

বসু বিজ্ঞান মন্দির
बसु विज्ञान मन्दिर

BOSE INSTITUTE Newsletter



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A NEWSLETTER OF BOSE INSTITUTE



FROM THE DIRECTOR'S DESK

I wish to heartily congratulate all the students, Deans, Heads/Chairpersons of the Departments/Divisions/Sections, faculty members and staff of Bose Institute by unveiling this edition of Newsletter of the Institute.

Notwithstanding the devastating effects of COVID-19 and pandemic-driven hardship, disruption and other ancillary vulnerabilities, the students and faculty members of the Institute have made significant contribution to meet the research needs of the Institute as well as to the repository of scientific knowledge of

the country by their dedicated endeavours. They have successfully utilized their capacity/performance, efficiently managing their knowledge through their experiences, empirical study/observations/success, failures and learning over time, to augment the very base of research and development of the Institute and moved towards fulfilment of the objectives set by our iconic founder Acharya Jagadish Chandra Bose.

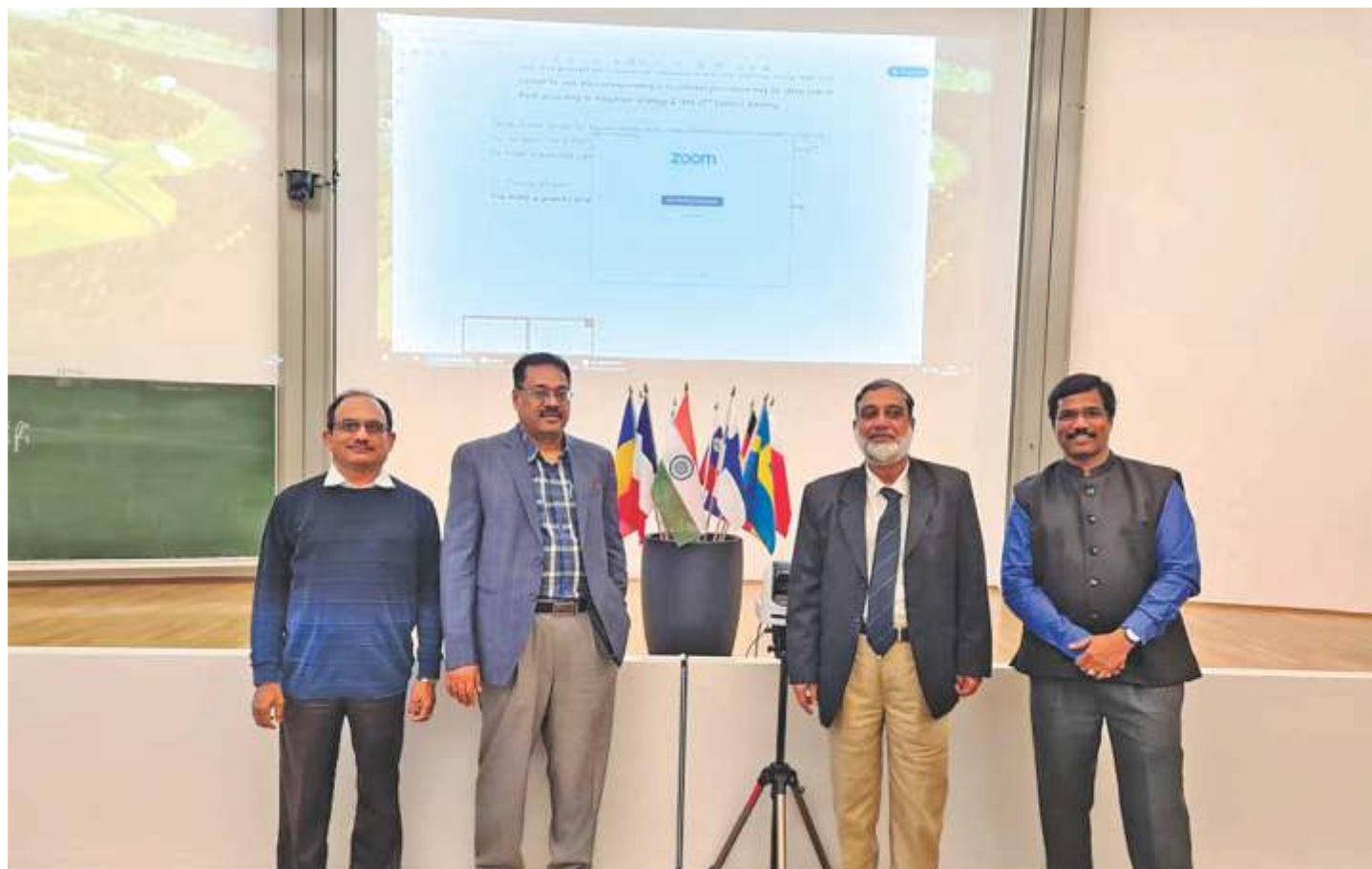
It is praiseworthy to mention the major accomplishments of the Institute in the fields of (i) *Microbes and Microbiome* (ii) *Diseases, Therapeutics and Drug Target*

Editorial Board

Members of J. C. Bose Center
(Comprising Publication and Museum Unit)

Published by

Registrar (Officiating), Bose Institute
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(iii) Structure Function and Dynamic of Protein (iv) Plant Development, Stress and Yield (v) Biological Systems, Information and Networks (vi) High Energy and Nuclear Physics (vii) Physics of Material and Quantum Systems (viii) Climate Change, Aerosol and cloud Formation.

During the year 2021-22, Bose Institute had published 202 numbers of full length peer reviewed research papers in referred journals and 20 Books/Book Chapter/Invited Reviews. The Institute had produced 15 Ph.D. students and trained 28 research manpower (B.Tech., M.Tech., M.Sc., Diploma etc.) who are successfully leading their professional lives all over the globe.

Bose Institute has always played pioneering role in catalyzing frontier research with tangible global impact. Our active involvement in overseeing the designing, manufacturing and supply of in-kind items (e.g. power converters, beam stoppers etc.) for accelerator and coordinate participation of Indian scientists in the experiments at FAIR, Germany under the project entitled “India’s participation in the construction of Facility for Antiproton and Ion Research (FAIR) at Darmstadt, Germany”, turning this mission into reality. It is also noteworthy to mention that this in-kind endeavour is boosting the financial growth of different indigenous organizations/ companies, invigorating the financial stability of the country as well as industry and science holistically. Different Indian companies are attracted by the foreign investors to provide various in-kind items.

