

IISER KOLKATA Newsletter



December, 2024

Indian Institute of Science Education and Research Kolkata (IISERK) is an Institute of National Importance established as an autonomous institute for higher education by the then Ministry of Human Resource Development (now Ministry of Education), Government of India, to promote high-quality education and research in basic sciences. It is one of the seven Indian Institutes of Science Education and Research and is one of the first IISERs to be established along with IISER Pune. In terms of research output, it is considered to be one of the leading institutes in India.



Hat-trick Champions - IISER Kolkata wins IICM '24

Hat-trick Champions - IISER Kolkata wins IICM '24: The Inter INCI-Cultural meet (IICM) is an annual cultural gathering in which participants from all 7 IISERs across India, NISER, CEBS, and IISc come together to celebrate the spirit of creativity, diversity and camaraderie. Through 27 different art, literary, music, dance, and drama events, the meet promotes cultural exchange and provides a platform for students to showcase their talents beyond academics. This year, IICM was hosted by IISER Kolkata from 26th to 29th December 2024. This year, IISER Kolkata emerged as the overall champion, with IISc and IISER Pune securing the 2nd and 3rd positions.

Inter IISER Sports Meet (IISM 2024)



The display of medals won by the IISER Kolkata contingent in the 11th IISM 2024.

IISER Kolkata attained the 5th position in the 11th Inter IISER Sports Meet (IISM 2024), held at IISER Pune from Dec 17-23, 2024. IISER Kolkata secured 3 Gold, 8 Silver, and 3 Bronze medals.

Summary on results of IISER Kolkata contingent participation in 11th IISM 2024.

1. Athletics: Gold - 2 , Silver - 2 , Bronze - 1

- Ø Inoday Bhardwaj 5000 Meter (M) Gold
- Ø Inoday Bhardwaj 10000 Meter (M) Gold
- Ø Rahul Bhoi Triple Jump (M) Silver
- Ø Anshita Mishra Long Jump (F) Silver
- Ø Rahul Bhoi Long Jump (M) Bronze

2. Lawn Tennis Mixed Double (Piduri & Sawini): Gold

3. Lawn Tennis Men: Silver

4. Lawn Tennis Women: Silver

5. Basketball : Women: Silver

6. Kabaddi Men: Silver

7. Volleyball Men: Silver

8. Table Tennis women's Singles match (Sindhu): Silver

9. Chess: Bronze

10. Football Women: Bronze

Visit of the Embassy Science Fellow and U.S. Consulate Team



The Embassy Science Fellow and U.S. Consulate Team visited IISER Kolkata on Thursday, November 21, 2024. The team visited us for an education outreach session focusing on higher education and exchange opportunities in the United States. Embassy Science Fellow Dr. Sharmistha Bagchi Sen graced the occasion and conducted two interactive sessions. The first session (for the faculty members) engaged educators in university collaborations, while the second



session was designed for students, covering topics such as:

- Finding graduate programs that offer funding through TAs
- Excelling in the GRE
- Developing a competitive portfolio
- Writing research and personal statements
- Preparing a CV
- Searching for internships

Bhartiya Bhasha Utsav Celebration and Rajbhasha Karyashala



As per the directives of the Government of India, IISER Kolkata celebrated the Bhartiya Bhasha Utsav in the Institute. Shri Priyankar Paliwal, former senior Hindi officer at CSIR Central Glass and Ceramic Research Institute, was the keynote speaker at this function. He enhanced our knowledge of the development of Indian languages.



The Official Language Implementation Committee of IISER Kolkata organized the Rajbhasha Karyashala on Monday, 23 December 2024, in the Institute. The keynote speaker of this workshop was Shri Ram Niwas Shukla, Former Joint Director of the Ministry of Health and Family Welfare, Government of India. Rajbhasha Special Issue of the Institute's Newsletter was released on this day.



Participation of IISER Kolkata at the 28th Sundarban Krishti Mela o Loksanskriti Utsav

IISER Kolkata participated in the 28th Sundarban Krishti Mela o Loksanskriti Utsav, a 10-day-long socio-cultural fest held at Kultali, Basanti, South Pargana from 20-29 December 2024. The event was a great success in disseminating the wonders of science education and research to a diverse audience group in a playful manner. Volunteers from various departments of the Institute participated in this science exhibition.

Participation of IISER Kolkata at the 28th Kalyani Book Fair

The Institute participated in the 28th Kalyani Book Fair held at Central Park, Kalyani, Nadia, West Bengal, from 19-29 December 2024. By showcasing educational materials and research initiatives, the event inspired scientific curiosity among students, encouraged interest in higher education, and allowed IISER Kolkata to strengthen its community outreach and promote academic programs.





