

বসু বিজ্ঞান মন্দির

बसु विज्ञान मन्दिर

BOSE INSTITUTE

Newsletter



No. 60

November 2025

A NEWSLETTER OF BOSE INSTITUTE

FROM THE DIRECTOR'S DESK



legacy remains our guiding force as we expand research frontiers and deepen societal engagement.

The past year has been marked by significant academic and research achievements. Our scientists published nearly 200 papers in reputed journals, along with several book chapters and conference contributions, reflecting sustained excellence. Many scholars earned their Ph.D. degrees and have joined leading national and international institutions, exemplifying our commitment to nurturing talent. The filing of a new patent further highlights our focus on innovation and translational research.

Our researchers received several prestigious recognitions, including the JC Bose Grant (DST–ANRF, India), S. Ramanujan Award 2024 (ARAI, India), Prof. K.C. Bose Gold Medal (NESA, New Delhi), ACCT(i) Excellence in Carbohydrate Research Award (USA), and the VAJRA Fellowship (DST–ANRF, Government of India). These honours reaffirm the Institute's leadership and global presence in frontier science.

Bose Institute continues to play a vital role in international collaborations as India's nodal agency for ALICE (CERN) and the FAIR project. Our scientists contributed to prototype detector development for the Compressed Baryonic Matter

It is both an honour and a moment of reflection to share the recent milestones and scientific endeavours of Bose Institute. Founded in 1917 by Acharya Jagadish Chandra Bose, the Institute continues to uphold his vision of pursuing truth through curiosity, innovation, and service to society. This

experiment at FAIR. A major highlight was the 42nd FAIR Council Meeting hosted on our campus—the first ever held outside Germany—signifying India's growing prominence in high-energy and nuclear physics.

The Institute's academic calendar was enriched by distinguished lectures and events. Dr. Soumya Swaminathan, WHO's Chief Scientist and Former Director General of ICMR, has graciously agreed to deliver the 86th Acharya J.C. Bose Memorial Lecture, offering valuable insights into global health research. The D.M. Bose Memorial Lecture–2025, delivered by Prof. Rajesh Gopakumar, Centre Director, ICTS–TIFR, Bengaluru, highlighted new advances in theoretical physics.

Looking ahead, the Institute is establishing Interdisciplinary Research Centres integrating AI and Machine Learning into studies on energy, climate change, agriculture, healthcare, and drug discovery. The reintroduction of the M.Sc.–Ph.D. programmes in Life and Physical Sciences will further strengthen training and mentorship. Bose Institute remains steadfast in its mission to explore without boundaries, innovate with purpose, and serve humanity through science.

Prof. Kaustuv Sanyal

Director



Published by

Registrar (Officiating), Bose Institute

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The 108th Foundation Day of Bose Institute was celebrated on November 30, 2024. Prof. Sankar K. Pal, National Science Chair, Gol, President, Indian Statistical Institute, distinguished Scientist and Former Director, Indian Statistical Institute, Kolkata, delivered the 85th Acharya J.C. Bose Memorial Lecture on “Pattern Recognition, Machine Intelligence to Deep Learning and Data Science: Evolution, Challenges and Concerns”. Prof. Anuradha Lohia, Former Vice Chancellor, Presidency University, Kolkata, presided over the programme.

CURRENT EVENTS

The 42nd FAIR Council Meeting



The 42nd FAIR Council Meeting, the first such meet outside the FAIR site at Darmstadt, Germany, was held at Bose Institute during December 3-4, 2024 to discuss policies, challenges and way forward towards the implementation of one of the largest multipurpose particle accelerator projects of our times. Several delegates from the partner countries and FAIR/GSI Management were present in the meeting. After the meeting, the members visited the Bose Institute Main Campus and J.C. Bose Museum at Rajabazar.

As in previous years, Bose Institute actively participated in the Viksit Bharat 2047, Sci-Tech Expo and the Science–Technology–Defence–Space Exhibition. The Bose Institute Pavilion highlighted the institute’s ongoing research activities, recent achievements, and its rich scientific legacy tracing back to Sir Jagadish Chandra Bose. The display included well-structured posters, models on light-mediated signal transduction, three innovative experimental demonstrations, and 3D-printed biological structures, which collectively drew significant attention from visitors.

The pavilion received an esteemed visit from Dr. Jitendra Singh, Hon’ble Minister of Science and Technology, Government of India, and Prof. Abhay Karandikar, Secretary, Department of Science & Technology (DST), along with several other dignitaries from DST and participating institutions. Their visit and appreciation were a source of encouragement and pride for the Bose Institute team.

India International Science Festival (IISF)



The 10th edition of India International Science Festival (IISF) was held at IIT Guwahati from November 30 to December 3, 2024, on the theme “Transforming India into an S&T-driven Global Manufacturing Hub.”

Broadcast live on DD Bangla



Discussion on the 2024 Nobel Prize in Physics (Neural Networks and Machine Learning) by Prof. Soumen Roy was broadcast live on DD Bangla at 5:30 PM on December 5, 2024.

Outstanding Participation Award



Bose Institute participated in the Mega Exhibition “Aspiring Odisha” at Baripada, Mayurbhanj, from 12-14 December 2024. The Institute showcased its research through scientific posters and 3-D models of DNA and proteins. Physics exhibits, including signal transmission models and the Plasma Ball, were particularly popular among school students. Bose Institute was awarded ‘Outstanding Participation’ for its stall and scientific demonstrations.

Participation in the XXVI DAE-BRNS High Energy Physics Symposium



The High-Energy Physics Group of Department of Physical Sciences at Bose Institute, Kolkata, participated in the prestigious XXVI DAE-BRNS High Energy Physics (HEP) Symposium held during December 19-23, 2024, at Banaras Hindu University (BHU), Varanasi. This renowned symposium, sponsored by the Board of Research in Nuclear Sciences (BRNS) under the Department of Atomic Energy (DAE), brought together leading researchers and academics from across the nation as well as from abroad.

Visited Bose Institute



Dr. Praveen Kumar Somasundaram, Head, International Cooperation division, DST visited Unified Academic Campus of Bose Institute on December 30, 2024, for a discussion on the FAIR project. He interacted with the students and post-doctoral fellows of Bose institute working in FAIR and ALICE experiments. He also visited the library and some laboratories in the Unified Academic Campus.

Physical Sciences Seminar



Dr. Sk. Mustak Ali delivered an informative and stimulating talk on “Nuclear Astrophysics with Charge-Exchange Reactions at FRIB” on January 7, 2025, at the Unified Academic Campus of Bose Institute. Dr. Ali, an alumnus of Bose Institute with an M.Sc. and Ph.D. from the Institute, is currently a Postdoctoral Researcher at the Facility for Rare Isotope Beams (FRIB), Michigan State University, USA.

Lecture by Dr. Vladimir F. Lazarev



Dr. Vladimir F. Lazarev from the Institute of Cytology, Russian Academy of Sciences, delivered a lecture on “Chaperone-associated small molecule inhibitors as anticancer drugs” on January 15, 2025 at Bose Institute UAC, Salt Lake Campus. His research focuses on chaperone proteins in cancer and neurodegenerative diseases and on small-molecule modulators of chaperone activity. During the visit, he expressed interest in collaborating with Prof. Debaraj Mukherjee’s lab, DCS, Bose Institute, on developing small molecules to inhibit autophagy for anticancer therapy.

Bose Institute Colloquium



Prof. Peter Coveney delivered Bose Institute Colloquium on January 16, 2025. The lecture was titled “Digital You: The Virtual Future of Medicine” and provided an insightful introduction to the concept of “digital twin.” The talk was engaging and well-received by the audience. The event was organized in collaboration with the British Council.

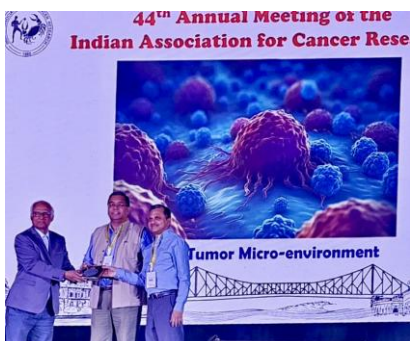
Participation in 10th Asian Triangle Heavy-Ion Conference (ATHIC 2025)



The 10th ATHIC, organized by IISER Berhampur, was held at Mayfair Palm Beach Resort, Gopalpur-on-Sea, Odisha, during January 13-16,

2025. Faculty members, students, and post-doctoral fellows from the Department of Physical Sciences, Bose Institute, participated. Dr. Saikat Biswas delivered a plenary talk on Indian participation in FAIR construction, and Prof. Supriya Das gave a review talk on Astrophysics in laboratory: the CBM experiment. Mr. Subir Mandal, Dr. Somen Gope, Dr. Anjali Sharma, and Dr. Sanchari Thakur presented oral papers on ALICE and CBM-related studies. Prof. Rajarshi Ray chaired a session and served on the National Advisory Committee.

44th Annual Meeting of the Indian Association for Cancer Research (IACR)



The 44th Annual Meeting of the Indian Association for Cancer Research (IACR) was held at the Biswa Bangla Convention Centre, Kolkata, from 16–18 January 2025, with over 350 participants. The

conference theme was “Convergence of Fundamental and Translational Approaches in Cancer Theranostics.” Prof. Kaushik Biswas (Department of Biological Sciences, Bose Institute) delivered an invited lecture titled “Transcriptional Control of the GM2-synthase gene in Cancer: The Sp1-HDAC1-p300 Enigma,” highlighting a novel mechanism of GM2-synthase gene regulation in cancer.

76th Republic Day Celebration



The 76th Republic Day was celebrated on January 26, 2025, at the Unified Academic Campus of Bose Institute with great enthusiasm. The programme began with the ceremonial unfurling of the National Flag by the Director, Bose Institute, followed by the singing of patriotic songs organized by faculty members and research scholars. The event witnessed active participation from all staff members, making the celebration a grand success.

Congratulation Prof. Anirban Bhunia, Department of Chemical Sciences

Ayurveda's Hope for Alzheimer's
Modern science with Ayurveda to tackle Alzheimer's Disease & other neurodegenerative conditions

Impact

- Offers hope for Alzheimer's and dementia patients
- Highlights Ayurveda's potential in treating complex neurodegenerative disorders

Ayurvedic Solution
Lasunadya Ghrita

Ancient Ayurveda & modern science paving way for improved lives

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Happy to share that the research work of Prof. Anirban Bhunia in the application of Ayurveda and modern science to tackle Alzheimer's Disease and other Neurodegenerative conditions, has been published under "Weekend Wellness" by DST. Looking forward to more of such researches in future.

Congratulation Prof. Saikat Biswas, Department of Physical Sciences

India's Breakthrough in Particle Detector Technology

New technique to study radiation effects on GEM detectors, crucial for nuclear and particle physics experiments

Achievement

- Supports India's role in building GEM chambers for the FAIR project, Germany
- Indian scientists develop a method to study the charge-up effect
- Helps improve detector stability and efficiency

A proud milestone for India

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India achieves a new milestone in particle detector technology. Scientists at Bose Institute have developed a novel method to study radiation effects on GEM detectors, vital for high-energy physics and medical imaging. This achievement marks a significant step forward in strengthening India's contribution to the FAIR project, Germany.

Bose Institute Scientists Featured on Doordarshan Program on Ancient Life Forms



Do ancient life forms still coexist with us? Yes — microorganisms like Archaea, which emerged over two billion years ago, continue to thrive in extreme environments such as hot springs and deep-sea volcanoes. Dr. Abhrajyoti Ghosh of Bose Institute recently discovered how Archaea use toxin-antitoxin (TA) systems to survive under high-temperature conditions. He discussed these findings on Doordarshan (DD Bangla). Dr. Shubhra Ghosh Dastidar also featured in the program, explaining how computational tools help trace evolutionary timescales and genetic adaptability. The discussion highlighted the significance of such studies in modern biotechnology.

Bose Institute at 'Radiant Jharkhand' Exhibition



Bose Institute participated in the mega exhibition Radiant Jharkhand at Jamshedpur from February 20–22, 2025. Students eagerly visited the stall to observe living cells under a microscope and explore experiments on photosynthesis and transpiration. Prof. Saikat Biswas's Plasma Ball demonstration was a major attraction. Bose Institute was awarded the trophy for outstanding performance.

National Science Day Celebration

Bose Institute celebrated the National Science Day with a one-day event on February 28, 2025. During the day about 280 students from more than 10 colleges/universities visited



several research laboratories and the Central Instrumentation Facility at Bose Institute. Later on the day they attended lectures by eminent speakers on this year's theme.

Prof. Kaustuv Sanyal Featured on DD Bangla National Science Day Program



Prof. Kaustuv Sanyal, Director, Bose Institute, participated as a panelist in the program “Jatiyo Bigyan Dibas – Bigyane Bangali” televised on DD Bangla on February 28, 2025, marking National Science Day. Speaking in Bengali, Prof. Sanyal highlighted the Institute's past and present scientific achievements, its integration with national and international research initiatives, and its rural biotechnology programs addressing grassroots needs. He also encouraged young students to actively engage in scientific research and innovation.

Participation in Post-Budget Webinar on “Investing in Innovation”



Bose Institute participated in the Post-Budget Webinar on the theme “Investing in Innovation” held virtually on March 5, 2025. The event focused on strategies for implementing the sub-theme Research, Development & Innovation (RDI) and the Deep Tech Fund of Funds. The Hon'ble Prime Minister, Shri Narendra Modi, delivered the inaugural address, followed by a panel discussion with eminent industrialists. The session began with opening remarks by the Secretary, DST. The Director, along with the Registrar (O), Deans, Chairpersons, and Faculty Members of Bose Institute, attended the discussion. The concluding session was chaired by the Hon'ble Union Minister of Science & Technology, Dr. Jitendra Singh.

Breakthrough Prize 2025: Bose Institute Shines in ALICE Collaboration at CERN



The \$3 million Breakthrough Prize in Fundamental Physics 2025 has been awarded to researchers from over 70 countries representing CERN's Large Hadron Collider (LHC)

collaborations — ATLAS, CMS, ALICE, and LHCb. Scientists from the High Energy Physics Group of Bose Institute share this honour as part of the ALICE Collaboration, contributing significantly to detector hardware development, simulation, physics analysis, data-taking, and experiment operations. This recognition highlights Bose Institute's vital role in advancing international research in high-energy physics.