Bose Institute has been successfully pursuing research on High Energy Physics – Understanding of Sub-atomic

Particles, Quantum Information and Communication, Understanding of Response of Plants under Biotic and Abiotic Stress, System and Synthetic Biology, Environmental Microbiology and Climate Change, Structure and Functions of Macromolecules, Bioinformatics, Bioorganic Chemistry for Drug Development, Identification of Drug Target and Validation of Bioactive Molecules for Therapeutic Intervention etc. It is significant to mention that we are always catalysing frontier research in the field of Biomedical Sciences and venturing to find out a new molecules and targets for preventing/curing diseases like Cancer, Alzheimer, Diabetes, Malaria, Tuberculosis and many infectious diseases. I take pleasure to inform you that our Institute is also aligned with different projects of Government of India and associated with a number of projects/mega projects that are completely aligned with the mandate of Department of Science and Technology, Government of India.

Asserting various national and global collaborations with Bose Institute, we may cite:

FAIR, Darmstadt, Germany: Facility for Anti-proton Ion Research (FAIR) - participate and oversee the designing, manufacturing and supply of in-kind items (e.g. power converters, beam stoppers etc.) for accelerator and coordinate participation of Indian scientists in the experiments at FAIR; Compressed Baryonic Matter – Muon Chamber (CBM-MuCh): Compressed Baryonic Matter (CBM) experiment will study and characterize the matter created in the relativistic nucleus-nucleus collisions

at FAIR. A large section of the Muon Chamber (MuCh) detector system will be built at Bose Institute in addition to the development of analysis tools and analysis of data from this experiment; A large ion collider experiment (ALICE): a dedicated heavy ion collision experiment at Large Hadron Collider (LHC) at CERN, Switzerland for the understanding of physics of strongly interacting matter at very high energy densities; National Carbonaceous Aerosols Programme (NCAP) WGIII: Carbonaceous Aerosols Emissions, Source appointment and Climate effects with IIT Bombay and 16 others; Bose Institute has been participating in the National Network program "Metflux" of MoES, Govt of India. Investigation on "Eastern Himalayan coniferous forest: Source or sink of Greenhouse Gases"; Bose Institute has been actively participating in National Mission on Strategic Knowledge for Climate Change (NMSKCC), DST since 2018. We are working on "Relative role of biogenic and anthropogenic air pollutants on cloud formation over eastern Himalaya"; National clean air program: NCAP (MoEFCC, Govt of India) Strategic action plans to mitigate air pollution state-wise. Bose Institute is the Nodal Institute and Dr. Abhijit Chatterjee, ESS is the Nodal Faculty for West Bengal; The Plant Germplasm Registration Committee of the Indian Council of Agricultural Research certified the germplasm R6 of Sesame (INGR22090) developed by Prof. Gaurab Gangopadhyay, Division of Plant Biology, Bose Institute and preserved it in their repository.

So many lectures/colloquia/webinars/seminars/symposia through hybrid mode were hosted/ organized by the Institute. To name a few are:

Prof. Amitava Raychaudhuri, Emeritus Professor, Department of Physics, University of Calcutta, delivered Professor D M Bose Memorial Lecture 2021 on "Musings on Mass" on 26-11-2021, the 137th Birth Day of Professor Debendra Mohan Bose; Prof. Gautam R. Desiraju, Honorary Professor, IISC, Bangalore, delivered the 82nd Acharya Jagadis Chandra Bose Memorial Lecture on "Science & Society, What does Bose Institute owe them?" on the 105th Foundation Day Celebration of Bose Institute on 30-11-2021; Prof. Ranjith Padinhateeri,



IIT, Bombay delivered a colloquium talk on "Physical models to Understand chromatin assembly and inheritance of epigenetic information" on 26-08-2021; BIC Webinar-VIII on 29-05-2021: Current Research Trends in Bioinformatics- From basics to applications: (a) Dr. Debasree Sarkar, Emory University, School of Medicine, Atlanta, Georgia delivered a talk on "Single Cell RNA-Sequencing of Diabetic Foot Ulcers as a basis for understanding wound healing process" (b) Dr. Sohini Chakraborty, NYU Grossman, School of Medicine, New York, USA delivered a talk on "Cellular heterogeneity in hematopoietic stem cell aging" (c) Dr. Atanu Maity, IIT, Bombay delivered a talk on "Staple diet for entropic penalty of protein-peptide binding"; DMM Seminar Series organised by Prof. Kaushik Biswas, Division of Molecular Medicine: (a) Dr. Somnath Dutta, Molecular Biophysics Unit, IISC Bangalore delivered a talk on "Cryo-EM reveals the allosteric activation mechanism of Mtb Cystathionine- β -synthetase" on 22-06-2022; (b) Dr. Anirban Banerjee, Senior Investigator, NICHD, NIH Bethesda, Maryland, USA delivered a talk on "How the fat gets on proteins - structure and mechanism of enzymes that catalyze protein palmitoylation" on 07-07-2022; (c) Prof. Barsanjit Mazumder, Centre for Gene Regulation in Health & Disease, Cleveland State University, OH, USA delivered a talk on "A translation control-dependent novel route of communication between SARS-CoV-2 and human lung cells: A new paradigm of potential self-regulation of





the virus"; (d) Dr. Apratim Chatterji, Physics Department, IISER, Pune delivered a talk on "Inducing organization in intrinsically disordered polymeric systems: lessons from bacterial chromosomes" on 03-08-2022; (e) Dr. Debabrata Biswas, Molecular Genetics, CSIR-IICB delivered a talk on "Understanding of Eukaryotic Transcriptional Regulatory Mechanisms Involving Super Elongation Complex and Its Implications in MLL Fusion-mediated Leukemogenesis" on 17-08-2022; BIC Webinar-X on 22-06-2021: Perspectives on SARS-COV2: Prof. Syamal Roy, Emeritus Scientist, CSIR-IICB, Kolkata delivered a talk on "Paradise Lost" to "Paradise Regained"- a long haul to know many unknowns about SARS-CoV2; BIC Webinar-XI on 14-09-2021: In-silico Approaches for Cancer Therapy: Prof. G.P.S. Raghava, Head & Professor, Dept. of Computational Biology, IIIT-Delhi delivered a talk on "Computer aided solutions for managing Treatment of Cancer"; BIC Webinar-XII on 25-10-2021: Dr. Dipyaman Ganguly, CSIR-IICB, Kolkata delivered a talk on 'May the force be with you': Piezol for mechanosensing in immune cells.