Vigyan Pratibha Local Teachers' Training Workshop at IISER Kolkata: Empowering Teachers' to Foster Scientific Temperament in Students

A four-day Teachers' Training Workshop was organized by IISER Kolkata under the Vigyan Pratibha (VP) Project from 10th to 13th December 2024. 28 Teachers from KV and AECS Schools participated in this workshop to enhance science and mathematics education and promote critical thinking. Faculty members of IISER Kolkata, assisted by several student volunteers, led interactive sessions, focusing on innovative teaching methods with hands-on experiments and demonstrations, emphasizing Pedagogical Content Knowledge and best practices in Science and Mathematics education. The participation by the teachers was highly enthusiastic, and several of them have already conducted some of the modules of the VP project in their schools.

Deci-Hz mission brainstorming meeting by CESSI, IISER Kolkata



Participants at the deci-Hz mission brainstorming meeting organized by CESSI, IISER Kolkata

A two-day meeting was organized by CESSI at IISER Kolkata to discuss and plan the next-generation space-based gravitational wave observatory. Currently, LIGO-India is a funded mega-science project expected to see first light by 2030. With this project, India is poised to become an important partner in global gravitational wave (GW) efforts. By then, India is expected to have trained enough human resources to construct a complex detector like LIGO-India. By 2035, several third-generation gravitational wave detectors will be operational worldwide at various GW frequency bands. Some of these detectors are located on Earth and have arm lengths of 20-40 km, while others are planned for space deployment, where arm lengths can be extended more easily.

However, due to geographical and socio-economic constraints, it is not possible to build such a large-scale detector on Indian soil, but space-based detectors provide an opportunity.

ISRO initiated the Space Science Roadmap Formulation (SSRF) activities under which six major themes were identified, and six Splinter Groups (SGs) were formed to engage the Indian space science community in identifying and prioritizing future space science activities. A SSRF meeting was organized by URSC, Bengaluru in April 2024 with the national science community to prioritize scientific areas of interest identified under each theme. Under SG-2 (Gravitation and Cosmology), the community strongly advocated for a deci-hertz gravitational wave mission.

To advance these activities into an action plan, a brainstorming meeting was organized by CESSI, IISER Kolkata in coordination with ISRO on December 14 and 15, inviting a small group of dedicated participants to contribute towards finalizing a plan for an Indian deci-Hz space mission. Following presentations and active brainstorming, it was decided to prepare a detailed technical document in the coming months to develop a preliminary work plan. Around 20 experts from across the country and 12 scientists and students from IISER Kolkata participated in this workshop. For further details refer to the workshop website: https://cessi.iiserkol.ac.in/deci_hz/.



Physical Chemistry Symposium - SoPhyC 2024-Kolkata Chapter

The Indian Institute of Science Education and Research Kolkata (IISER Kolkata), in collaboration with the University of Kalyani, organized the inaugural local chapter of the Society of Physical Chemistry (SoPhyC) 2024-Kolkata Chapter on December 3, 2024. This symposium featured a keynote lecture, invited scientific talks, and poster presentation sessions by student and faculty participants, focusing on emerging dimensions of research in physical chemistry. Additionally, a panel discussion was held on advanced teaching methodologies in physical chemistry. The symposium aimed to bring together a distinguished group of experts engaged in cutting-edge research and advancing education in physical chemistry in India, aligning with the vision of the National Education Policy (NEP). IISER Kolkata was honored to host several distinguished guests at the symposium, including Prof. Biman Bagchi (Indian National Science Chair, IISc Bangalore), who serves as the Chairperson of the Society of Physical Chemistry

(SoPhyC), and the Dean of Science from Kalyani University. The event also welcomed many esteemed professors and researchers from renowned institutions such as the University of Calcutta, Vidyasagar University, Visva-Bharati University, Kalyani University, Kazi Nazrul University, Amity University, NIT Durgapur, Maulana Abul Kalam Azad University of Technology (MAKAUT), Indian Institute of Engineering Science and Technology, Shibpur, Bose Institute, S.N. Bose National Centre for Basic Sciences, the Indian Association for the Cultivation of Science, and Jadavpur University.

The program successfully achieved its objectives, fostering meaningful discussions, academic collaboration, and knowledge sharing among researchers, educators, and students. It was widely regarded as a significant step forward in advancing research and education in physical chemistry in India.



Physics and Chemistry of Atomic, Molecular and Condensed Matter Systems Conference (PCAMC-2024) was held at IISER Kolkata during December 11-14, 2024. Eminent Theoretical Chemists and Physicists from India and abroad delivered lectures in the conference.