Participation in 'Theme Meeting on FAIR-Science' at Panjab University



Prof. Kaustuv Sanyal, Director, along with other scientists from Bose Institute, participated in the Theme Meeting on FAIR-Science held at Panjab University, Chandigarh, from April 23–25, 2025.

Bose Institute Colloquium

It was a proud privilege for Bose Institute to host Prof. Ajeet N. Mathur, Professor Emeritus, New Delhi Institute of Management, and Member of the Board of Directors, International Society for the Psychoanalytic Study of Organizations, who delivered the Bose Institute Colloquium



titled “Dwelling in Wonder, Mysteries and Marvels.” During his visit, Prof. Mathur toured the J.C. Bose Museum and the Main Campus, expressing his admiration by remarking, “One of the most inspiring places in the world I have ever visited. The Muse practically resides here.”

Swachhata Hi Seva



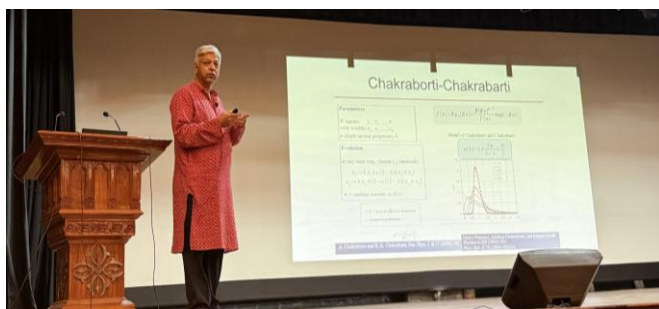
Bose Institute observed Swachhata Pakhwada during May 01-15, 2025

Observation of the International Day of Yoga 2025



The International Day of Yoga 2025 was observed on June 20, 2025, at the Unified Academic Campus of Bose Institute, Salt Lake. The programme witnessed enthusiastic participation from the staff members and research scholars of the Institute. Shri Rama Sankar from Ananda Yoga Centre, Salt Lake, conducted a graceful yoga demonstration showcasing various postures and breathing techniques. The session inspired the audience with its display of discipline, energy, and positivity, emphasizing the importance of yoga in promoting physical and mental well-being.

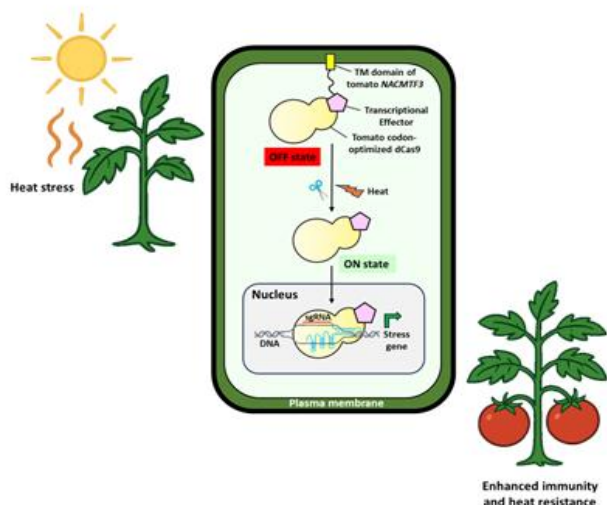
Bose Institute Colloquium



Professor Anirban Chakraborti from the School of Computational & Integrative Sciences, Jawaharlal Nehru University, New Delhi, delivered the Bose Institute Colloquium on June 20, 2025. His talk, titled “Making Sense of Chaos – Data Science for Complex Systems,” was highly engaging and thought-provoking, offering deep insights into the application of data science in understanding complex phenomena.

Recognition of Research Work by Prof. Pallob Kundu

A Smart Tool to Help Plants Tackle Heat and Infections Under Heat Stress



Prof. Pallob Kundu, Dean, Student Affairs, Bose Institute, has authored a research article titled "New CRISPR Technology Helps Plants Outsmart Heat and Disease." The article has been featured and disseminated by the Press Information Bureau (PIB) and the DST Media Cell.

This acknowledgment underscores the significance of the research and reflects the Institute's continued contribution to advancing scientific innovation. We look forward to more such impactful research in the future.

Visit of Officials from the Department of Pharmaceuticals and NIPER-Kolkata



Shri Amit Agarwal, Secretary, Department of Pharmaceuticals (DoP), Ministry of Chemicals and Fertilizers, Government of India, along with Dr. U.S.N. Murty, Director, NIPER-Kolkata, and Dr. Subramanian Natesan, Registrar (I/c), NIPER-Kolkata, visited the Unified Academic Campus (UAC) of Bose Institute on July 4, 2025. During the visit, they interacted with the Director and faculty members of Bose Institute to explore possibilities for collaboration in initiating a post-graduation course and advancing pharmaceutical research through joint academic and research initiatives.

Visit to CERN, Geneva

Prof. Kaustuv Sanyal, Director, Bose Institute, along with Prof. Supriya Das, Prof. Saikat Biswas, and Dr. Sidharth K. Prasad, faculty members of the Department of Physical Sciences, visited CERN, Geneva, Switzerland. During the visit, Prof. Sanyal met with the Director for International Relations, the Head of Associate Member and Non-Member State Relations, and the Spokesperson and Deputy Spokesperson



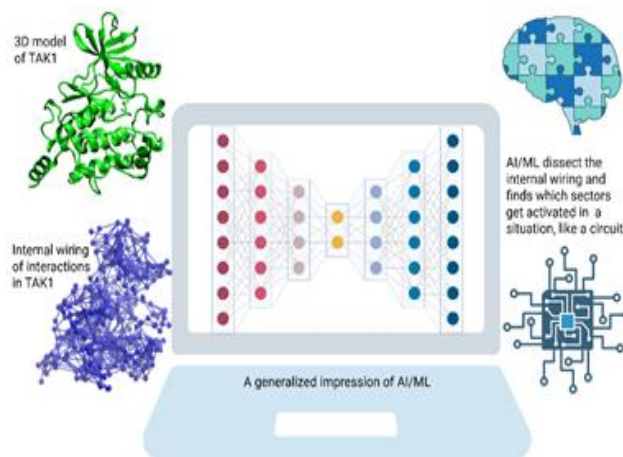
of the ALICE Collaboration at CERN. He also visited the ALICE Run Control, ISOLDE, and several other key research facilities on the campus.

National Conference on "Interdisciplinary Horizons of Physical Chemistry (IHPC) – 2025"



The Department of Chemical Sciences, Bose Institute, in collaboration with SN Bose National Centre for Basic Sciences (SNBNCBS) and IISER Kolkata, organized a three-day national conference on "Interdisciplinary Horizons of Physical Chemistry (IHPC) – 2025" during July 17-19, 2025. A total of 42 eminent scientists from across India, specializing in Physical Chemistry and its interdisciplinary domains, delivered insightful scientific lectures. In addition, 35 Ph.D. students and postdoctoral researchers presented posters showcasing their research work. The conference witnessed active participation from about 100 delegates from various institutions across the country, fostering vibrant academic discussions and collaborative exchange of ideas.

Research Story Featured by DST and PIB



The research story of Prof. Shubhra Ghosh Dastidar, Department of Biological Sciences, Bose Institute, was featured and disseminated on social media platforms by the

Department of Science and Technology (DST) and the Press Information Bureau (PIB).

79th Independence Day



The 79th Independence Day was observed all the 7 Campuses of Bose Institute with great enthusiasm. The occasion was marked by a flag hoisting ceremony, followed by the singing of the national anthem. Staff members, students and other members actively participated in the event, reflecting on the spirit of freedom and national unity.

National Space Day 2025



National Space Day 2025 was observed at the Unified Academic Campus, Bose Institute. On this occasion, Prof. Soumen Mondal from S.N. Bose National Centre for Basic Sciences, Kolkata delivered a talk on August 22, 2025, titled “Exploration of Astrophysics Using Space Technology”. The lecture provided valuable insights into the use of space technology for astrophysical research and was well received by the faculty, staff, and students in attendance.

Participation in 28th National Science Exhibition



Bose Institute participated in the 28th National Science Exhibition held at Central Park Maidan, Salt Lake, Kolkata, during 21.08.2025 – 24.08.2025. The Institute’s pavilion

drew significant attention throughout the four-day event with its scientific models, physics and chemistry demonstrations, and live cell imaging exhibits. Scientists and technical staff members remained present to engage visitors and disseminate scientific knowledge in the spirit of Sir J. C. Bose, the Institute’s illustrious founder.

Leibniz Lecture



The “Leibniz Lecture” was organized on 27th August 2025 at the Unified Academic Campus, Bose Institute, in collaboration with the German Research Foundation (DFG) and the Max Planck Society (MPG), in association with the German Consulate General, Kolkata. Prof. Dr. Michael Brecht delivered the lecture on “Large-Brain Neuroscience of Elephants.”

Participation in Hot QCD Matter 2025 Conference



The Hot QCD Matter 2025 (Series 3) conference, held at IIT Bhilai from 4th to 6th September 2025, featured active participation from researchers of the Department of Physical Sciences, Bose Institute. Dr. Saikat Biswas delivered a plenary talk on the Indian contribution towards the construction of the Facility for Antiproton and Ion Research (FAIR), Germany, and also chaired the first plenary session on the concluding day. In the parallel sessions, Mr. Subir Mandal presented “Performance Studies of GEM Detectors for Future Heavy Ion Experiments,” while Mr. Mintu Haldar presented “Recent Results on Two-Particle Correlation Measurements at LHC Energy.” Mr. Subir Mandal was honoured with one of the Best Oral Presentation Awards.

Orientation Programme 2025



Reintroduction of Integrated M.Sc.-Ph.D. programme in Life Sciences and Physical Sciences

This year, we have successfully reintroduced the Integrated M.Sc.-Ph.D. programme in Life Sciences and Physical Sciences in collaboration with the University of Calcutta. Sixteen students have enrolled in Life Sciences and eight in Physical Sciences. Our scientists are actively and enthusiastically engaged in delivering high-quality teaching.

Hindi Day and Hindi Pakhwada



The Inaugural Ceremony of Hindi Pakhwada 2025 was held on September 9, 2025 at Bose Institute. Special lectures were delivered by Prof. Jajati K. Nayak, Scientific Officer-G, VECC, Kolkata, Prof. Ajit Bikram Datta, Department of Biological Sciences, and Mr. Vikas Kumar, A&FO. The Registrar (Officiating), Deputy Registrar, Dr. Sidharth Kumar Prasad, Chairman, Hindi Implementation Committee, and other staff members shared their views on the significance of observing Hindi Day and Hindi Pakhwada. The event was attended by faculty members, research scholars, and students of the Institute. Various activities such as essay competition, damsharas game, antakshari game etc. were also organized throughout the Hindi Pakhwada.

Swachhata Seva



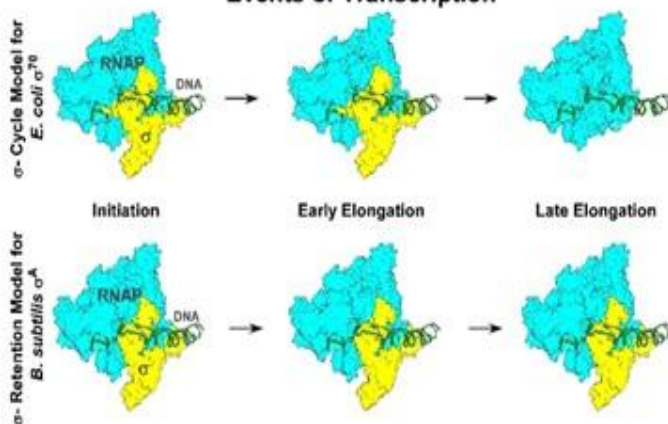
Bose Institute observed "Swachhata Seva" and administered the Swachhata Pledge on September 19, 2025.

Published a research article in PNAS, USA

Bose Institute takes pride in announcing that Prof. Jayanta Mukhopadhyay, Department of Chemical Sciences, has published a research article in the Proceedings of the National Academy of Sciences (PNAS), USA, a journal of international repute.

The study, conducted in collaboration with Rutgers University, challenges a longstanding model of bacterial gene regulation by demonstrating that the widely accepted " σ cycle" is not universal across bacteria. The team discovered that in *Bacillus subtilis*, the principal transcription factor σA —unlike *E. coli* $\sigma 70$ —remains bound to RNA polymerase throughout transcription.

Events of Transcription



This finding overturns a 50-year-old paradigm in molecular biology and offers new insights into bacterial transcription mechanisms with far-reaching implications for understanding gene regulation and antibiotic development, doi:10.1073/pnas.2503801122.

Observation of Swachhata Hi Seva 2025



Observation of Swachhata Hi Seva 2025 at Unified Academic Campus, Bose Institute on October 03, 2025.

Bose Institute and S. N. Bose Centre Discuss Future Scientific Collaborations



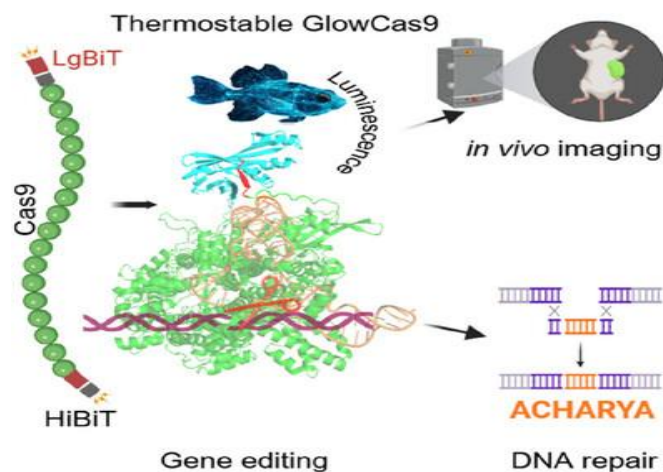
A joint meeting between Bose Institute and the S. N. Bose National Centre for Basic Sciences was held at the Unified Academic Campus of Bose Institute on October 13, 2025. The meeting facilitated discussions on prospective areas of joint scientific collaboration between the two premier institutes in the near future.