As a part of the celebration of 75th year of Independence "AZADI KA AMRIT MAHOTSAV", Bose Institute organized lectures such as (i) November 8-20, 2021: "IV ALICE-India School on Quark-Gluon Plasma" -organized by The High Energy Physics group of the Department of Physics, Bose Institute (ii) November 17, 2021: Keynote Lecture on "The Brownian motion of Corona and Quarks" delivered by Prof. Jan-e Alam, VECC at the Unified Academic Campus, Bose Institute, Salt Lake, Kolkata; "National Science Day" was celebrated on February 28, 2022 by organizing one day scientific programme for local school students on "Commonly used Biotechnological Methods" at Falta Experimental farm, Falta. Talks by young researchers of Bose Institute were held at the Unified Academic Campus, Bose Institute, Salt Lake, Kolkata; A panel discussion on "The Contribution of Women in Science, Science Education & Science Management" was held at the Unified Academic Campus, Bose Institute, Salt Lake, Kolkata as a part of the celebration of "International Women's Day" on March 08,

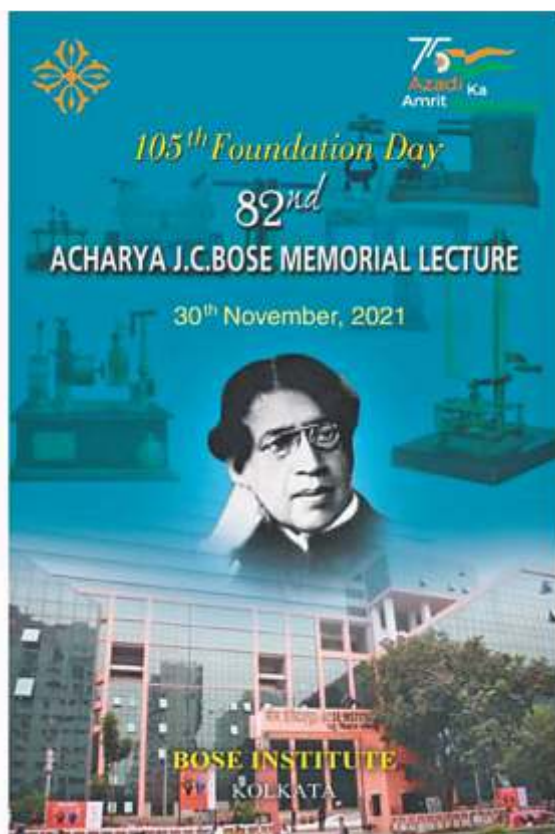
2022; Celebration of "Rashtriya Ekta Diwas (National Unity Day)" was held on October 31st, 2022 in the form of a pledge taking ceremony through virtual mode to commemorate the birth anniversary of Sardar Vallabhbhai Patel as "Rashtriya Ekta Diwas (National Unity Day)" in order to boost sentiments of unity, integrity and security of our Nation;

Despite our systematic endeavours as well as substantial contribution to elevate the research level of the Institute and the country as well, sustainable developments in some frontier research areas need to be accomplished. Researchers of the institutes of higher education acknowledge, at present, that upliftment of research quality, discharging strategic & techno-administrative activities, curriculum development, teaching-learning process, students as well as faculty development, effective utilization of human resource, ensuring conducive research and working environment in the institutes with pertinent technological support, enhancement of competitive advantage, increasing industry-academia interactions, betterment of effective governance in the administration and finance with greater transparency and accountability, reducing cost of research and development, improving better network by setting up collaborative methods, incubating innovative ideas, archiving large volume of data/knowledge-based information, providing quality services to the stakeholders etc. may be fruitfully implemented by efficient as well as efficacious use of a sound and sustainable Knowledge Management System.

Last but not the least I may conclude by extending sincere thanks and gratitude to all the students, academic and non-academic staff members of the Institute once again for their incessant support and assistance.

Prof. (Dr.) Uday Bandyopadhyay
Director

105TH FOUNDATION DAY OF BOSE INSTITUTE



The 105th Foundation Day of Bose Institute was celebrated on November 30, 2021. **Professor Gautam R. Desiraju**, Honorary Professor, Solid State and Structural Chemistry Unit, Indian Institute of Science, Bangalore, delivered **82nd Acharya J.C. Bose Memorial Lecture** on “**Science and Society. What does Bose Institute owe them?**”. Prof. Sabyasachi Sarkar, Honorary Professor, Nanoscience and Synthetic Leaf Laboratory at Downing Hall, IEST, Shibpur, Howrah and Former Senior Professor and Head, Chemistry, IIT-Kanpur presided over the programme.

Mega Science Technology and Industry Expo of 7th India International Science Festival (IISF) 2021

Bose Institute participated in the **Mega Science Technology and Industry Expo of 7th IISF 2021** held at Panaji, Goa from December 10–13, 2021. Prof. Uday Bandyopadhyay, Director, Bose Institute actively attended the Science Festival alongwith Faculty members and staff of Bose Institute.




**Additional Secretary & Financial Adviser, DST
Visited Bose Institute**




Shri Vishvajit Sahay, Additional Secretary & Financial Adviser, Department of Science & Technology, GOI, visited Bose Institute on February 08, 2022, in presence of Director, Bose Institute and Registrar (Officiating), Bose Institute. Floral offerings were made at the Samadhi Mandir, followed by a walk around the Campus, visit to the Lecture Hall and J.C. Bose Museum. Thereafter, he visited Unified Academic Campus for official discussion.

National Science Day 2022




विज्ञान एवं प्रौद्योगिकी विभाग
DEPARTMENT OF
SCIENCE & TECHNOLOGY



BOSE INSTITUTE
(An Autonomous Institute of Department of Science & Technology, Govt. of India)

NATIONAL SCIENCE DAY CELEBRATION
February 28, 2022



National Science Day is celebrated every year on 28 February to commemorate the discovery of the 'Raman Effect'. On this day Sir C. V. Raman announced the discovery of the 'Raman Effect' for which he was awarded the Nobel Prize in 1930. On this occasion, Bose Institute will perform science communication activities, as follows.

Talks by Young Researchers of Bose Institute
Venue: Unified Academic Campus, Saltlake
Time: 3 pm

One-day scientific programme for local school students
Topic: Commonly Used Biotechnological Methods
Venue: Falta Experimental Farm, Falta

Bose Institute observed **National Science Day** on February 28, 2022, through various activities. The theme of the National Science Day 2022 was **"Integrated Approach in science and technology for Sustainable Future"**.



National Science Day 2022 at Falta Experimental Farm, Bose Institute.

International Kolkata Book Fair 2022



Bose Institute participated at the 45th International Kolkata Book Fair at Central Park Mela Ground, during February 28 to March 13, 2022. Director, Bose Institute inaugurated the stall of Bose Institute in presence of Registrar (Officiating), Bose Institute. A large number of people visited the stall of Bose Institute. Bose Institute Publications were in great demand. It was our privilege to have with us the Director, Registrar (O), Faculty members, Research Fellows and staff members who visited the stall every day.



International Women's Day



As a part of the celebration of the 75th year of Independence of India, "Azadi Ka Amrit Mahotsav" Bose Institute observed International Women's Day at Unified Academic Campus of Bose Institute on March 08, 2022.

French Ambassador visited Bose Institute



French Embassy, Dr. Didier Raboisson, Attaché for Scientific Cooperation, Embassy of France in India, Delhi, Dr. Meenakshi Singh, Scientific Coordinator, Embassy of France in India, Delhi and Mr. Amitava Das, Academic and Scientific Coordinator, Embassy of France in India, Kolkata visited the Unified Academic Campus, Bose Institute on March 21, 2022 to meet the Director, BI. The purpose of visit was to discuss and explore the possible collaboration between India and France in the field of training, research and innovation in healthcare.

