 1892, and also a poem entitled "Go, Get Education" in which she encouraged those who are oppressed to free themselves by obtaining an education.

Legacy :

- 1. In 2015, the University of Pune was renamed as Savitribai Phule Pune University in her honour.[[]
- 2. On 10 March 1998 a stamp was released by India Post in honour of Phule.
- 3. On 3 January 2017, the search engine Google marked the 186th anniversary of the birth of Savitribai Phule with a Google doodle.^{[14][15]}
- 4. Along with B. R. Ambedkar and Annabhau Sathe, Phule has become an icon in particular for the backward classes. Women in local branches of the Manavi Hakk Abhiyan (Human Rights Campaign, a Mang-Ambedkarite body) frequently organise processions on their jayanti (birthday in Marathi and other Indian languages).
- 5. A Kannada biopic movie was made about Phule in 2018^I and in 2020 the Indian Prime Minister paid tribute to her contribution on her birthday.

Sr. No.	Title	Author	Publisher	Acc No.
1	Savitribai Phule Marathi	S. Patil	Ajab Distributor	
	Vyakaran, Nibandhmala aani Kalpana Vistar		Kolhapur	
2	Dnyanjyoti Savitribai Phule	U. Khandare	Komal Prakashan	4536

We have following books of Savitribai Phule at IWSA Library.



Ms. Arpita Salve completed her MLib & ISc (Masters in Library and Information Science) and worked with Hiraben Nanavati Institute of Management, Pune before joining IWSA Library.

We Salute these Women Achievers

1. Particle physicist Rohini Godbole conferred with French Order of Merit

Indian physicist and Padma Shri awardee Prof. Rohini Godbole has been conferred with the Ordre National du Merite, one of the highest distinctions granted by France to honour eminent persons. Dr. Rohini Godbole is a professor at the Centre for High Energy Physics in the Indian Institute of Science (IISc), Bangalore. She has been recognized by France, not only for her contributions to the collaborations between France and India but also for her work in promoting the visibility of women in science.

Ordre National du Mérite is a French honour to reward "distinguished merit" order of merit with membership awarded by the President of the French Republic. Prof. Godbole has now joined the league of Indians awarded this honour, which includes Dr Indira Nath, former founder head of the department of biotechnology at the All India Institute of Medical Sciences, who received the Chevalier Ordre National du Merite, and Prof. Govardhan Mehta, professor, School of Chemistry University of Hyderabad, who received the Légion d'honneur.

Born in Pune in 1952, Godbole completed her BSc (Physics) from the University of Pune, securing the first rank. She went on to complete her MSc from the Indian Institute of Technology-Bombay,in 1974. Having secured the first rank again, she was the recipient of the institute's silver medal. Godbole completed her PhD from the Stony Brook University, New York, USA. Prof. Godbole is also an elected fellow at the National Academy of Sciences, India (NASI), Academy of Sciences of the Developing World, The World Academy of Sciences (TWAS) and the Indian National Science Academy.

According to Prof. Godbole, "We need more women role models in STEM (Science, Technology, Engineering and Mathematics) to normalize the concept that one's career or opportunities do not have anything to do with gender. This message is not just to young women but young men as well. We need to build a world where the society shouldn't intuitively think that a scientist is a man".

Best known for her work for CERN, the European Organization for Nuclear Research, Prof. Godbole has been actively involved in various policy measures to increase the visibility of women in STEM. She is the co-author of the book Lilavati's Daughters, a collection of biographical essays on women scientists from India. Her talks at various colleges and schools on the importance of taking up science as a profession has encouraged many women scientists to follow in her footsteps. **Dr. Godbole ia a member of IWSA.**

Particle physicist Rohini Godbole conferred with French Order of Merit | Hindustan Times dated 25th January 2021