Prof. Marco van Leeuwen visited Bose Institute



Prof. Marco van Leeuwen, Spokesperson of the ALICE Collaboration at CERN, along with Dr. Zubayer Ahammad, Spokesperson of the India–ALICE Collaboration, visited Bose Institute. Prof. van Leeuwen met Prof. Kaustuv Sanyal, Director, Bose Institute, and interacted with faculties, doctoral and master's students of the Department of Physical Sciences, where they discussed the research being carried out at CERN and explored opportunities for students to participate in collaborative projects.

Research Achievement by Dr. Basudeb Maji



Bose Institute takes pride in the outstanding research contribution of Dr. Basudeb Maji, Assistant Professor, Department of Biological Sciences, whose work has been published in the prestigious journal *Angewandte Chemie International Edition* (Early View). The research article, titled “Engineered Thermostable Chemically Responsive GlowCas9 System for Real-Time Therapeutic Monitoring Applications,” presents an innovative approach for real-time therapeutic monitoring through an engineered, thermostable CRISPR-Cas9 system. DOI: 10.1002/anie.202511707.

Special Campaign 5.0



Plantation programme organised at Unified Academic Campus, Bose Institute on October 16, 2025, in connection with Special Campaign 5.0.

24th International Conference on Bioinformatics (InCoB2025)



Bose Institute organized the 24th International Conference on Bioinformatics (InCoB2025), the flagship event of the Asia-Pacific Bioinformatics Network (APBioNET), from September 18–20, 2025, on the theme “Bioinformatics-Driven Therapeutics Innovations: Microbiome and Beyond.” The conference was inaugurated by Prof. Kaustuv Sanyal, Director, Bose Institute, and featured keynote and invited talks, poster sessions, workshops, and an industry–academia interaction. Over 200 participants from India and abroad attended, including delegates from Japan, Korea, Singapore, Malaysia, UAE, the UK, and the USA.

Symbiotic combination can clean polluted water- another significant research work from Bose Institute



Researchers at the Bose Institute, Kolkata, have shown that bacteria living inside freshwater sponges (*Ephydatia meyeri*) can act as real-time indicators of toxic metal pollution in the Indian Sundarbans. The team, led by Dr. Abhrajyoti Ghosh, found that sponges from polluted sites contained higher concentrations of metals and distinct bacterial communities compared to cleaner waters. Certain bacterial species such as *Pseudomonas*, *Bacillus*, *Micrococcus*, *Streptomyces*, and *Arthrobacter* were linked with specific metal accumulations, suggesting their role in detoxification and metal sequestration. The study highlights the sponge–bacteria partnership as a potential eco-friendly biosensor and bioremediation tool for monitoring aquatic pollution. DOI: 10.1038/d44151-025-00192-1.

Vigilance Awareness Week



Vigilance Awareness Week was observed from October 27 to November 2, 2025, across all campuses of Bose Institute. the “Vigilance Pledge” was administered at the Unified Academic Campus on October 27, 2025.

Rashtriya Ekta Diwas (National Unity Day)



A pledge-taking ceremony was held on 31.10.2025 at the Unified Academic Campus, Bose Institute, on the occasion of the celebration of "Rashtriya Ekta Diwas (National Unity Day)" to commemorate the 150th birth anniversary of Sardar Vallabhbhai Patel.

Research Story Published

The research work of Prof. Gaurab Gangopadhyay, Department of Biological Sciences, Bose Institute, titled "Overexpression of AcSERK3 Confers Fusarium Tolerance to Transgenic Pineapple," was recognized by the Ministry of the Government of India and featured by the Press Information Bureau (PIB), Delhi on July 22, 2025.

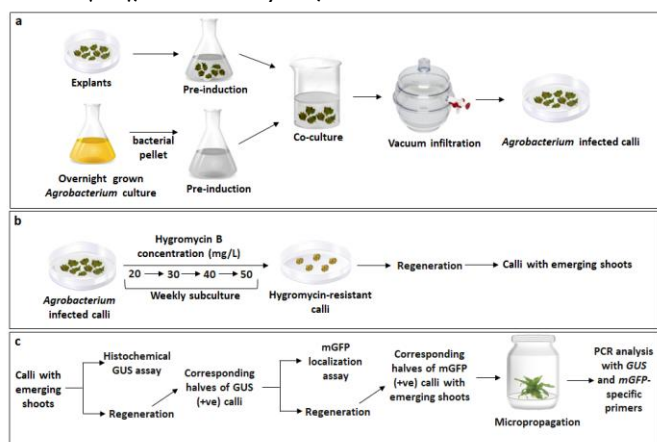


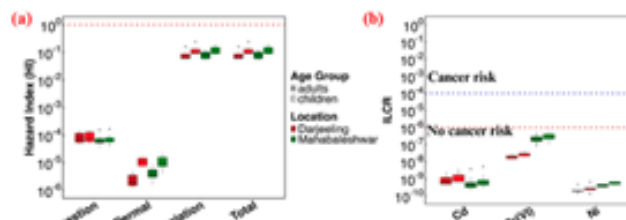
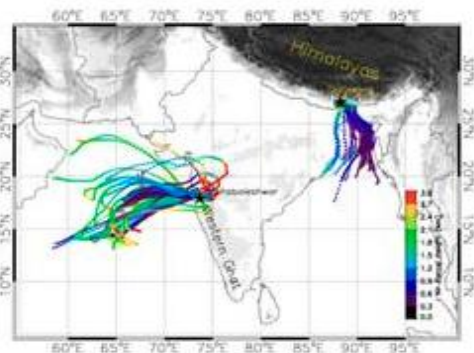
Fig-1: Workflow of transformation (overexpression) of Pineapple (*Ananas comosus* L. Merr.) with *Agrobacterium* harboring the overexpression construct: (a) infiltration of *Agrobacterium* in explant, (b) selection of the putative transformants, and (c) validation of transformed plantlets



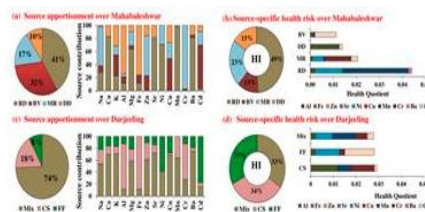
Fig-2: Transgenic Pineapple plants overexpressing AcSERK3 with enhanced *Fusarium* tolerance is ready for transplantation.

Research works on 'Himalayan clouds carrying toxic metals pose health risks'

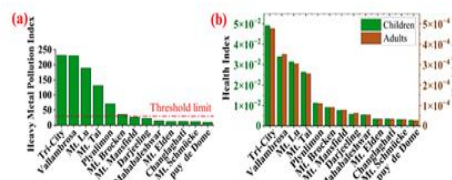
Dr. Sanat Kumar Das, Department of Physical Sciences, Bose Institute, was featured and disseminated on social media platforms by the Department of Science and Technology (DST) and the Press Information Bureau (PIB). This work has also been reported in many news papers like DD News, Times of India, The Economic Time, Anandabazar, Aaj Tak, India Today, NDTV, The Week.



(a) Non-carcinogenic health risk (HI) through different exposure routes for children and adults, and (b) carcinogenic health risk (ILCR) through inhalation of carcinogenic metals over Mahabaleshwar and Darjeeling in India.



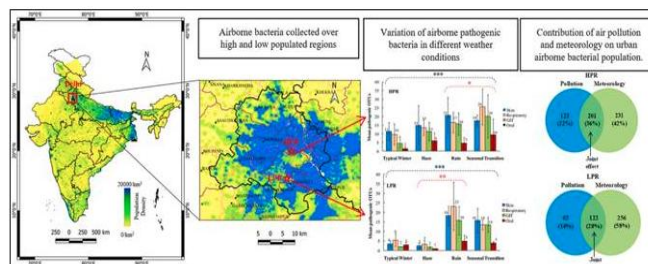
(a-b) source apportionment (%) and individual cloud-borne metal specific source contribution (%); and (c-d) source-specific health risk parameters like total HI and total HQ with individual cloud-borne toxic metal contribution over Mahabaleshwar and Darjeeling



(a) Heavy metal pollution index (HPI), and (b) non-carcinogenic risk from the cloud water over different locations in the world.

Research works on 'Invisible bacteria get free ride in the city air, threatening human health'

The research works on 'Invisible bacteria get free ride in the city air, threatening human health' of Dr. Sanat Kumar Das, Department of Physical Sciences, Bose Institute, was featured and disseminated on social media platforms by the Department of Science and Technology (DST) and the Press Information Bureau (PIB).





1. Botany (B.Sc. Hons.) students from Shri Shikshyatan College, Kolkata visited the Unified Academic Campus (UAC) of Bose Institute on January 7, 2025, as part of their academic curriculum under the University of Calcutta. During the visit, they attended a lecture on Plant Tissue Culture and explored several laboratories and plant tissue culture facilities of the Department of Biological Sciences.



2. A group of M.Sc. 3rd Semester Biotechnology students from St. Anthony's College, Shillong, visited the Unified Academic Campus of Bose Institute on 8 January 2025 as part of their Institutional Study Tour. The visit was organized under the DST's Scientific Social Responsibility (SSR) initiative for two ongoing SERB projects at Bose Institute. During the visit, the students attended lectures on Cancer Therapy and Plant Epigenetics delivered by Prof. Kaushik Biswas and Prof. Shubho Chaudhuri, respectively. They also toured several laboratories and the Central Instrumentation Facility of the Institute.



3. An outreach programme was organized on January 14, 2025, by Prof. Debaraj Mukherjee and Dr. Amit Kumar Paul, Department of Chemical Sciences, for undergraduate Chemistry students under the SSR mandate of ANRF-sponsored projects (DST, Govt. of India). Thirty-five students from St. Xavier's College, Victoria Institution (College), Rammohan College, and Vidyasagar College for Women participated. The programme included visits to the Main Campus and J. C. Bose Museum, lectures by Prof. Anirban Bhunia and Prof. Shubhra Ghosh Dastidar at the UAC, and a demonstration of advanced facilities at CIF, including NMR. The event successfully inspired students toward higher studies and research.

4. A one-day Science Camp for local school students was organized at the Falta Experimental Farm on January 17 2025 with an objective to foster scientific curiosity and awareness among young learners through interactive demonstrations and hands-on activities conducted by the Institute's scientists. Students from Dostapur High School (Dostapur), Harindanga High School (Chabaria), Mahirampur High School (Mahirampur), Parulia Sri Ramkrishna High School (Darikrishnanagar), and Falta Vivekananda Adarsha Vidyalaya (Falta) participated in the camp. The event witnessed enthusiastic participation from both students and teachers and served as a successful science outreach initiative of the Institute.



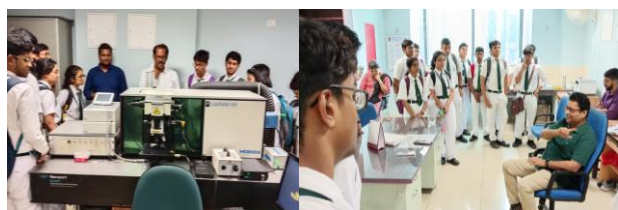
5. A team of students and faculty from the Department of Statistics, North-Eastern Hill University (NEHU), Shillong, led by Prof. Bishal Gurung, visited the Bose Institute Darjeeling campus on January 13, 2025. The visit included a guided tour of the campus museum, where Mrs. Yashodhara Yadav introduced the Institute's history and artefacts, followed by a laboratory visit with demonstrations of air quality measuring instruments. The NEHU team appreciated the facilities and extended positive feedback on the hospitality.



6. A group of M.Sc. fourth-semester students from the Department of Biotechnology, Gauhati University, visited the Unified Academic Campus of Bose Institute on February 7, 2025. Prof. Pallob Kundu delivered a lecture on gene silencing, miRNA, and siRNA technologies, while Prof. Shubhra Ghosh Dastidar and his group conducted an engaging session on bioinformatics and modelling. The students were delighted to interact with Prof. Zhumur Ghosh, author of their Bioinformatics textbook, and visited the CIF facility to learn about instruments such as NMR, MALDI, and LC-MS. The programme was coordinated by Prof. Gaurab Gangopadhyay, Chairman, Public Relations Committee.



7. Bose Institute had the privilege of hosting a group of students from the Department of Biotechnology, Adamas University, at the Central Instrumentation Facility (CIF) on March 3, 2025. The visit commenced with a welcome address and an informative lecture delivered by the Chairman of CIF, providing the students with insights into the advanced instrumentation and ongoing research at the facility.



8. A group of Class XII students from Delhi Public School, Howrah, visited the Unified Academic Campus of Bose Institute on April 7, 2025. The students explored several research laboratories, where Prof. Achintya Singha demonstrated the Raman Effect and Raman Spectroscopy, and research scholars from Prof. Anup Kumar Misra's lab showcased TLC and column chromatography techniques. Biology students performed hands-on gel electrophoresis in Dr. Basudeb Maji's lab, while computer science students interacted with Prof. Soumen Roy, who introduced them to applications of AI in computer science. The visit proved to be an inspiring outreach activity, motivating students to pursue careers in basic sciences and research.



9. The M.Sc. Biotechnology students from Swami Vivekananda Institute of Modern Science, Sonarpur, visited the Unified Academic Campus on May 16, 2025. Following an introduction by Prof. Gaurab Gangopadhyay, they attended lectures on Cancer Biology and Plant Rhizosphere Microbiology by Prof.

Kaushik Biswas and Dr. Abhrajyoti Ghosh, respectively. The visit included laboratory demonstrations by research scholars, giving students hands-on experience with various instruments. The students departed inspired to pursue advanced research in their careers.



10. Forty-three School Laboratory Assistants from the Kingdom of Bhutan visited the Unified Academic Campus of Bose Institute on 28.05.2025 as part of a 5-day Residential Training Programme on Advancing Laboratory Practices organized by Adamas University. At the Institute, faculty, laboratory staff, and research scholars demonstrated the operation of various instruments relevant to school laboratories. Prof. Achintya Singha (Department of Physical Sciences) showcased a wireless transmission experiment and explained the accessory equipment for replication at the participants' schools. The event was coordinated by Prof. Gaurab Gangopadhyay, who also presented the visitors with a booklet on simple experiments in basic sciences on behalf of Bose Institute. The participants returned inspired and motivated to enhance laboratory practices at their respective schools.