Lecture on "Mental Stress and its Management"



As a part of the celebration of the 75th year of Independence of India, "Azadi Ka Amrit Mahotsav" Bose Institute organized Lecture entitled "Mental stress and its management" by Dr. Devasis Ghosh (Sr. Consultant Mental Health) on May 4, 2022, at Bose Institute Unified Academic Campus, Salt Lake.

Swacchta Pakhwada 2022



Bose Institute observed Swacchta Pakhwada 2022 at Unified Academic Campus of Bose Institute on May 02, 2022.

International Day of Yoga



International Day of Yoga was observed on June 21, 2022 at Unified Academic Campus of Bose Institute.

Dr. R.K. Joshi, Scientist-F,DST Visited Bose Institute



Dr. R.K. Joshi, Scientist-F, Autonomous Institution Division, Department of Science & Technology, Gol and Mr. Rohit Kumar, Deputy Secretary (Finance), Department of Science & Technology, Gol visited Bose Institute Main Campus and J.C. Bose Museum on August 08, 2022.

9th Indian National Exhibition Cum-Fair 2022



Bose Institute participated in the "9th Indian National Exhibition Cum-Fair 2022" organized by Bengal Human Resource Development Foundation during August 4 – 8, 2022 at KMDA Ground, Patuli, Garia, Kolkata.

25th National Science Exhibition



Bose Institute participated at the 25th National Science Exhibition organized by Central Calcutta Science and Culture Organization for Youth in Central Park, Salt Lake from August 24 to 27, 2022.

MOU with Tea Board



The Division of Plant Biology Organized the signing of MOU between Bose Institute and Tea Board India at the Unified Academic Campus, Bose Institute on August 26, 2022.

Hindi Pakhwada



Bose Institute organized "Hindi Diwas and Pakhwada" during September 14 to September 28, 2022. "Hindi Diwas" was observed on September 14, 2022 in the main auditorium of UAC. The Director, BI welcomed all the scientists and staff of the Institute with his Inaugural

Address. The Registrar (Officiating), the Deputy Registrar, the Chair, Hindi Implementation Committee and Members of Bose Institute, Kolkata were present and delivered short speeches about Hindi Diwas. The participation certificates for Hindi writing competitions of previous years were distributed. The following two weeks were celebrated as "Hindi Pakhwada". Essay/Poem/Story/Article writing competition in Hindi were organized during these weeks.

One-Day Visit of School Students Programme



A One-Day visit of school students was conducted in a programme to the Unified Academic Campus and Main Campus, BI on September 6, 2022 under Scientific Social Responsibility (SSR) activities of SERB, DST, GoI, proposed by Dr. Sanat Kumar Das, Associate Professor, Environmental Sciences Section, BI.

Visit of ALICE Spokesperson to Bose Institute



ALICE spokesperson **Prof. Luciano Musa** and ALICE Ex-Deputy Spokesperson **Prof. T. K. Nayak** visited Bose Institute Kolkata on 19/10/2022 for a discussion meeting with the Director, Faculty members and students of HEP group of Department of Physics, Bose Institute.

Rashtriya Ekta Diwas (National Unity Day)



"Rashtriya Ekta Diwas" (National Unity Day) was observed by Bose Institute, Kolkata on October 31, 2022 to commemorate the birth anniversary of Sardar Vallabhbhai Patel. A Pledge taking ceremony was organized in the Unified Academic Campus, Bose Institute.

Vigilance Awareness Week



The Vigilance Awareness Week was observed during October 31 – November 06, 2022. As a part of this programme, the Integrity Pledge taking ceremony was organized by Bose Institute on October 31, 2022.

Constitution Day



"Constitution Day" was observed by Bose Institute, Kolkata on November 26, 2022. Pledge taking ceremony was organized at Unified Academic Campus, Bose Institute to mark the day at 11:00 am.

138th Birthday of Prof. Debendra Mohan Bose



As a part of Azadi Ka Amrit Mahotsav, Bose Institute observed **138th Birthday of Prof. Debendra Mohan Bose** on November 26, 2022. **Dr. Satinath Mukhopadhyay, MD DM FRCP (London), Fellow, National Academy of Medical Sciences (India),** Professor, Department of Endocrinology & Metabolism, IPGMER & SSKM Hospital, Calcutta, graced the

occasion as Guest of Honour and delivered the **D. M. Bose Memorial Lecture 2022** on the topic **“Impact of Vitamin D Deficiency on Skeletal and Non-skeletal Health”**. **Prof. Syamal Roy**, ICMR Emeritus Scientist, CSIR-Indian Institute of Chemical Biology, Kolkata & Former Vice Chancellor, Cooch Behar Panchanan Barma University, presided over the programme.

Research Scholar's Symposium 2022

Bose Institute organised Research Scholar's Symposium 2022 on **“Recent Trends in Natural Sciences”** during November 28 - 29, 2022, as a part of the celebration of 75th year of Independence **“AZADI KA AMRIT MAHOTSAV”**. About 100 scholars/students participated in the symposium and presented their research work.

Recognition of inter-specific hybrid sesame with high lignan content developed at the Division of Plant Biology, Bose Institute by the Indian Council of Agricultural Research



The presence of lignans (sesamin, sesamol) adds pharmaceutical value to sesame oil. Wild sesame, *Sesamum mulayanum*, though less oil-yielding but contains remarkably higher lignan in oil. Prof Gaurab Gangopadhyay and his students (Debabrata Dutta and

Ranjana Prasad) from the Division of Plant Biology performed an inter-specific hybridization between cultivated Indian sesame (*S. indicum*) and *S. mulayanum* to bring a better oil profile to the cultivated sesame. The selected recombinant lines of F₆ generation showed high oil content with a superior lignan profile and manifested distinct phenotypic selection traits. The recombinant lines with high sesamin content showed increased expression of the sesamin synthase gene. This gene is a potential candidate for allele-based molecular marker development in future sesame breeding programmes. Besides the improved oil quality, the selected recombinant line (R6) also showed tolerance to charcoal rot disease of sesame seedlings caused by *Macrophomina phaseolina*.

The Plant Germplasm Registration Committee (PGRC) of the Indian Council of Agricultural Research (ICAR) has certified the germplasm (R6 of sesame) with the registration number INGR22090 (IC0643978) and preserved it in their repository on July 08, 2022.