Morning India

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Kolkata, Friday
27 December 2024

IISER Kolkata Celebrates 100 years of the Foundation of Quantum Mechanics



MI News Service, Kalyani: The Indian Institute of Science Education & Research (IISER) Kolkata successfully hosted a conference commemorating 100 years of the foundations of quantum mechanics from December 18-21, 2024, said IISER K Prof. Soumitra Banerjee. The conference, meticulously organized by Prof. Soumitro Banerjee, Dr. Ritesh Kumar Singh, and Prof. Rangeet Bhattacharyya (IISER Kolkata), along with Prof. Dipankar Home (Bose Institute) and Dr. Manik Banik (S. N. Bose National Centre for Basic Sci-

ences), and Dr. Manabendra Bera (IISER Mohali), brought together eminent physicists from around the world to celebrate and advance discussions on quantum mechanics. Modeled after the legendary Solvay Conferences, this event featured a unique format with a limited number of invited talks and extensive, focused discussions during each session. Topics ranged from foundational aspects of quantum mechanics to cutting-edge research in quantum information and macroscopic quantum phenomena.

A panel discussion provided a platform for open debate on unresolved questions in quantum theory, fostering dynamic exchanges of ideas.

Renowned speakers, including Prof. Nicolas Gisin, Prof. Adrian Kent, and Prof. Howard Wiseman, shared their insights on topics like Bell's theorem, the quantum measurement problem, and the wavefunction's interpretation.

Their contributions, combined with in-depth discussions, made the conference a pivotal event for the quantum physics community.

The conference was accessible globally through live streaming on YouTube, enabling participation beyond the physical venue.

For those who could not attend live, the recorded sessions will soon be available on the IISER Kolkata YouTube channel, a IISER Kolkata sources said. This conference not only honored a century of groundbreaking discoveries in quantum mechanics but also fostered meaningful discussions on the future directions of this ever-evolving field.



Prof. Sunil Khare,
Director IISER Kolkata

Prof. Sunil Khare, Vice President of the Biotech Research Society, India (BRSI), was invited as the Guest of Honor at the "International Conference on Advances in Biotechnology and Bioinformatics (ICABB 2024)" and the XXI Convention of the Biotech Research Society, India. The conference was held from November 26th to 29th, 2024, at Dr. D. Y. Patil Vidyapeeth, Pune, India. Prof. Khare delivered the inaugural lecture and chaired a session during the event.



Prof. Sunil Khare, President of the Association of Microbiologists of India (AMI), inaugurated and addressed the 65th Annual International Conference of AMI, held from 14–17 November 2024 at Guru Jambheshwar University of Science & Technology, Hisar, Haryana, India. The conference, themed **“Perspectives on Microorganisms in Human Welfare”**, focused on addressing pressing national and global challenges. Prof. Khare highlighted the importance of focused research and interdisciplinary collaborations to tackle issues such as sustainable development, climate change, emerging pollutants, the gut microbiome and personalized medicine, antimicrobial resistance, and rapidly mutating viral strains.

The thought-provoking discussions and insights shared during the conference underscore the critical role of microbiology in shaping a sustainable and healthier future.

Eminent Visitors’



Prof T. K. Chandrashekhar from IIT Kanpur delivered an Institute Colloquium 27 December 2024 on topic, 'Modeling of Huckel, Mobius and Baird Aromaticity using Non-Metal containing Expanded Porphyrins'.



Prof. L S Shashidhara (National Centre for Biological Sciences) delivered an Institute Colloquium at IISER Kolkata on 11 December 2024 on "Science Education and Research in Independent India: less known stories, unimaginable impact".



Special lecture delivered by Dr. Tanweer Khan of Atai Life Sciences New York on topic, 'Structure-Based Discovery of Aspartyl Protease Inhibitors for Alzheimer's, Hypertension, Malaria, and Discover of Novel ELN-YEATS inhibitor for Leukemia'.



An Extra Mile 2024: A Celebration of Togetherness

On 20th December 2024, IISER Kolkata came alive with the vibrant Second Staff Day Celebration, *An Extra Mile 2024*. Graced by Chief Guest, Dr. Kaoushik K. Mukherjee, Registrar of IIIT Kalyani, the event at the R.N. Tagore Auditorium showcased a mesmerizing blend of cultural brilliance and motivational fervor.

Preceding the main event, spirited cricket and football matches set the tone, with awards for the players presented by the Director, Prof. Sunil K. Khare, and the Registrar, Mr. Joydeep Sil, during the festivities. The day also featured a stunning exhibition, showcasing an exquisite

array of paintings, photographs and creative writings by talented staff members, drawing widespread admiration.