11. The first-year B.Pharm. students of Guru Nanak Institute of Pharmaceutical Science & Technology (GNIPST), accompanied by faculty members, visited the Main Campus and J.C. Bose Museum of Bose Institute on September 18, 2025, as part of their Students Induction Program. Prof. Gaurab Gangopadhyay, Chairman, Department of Biological Sciences, interacted with the students and briefed them on the institute's research activities. The visit included film screenings on Bose Institute's scientific contributions, followed by a guided tour of the museum and campus.

MOMENTS OF PRIDE



Prof. Debaraj Mukherjee from the Department of Chemical Sciences, Bose Institute, Kolkata, delivered a talk at the "International Conference on Chemistry for Human Development (ICCHD-2025)", jointly organized by the Professor Asima Chatterjee Foundation, University of Calcutta, Biswa Bangla Biswabidyalay, and the Luminescent Organic Consortium of India, held from January 4–6, 2025,

at the University of Calcutta (Rajabazar Campus). His presentation, titled “Effect on C-2 Carbonylation of Sugar Enol Ethers towards Altered Reactivities,” highlighted the challenges of regio-selective glycosylation and demonstrated how introducing keto functionalities can modulate monosaccharide reactivity, leading to the synthesis of 3-aryl-thio sugars and S/O-linked disaccharides, potential substrates for metabolic glycan leveling.



It is a matter of pride that Ms. Shahina Raushan Saikh, working under the supervision of Dr. Sanat Kumar Das (Department of Physical Sciences), received the Swami Vivekananda Excellence Award 2025 on the auspicious occasion of Swami Vivekananda's birthday, celebrated by the International Benevolent Research Foundation (IBRF), a non-profit organization incorporated under Act II of 1882, Govt. of India, on 12th January 2025 at the Birla Industrial and Technological Museum (BITM).

This prestigious recognition acknowledges her notable achievements and contributions in her field of research.



Bose Institute feels proud to share that Dr. Bratati Sikdar (Senior Project Associate, BI Intramural Project), Mr. Mushtaq Ahmad Najar (CSIR-SRF), and Ms. Saptadipa Banerjee (UGC-SRF), working under the supervision of Prof. Gaurab Gangopadhyay, Department of Biological Sciences, have received ‘Outstanding Paper’ Awards in their respective categories at the 7th Regional Science & Technology Congress, West Bengal, 2024–25.

We are delighted to share that Ms. Saptadipa Banerjee (UGC-SRF), working with Prof. Gaurab Gangopadhyay, Department of Biological Sciences, has been awarded the First Prize for ‘Outstanding Paper’ in the Botany category at



the 32nd West Bengal Science and Technology Congress, held at the Biswa Bangla Convention Centre, Kolkata, from 28th February to 2nd March 2025.

Happy to share that Prof. Debaraj Mukherjee, Dept. of Chemical Sciences, Bose Institute has accepted the invitation to serve as Editorial Advisory member of the reputed Wiley Journal- Chemistry & Biodiversity.



Ritankar Mitra, working with Prof. Dhruva Gupta, Department of Physical Sciences, presented his research work “Breakup studies of ^7Be on ^{12}C at 5 MeV/u” at the “38th Mazurian Lakes Conference on Physics” at Piaski, Poland during August 31 - September 6,

2025. Ritankar was selected for International Travel Support (ITS) from Anusandhan National Research Foundation (ANRF), Government of India, to participate in this prestigious conference.



Ms. Rudrapriya Das, SRF, working with Prof. Supriya Das, Department of Physical Sciences, attended the “International School of Nuclear Physics: 46th Course” held at Erice, Sicily, from September 17 to 21, 2025. She

delivered an oral presentation on her research titled “Strangeness Enhancement in PHQMD Model.” Ms. Das was awarded the International Travel Grant (ITS) by the Anusandhan National Research Foundation (ANRF), Government of India, to participate in the school.

Dr. Bratati Sikdar, Senior Project Associate, working under the supervision of Prof. Gaurab Gangopadhyay and Prof. Suman Banik, received the Best Poster Award on 31st October 2025 at the ASM–IISc Global Symposium on “One Health Approach to AMR” held at IISc, Bangalore. She presented her work on the anti-quorum sensing role of EGCG, a bioactive compound found in green tea.



141st Birthday of Prof. Debendra Mohan Bose



Bose Institute observed the **141st Birthday of Prof. Debendra Mohan Bose** on November 26, 2025. The occasion was graced by **Prof. Rajesh Gopakumar**, Distinguished Professor and Centre Director, International Centre for Theoretical Sciences, Tata Institute of Fundamental Research (TIFR), Bengaluru, who delivered the **D. M. Bose Memorial Lecture 2025** on the topic “**Why Strings?**”. **Prof. Tanusri Saha-Dasgupta**, Director, S. N. Bose National Centre for Basic Sciences, Kolkata, presided over the programme. The event also featured a stage performance of “The Trial of Abdus Salam”, directed by Nilanjan P. Choudhury, held at the Bose Institute Auditorium.

Bose Institute Annual Symposium 2025 - BIAS 2025



Bose Institute organised the “**Bose Institute Annual Symposium 2025 (BIAS 2025)**” during 25 – 27 November 2025. About 85 scholars/students participated in the symposium and presented their research work.



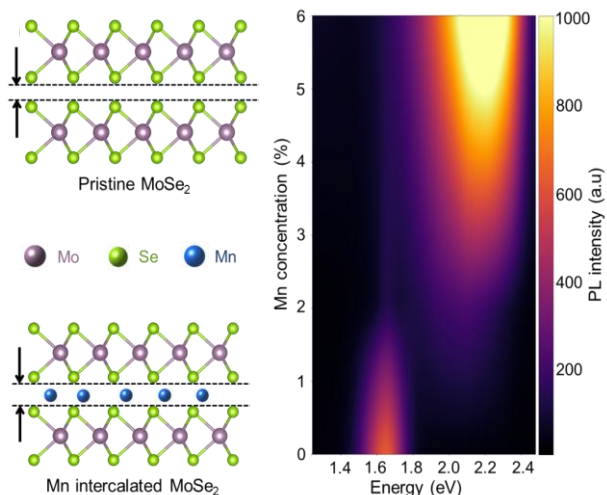
SIGNIFICANT RESEARCH FINDINGS/RECOGNITION (NATIONAL AND INTERNATIONAL)

Prof. Abhijit Chatterjee (Chemical Sciences) (i) Introduced a “Toxicity Standard” of the air pollutant, PM_{2.5}, over Kolkata. We determined a threshold value of PM_{2.5} loading in the ambient air of Kolkata above which, the toxicity (in terms of oxidative potential) increases sharply. It was found that the toxicity increases when PM_{2.5} reaches at around 70 microgram per cubic meter of ambient air and stabilizes when the PM_{2.5} load exceeds 130 microgram per cubic meter. Therefore, keeping the PM_{2.5} level within 70 microgram per cubic meter is crucial for this city. Such determination of aerosol-bound toxicity standard is the first-ever in India. (Ghosh et al., 2024; <https://doi.org/10.1016/j.scitotenv.2024>). (ii) The study and the findings of the determination of toxicity standard of atmospheric aerosols has been highlighted as a cover story in the official website of DST, Govt. of India (<https://dst.gov.in/study-introduces-toxicity-standard-ultrafine-aerosol-pm25-pollution-over-kolkata-megacity>) and Press Information Bureau, Govt. of India (<https://www.pib.gov.in/PressReleasePage.aspx?PRID=2120919>). (iii) Prepared a “Winter Action Plan” based on the long-term source apportionment of PM_{2.5} over Kolkata and submitted to Kolkata Municipal Corporation (KMC) for effective implementation for the winter season 2024-25. KMC has implemented the same and observed significant achievement in Kolkata’s air quality in winter (2024-25). [<https://indianexpress.com/article/cities/kolkata/kolkata-improved-air-quality-6-years-10012146/>].

Dr. Abhrajyoti Ghosh (Biological Sciences) (i) First description of the role of the role of A domain and N-terminal alpha-helices of FtsY in archaeal signal recognition particle. (ii) Study of archaeal communities in the mangrove rhizosphere and the microbiome of freshwater sponge species in the Indian Sundarbans, in the context of anthropogenic pollution.

Prof. Achintya Singha (Physical Sciences):

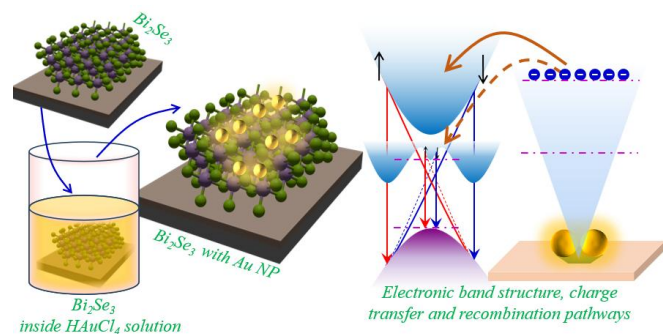
i. Manganese-Intercalated MoSe₂: A New Pathway for



Tunable Light Emission in Optoelectronic Devices

Prof. Singha and his group have found a novel way to tune the optoelectronic properties of MoSe₂. By inserting manganese (Mn) atoms between the atomic layers—a process called intercalation—they have successfully engineered the material’s band structure and light emission properties. The added Mn donates electrons to the conduction band of MoSe₂, inducing a Burstein–Moss shift in the band gap. These Mn-treated samples also show a broad range of light emission due to the combined effects of the host material and the Mn atoms. The results provide new insights into how adding atoms between layers can control material properties, opening possibilities for future light-based and electronic technologies [Ref. Sreyan Raha et al., Nano Letters, 25, 14333 (2025)].

ii. Tuning Light-Matter Interaction in 2D Topological Material Through Plasmonic Particle Coupling



Prof. Singha and his group explores how coupling 2D Bi₂Se₃, a topological insulator, with gold nanoparticles can tune light-matter interactions, boost photoluminescence, and even introduce a new chiral excitonic pathway.

By combining experiments, first-principles calculations, and electrodynamics simulations, they demonstrate controllable exciton-plasmon coupling and enhanced circular polarization—opening up exciting possibilities for next-generation optoelectronic and chiral light-emitting devices [Ref. T.S. Bhattacharya et al., Adv. Funct. Mater. e10990 (2025)].

Dr. Amit Kumar Paul (Chemical Sciences) When two molecules approach each other with a fixed impact parameter (a perpendicular distance of the velocity vectors of the two molecules), it remains the same in a vacuum condition. If the same process is taking place in presence of solvent of moderate to high density/pressure, it changes. We show that the change of association rate from vacuum to condensed phase is due to the change of impact parameter. Thus, if one can track the change of impact parameter, one can guess the rate constant under new condition (doi: <https://doi.org/10.1039/D5CP02572A>).

Prof. Anirban Bhunia (Chemical Sciences) (i) Understanding the structure-function correlation of rationally designed antimicrobial peptide against Pseudomonas-associated corneal keratitis. (ii) Transgenic tobacco plants expressing synthetic antimicrobial peptides: A functional and structural analysis for pathogen resistance. (iii) Introducing peptide derivatives of the SARS-CoV E protein for materials science: leveraging their viral origin for inherent bioactivity and self-assembly to enable smart biomaterials. (iv) The water extract of Lasunadya Ghrita (LG), an Indian traditional medicine, has been repurposed to treat Alzheimer's disease.

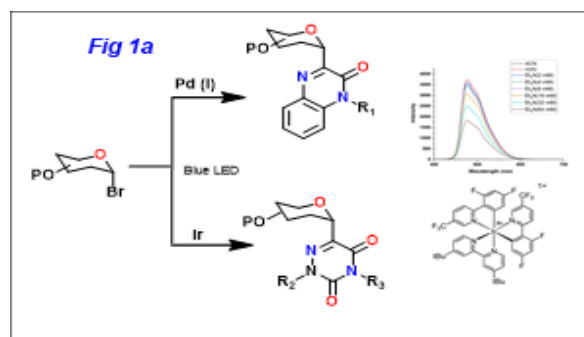
Dr Anup Ghosh (Chemical Sciences) Study reveals a clear material-dependent disparity in the self-assembled structures of L-glutathione on gold and silver nanoparticles. While GSH forms a random secondary structure on AuNPs, it adopts a β -sheet conformation on AgNPs despite both nanoparticles having comparable size, shape, and group identity. The thiol group anchors GSH to both surfaces; however, additional interactions through the terminal carboxyl groups occur exclusively on AgNPs. The contrasting IR enhancement—strong amplification on AuNPs and notable suppression on AgNPs—highlights fundamental differences in surface-molecule interactions. These findings provide important insight into nanoparticle-biomolecule interfacial chemistry and will aid future design of nanoparticle-based sensors, therapeutic carriers, and surface-enhanced spectroscopic applications

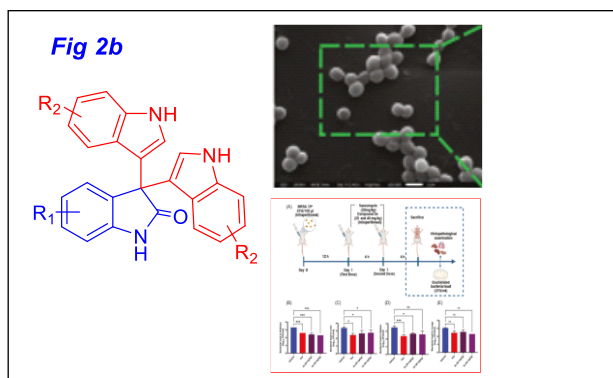
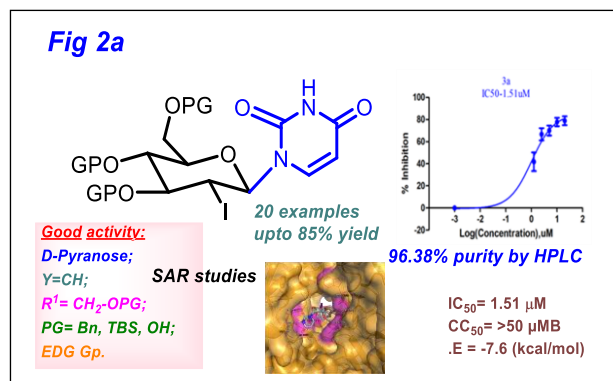
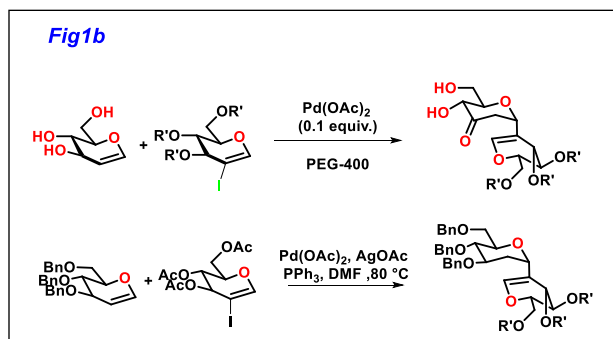
Prof. Atin Kumar Mandal (Biological Sciences) Stress induced protein aggregates are mobilised by the cellular

disaggregation machinery comprising of Hsp104, Hsp70 and Hsp110. FEBS letter 2025.