SYMPOSIA/CONFERENCES/COLLOQUIA/ WORKSHOPS/WEBINARS ORGANIZED

- Dr. Abhrajyoti Ghosh** (Biochemistry) (i) organized 4th Annual Conference of the Biological Engineering Society (BESCON-2022) between November 4-6, 2022 at the Unified Campus of Bose Institute, Kolkata jointly with Indian Institute of Technology (IIT), Kharagpur, India; (ii) organized 16th Asian Conference on Diarrhoeal Disease and Nutrition (ASCODD-2022) between November 11-13, 2022 at the Westin Kolkata Rajarhat jointly

with ICMR-National Institute of Cholera and Enteric Diseases (NICED), Kolkata, India. (iii) Attended and received IGSTC (Indo German Science and Technology Centre) grant to Indo-German bilateral workshop on “Agricultural Management Practice Effects on Soil- And Plant-associated bacterial communities and their resistome” at Leibniz Institute of Agricultural Engineering and Bio-economy e.V. (ATB), Potsdam, Germany.

- **Prof. Shubhra Ghosh Dastidar** (Bioinformatics) organized a seminar on “The Applications of Machine learning in Drug Discovery”, presented by Srijit Seal, Department of Chemistry, University of Cambridge, United Kingdom, on September 07, 2022.
- **Dr. Debjani Roy** (Biophysics) Speaker in a seminar organized by Dr. B.C. Roy College of Pharmacy and allied health sciences held on September 20, 2022.
- **Dr. Saikat Biswas and Prof. Achintya Singha** (Physics) worked as the centre coordinators of two centres of Burdwan. Bose Institute was the JEST 2022 coordinating Institute (Joint Entrance Screening Test 2022) for The Burdwan centre. The exam was held on March 13, 2022.
- (i) **Dr. Sidharth Kr. Prasad** (Physics) organized the following webinars as a part of Special Lecture Series on Heavy Ion Physics on behalf of ALICE India Collaboration:
 - (i) “A next-generation heavy-ion experiment for the LHC”; Speaker: **Dr. Marco van Leeuwen, Senior Scientist Nikhef (NL), Amsterdam, Netherlands**; on February 03, 2022.
 - (ii) “Gaseous detector: An state-of-the-art and future perspectives”; Speaker: **Dr. Archana Sharma, Principal Physicist, CERN Laboratory, Geneva**; on March 21, 2022.
 - (iii) “Thermodynamics of strong interaction matter from Lattice QCD calculations”; Speaker: **Prof. Frithof Karsch, Professor, Physics Bielefeld University, Germany**; on April 22, 2022.
 - (iv) “Jet interactions in the QGP: what we have learned, and where are we going?”; Speaker: **Prof. Peter M. Jacobs, LBNL, USA**; on July 20, 2022.
 - (v) “Imaging nuclear structure with heavy ion collisions”; Speaker: **Prof. Jiangyong Jia, Stony Brook University, USA**; on September 27, 2022.
 - (vi) “Phenomenological approach for the interplay between QGP fluids, and jets or Non-equilibrium components from large to small systems”; Speaker: **Prof. Yasuki Tachibana, Akita International University, Japan**; on November 01, 2022.
- (ii) **Seminar Series organized by the Division of Molecular Medicine:**
 - (i) delivered by Prof. Barsanjit Mazumder, Professor, Center for Gene Regulation in Health & Disease, Cleveland State University, OH, USA; on “A translation control-dependent novel route of communication between SARS-CoV-2 and human lung cells: A new paradigm of potential self-regulation of the virus” on July 27, 2022.
 - (ii) delivered by Dr. Apratim Chatterji, Associate Professor, Physics Department, IISER, Pune; on “Inducing organization in intrinsically disordered polymeric systems: lessons from bacterial chromosomes”; on August 03, 2022.
 - (iii) delivered by Dr. Debabrata Biswas, Senior Principal Scientist, Molecular Genetics, CSIR-IICT; on “Understanding of Eukaryotic Transcriptional Regulatory Mechanisms Involving Super Elongation Complex and Its Implications in MLL Fusion-mediated Leukemogenesis” on August 17, 2022.
 - (iv) delivered by Prof. Gautam Basu, Ex-Prof. Biophysics Department, Bose Institute, Kolkata; on “Science, Society and Scientists: A Spatio-temporal Evolution”; on September 28, 2022.
- **The Division of Plant Biology** organized a one-day scientific programme for local school students on 28th February, 2022 at the Falta Experimental Farm, Falta on the occasion of the celebration of National Science Day. Topic of the programme was “Commonly Used Biotechnological Methods”. Profs. Pallob Kundu, Gaurab Gangopadhyay and Shubhra Ghosh Dastidar along with students Mr. Sayan Mal, Raghubir Singh and Himadri Das served as resource persons.
- **Dr. Anupama Ghosh** (Plant Biology) delivered lecture on “Small heat shock proteins play key role in framing the morphological development in *Ustilago maydis* Event” in the Biological Engineering Society Conference 2022 (BESCON 2022) held during November 04 to 06, 2022, organized by IIT Kharagpur and Bose Institute.

VISITS ABROAD

- **Dr. Abhrajyoti Ghosh** (Biochemistry) Participated and delivered an invited lecture entitled “Spatial dynamics and ecological dissemination mechanism of antibiotic resistome in the mangrove sediment of Sundarban, India” in the IGSTC-sponsored Indo-German bilateral workshop on “Agricultural Management Practice Effects on Soil- And Plant-associated bacterial communities and their resistome” at Leibniz Institute of Agricultural Engineering and Bio-economy e.V. (ATB), Potsdam, Germany from 20-22 June 2022.
- **Mr. Koustav Bhakta**, SRF (Biochemistry) attended to “Gordon Research Conference” on Folding and Misfolding: Effects of Evolution and Environment at Four Points Sheraton in California, United States from 23 to 28 October 2022.
- **Prof. Soumen Roy** (Physics) (i) visited the International Centre for Theoretical Physics of UNSECO in Trieste, Italy as a Regular Associate of ICTP during October-November 2022 and delivered a lecture on October 26, 2022. (ii) Visited the Istituto Superiore di Sanità (NIH, Italy) in Rome, Italy and delivered a lecture on November 11, 2022.
- **Mr. Arindam Sen**, SRF (Physics) attended 15th Pisa meeting on Advanced Detector 2022 in Italy during May 22-28, 2022.
- **Mr. Sayak Chatterjee**, SRF (Physics) attended 15th Pisa meeting on Advanced Detector 2022 in Italy during May 22-28, 2022.
- **Mr. Abhi Modak**, SRF, (Physics) visited Bologna Italy for delivering an oral presentation on behalf of the ALICE collaboration in the International Conference on High Energy Physics (ICHEP) during July 06 – 13, 2022.