2. Swati Mohan, Indian-American scientist who led charge to land Nasa rover on Mars.

When Nasa landed its Mars rover Perseverance on the Martian surface, it was an Indian-American handling the controls and landing system. Dr. Swati Mohan spearheaded the attitude control and landing system of the Perseverance rover that navigated a particularly difficult touchdown. The National Aeronautics and Space Administration's (NASA) Perseverance rover successfully touched down on the surface of Mars after surviving a blazing seven-minute plunge through the Martian atmosphere. Dr. Swati Mohan has been associated with the Perseverance Mars mission since its inception and has been working on the project for over seven years. She has also worked on Nasa's Cassini mission to the Saturn. As the world watched Perseverance make a dramatic and difficult landing on the Martian surface, Dr. Swati Mohan steered through the operations in her calm and composed self. After working on several Nasa projects, Swati Mohan spearheaded one of its most ambitious missions to bring back rocks from Mars to find signs of ancient life on the Red Planet.

Dr. Swati Mohan immigrated to the US from India at age 1, was inspired by Star Trek at 9, then earned a B.S from Cornell in mechanical and aerospace engineering, and an M.S. and Ph.D from MIT in aeronautics.

3. Woman of many Heights – Air Marshal Padmavathy Bandopadhyay

Following the end of the Sino-Indian war of 1962, which cost India about 13,454 soldiers, a song Aye Mere Watan Ke Logo caused a wave of patriotism across the nation. Every young man and woman wanted to join the Indian defense forces upon hearing the song that commemorated Indian soldiers who died during the war, among them is India's first woman Air marshal Dr Padmavathy Bandopadhyay. Having joined the Indian Air Force (IAF) in 1968, she is the second woman in the Indian armed forces to be promoted to a three-star rank and to be conferred with the highest degree of armed forces awards, including the Param Vishisht Seva, Ati Vishisht and Vishisht Seva Medals.

Today, the retired officer continues to give her medical and education services to underprivileged children of Eastern Uttar Pradesh, which led the Indian Government to award her India's civilian honour — the Padma Shri. Dr. Padmavathy Bandopadhyay is the first defense officer to receive a civilian award in India as armed forces are not eligible for civilian honours. "I am humbled to receive this award. It's very rare that a defense officer gets a civilian award, but I think this is not for the work of one or two days, but of the lifetime," says Dr. Bandopadhyay, who was also a medical officer during the Indo-Pakistan War of 1971.

Hailing from a middle-class Tamil family from Tirupati, it was not easy for Dr. Bandopadhyay to break the glass ceiling. At the age of three, she learnt to cope up with her ailing mother until the age of 13. It was after she cleared the 10th standard board examination that she decided to become a doctor. Back in the 60s when Dr. Bandopadhyay became a doctor, her male friends in the neighbourhood joined the Indian Army, which subsequently changed the course of her life. However, becoming an officer was not an easy task. At the time when very few women would think of joining defense forces, Military Nursing Service (MNS) was the only option for her. She learnt about Armed Forces Medical College (AFMC) in Pune. Dr. Bandopadhyay not only became a doctor but also successfully completed her training as a medical officer of the armed forces.

An aviation medicine specialist, Dr. Bandopadhyay, in her 37 years of service worked for the betterment of armed forces. She has done high altitude and aeromedical research which is path-breaking for the soldiers in adverse conditions. While the entire country is rolling over discrimination towards women in defense forces, Dr. Bandopadhyay — despite facing initial challenges of no maternity leaves and any casual leaves — denies the notion of inequality."There is nothing like woman and man there. You are an officer. I was the first batch of women to join armed forces, there was no provision for maternity leaves, but I have managed my deliveries and children. Everything takes time to change," she says, adding that one needs to prove the capabilities to be able to earn respect in forces.

https://www.deccanchronicle.com/sunday-chronicle/cover-story/010420/woman-of-many-heights.html



Dr. Rohini Godbole Conferred French Order of Merit



Dr. Swati Mohan, NASA



Air Marshall Padmavati Bandopadhyay

66

Women Achievers from IWSA

Dr. Niranjana Chavan is listed among top International Agricultural Scientists

Dr. Niranjana Suneel Chavan is 'Adjuct Professor' in Department of Botany, Shivaji University, Kolhapur, and Convenor of IWSA Kolhapur Branch. Recently, in 2021, A D



Scientific Index published a list of 5 lacs scientists at international level among 167 countries. For this, they considered the scientist's research papers, h index, i10 index and citations of publications. Dr. Niranjana Chavan is one of the scientists who acquired a position in this list under the field of Agriculture/Forestry & Plant Sciences. We congratulate her for this achievement.