Prof. Biswanath Maity (Biological Sciences) (i) established the impact of G protein modulators particularly FNDC5 group of proteins in stress induced cardiovascular complications and shown that mitigating them might provide essential means to attenuate the chemo induced cardiac problems. Intriguingly, we identified two parallel signaling cascades impacted by FNDC5 in cardiomyocytes: the ROS-driven intrinsic mitochondrial apoptosis pathway and the ROS-independent Ataxia Telangiectasia and Rad3-Related Protein ATR/Chk1 pathway. The detrimental impact of FNDC5 depletion on heart function could be mitigated via treatment with a Chk1 inhibitor identifying Chk1 hyperactivity as a causative factor in cardiac disease. Though our data point to the potential clinical utility of FNDC5/irisin-targeted agents in the treatment of chemotherapy-induced cardiotoxicity, we also found significant down regulation in FNDC5 expression in the hearts of aged mice that attenuated the cardioprotective impacts of FNDC5 overexpression following doxorubicin exposure. Together our data underscore the importance of FNDC5/irisin in maintenance of cardiac health over the lifespan. (Redox Biology, 2025). (ii) Also developed functionalized and biocompatible drug delivery systems for site-specific release of small molecules which is emerging as a means to target disease sites while sparing healthy tissue. We designed and synthesized two tetra peptides with or without Trp-Trp-sequence and self-assembled them using Zn. Self-assembled structure effectively encapsulated the chemo drug and also chemically modified with folic acid to target folate receptor α , commonly overexpressed on the surface of cancer cells. Our results represent an important proof of concept describing the fabrication of fluorescent Zn(II) coordinated, self-assembled short peptides may be used to develop superior imaging reagents and site-specific drug delivery systems. (ACS Applied Bio Materials, 2025).

Prof. Debaraj Mukherjee (Chemical Sciences) has made significant contributions to synthetic and medicinal carbohydrate chemistry, developing innovative strategies for the construction of biologically active nucleosides, glycoconjugates, and sugar-based therapeutics. Among his landmark contributions are the synthesis of C-nucleosides (fig1a) under photoredox conditions (Chem. Eur. J., 2025, e202500882 & Org. Lett., 2025, 27, 5491-5496), challenging C-disachharide (fig1b) (ChemComm, 2025, 61, 14161-14164). Prof. Mukherjee's translational research in medicinal chemistry has yielded several promising drug leads. 2-Iodonucleosides (fig 2a) developed in his laboratory exhibit potent activity against Japanese Encephalitis Virus (JEV) (RSC, Indian Patent IN202411022366, 2024) and Triindolylmethane derivatives (fig 2b) as anti-MRSA agents (NPJ Biofilms Microbiomes, 2025, 11, 184).





Prof. Dhruva Gupta (Physical Sciences) Our recent research interests involve nuclear reactions relevant to big-bang nucleosynthesis, stellar nucleosynthesis and inhomogeneous nucleosynthesis using exotic radioactive beams at ISOLDE and GANIL. The standard big-bang model of the primordial universe is very successful in predicting the abundance of light elements except lithium, known as the cosmological lithium problem. To explore this decades old problem, we carried out experiments at CERN-ISOLDE on several nuclear reactions involving ⁷Be beam. We found that our present knowledge of nuclear physics cannot solve it, and it may point towards new fundamental physics. We also carried out improved measurements relevant to the nuclear reaction ¹²C(α,γ)¹⁶O that is aptly called the “holy grail of nuclear astrophysics”, critical for the abundance ratio of carbon to oxygen after the helium-burning cycle. This is a key input for subsequent stellar evolution and is the fundamental basis for all organic chemistry and for the evolution of biological life in our universe.

Dr. Nirmalya Sen (Biological Sciences) DNAPK mediated phosphorylation of ETS1 promotes chemoresistance in triple negative breast cancer (First demonstration of post-translational modification of ETS1 in TNBC resistance which acts as chemoresistance specific biomarker for TNBC relapse cases)

Triple Negative Breast Cancer (TNBC) accounts for ~20% of all breast cancer and results in thousands of deaths every

year. Since the choice of drugs remains limited to chemotherapy, the median survival of TNBC patients sharply declines with the development of chemoresistance and metastatic disease. Although high expression of ETS1 in TNBC has been loosely associated with aggressiveness, the mechanisms of ETS1 in TNBC therapy relapse are poorly understood. Here, we show that ETS1 is responsible for driving acquired drug resistance. Protein kinase, DNAPK (aka PRKDC) mediated phosphorylation of ETS1 at Serine 251 residue enhances protein stability by preventing ETS1's degradation from COP1 E3 ligase, thus enhancing ETS1-driven resistance mechanisms. DNAPK inhibitors resulted in ETS1 degradation, inhibition of proliferation and subsequent apoptosis in resistant. This is the first report of ETS1 transcription factor being regulated by evolving phosphorylation during chemoresistance in TNBC and has the potential for future applications as drug targets.

Dr. Pramod Kumar Shukla (Physical Sciences) works in the area of Theoretical High Energy Physics, in particular String Theory. His main topics of interests are aimed towards the model building in string cosmology and string phenomenology. Main findings are as below:

(i) Proposed an assisted fibre inflation dynamics of multiple fields which can dilute/avoid the standard challenge of large field excursion in the single field case. [JCAP 10 (2025) 070; DOI: <http://dx.doi.org/10.1088/1475-7516/2025/10/070>].

(ii) Presented a cohomology formulation for the scalar potential arising from the U-dual completion of the type IIB flux superpotential. [JHEP 01 (2025) 153; DOI: [http://dx.doi.org/10.1007/JHEP01\(2025\)153](http://dx.doi.org/10.1007/JHEP01(2025)153)].

(iii) Demonstrated the applicability of cohomology formulation via analysing the landscape of vacua corresponding to the geometric and non-geometric fluxes. [EPJC 85 (2025) 244; DOI: <https://doi.org/10.1140/epjc/s10052-025-13980-x>].

Prof. Saikat Biswas (Physical Sciences) (i) Instability in the count rate is observed along with instability in the gain, energy resolution during the conditioning phase of Gas Electron Multiplier (GEM) chamber prototype. However, after about 20 hours of operation, when the highest operating voltage is reached, the efficiency of the chamber (count rate with the radioactive source) is found to be stable and does not depend significantly on the variation of the bias current or other ambient parameters even though the gain decreases a bit. (ii) A new method of linseed oil coating is developed for the bakelite based detectors to avoid the surface roughness issue. The detector is characterised with Tetrafluoroethane (R134a) based gas mixture. The detector is also tested with a high rate of gamma radiation environment in the laboratory for the radiation hardness test.

Dr. Smarajit Polley (Biological Sciences) Novel mode of phosphotransfer by a eukaryotic protein kinase to maintain signaling fidelity (to be published in eLife).

Hitherto unreported activation of a p38-MAPK by its downstream kinase by feedback phosphorylation through LLPS (under review).

Prof. Shubhra Ghosh Dastidar (Biological Sciences) and his doctoral student Nibedita Ray Chaudhuri, using advanced computational biology and AI/ML methods, revealed the TAK1 kinase domain as a pseudo-intelligent machinery, which discovery has got wide publicity in the public domain too. *J. Chem. Inf. Model.* 2025, 65, 13, 6976–6997, <https://doi.org/10.1021/acs.jcim.5c00529>; <https://www.pib.gov.in/PressReleasePage.aspx?PRID=2153623>

Prof. Subhrangsu Chatterjee (Biological Sciences) lab's theme stands on Cancer Biology, G Quadruplex structural elucidation and designing peptides for working against diseases including cancer, diabetes and COVID19. In the past one year our lab has made several progresses especially in

finding out the synergism of quadruplex aptamer based therapy in nanorobotics and nanomedicine, in finding out its role in cancer immunotherapy and cell to cell junction determining genes. We have also found out the role of a non coding RNA in progression of Glioblastoma Multiform. Moreover we have had a very interesting work publication where we have determined the role of promoter G Quadruplex in the promoter of Orai1 gene, which is an important regulator of calcium influx. Overall, the multidimensional approach built by our lab in the last one year is one of the brightest achievements so far.

Prof. Subrata Sau (Biological Sciences) (i) A staphylococcal capsule-producing enzyme primarily forms trimers in solution and unfolds via the formation of multiple intermediates (J Biomol Struct Dyn. 2024 Dec 13: 1-15). (ii) Two acidic amino acid residues of a staphylococcal anti-anti-sigma factor are required to preserve its structure and function (J Basic Microbiol. 2025 Aug; 65:e70046). (iii) Three basic amino acid residues of a staphylococcal anti-anti-sigma factor are needed to maintain its structure and function (Protein J. 2025 Nov 12).

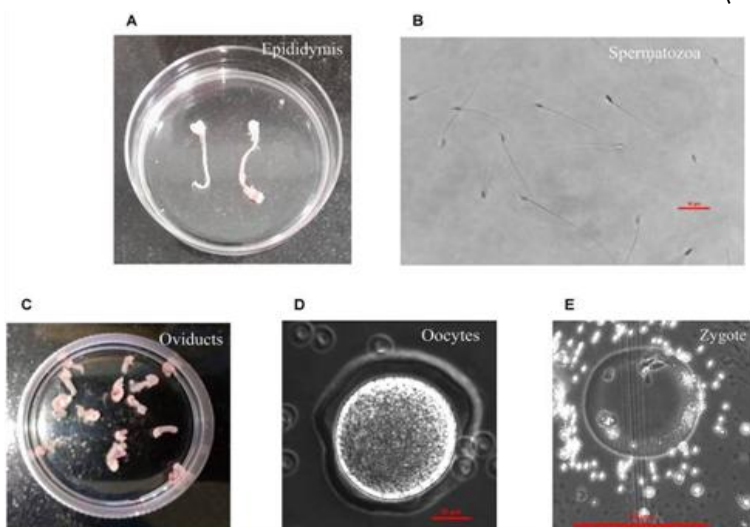
Prof. Supriya Das (Physical Sciences) We took up a study of net-proton fluctuation in Au+Au collisions at FAIR energies using Parton Hadron Quantum Chromodynamics (PHQMD) model. Our work shows that in case of central collisions, the

results for the moments in two different scenarios namely 'QGP ON' and 'QGP OFF' tend to differ. Our results also reveal that the presence of a QGP phase can significantly influence the net-proton fluctuation observables, particularly at lower collision energies. The comparison of these results with those available from experiments at these energies shows similar trend.

Ref: Physics 2025, 7(4), 50;
https://doi.org/10.3390/physics7040050

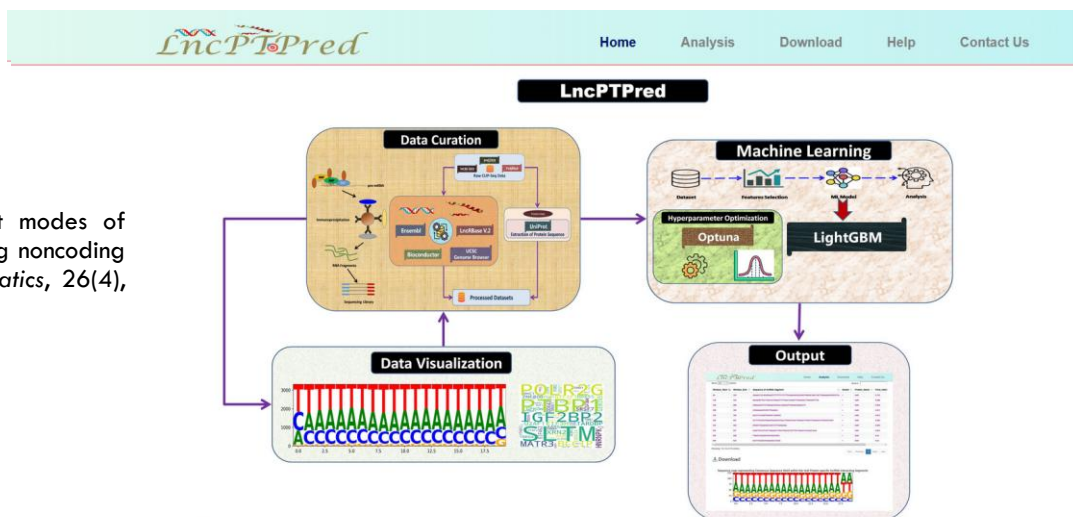
Dr. Utpal Nandi (Chemical Sciences) (i) Exploration of pharmacokinetics (ADME/PK) for novel candidates in order to develop new chemical entities (NCEs) with favorable pharmacokinetics and pharmacological actions mainly in the area of Alzheimer's disease and cancer. The research works are published in the following journals: RSC Medicinal Chemistry, 2025, doi: 10.1039/D5MD00019J; RSC Medicinal Chemistry, 2025, doi: 10.1039/D4MD00826J; Journal of Medicinal Chemistry, 2025, doi: 10.1021/acs.jmedchem.5c01164. (ii) Identification of plant-based molecule to boost the bioefficacy of paclitaxel with lower adverse effect in metastatic breast cancer involving a novel mechanism of modulating cytochrome P450 (CYP) epoxigenase pathway. The research work is published in the following journal: ACS Omega, 2025, doi: 10.1021/acsomega.5c02803.