RECENT AWARDS/HONOURS/MEMBERSHIP

- **Dr. Abhrajyoti Ghosh** (Biochemistry) received IGSTC (Indo German Science and Technology Centre) grant on 20.06.2022 to attend Indo-German bilateral workshop on "Agricultural Management Practice Effects on Soil-And Plant-associated bacterial communities and their resistome" at Leibniz Institute of Agricultural Engineering and Bio-economy e.V. (ATB), Potsdam, Germany.
- **Koustav Bhakta**, Institute SRF (Under Guidance of Dr. Abhrajyoti Ghosh) (1) received SERB-ITS grant to attend "Gordon Research Conference" on Folding and Misfolding: Effects of Evolution and Environment at Four Points Sheraton in California, United States, from October 23 – 28, 2022. (2) received DBT-CTEP grant to attend "Gordon Research Conference" on Folding and Misfolding: Effects of Evolution and Environment at Four Points Sheraton in California, United States from October 23 – 28, 2022.
- **Arghya Bhowmick**, CSIR Adhoc-SRF (Under Guidance of Dr. Abhrajyoti Ghosh) received DBT-CTEP grant, CSIR and EMBO travel support to attend "EMBO workshop 2022" on Molecular Biology of Archaea at Goethe University in Frankfurt, Germany from August 01-04, 2022.
- **Ms. Trisha Ghosh**, UGC Adhoc-SRF (Under Guidance of Prof. Srimonti Sarkar) Awarded the best poster prize at the 16th National Congress of The Indian Academy of Tropical Parasitology during September 21-24, 2022.
- **Ms. Nabanita Patra**, CSIR Adhoc-SRF (Under Guidance of Prof. Srimonti Sarkar) Awarded the 3rd Prize in the poster presentation category at the 16th National Congress of The Indian Academy of Tropical Parasitology during September 21-24, 2022.
- **Ms. Anurupa Sett**, UGC Adhoc-JRF (Under Guidance of Prof. Srimonti Sarkar) Awarded 2nd best poster in the 16th Asian Conference on Diarrhoeal Disease and Nutrition, organized by ICMR-National Institute of Cholera and Enteric Diseases, Kolkata during November 11-13, 2022.
- **Prof. Shubhra Ghosh Dastidar** (Bioinformatics) Selected as the Associate Editor, Frontiers in Molecular Biosciences.
- **Prof. Anirban Bhunia** (Biophysics) (1) **Editorial Board member** of (i) Journal of Colloid and Interface Science; (ii) Biochimica et Biophysica Acta – Biomembranes; (iii) Scientific Reports (Nature Publishing Group); (iv) PLoS One; (v) Frontiers in Chemistry. (2) Guest Editor of themed issue on "**Protein Disorder in Proteostasis and Pathogenesis**", by Biophysical Chemistry (Elsevier). (3) Miss Dipita Bhattacharyya received "Jharna Rani Samal Best Student Thesis Award" for the year 2021-22 from Nuclear Magnetic Resonance Society (NMRS), India.
- **Dr. Abhijit Chatterjee** (Environmental Sciences Section) (1) Three tripartite MoUs have been signed between: (A) Bose Institute, WBPCB and Kolkata Municipal Corporation; (B) Bose Institute, WBPCB and Howrah Municipal Corporation; (C) Bose Institute, WBPCB and Barrackpore Municipality. (2) Working as the Scientific Advisor for the above three urban local bodies to frame the policies and mitigation plans to combat air pollution.
- **Dr. Sanat Kumar Das** (Environmental Sciences Section) **Memberships:** (1) Subject Expert Committee - Earth & Atmospheric Sciences Areas of "Fund for Improvement of S&T infrastructures in Universities and Higher Educational institutions" (**FIST**) Program of Department of Science and Technology (**DST**), Ministry of Science and Technology, Govt. of India. (2) Institute of Repute (IoR) under the National Clean Air Mission, the Ministry of Environment, Forest and Climate Change (**MoEF-CC**); and Central Pollution Control Board (**CPCB**).
- **Prof. Kaushik Biswas** (Molecular Medicine) Editorial Board Member of the Journal PLoS One.
- **Dr. Kuladip Jana** (Molecular Medicine) (1) Fellow of the National Environmental Science Academy (FNESA). (2) Fellow of the Society for Reproductive Biology & Comparative Endocrinology (FRE). (3) Outstanding Scientist Award from INSO Awards. (4) Eminent Scientist of the Year Award from National Environmental Science Academy.
- **Dr. Wriddhiman Ghosh** (Microbiology) and Dr. Aninda Mazumdar of CSIR National Institute of Oceanography co-edited the topical monograph "**Systems Biogeochemistry of major Marine Biomes**", published by The John Wiley and Sons, Inc. in April 2022.
- **Prof. Dhruba Gupta** (Physics) (1) The first experiment at the HIE-ISOLDE facility of CERN, from an institute in India (PI: Prof. Dhruba Gupta) was earlier carried out successfully. The data from this experiment in nuclear astrophysics have now been published in the journals Physical Review Letters and Physics Letters B in 2022. (2) Delivered a lecture on "Measurement of the ${}^7\text{Be}(d,p){}^8\text{Be}^*$ reaction at 5 MeV/A" at the "ISOLDE Workshop and Users Meeting 2021", CERN, Geneva, Switzerland, during December 14-16, 2021 (online).
- **Prof. Soumen Roy** (Physics) (1) Regular Associate of the International Centre for Theoretical Physics (UNESCO), Trieste, Italy. (2) Editorial Board member of: (i) PLOS ONE, (ii) Indian Journal of Physics (Springer), (3) Frontiers in Physics.
- **Dr. Saikat Biswas** (Physics) (1) Proud Indian - Georges Charpak Distinguished Scientist Award, 2022 from IMRF, Institute of Higher Education & Research, India. (2) Selected as member of the organizing committee of 5th ALICE-STAR India school on Quark-Gluon plasma in IOP, Bhubaneswar.