Obituary

Dr. V. Shanta (11th March 1927 - 19th January 2021)



Dr. Viswanathan Shanta was an Indian Oncologist and Chairperson of Adayar Cancer Institute, Chennai. She is known for her efforts towards making affordable and quality cancer treatment to all cancer patients in the country. Her pioneering work was in organizing cancer care, understanding the disease, it's prevention

and treatment and training specialists and scientists in different specialties in oncology. She was born in a distinguished scientific family which included two Nobel laureates - Dr. C. V. Raman (Grand Uncle) and Dr. S. Chandrasekhar (Uncle). She did her MBBS from Madras Medical College in 1949 and did her MD in 1955. She joined Adayar Institute in 1955 and spent 60 years of dedicated service until her death in 2021. She was the Director of Adayar Cancer Institute from 1980 to 1997. She was also a member of several national and international committee including WHO's advisory committee on health. Dr. Shanta, an elected fellow of the National Academy of Medical Sciences was a recipient of prestigious national awards Padma Shri (1986), Padma Bhushan (2006) and Padma Vibhushan (2016). Dr. Shanta was also recipient of Ramon Magsaysay Award in 2005. She has published about 100 papers in international journals, contributed chapters in oncology books and delivered many lectures in conferences. Her mission was to strive for affordable cancer care which found excellent results.





Science Utsav Conference 6th February 2021

←

 \rightarrow

SIESCOM - IWSA Internship Program 4th March 2021



Learning Garden Member Enrichment Program



13th January 2021



27th January 2021



10th February 2021



iii.



24th February 2021



10th March 2021

69



Teaching Aids Prepared by ECCED Students





Hostel Day Celebration on 9th January 2021

Republic Day Celebration on 26th January 2021

Some Pictures from Scholarship Awards Function













Activities from IWSA Branches



27th February 2021 Amravati Branch



BRNS Lecture on 9th March 2021 Amravati Branch



International Women's Day Celebration on 9th March 2021 Amravati Branch



BRNS Lecture on 2nd March 2021 Bengaluru Branch

Kalpakkam Branch



International Women's Day Celebration on 8th March 2021 Bengaluru Branch





20th March 2021 Bengaluru Branch



13th March 2021 Kolhapur Branch


BRNS Lecture on 16th March 2021 Kolhapur Branch

G5jUk0yU21JaW0ya01mTTFPUT09



BRNS Lecture on 20th March 2021 Kolhapur Branch



BRNS Lecture on 5th March 2021 Nagpur Branch



BRNS Lecture on 17th March 2021 Kolhapur Branch



BRNS Lecture on 11th February 2021 Nagpur Branch



BRNS Lecture on 6th February 2021 Pune Branch



Karve Road, Pune 411004 Weihar on "Human Pulse Detection System and Pulse Analysis" by Dr. Shashikala A. Gangal Former Head, Oppartment of Electronic Science, Savitibal Punie Pune University, Pune 411007 Session will be held through Zoom

Thursday 4th March,2021 at 3:00 pm Register Free @ https://forms.gle/JskFTo7baQGtWJQk6 Zoom meetine link will be shared on registered email ID

> BRNS Lecture on 4th March 2021 Pune Branch



BOOK POST

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



BRNS Lecture on 13th March 2021



Students from New Horizon Public School, Panvel explaining their model of Dialysis Machine at the Science Day Celebration on 26th February 2021

То

From

Ξī.

IWSA Head Office Plot No.20, Sector 10A Dr. Mar Theophilus Road, Vashi Navi Mumbai: 400703 Tel: 27661806, Email: <u>iwsahq@gmail.com</u> Website: <u>www.iwsa.net</u>

Published by Dr. Lalitha Dhareshwar, President, IWSA, Plot No.20, Sector 10A,Vashi, Navi Mumbai 400703. Editor Dr. Shyamala Bharadwaj.