Prof. Zhumur Ghosh (Biological Sciences):



(a) Elucidated the role of parental noncoding RNAs as regulators during fertilization and early stages of murine development and identifying potential noncodingRNA-mRNA interaction which is having significant role in determining fertility (NAR Genomics and Bioinformatics, 7(4), (2025))

(b) Predicting the different modes of interaction mediated by long noncoding RNAs (Briefings in Bioinformatics, 26(4), (2025))



LncPTPred is a Machine Learning (ML) based tool to predict the interaction between Long non-coding RNA (lncRNA) and Protein. It has been executed in 2 phases: Data Curation & Machine Learning. In the Data curation phase, data has been collected from Photoactivatable Ribonucleoside-enhanced Crosslinking and Immunoprecipitation (PAR-CLIP), High-throughput Sequencing of RNA isolated by Crosslinking Immunoprecipitation (HITS-CLIP) and Enhanced crosslinking and immunoprecipitation (eCLIP) based experimental assay to extract RNA binding position corresponding to given protein. Then, they are rigorously pre-processed against

Dr. Abhrajyoti Ghosh (Biological Sciences) Organized "National Science Day 2025" at Bose Institute, Unified Academic Campus, Kolkata on February 28, 2025.

Dr. Amit Kumar Paul (Chemical Sciences) (i) Delivered twelve (12) invited lectures in various national and international conferences during 01 December 2024 - November 2025. (ii) Organized a national conference, Interdisciplinary Horizons of Physical Chemistry (IHPC – 2025) during July 17 – 19, 2025 as a joint convenor.

Prof. Anirban Bhunia (Chemical Sciences) (i) As a convenor on 08 April 2025, an in-house symposium titled "Microbes and Microbe-Host Interactions" was organized at Bose Institute, Rajabazar Campus. The event brought together 13 enthusiastic scientists across three departments of Bose Institute and their group members. Its primary aim was to foster future collaborations among scientists, promote the development of extramural grant proposals centered on shared research themes, and lay the groundwork for a workshop focused on microbial research. The symposium attracted over 60 students and scholars, creating a dynamic and engaging environment for learning and discussion. (ii) Speaker at the in-house symposium titled 'Microbes and Microbe-Host Interactions,' organized at the Bose Institute. (iii) Invited speaker at the joint meeting of the 11th Asia-Pacific NMR (APNMR) Symposium and the 30th National Magnetic Resonance Society Conference, held at IISER Pune. (iv) Two students attended the 10th Indian Peptide Society Symposium, which was held at IISER Pune. (v) Helped in organizing an International conference on Bioinformatics (InCoB 2025) as a treasurer. (vi) Speaker at the joint workshop organized by Bose Institute and SN Bose National Centre for Basic Sciences (SNBNCBS), Kolkata. (vii) Participated at the Mega Exhibition 'Aspiring Odisha' at Mayurbhanj, Odissa, from 12th to 14th December 2024; Bose Institute received the Outstanding Participation award. (viii) Speaker at the outreach programme of Department of Chemical Sciences at Bose Institute, Kolkata.

Dr. Anupama Ghosh (Biological Sciences) New findings on the novel biological function of a small heat shock protein Hsp20 from *Ustilago maydis* in the pathogenic development of the fungus has been reported.

[Mitra, A, Kar, A, Bhakta, K, Roy, A, Mukherjee, A, Ghosh, A, Ghosh, A. Small heat shock protein Hsp20 regulates multiple cellular pathways in *Ustilago maydis* through its interaction with cytoskeletal proteins. The FEBS Journal doi: [10.1111/febs.70280](https://doi.org/10.1111/febs.70280)].

Dr. Anup Ghosh (Chemical Sciences) (i) Delivered invited lecture in two national and international conferences (SOPHYC 2025, IIT Patna, SRAPCR-2025, IACS Kolkata). (ii) Organised a national conference, Interdisciplinary Horizon of Physical Chemistry 2025 (IHPC 2025).

Dr. Basudeb Maji (Biological Sciences) (i) delivered an online talk titled "Nanomaterials in PRoteolysis TArgeting Chimera (PROTAC)-based Therapeutic Methodologies" at the Graduate School of Department of Chemistry and BK21 program at Gyeongsang National University on 1st August, 2025. (ii) delivered an invited BK21 (Brain Korea 21) program in Chemistry talk online at the Graduate School for Molecular Material Chemistry (BK21 FOUR), Gyeongsang National University, South Korea, on 25/03/2025. (iii) delivered an invited Asutosh College Alumni Talk, Asutosh College, Kolkata, Title: Chemical Biology: Chemical Biology: Intertwining Chemistry and Biology for Next-gen Therapeutics, Date: 19/12/24. (iv) Seminar organized on Targeting of Triangular Neuron-Cancer Cell-Immune Cell Cross-talk as a Potential Cancer Immunotherapy Strategy, delivered by Prof. Avinash Bajaj, Regional Centre for Biotechnology on 14th February 2025. (v) Conference organised Anusandhan 2025 conference during March 7-8, 2025. (vi) Conference organised on Transcription Assembly Meeting -2025 during March 19-21, 2025.

Prof. Debaraj Mukherjee (Chemical Sciences) organised a talk by Prof. Bimal K. Banik, Deanship of Research

Development, Prince Mohammad Bin Fahd University, Saudi Arabia, on the topic "Synthesis of Anticancer β -Lactams and Their Targets."

Prof. Dhruva Gupta (Physical Sciences) (i) served as a member of the Board of Judges for the "Young Physicists' Colloquium (YPC-2025)", organized by the Indian Physical Society, during August 21–22, 2025, at Saha Institute of Nuclear Physics; (ii) delivered an invited talk on "Nuclear Astrophysics with ^7Be Beams" at the meeting on "Future Prospects of Nuclear Astrophysics Research at Inter-University Accelerator Centre (IUAC)", IUAC, New Delhi during May 18-21, 2025; (iii) delivered a talk on "Projectile Breakup of ^7Be on ^{12}C at 5 MeV/u" at the ISOLDE Workshop and Users Meeting, CERN, Switzerland, November 27-29, 2024 (online); delivered an invited talk on "Nuclear Astrophysics with Rare Isotope Beams" at the National Seminar on Recent Advancement in Nuclear & Chemical Sciences, Berhampore Girls College, Murshidabad, November 13, 2024 (online).

Prof. Kaushik Biswas (Biological Sciences) (i) Participated as an organizing member of the 22nd Transcriptional Assembly Meeting held during March 19-21, 2025 at the Unified Academic Campus (UAC) in Bose Institute, Kolkata. (ii) Organized the One Day Symposium titled "Interdisciplinary Approaches to Modern Biology" organized by the Department of Biological Sciences, Bose Institute, Kolkata on June 21, 2024. (iii) Delivered an invited Lecture at the 22nd Transcriptional Assembly Meeting held during March 19-21, 2025 at the Unified Academic Campus (UAC) in Bose Institute, Kolkata. (iv) Delivered an invited lecture titled "Transcriptional Control of the GM2-synthase gene in Cancer: The SP1-HDAC1-p300 Enigma" in the 44th Annual Meeting of the Indian Association for Cancer Research (IACR), held at Biswa Bangla Convention Center, Kolkata during January 16-18, 2025.

Dr. Nirmalya Sen (Biological Sciences) organized (i) Anushandhan 2025, March 7-8, 2025. (ii) 22nd Transcription Assembly Meeting (TAM 2025), March 19- 21, 2025.

Dr. Pramod Kumar Shukla (Physical Sciences) (i) A talk titled "On Assisted Fibres with Swiss-Cheese" on September 10, 2025 at CERN, Geneva, Switzerland; [<https://indico.cern.ch/event/1586816/>]. (ii) Chairman of the Local Venue Management Team at UAC regarding the 42nd FAIR Council Meeting held at Bose Institute during Dec 03-04, 2024. (iii) One of the organizers of the Joint Entrance Screening Test (JEST) 2025.

Prof. Saikat Biswas (Physical Sciences) (i) took part in the outreach program "Aspiring Odisha" at Mayurbhanj during 12-14 December 2024, (ii) took part in the organization of the 42nd FAIR Council Meeting at Bose Institute Kolkata during 3-4 December 2024, (iii) took part an outreach program titled "Radiant Jharkhand" at Jamshedpur during 19-22 February 2025, (iv) worked as the co-convenor of the National Science Day 2025 program at Bose Institute on 28 February 2025, (v) worked as a member of the National Organising Committee of Theme meeting on FAIR-Science at Panjab University, Chandigarh during 23-25 April 2025, (vi) Chaired a session on Future Experiment and Detector Development in the XXVI DAE-BRNS High Energy Physics Symposium 2024, held from December 19-23, 2024, at BHU, Varanasi, (vii) delivered an invited plenary talk on "Indian participation in the construction of the Facility for Antiproton and Ion Research (FAIR)" in the 10th Asian Triangle Heavy-Ion Conference (ATHIC2025), held in IISER Behrampur, Odisha during 13-16 January 2025, (viii) work along with his student Sayak Chatterjee on the Radiation effect on GEM detector has been highlighted by the DST titled "New milestone in indigenous development of gaseous detector important for mega science FAIR project in Germany".<https://dst.gov.in/new-milestone-indigenous-development-gaseous-detector-important-mega-science-fair-project-germany>, (Release ID: 2100715) An info-graph is also published in the DST social media on this work. (xi) worked as a member of the judges to evaluate the Oral and

Posters of Physics in Anusandhan 2025, 7-8 March 2025 at Bose Institute, (x) delivered an invited plenary talk entitled "Construction of the Facility for Antiproton and Ion Research (FAIR) in Germany and Indian contribution" at Hot QCD Matter 2025 (Series -3), organized by the Department of Physics, Indian Institute of Technology, Bhilai, during 4-6 September 2025, (xi) chaired a session at Hot QCD Matter 2025 (Series -3), organized by the Department of Physics, Indian Institute of Technology, Bhilai, during 4-6 September 2025.

Dr. Sanat Kumar Das

(Physical Sciences) (i) Delivered an invited talk he international conference MPrism (MICROPLASTIC RESEARCH INNOVATION & SUSTAINABLE MANAGEMENT - 2025) held at IISER Kolkata from Feb 14-15, 2025. (ii) Delivered an invited talk in Inaugural Function of one day Seminar on World Ozone Day 2025 at Zoological Survey of India (ZSI), Andaman & Nicobar Islands on 12th September 2025. (iii) Attended, on the basis of Invitation, for moderate the technical session on Environmental Sciences including Climate Change on 17th and 18th January, 2025, at Presidency University (College Street Campus) during Regional Science & Technology Congress 2025. (iv) Received an invitation and attended a special Event titled "TATWA"- symbolizing "Transforming (emissions) Air, (rising) Temperature, Water (availability) through Climate Actions" organized by Climate Change, Clean Energy Transitions and Sustainable Technologies (CEST), Department of Science and Technology (DST), Govt. of India to celebrate the World Environment Day on June 5, 2025 at Vigyan Bhawan, New Delhi.



Prof. Soumen Roy

(Physical Sciences) delivered an invited talk at the GN Ramachandran Lecture Series on Bioinformatics and Computational Biology at Kharagpur Indian Institute of Technology (IIT) Kharagpur on December 18, 2024.



Dr. Subhas Haldar (Biological Sciences) organized symposium 'Anusandhan 2025' on March 7-8 at UAC, Bose Institute.

Prof. Supriya Das (Physical Sciences) (i) worked as a member of the National Organising Committee of Theme meeting on FAIR-Science at Panjab University, Chandigarh during 23-25

Prof. Anirban Bhunia (Chemical Sciences) Seoul National University of Science and Technology (SeoulTech), Korea.

Dr. Abhrajyoti Ghosh (Biological Sciences) (i) September 8, 2025: Delivered lecture entitled "Understanding the Role of VapBC4 in Archaeal Persister-like Cell Formation: Insights from Structures, Regulation, and Genetics" at the International Thermophiles Congress 2025 held at the University of Muenster, Muenster, Germany (September 07-11, 2025). (ii) May 23, 2025: Delivered an invited lecture entitled "Unveiling the key players of plant-microbe crosstalk at the rhizosphere interface" at the CEFIPRA-Sponsored Indo-French workshop "Plant microbiome as driver for the next green agricultural revolution" held on May 22-23, 2025, at INSA Lyon, France.

Dr. Pramod Kumar Shukla (Physical Sciences) (i) Participated in the conference "Lotus and Swamplandia" held during June 04-06, 2025 at Naxos, Greece [https://www.swamplandia.com/].

April 2025 and made a presentation on 'Role of India in building the Facility of Antiproton and Ion Research (FAIR)'. (ii) participated in the 10th. Asian Triangle Heavy-Ion Conference (ATHIC 2025), Berhampur, Odisha during January 13-16, 2025 and made an oral presentation on "Astrophysics In Laboratory: The Compressed Baryonic Matter (CBM) Experiment". (iii) took lead in the organization of the 42nd FAIR Council Meeting at Bose Institute Kolkata during 3-4 December 2024. (iv) delivered an outreach lecture at RKMV College, Rahara, West Bengal on September 22, 2025 on High Energy Physics Experiments: Science, Technology and Career'.

Dr. Utpal Nandi (Chemical Sciences) (i) Delivered invited talk on 'Opportunities and challenges in inhibiting cytochrome P450 enzyme for drug discovery' in 4th National Conference on "HEALTH MARGDARSHAN – 2025 at Adamas University, Kolkata, India on 29th August, 2025. (ii) Organised (Member) a national conference, Anusandhan 2025 at Bose Institute, Kolkata on 7-8th March, 2025. (iii) Organized (Member) a national conference, Interdisciplinary Horizons of Physical Chemistry (IIPC – 2025) at Bose Institute, Kolkata on 17-19th July, 2025.

Prof. Zhumur Ghosh (Biological Sciences) (a) Delivered a talk entitled "Noncoding RNomics integrated Predictive approaches shapes modern day therapeutics" in the Symposium on 'Computational Oncology - Systems and Advanced Omics Approaches in Cancer Biology' organised by IISER Behrampur on 27th Feb-1st March 2025. (b) Delivered a talk in the National Level Seminar on Library Book review by Prominent writers organized by Ramkrishna Mission Vivekananda Centenary College, Rahara on 12th and 13th August 2025. (c) Organised Transcription Assembly Meeting TAM2025 from 19th to 21st March 2025. (d) Organised 24th annual conference of the Asia Pacific Bioinformatics Network, the International Conference in Bioinformatics (InCoB), Sept. 18-20, 2025.

Poster Awards by Group Members of Dr. Amit Kumar Paul (Chemical Sciences)

Basudha Deb at PCAMC (IISER Kolkata), December 11-14, 2024.