- **Dr. Sidharth Kumar Prasad** (Physics) (i) serving as the **Physics Coordinator** of the ALICE-STAR-India Collaboration. (ii) appointed as one of the conveners of the Heavy Ions and QCD working group of the DAE-HEP symposium 2022 to be organized by IISER, Mohali during 12-16 December 2022.
- **Mr. Sayak Chatterjee**, SRF (Physics) (1) received the Ernest Rutherford best researcher award 2022 on January 26, 2022 by the International Multidisciplinary Research Foundation (IMRF) from IMRF, Institute of Higher Education and Research, India. (2) Received the Financial support from the organizer to attend the Quark Matter, QM2022 in Poland. (3) Selected to receive the CBM Juniors travel grant to participate in the QM2022, Poland. (4) Received the Young Researcher Grant from INFN, Pisa to attend 15th Pisa meeting on Advanced Detector 2022 in Italy. (5) Acted as a judge to adjudicate the Senior School Science Exhibition, 2022 at La Martiniere for Boys, Kolkata.
- **Mr. Arindam Sen** (Physics) (1) received the Financial support from the organizer to attend the Quark Matter, QM2022 in Poland. (2) Received the Young Researcher Grant from INFN, Pisa to attend 15th Pisa meeting on Advanced Detector 2022 in Italy.
- **Mr. Prottoy Das** (Physics) received 1st prize in oral presentation (Experimental) at the Hot QCD Matter 2022 conference.
- **Mr. Abhi Modak** (Physics) received 3rd prize in oral presentation (Experimental) at the Hot QCD Matter 2022 conference.
- **Ms. Kabita Kundalia** (Physics) (1) received the Best Poster Prize in the Nuclear Reaction and Nuclear Astrophysics Category for her presentation on "Elastic and inelastic scattering of ^7Be on ^{12}C at 5 MeV/A", at the "65th DAE Nuclear Physics Symposium", Bhabha Atomic Research Centre, Mumbai, during December 1-5, 2021. She was also selected to give an oral presentation on "Study of α -cluster transfer reactions with ^7Be in the context of He-Burning processes" and a poster presentation on "Composition of different calibration methods for Si-strip detectors"; (2) received the Third Prize for oral presentation on "Elastic scattering and transfer reactions with ^7Be on ^{12}C " in the "Conference on Low Energy Reaction Dynamics" at Aligarh Muslim University, during March 7-9, 2022. (3) Selected for oral presentation titled "Study of α -transfer reactions with ^7Be in the context of nuclear astrophysics" at @FlipPhysics Workshop, Instituto de Física Corpuscular, Valencia, Spain during March 21 – 25, 2022 (online).
- **Sk Mustak Ali** (Physics) (1) received full financial support from the Joint Institute for Nuclear Astrophysics- Center for the Evolution of the Elements (JINA-CEE), to attend the "Astrophysics with Radioactive Isotopes (AwRI)" conference in Budapest, Hungary during June 12-17, 2022. He delivered a talk titled "Measurement of (d,p) and (d, ^3He) reactions with ^7Be in the context of Li abundance anomaly". (2) selected to give oral presentations on " $^7\text{Be}(d,p)^*$ reaction at 5MeV/A at HIE-ISOLDE, CERN" and "Study of $^7\text{Be} + p$ elastic scattering at 5 MeV/A" at the "65th DAE Nuclear Physics Symposium", Bhabha Atomic Research Centre, Mumbai, during December 1-5, 2021.
- **Ms. Shreya Roy** (Physics) received GET_INVOLVED support to work at FAIR, Darmstadt for six months during June 01, 2022 – November 30, 2022.
- **Prof. Shubho Chaudhuri** (Plant Biology) elected Fellow of the West Bengal Academy of Science & Technology (WAST).
- **Prof. Gaurab Gangopadhyay** (Plant Biology) selected as the external member for the 'Board of Studies' committee, Department of Biotechnology and Microbiology of Swami Vivekananda University, Barrackpore, Kolkata on January 16, 2022.
- **Prof. Gourisankar Sa** (Molecular Medicine) (1) Editor-in-Chief: International J Immunology; (2) Sectional Editor: Scientific Reports, Frontiers in Immunology, Frontiers in Oncology, Proceeding of National Academy of Science, India, Section-B, Head & Face Medicine; Austin J. Clinical Immunology, J Cancer Research & Molecular Medicine.

RECENT PH.D. DEGREES AWARDED

- **Debabrata Sinha** (Biochemistry) Studies on an anti-sigma factor from *Staphylococcus aureus*. Supervisor: Prof. Subrata Sau.
- **Soham Seal** (Biochemistry) Studies on a cyclophilin from *Staphylococcus aureus*. Supervisor: Prof. Subrata Sau.
- **Mousam Roy** (Biochemistry) Structural and Functional Analysis of Heat Shock Proteins from Thermoacidophilic Crenarchaea *Sulfolobus acidocaldarius*. Supervisor: Dr. Abhrajyoti Ghosh.
- **Chandrima Bhattacharyya** (Biochemistry) Exploring the Microbial Diversity in Tea Rhizosphere and an Assessment of Resident Plant Growth Promoting Rhizobacteria (PGPR). Supervisor: Dr. Abhrajyoti Ghosh.
- **Shayantan Mukherji** (Biochemistry) Microbiology of Sundarban Mangrove Ecosystem: Insights into Diversity, Distribution and Function of Resident Microbial Communities. Supervisor: Dr. Abhrajyoti Ghosh.
- **Sayandeep Gupta** (Biochemistry) Understanding the mechanism of RNA-protein interaction involved

in the protein translocation in Archaea. Supervisor: Dr. Abhrajyoti Ghosh.

- **Sibun Parida** (Bioinformatics) A Comparative Genomics Approach To Identify The Molecular Drivers In Disease Progression. Supervisor: Dr. Zhumur Ghosh.
- **Sreyashi Majumdar** (Bioinformatics) Systemic discovery of asthma biomarkers for therapeutics. Supervisor: Dr. Sudipto Saha.
- **Bhisma Narayan Ratha** (Biophysics) Peptide Based Biophysical Studies and Inhibitor Designing For Signalling and Amyloidogenic Class of Proteins. Supervisor: Prof. Anirban Bhunia.
- **Swapna Bera** (Biophysics) Structural Insights of A β Peptides in Membrane: Understanding the Role of Fibrillation in Alzheimer's Pathogenesis and Designing of Peptides for A β Fibril Inhibition. Supervisor: Prof. Anirban Bhunia.
- **Humaira Ilyas** (Biophysics) Structural and Functional Studies of Designed Antimicrobial & Anti-Inflammatory Peptides: Prospects in Plants and Animal Disease Control. Supervisor: Prof. Anirban Bhunia.
- **Arijita Subuddhi** (Chemistry) Dissecting the response of macrophages to *Mycobacterium tuberculosis* infection: the role of epigenetic modifications and immune surveillance mechanisms. Supervisor: Prof. Joyoti Basu.
- **Abhinandan Ghosh** (Environmental Sciences Section) Physico-chemical characterization of size-segregated atmospheric aerosols over tropical urban and high-altitude Himalayan stations in eastern India. Supervisor: Dr. Abhijit Chatterjee.
- **Baijayanti Ghosh** (Molecular Medicine) Protein Quality Control Machinery In Modulation of Spinocerebellar Ataxia Type 3 Pathogenesis. Supervisor: Prof. Atin Kumar Mandal.
- **Sayantana Bose** (Molecular Medicine) Regulation of FOXP3 expression in tumor-associated T-regulatory cells. Supervisor: Prof. Gaurisankar Sa.
- **Dia Roy** (Molecular Medicine) Breast tumour-associated Th17 cells: Their epigenetic regulation and interrelationship with T-regulatory cells. Supervisor: Prof. Gaurisankar Sa.

- **Ananya Dutta** (Molecular Medicine) Natural Product Derived Small Molecules As Anti-Cancer Agents: A Molecular and Cellular Approach. Supervisors: Dr. Kuladip Jana & Prof. Manju Ray.
- **Apurba Sarkar** (Microbiology) Identification of a Novel Inhibitor of Mycobacterial Growth that Functions by Targeting its Thymidylate Synthesizing Enzyme Thyx. Supervisor: Prof. Sujoy Kr. Das Gupta.
- **Sabyasachi Bhattacharya** (Microbiology) Microbiology of the Sediments of the Arabian Sea Oxygen Minimum Zone. Supervisor: Dr. Wriddhiman Ghosh.
- **Deeptak Biswas** (Physics) Dynamical evolution of matter at extreme conditions. Supervisor: Prof. Sanjay Kr. Ghosh.
- **Pooja Bhattacharjee** (Physics) Study of Potential Self Annihilation Signal from Dark matter Particles in some Prospective Astrophysical Dark matter Sources. Supervisor: Dr. Partha Sarathi Joarder (Retd.) and Prof. Dhruba Gupta (Joint Supervisor).
- **Rathijit Biswas** (Physics) Study of jet cross-sections and properties in hadronic and heavy-ion collisions with ALICE at the Large Hadron Collider. Supervisor(s): Prof. Sibaji Raha and Prof. Supriya Das.
- **Shinjini Sengupta** (Plant Biology) Reduction of phytic acid level in rice seeds by RNAi mediated down-regulation of inositol 1,3,4-trisphosphate-5/6-kinase (ITPK) gene. Supervisor: Prof. Gaurab Gangopadhyay.
- **Debabrata Dutta** (Plant Biology) Validation of few Genic-SSR markers and candidate genes to screen two inter-specific hybridization-derived breeding populations of sesame with particular reference to plant architecture and oil. Supervisor: Prof. Gaurab Gangopadhyay.
- **Pratiti Dasgupta** (Plant Biology) Genome-Wide Study of Changes in Histone H3K27 Methylation and its Correlation with Differential Gene Expression in *Oryza sativa* L. Under Cold Stress. Supervisor: Prof. Shubho Chaudhuri.
- **Shib Shankar Singha** (Physics) Optical properties and applications of Molybdenum Disulphide (MoS₂). Supervisor: Prof. Achintya Singha

GRANTS RECEIVED

- Mechanism of ganglioside GM2-mediated regulation of miR-615-5p in targeting oncogenic ID1 to mediate tumorigenesis; SERB; Prof. Kaushik Biswas, Division of Molecular Medicine; Rs. 52,72,400/-; 03 years.
- Investigating the role of HSP20 in the pathogenic development of *Ustilago maydis*; SERB; Dr. Anupama Ghosh, Division of Plant Biology; Rs. 29,61,495/-; 03 years.
- Continuation of the existing Centre of Excellence in Bioinformatics and expanding it as a datacenter involving newer direction of research to address the healthcare and environmental issues of national need-BIC at Bose Institute, Kolkata; DBT; Prof. Shubhra Ghosh Dastidar, Dr. Zhumur Ghosh; Division of Bioinformatics; Rs. 1,87,54,131/-; 05 years.
- Indian Participation in the ALICE Experiment at CERN; DST & DAE; Prof. Supriya Das, Department of Physics (CAPSS); Rs. 5,73,50,000/-; 05 years.
- Unravelling the mechanism of action of LINC00273 (Long intergenic Non Coding RNA) in inducing Epithelial to Mesenchymal Transition in Cancer; DBT; Dr. Subhrangsu Chatterjee, Department of Biophysics; Rs. 69,28,000; 03 years.
- Revealing bioaerosol movements within the area spanning eastern Himalayas and coastal Bay of Bengal; SERB; Dr. Sanat Kr. Das, Environmental Sciences Section; Rs. 38,14,360/-; 03 years.

Facility Development: Setting up a Remote Monitoring and Control Centre at UAC, Bose Institute



A unique facility Centre for the monitoring and control of remotely operated experiments, is built at the Unified Academic Campus, Bose Institute, Kolkata, India. The Centre aims at providing the necessary tools/support for monitoring and control of remotely operated experiments through network-based applications. The facility is being used primarily for taking online ALICE shifts.

Short Term Training at Bose Institute

Short term summer training was offered during June to August 2022 at Bose Institute after a hiatus of two years. Outstanding students in Life Sciences (17) and Physical Sciences (7) from all over India successfully carried out projects at Bose Institute (Coordinator : Prof. Dhruva Gupta).

Fisheries Training Programme

Bose Institute conducted One Day Training Programme on “Emerging Techniques for Fish Cultivation” at Falta Experimental Farm, Bose Institute on November 16, 2022. Dr. Archan Kanti Das, Principal Scientist, ICAR-CIFRI, Barrackpore, acted as the Lead Resource Person.

STAFF NEWS

Appointments

1. **Dr. Subhash Haldar**, joined as Assistant Professor in the Department of Biochemistry w.e.f. 25.10.2022.
2. **Dr. Nirmalya Sen**, joined as Assistant Professor in the Division of Molecular Medicine w.e.f. 01.11.2022.

Retirements on Superannuation

1. Dr. Arun Kumar Chakraborty, Librarian, superannuated on 31.12.2021.
2. Mr. Kissun Turi, Biochemistry, superannuated on 31.12.2021.
3. Mr. Arup Kumar Dey, Plant Biology, superannuated on 31.12.2021.
4. Mr. Subal Basak, Plant Biology, superannuated on 31.01.2022.
5. Mr. Kodan Das, Workshop, superannuated on 31.01.2022.
6. Mr. Abdul Rahaman Molla, Workshop, superannuated on 28.02.2022.
7. Mr. Mahendra Nath Shee, Administration, superannuated on 28.02.2022.
8. Mrs. Rama Chatterjee, Biochemistry, superannuated on 31.05.2022.
9. Mr. Siddhartha Roy, Plant Biology, superannuated on 31.10.2022.

83rd Acharya J.C. Bose Memorial Lecture will be delivered by Prof. Ashutosh Sharma, Institute Chair Professor, Department of Chemical Engineering, Indian Institute of Technology, Kanpur

Abstract

The Brave New World of Science Today is but the World of J C Bose & C V Raman: Coming Full Circle



This talk is NOT about a specific area or product of science, but an examination of some of the compelling processes of doing science and its translation to useful applications. Such processes include, but are not limited to: the power of lateral thinking and scientific commonsense; connecting the dots, creativity, being interdisciplinary; relating

a narrow domain of research to the larger concerns of science and, while doing all this, putting some fun, quality and excitement back in research

starting at PhD level! In short, everything that is not addressed in classrooms and labs!

The talk will indicate some major oncoming challenges, opportunities and directions in scientific research such as: Sustainable Development, Convergence of technologies, Rise of Intelligent Machines & Industry 4.0/Society 5.0, Managing Data and information and knowledge: Science Communication and Popularization; Connecting Science to Innovation and Society; and Nurturing Diversity.

To meet these and other challenges requires a new mind, a new culture which I will argue were in fact not so different in the life and world of Acharya J. C. Bose!

The idea is to encourage awareness and debate on some of the issues that concern the principles, processes and practice of science in the future which is rushing at us at ever faster (even exponential) rate!