Manju Siyaram Yadav at Anusandhan (Bose Institute), March 7-8, 2025.

Manju Siyaram Yadav at IIPC (Bose Institute), July 17-19, 2025.

Manju Siyaram Yadav at RAC 2025 (NIT Meghalaya), October 30 - November 1, 2025.

Krishnandu Dey at Anusandhan (Bose Institute), March 7-8, 2025.

Dr. Smarajit Polley (Biological Sciences) organized (i) lecture delivered on "Restoration Hardware" by Dr. Anindya Ghosh Roy, Professor and Wellcome Trust-DBT India Alliance Senior Fellow, National Brain Research Centre, Gurgaon, on March 11, 2024

(ii) Organized lecture delivered on "Synergistic evolution of lipids and proteins towards successful molecular machines" by Dr. Swasti Raychaudhuri, Principal Scientist and Group Leader, CSIR-CCMB, Hyderabad on October 07, 2024.

VISITS ABROAD

This visit was financially supported by the "Swampland Initiative Program" from Harvard University. Remarks: Swamplandia is an annual conference with the goal to bring leaders together from across the globe and discuss questions related to the Swampland and Landscape. Being part of the "Swampland Initiative Program" from Harvard University led by Professor Vafa (<https://swampland-initiative.physics.harvard.edu/>), this is among the most prestigious and impactful events in the string theory and mathematics community. (ii) Visited the Department of Theoretical Physics, CERN (CERN-TH) during September 05-18, 2025 for the purpose of giving a talk, attending a workshop and scientific interactions/collaborations. This visit was financially supported by CERN, Geneva, Switzerland.

Prof. Saikat Biswas (Physical Sciences) (i) Visited FAIR-GSI, Darmstadt, Germany, during May 11-18, 2025 for mini-CBM beam time experiment and meeting on PASTA and future MUST project. (ii) CERN, Geneva, Switzerland, June 21 - July 11,

2025, to take DCS data taking shift of ALICE experiment as expert shifter during pO and OO run and discussion on ALICE upgrade. ALICE data taking was very smooth. In pO collisions in total 7.4/nb were collected, with all detectors included. Total statics of 5.01/nb were collected for OO collisions.

Dr. Sidharth Kumar Prasad (Physical Sciences) (i) visited CERN, Geneva, Switzerland for ALICE experimental work during 04-07-2025 to 27-07-2025.

(ii) visited CERN, Geneva, Switzerland for ALICE experimental work during 30-10-2025 to 09-11-2025.

Mintu Haldar student of Dr. Sidharth Kumar Prasad (Physical Sciences) (i) visited CERN, Geneva, Switzerland for ALICE experimental work during 08-06-2025 to 03-07-2025. (ii) Visited CERN, Geneva, Switzerland for ALICE experimental work during 30-10-2025 to 19-11-2025.

Prof. Supriya Das (Physical Sciences) (i) attend FAIR AFC Meeting, Jyvaeskylae, Sweden during May 09 - 10, 2025. (ii) attend the FAIR Council Meeting FAIR/GSI during July 8 - 9, 2025. (iii) attended CERN, Geneva during July 10, 2025, as a member of the BI team for protocol visit of Director, BI to discuss strategic planning of participation of the ALICE BI team in ongoing and future ALICE activities with the ALICE Management and International Relations Section, CERN. (iv) attend FAIR Council Meeting, FAIR/GSI during October 9-10, 2025.

Prof. Shubhra Ghosh Dastidar (Biological Sciences) visited Institute of Protein Research, Suita Campus, Osaka University, Japan.

Subir Mandal, student of Dr. Saikat Biswas (i) visited CERN, Geneva, Switzerland during November 27 - December 6,

2024 for DRD1 Gaseous Detector School at CERN (ii) FAIR-GSI, Darmstadt, Germany during May 17-22, 2025, for mini-CBM beam time experiment and meeting on PASTA and future MUST project.

Somen Gope, FAIR-RA, visited FAIR-GSI, Darmstadt, Germany during May 17-22, 2025, for mini-CBM beam time experiment and meeting on PASTA and future MUST project.

Anisha Roy, student of Dr. Anupama Ghosh (Biological Sciences), received travel support from DBT-CTEP to present a poster entitled "Lip3 is a phospholipid-targeting lipase from *Ustilago maydis* contributing to its virulence" at the IS-MPMI Congress held at Cologne, Germany from 13th to 17th July 2025.

Student of Dr. Amit Kumar Paul (Chemical Sciences)

Poster Awards by Group Members:

Basudha Deb at PCAMC (IISER Kolkata), December 11-14, 2024.

Manju Siyaram Yadav at Anusandhan (Bose Institute), March 7-8, 2025.

Manju Siyaram Yadav at IHPC (Bose Institute), July 17-19, 2025.

Manju Siyaram Yadav at RAC 2025 (NIT Meghalaya), October 30 - November 1, 2025.

Krishnandu Dey at Anusandhan (Bose Institute), March 7-8, 2025.

Student of Dr. Sanat Kumar Das (Physical Sciences)

Md Abu Mushtaque attended EGU General Assembly 2025 at Vienna, Austria.

Shahina Raushan Saikh travelled to Vienna, Austria for attending EGU annual meeting 2025 at Vienna, Austria.

Seminars/Colloquia

Seminar

- (i) Delivered by Dr. Rakesh Das, Guest Scientist, Visitors Program, MPI-PKS, Dresden, on Self-organization in Active Polymers and Living Matter on December 20, 2024.
- (ii) Delivered by Mr. Joydeep Naskar (Northeastern University, Boston, USA) on "Towards a complete classification of holographic entropy inequalities, and beyond..." on December 24, 2024.
- (iii) Delivered by Dr. Sk Mustak Ali (Michigan State University, USA), on "Nuclear Astrophysics with Charge-Exchange Reactions at FRIB" on January 07, 2025.
- (iv) Delivered by Dr. Ali Ajmi (University of Winnipeg, Canada), on "LongBaseline Neutrino Experiments" on January 08, 2025.
- (v) Delivered by Tanmay Saha (IMSc, Chennai), on "Thermalization via Quantum Homogenization" on January 30, 2025.

(vi) Delivered by Dr. Aniruddha Bhattacharya, Georgia Tech., on "Entangling light without uncertainties" on February 20, 2025.

(vii) Delivered by Dr. Sanku Paul, DST INSPIRE Faculty, S N Bose Center, on "Hidden quantum criticality and entanglement in quench dynamics" on March 07, 2025.

(viii) Delivered by Dr. Upamanyu Moitra (University of Amsterdam), on "Extremal Black Holes in AdS/CFT: From Weak Gravity to Photon Rings" on July 11, 2025.

Colloquia

(ix) Delivered by Prof. Anirban Chakraborti, JNU, on "Making Sense of Chaos - Data Science for Complex Systems" on June 20, 2025.

(x) Delivered by Prof. Ajeet N. Mathur (Retired), Indian Institute of Management Ahmedabad, on "Dwelling in Wonder, Mysteries and Marvels" on April 25, 2025.

RECENT AWARDS/HONOURS/MEMBERSHIP

Prof. Abhijit Chatterjee (Chemical Sciences) (i) "Winter Action Plan" for Kolkata for 2025-26 is under process and to be submitted to Govt. of West Bengal in order to lessen the load of PM2.5 (ii) "Kolkata Climate Action Plan" has been launched by Govt. of West Bengal on 5th June 2025 where we significantly contributed for the "Air Pollution" sector. (iii) Plenary Lecture on "World Ozone Day" celebration in Kalyani University on 16th September 2025. (iv) Invited as distinguished guest in the curtain raiser on United Nations Climate Summit (COP 30) in Kolkata organized by Honorary Consulate of Brazil, Kolkata on 3rd September 2025. (v) Invited as distinguished guest in celebrating "International Day of Clean Air for Blue Sky" at Town Hall, Kolkata organized by Ministry of Environment, Govt. of West Bengal. (vi) Executive member, Indian Aerosol Science and Technology Association. (vii) Advisor to Govt. of West Bengal, West Bengal Pollution Control Board and Kolkata Municipal

Corporation under National Clean Air Program, Govt. of India. (viii) Editorial Board, "Earth and Space Chemistry", American Chemical Society. (ix) Editorial Board, "Aerosol and Air Quality Research", Springer Nature.

Dr. Abhrajyoti Ghosh (Biological Sciences) (i) Recipient of International Travel Grant (ITS/2025/003237) from the Anusandhan National Research Foundation (ANRF), Govt. of India for participating in the International Thermophiles Congress 2025 held at the University of Muenster, Muenster, Germany (September 07-11, 2025). (ii) Recipient of International Travel Grant (DBT/CTEP/02/20250558748) from the Conference, Travel, Exhibition and Popular Lectures (CTEP) Programme of Department of Biotechnology, Govt. of India for participating in the International Thermophiles Congress 2025 held at the University of Muenster, Muenster, Germany (September 07-11, 2025).

Dr. Amit Kumar Paul (Chemical Sciences) (i) Guest editor, Anusandhan Special Issue, Advanced Theory and Simulations (Wiley).

Prof. Anirban Bhunia (Chemical Sciences) (i) Editorial Board member of Elsevier Journals: Biophysical Chemistry, Journal of Colloid and Interface Sciences and Biochimica et Biophysica Acta (Biomembrane) (ii) Editorial Board member of Springer Journals: Scientific Reports, (iii) VAJRA faculty scheme of ANRF, DST, Govt of India for the year 2025.

Dr. Karishma Biswas (supervisor: Prof. Anirban Bhunia) received best poster award at 10th Indian Peptide Society symposium.

Prof. Debaraj Mukherjee (Chemical Sciences) (i) Inducted as an editorial board member in the Chemistry and Biodiversity (Wiley Journal) for 2 years. Chemistry & Biodiversity serves as a publishing forum covering a wide range of biorelevant topics for a truly international audience. (ii) Act as resource person and delivered distinguished lecture at the P.G. Department of Chemistry, Berhampur University on 19th September, 2025 on 'molecules to medicine'.

Prof. Gaurab Gangopadhyay (Biological Sciences) (i) Invited to deliver a 'keynote lecture' in the International Seminar on "Bio-interventions for a healthier tomorrow: Combating lifestyle hazards through innovation" organized by Sabang Sajanikanta Mahavidyalaya, Medinipore (W), WB on 18.02.2025. (ii) Invited by the Department of Posts, Chief Postmaster General, WB Circle to participate in a podcast session on 25.02.2025 to act as an expert to explore the intersection of Botany and Philately, highlighting the rich heritage of flora themed stamps and their scientific significance. (iii) Delivered the introductory deliberation entitled "Inter-disciplinary Sciences: Contributions of Bose Institute" on the National Science Day 2025 (28.02.2025), held at the UAC, Bose Institute. (iv) Invited to deliver the introductory lecture ("The genesis of Microbiology research in Bose Institute") in the symposium "Microbes & their hosts", held at the MC, Bose Institute on 08.04.2025. (v) Invited to act as the judge and chief guest for the inter-school science model exhibition at the Naktala High School on 22.07.2025. (vi) Invited to deliver a keynote lecture (entitled "JC Bose and his time") and judge the students' seminars at the Government General Degree College, Singur, Hooghly on 12.08.2025. (vii) Coordinated the study tour of the B.Sc. (Botany) students of Sri Shikshayatan College, Kolkata for the visit of Plant Tissue Culture laboratory at the UAC, Bose Institute on 07.01.2025. (viii) Organized the visit of the M.Sc 3rd Semester Biotechnology students of St. Anthony's College, Shillong as a part of their Institutional Study Tour on 08.01.2025. It was a DST Scientific Social Responsibility (SSR) initiative for two SERB projects presently running at the Department of Biological Sciences, Bl. (viii) Organized an outreach programme of the undergraduate Chemistry students of four Colleges under CU on 14.01.2025. It was a Scientific Social Responsibility (SSR) initiative for two ANRF (DST) projects presently running at the Department of Chemical Sciences, Bl. (ix) Coordinated the study tour of the M.Sc. 4th semester (Biotechnology) students of Gauhati University at the UAC, Bose Institute on 07.02.2025. (x) Coordinated the STEMM Podcast (an initiative of NCSTC, DST) interviews of the BI faculty members at the UAC on 12.02.2025. (xi) Participated in the Mega Exhibition "Radiant Jharkhand" at Jamshedpur, Jharkhand from 20.02.2025 to 22.02.2025 as the nodal person of Bose Institute pavilion. Bose Institute received the 'Outstanding Participation' award for their stall and scientific demonstration. (xii) Coordinated the study tour of the PG Department of Botany, Berhampur University at the UAC, Bose Institute on 03.03.2025. (xiii) Organized the academic visit of the Delhi Public School, Howrah at the UAC, Bose Institute on 07.04.2025. (xiv) Organized the lab visits of M.Sc. Biotechnology students of Swami Vivekananda Institute of Modern Science, Sonarpur, at the UAC, Bose Institute on

16.05.2025. (xv) Organized the visit of the School Laboratory Assistants from the Kingdom of Bhutan at the UAC Bose Institute on 28.05.2025 concerning a Training Programme on Advancing Laboratory Practices. (xvi) Attended a batch of UG students from BKC College's "Summer Internship Programme on Biotechnology" for their visit to a Plant Tissue Culture Laboratory at the UAC Bose Institute on 02.06.2025. (xvii) Participated in the "28th National Science Exhibition", at the Central Park, Salt Lake, Kolkata, as a member of the Bose Institute pavilion from 21.08.2025 – 24.08.2025.

Dr. Pramod Kumar Shukla (Physical Sciences) (i) Chair of the morning session of the talks on December 13, 2024 at National String Meeting NSM-2024 at IIT Ropar. [https://iitrpr.ac.in/nsm/Schedule.htm]. (ii) Acted as a judge for the Poster Evaluation during the National String Meeting NSM-2024 held during December 09-14, 2024 at IIT Ropar.

Prof. Saikat Biswas (Physical Sciences) NASI-Membership from The National Academy of Sciences, India, 2025.

Dr. Sanat Kumar Das (Physical Sciences) member of knowledge forum of 'Air Quality Modelling and Emission Inventory' under Sudh Vayu Sampark (SuVaS), under Commission for Air Quality Management, New Delhi which has been set up for Air Quality Management in National Capital Region and Adjoining Areas following ACT 2021 for better co-ordination, research, identification and resolution of problems surrounding the air quality index and for matters connected therewith or incidental thereto.

Dr. Sidharth Kumar Prasad (Physical Sciences) (i) serving as the Chairman of the Physics Board of the ALICE-STAR-INDIA Collaboration. (ii) serving as the convener of the Physics Analysis Group – Jet Substructure (PAG-JSUB), in the ALICE Collaboration at CERN, Geneva.

Prof. Soumen Roy (Physical Sciences) (i) Member of Editorial board in PLOS ONE, Indian Journal of Physics, (ii) acted as a judge at the Science and Engineering Fair on January 08, 2025 held at the Birla Industrial and Technological Museum (Ministry of



Culture, Govt. of India), Kolkata. (iii) Interviewed live for a discussion on the 2024 Nobel Prize in Physics (neural networks and machine learning) on DD Bangla on December 05, 2024.

Prof. Zhumur Ghosh (Biological Sciences) (i) Associate Editor: Molecular Plant-Microbe Interactions. (ii) Member of the National Academy of Science.

Dr. Utpal Nandi (Chemical Sciences) Member, American Society Pharmacology Therapeutics (ASPET) [2025].

Diksha Manhas (supervisor: Dr. Utpal Nandi) received the Young Researcher Award at NBRCOM-2024 at AIIMS New Delhi.

Gourab Das student of Prof. Zhumur Ghosh got the "Best Oral Presentation Award" from Prof. Shankar K Pal at "Bose Institute



Annual Symposium 2024" organized by Bose Institute from 27th to 29th November 2024 The topic of his presentation was "Predicting lncRNA-Protein Interaction".

Rudrapriya Das, SRF working with Prof. Supriya Das (i) selected from India to participate in the 24th ZIMÁNYI SCHOOL, Budapest, Hungary, December 2-6, 2024.

(ii) awarded the ANRF Travel Grant to participate in the 'International School of Nuclear Physics: 46th Course' at Sicily, Italy during September 17-21, 2025. (iii) obtained 'GET_INVOLVED' Fellowship to visit and work at FAIR/GSI, Darmstadt during November 2024 – April 2025.

Ritankar Mitra (SRF), working under Prof. Dhruva Gupta, selected for International Travel Support (ITS) from ANRF, Government of India to present his research work "Breakup studies of ^7Be on ^{12}C at 5 MeV/u" at the "38th Mazurian Lakes Conference on Physics" at Piaski, Poland during August 31 - September 6, 2025.

Subir Mandal, student of Dr. Saikat Biswas (i) selected from India to participate in the DRD1 Gaseous Detector School at CERN, Switzerland from November 27 to December 6, 2024. (ii) Received the Best Oral Presentation Award for his presentation entitled "Performance studies of GEM detectors for future heavy ion experiment" at Hot QCD Matter 2025 (Series-3), organized by the Department of Physics, Indian Institute of Technology, Bhilai, during 4-6 September 2025.

Dr. Utpal Nandi (Chemical Sciences) Member, American Society Pharmacology Therapeutics (ASPET) [2025].

Diksha Manhas (supervisor: Dr. Utpal Nandi) received the Young Researcher Award at NBRCOM-2024 at AllMS New Delhi.

Shahina Raushan Saikh received ANRF International Travel Support (ITS) (ITS/2025/000634) of amount Rs 1,72,667 for attending EGU annual meeting 2025 at Vienna, Austria.

Md. Abu Mushtaque student of Dr. Sanat Kumar Das received 350 Euro as 'Early Career Scientist's Travel Support' from EGU Programme Committee for attending EGU General Assembly 2025

Sounak Banerjee (i) received Best Poster Presentation Award at the 22nd "Transcription Assembly Meeting 2025" during March 19-21, 2025. (ii) Received Best Oral Presentation Award at the 1st "ANUSANDHAN 2025" during March 7-8, 2025.



RECENT PH.D. DEGREES AWARDED

- Debasmita Sinha** (University of Calcutta); Title of the Thesis: Mutations affecting the structure, function, and stability of a staphylococcal anti-sigma factor and cognate proteins; Supervisor: Prof. Subrata Sau.
- Ruby Biswas** (University of Calcutta); Title of the Thesis: Investigating the role of AtHMGB15 in differentiation induced programmed cell death during pollen development; Supervisor: Prof. Shubho Chaudhuri.
- Sonal Sachdev** (Jadavpur University); Title of the Thesis: Elucidating the regulatory role of Arabidopsis thaliana ARIDHMG protein ATHMGB15 in pollen development. Supervisor: Prof. Shubho Chaudhuri.
- Soumili Pal** (University of Calcutta); Title of the Thesis: Understanding the Role of Somatic Embryogenesis Receptor Kinase Gene to Combat Fusarium moniliforme Infection in Pineapple; Supervisor: Prof. Gaurab Gangopadhyay.
- Debarati Paul** (University of Calcutta); Title of the Thesis: Mechanistic insight into the intrinsic dynamics of Bcl2 proteins and dissecting the influences of the disordered and ordered Regions on their regulations; Supervisor: Prof. Shubhra Ghosh Dastidar.
- Jagannath Sarkar** (University of Calcutta); Title of the Thesis: Exploration of Aerobic Bacteria in Oxygen-limited Environments; Supervisor: Prof. Wriddhiman Ghosh.
- Abhishek Singh Sengar** (Kalyani University) Title of the Thesis: Studies on the Role of Pleiotropic R7RGS Proteins in Stress induced cardiomyopathy; Supervisor: Prof. Biswanath Maity.
- Kiran Das** (AcSIR); Title of the Thesis: Elucidating the role of G-protein modulator RGS11 protein in chemotherapeutic induced multiorgan complications; Supervisor: Prof. Biswanath Maity.
- Manish Kuma** (AcSIR); Title of the Thesis: Fibronectin type-III domain-containing proteins function to mediate chemotherapeutics-mediated cardiac phenotype. Supervisors: Prof. Biswanath Maity and Dr. Dinesh Kuma.
- Shazia Firdous** (University of Calcutta); Title of the Thesis: Studying the role of biomarkers in cancer and allergy/asthma using in silico and in vitro approaches; Dr. Sudipto Saha.
- Apratim Dutta** (University of Calcutta); Title of the Thesis: Unveiling the Role of FOXC1 in Breast Cancer Stem Cells Harboring Gain-of-Function p53; Joint PI: Dr. Kuladip Jana.
- Anirudhha Tewary** (University of Calcutta); Title of the Thesis: Mechanism of Gene Regulation By δ Factor of Bacillus subtilis; Supervisor: Prof. Jayanta Mukhopadhyay.
- Ranit Pariary** (Jadavpur University); Title of the Thesis: Structural and mechanistic insights of amyloid protein and designed inhibitor interaction in presence or absence of membrane interface; Supervisor: Prof. Anirban Bhunia.
- Sauryadeep Mukherjee** (University of Calcutta); Title of the Thesis: Aerosols Over Tropical Semi-Urban and High Altitude Himalayan Atmospheres in Eastern India: Source Apportionment, Role of Meteorology and Long-Range Transport; Supervisor: Prof. Abhijit Chatterjee.
- Diksha Manhas** (AcSIR); Title of the Thesis: Impact of phytochemicals on cytochrome P450-mediated pharmacokinetic modulation of drugs for implication in breast cancer therapy; Supervisor: Dr. Utpal Nandi.
- Palash Jyoti Boruah** (National Institute of Technology Meghalaya); Title of the Thesis: Investigations on the Reaction Mechanism of Chemical Reactions Based on Electronic Structure Calculations and Excited State Dynamics; Supervisor: Dr. Amit Kumar Paul.
- Kabita Kundalia** (University of Calcutta); Title of the Thesis: Study of α -Cluster Transfer Reactions with ^7Be ; Supervisor: Prof. Dhruva Gupta.
- Md. Asif Bhat** (University of Calcutta); Title of the Thesis: Study of Photon and Charged Particles in Relativistic Hadronic, Hadron-Nucleus and Nucleus-Nucleus Collisions; Supervisor: Prof. Supriya Das.
- Chumki Nayak** (University of Calcutta); Title of the Thesis: Light-Matter Interactions in Two-Dimensional Transition Metal Dichalcogenide Alloy MoSSe: Valley Physics, Exciton - Plasmon Coupling, and Optoelectronic Applications; Supervisor: Prof. Achintya Singha.
- Suvadip Masanta** (University of Calcutta); Title of the Thesis: Optical and Vibrational Properties of Transition-Metal Dichalcogenide-Based Nanostructures and Applications. Supervisor: Prof. Achintya Singha.

21. **Deep Nath** (University of Calcutta); Title of the Thesis: Information, games and graphs. Supervisor: Prof. Soumen Roy.
22. **Karishma Biswas** (University of Calcutta); Title of the Thesis: Functional Characterization of Antimicrobial Peptides in Combatting Plant and Human Pathogens. Supervisor: Prof. Anirban Bhunia.
23. **Debopriya Bose** (University of Calcutta); Title of Thesis: Physicochemical and Structural Aspects of G-quadruplex and i-motif. Supervisor: Prof. Subhrangsu Chatterjee.
24. **Laboni Roy** (University of Calcutta); Title of Thesis: Investigation of G Quadruplex Structures to Unravel the Integrity of Oncogenic Expression and Regulation. Supervisor: Prof. Subhrangsu Chatterjee.
25. **Norein Sakander** (AcSIR); Title of the Thesis: Investigating the Reactivities of Glycols and Locked Furanoses for the Chemoselective Synthesis of Architecturally Defined Complex Scaffolds. Supervisor: Prof. Debaraj Mukherjee and Dr. Naveed Qazi, CSIR-IIIIM).
26. **Bisma Rasool** (AcSIR), Title of the Thesis: Diversification of Sugar Enol Ethers via Palladium Catalysis and Potassium Persulfate-Initiated Radical Reactions. Supervisor: Prof. Debaraj Mukherjee and Dr. Naveed Qazi, CSIR-IIIIM).
27. **Abhijit Rana** (University of Calcutta); Title of the Thesis: Synthesis of bacterial cell-wall glycans and glycomimetics. Supervisor: Prof. Anup Kumar Misra.
28. **Samim Sahaji** (University of Calcutta); Title of the Thesis: Synthetic studies on complex glycans of the cell-wall of pathogenic bacteria". Supervisor: Prof. Anup Kumar Misra.
29. **Prateeka Borar** (University of Calcutta); Title of the Thesis: Probing Signalling Modularity of IKK2 Using Multidisciplinary Approaches. Supervisor: Dr. Smarajit Polley.
30. **Kaushik Naskar** (University of Calcutta); Title of Thesis: Aspects of Quantum Correlations and Decoherence in Different Systems and Processes. Supervisor: Dr. Parthasarathi Joarder and Prof. Dhruva Gupta.
31. **Nibedita Ray Chaudhuri** (University of Calcutta); Title of the Thesis: Understanding the Intrinsic Dynamics and Allostery in Kinases and Mechanisms of Their Interference with Regulatory Molecules, Supervisor: Prof. Shubhra Ghosh Dastidar.

GRANTS RECEIVED

- High-throughput in vivo Biosynthetic Cyclic Peptide Development Targeting CRISPR Adaptive Immunity in Pathogenic Bacteria to Enhance Bacteriophage Therapy against AMR; DBT; Dr. Basudeb Maji, Department of Biological Sciences; Rs. 75,67,470; 3 years.
- Leveraging Candida albicans D-amino acid oxidase inhibitions to protect the host from fungal infections; DBT; Prof. Kaustuv Sanyal, Department of Biological Sciences; Rs. 97,51,760; 3 years.
- Investigation of urban airborne bacteria and their impact on human health over metropolitan cities of Indo-Gangetic Plain in India (NMSKCC); DST; Dr. Sanat Kr. Das, Department of Physical Sciences; Rs. 1,32,78,300; 3 years.
- Functional characterization and interaction of archaeal prefoldin and small heat shock protein 14 with the Group II Chaperonin (Hsp60); DBT; Dr. Abhrajyoti Ghosh, Department of Biological Sciences; Rs. 63,18,000; 3 years.
- Identification of novel genome stability factors and potential antifungal drug targets in WHO-listed priority fungal pathogens; ANRF; Prof. Kaustuv Sanyal, Department of Biological Sciences; Rs. 1,30,00,000; 5 years.

STAFF NEWS

Appointments

1. **Mr. Sandip Ghosh**, joined as Jr. Mechanic (Mechanical) in the Workshop w.e.f. 20.01.2025.

Retirements on Superannuation

1. **Mr. Sudam Chandra Jana**, Sr. Asstt., Administration, superannuated on 31.12.2024.
2. **Mr. Shankar Prosad Bari**, Biological Sciences, superannuated on 31.01.2025.
3. **Mr. Kanai Hazra**, Administration, superannuated on 28.02.2025.
4. **Mr. Raj Kumar Mourya**, Physical Sciences, superannuated on 30.06.2025.
5. **Mr. Prafulla Bhuiya**, Administration, superannuated on 30.06.2025.
6. **Mr. Duryodhan Nayak**, Administration, superannuated on 31.08.2025.
7. **Prof. Subrata Sau**, Biological Sciences, superannuated on 30.11.2025.
8. **Mr. Uttam Kumar Ghosh**, Biological Sciences, superannuated on 30.11.2025.



86th Acharya J.C. Bose Memorial Lecture will be delivered by **Dr. Soumya Swaminathan**, WHO's Chief Scientist, Former Director General of the Indian Council of Medical Research (ICMR), Ministry of Health and Family Welfare, Government of India

Title of Talk:

Fragile Futures: The Climate Crisis and Its Toll on Women and Children

FORTHCOMING EVENTS

Prof. Abhijit Chatterjee (Chemical Sciences) (i) Gridded and sectoral data generation of criteria air pollutants over Kolkata city jointly with National Environmental Engineering Research Institute (CSIR). (ii) Data generation and policy recommendation on "energy use" over rural and remote areas of India jointly with India's leading think tank and policy research institute, Council on Energy, Environment and Water (CEEW), New Delhi. (iii) Executive Member of the

organizing committee of Asian Aerosol Conference to be held on Mumbai, India during December 1-4, 2025.

**We condole the passing away of
Shri Barun Majumder on 29.12.2024 and
Shri Goutam Behera on 02.06.2025**