From captivating performances by the staff and celebrated group of artists like Oikotaan and The LOKO Express to an inspiring talk by Mr. Mrinal Chakraborty, the evening enthralled an enthusiastic audience of staff, students, faculty and families. The celebration concluded with heartfelt thanks and a collective promise to elevate the joy and grandeur in the years to come.

Faculty Members Achievements

Prof. Priyadarsi De from the Department of Chemical Sciences has been awarded a prestigious DST-INT-RUS project by the Department of Science and Technology (DST), India, in collaboration with Russia. The project is titled: "Dispersion Polymerization Derived Macromolecular Hierarchical Nano-Architectures with Antioxidant Property". The project has been sanctioned a funding amount of Rs.91,33,548 to support this cutting-edge research.



Prof. Ashwani Kumar Tiwari received the Japan Society for the Promotion of Science [JSPS] Invitational Fellowship. Prof. Tiwari also organized the conference "Physics and Chemistry of Atomic, Molecular, and Condensed Matter Systems (PCAMC - 2024)" at IISER Kolkata from 11-14 December, 2024

Prof. Sayan Bhattacharyya was invited as a Member of the Expert Advisory Committee (EAC) on “Advanced Materials” under National Programme on Nano Science & Technology (NPNST), Department of Science and Technology (DST), Government of India.



A concept white paper on exploration of the Sun’s polar regions led by Prof. Dibyendu Nandi, involving an international team of scientists including many affiliated with CESSI, IISER Kolkata, has been prioritised by the United States National Academies as their top most science goal in the recently released National Academies Decadal Vision Document for Solar and Space Physics.

Do you Know?

IISER Kolkata Published 10 papers in Q1 Journals, 12 in Q2 Journals, and 2 in Q3 Journals in December 2024.

Students Achievements



Mr. Priyangshu Datta (19MS033) – BS-MS alumnus, belonging to the Department of Physical Sciences, did his Master's thesis under the supervision of Dr. Dwaipayan Roy from the Department of Computational and Data Sciences. His MS thesis work has received the prestigious Vannevar Bush Best Paper Award (recognizing papers that present novel ideas and demonstrate expert execution) at the ACM/IEEE-CS Joint Conference on Digital Libraries (JCDL 2024) held in Hong Kong (Ms. Leya Elsa George (23RS100) from Prof. Debasis Koley’s lab (CCMM Lab), Department of Chemical Sciences, currently pursuing her 1st year of PhD, has won one of the Best Poster Presentation Award from Dalton Transactions (Royal Society of Chemistry) at the recently held international MTIC-XXI (Modern Trends in Inorganic Chemistry) 2024 conference at IIT Kharagpur (<https://mtic2024.in/>). The title of the poster presentation was “Unraveling the role of a B(OH)₃ byproduct in a base-less Chan-Lam Amination reaction”). He received an official certificate and shared a US\$1,000 prize (<https://2024.jcdl.org/mdpi-open-access-journals-sponsorship-for-jcdl-2024-vannevar-bush-best-paper-award/>). Priyangshu is perhaps the youngest researcher as first author in a paper to receive this honour.

Ms. Leya Elsa George (23RS100) from Prof. Debasis Koley’s lab (CCMM Lab), Department of Chemical Sciences, currently pursuing her 1st year of PhD, has won one of the Best Poster Presentation Award from Dalton Transactions (Royal Society of Chemistry) at the recently held international MTIC-XXI (Modern Trends in Inorganic Chemistry) 2024 conference at IIT Kharagpur (<https://mtic2024.in/>). The title of the poster presentation was “Unraveling the role of a B(OH)₃ byproduct in a base-less Chan-Lam Amination reaction”.





Mr. Sandip Samanta (I8IPO21), a PhD student of Dr. Somnath Basu of the Dept. of Mathematics, gave an invited talk at the "International Conference in Differential Geometry & Topology", held at Jilin University, China between December 12th and 15th, 2024.

Ms. Anushka Mondal (Roll No. 23 RSo28) (PMRF fellow) from Prof. Jayasri Das Sarma's Lab in the Department of Biological Sciences, has won the Best Poster Presentation Award at the "Cancer Next" Conference jointly organized by Faba and Bharath Advanced Therapeutics. The conference was held at the Nizam's Institute of Medical Sciences, Hyderabad. As recognition, she was awarded Rs 50,000 in cash.



Mr. Sourabh Biswas (Roll No. 18RS107), under the guidance of Dr. Anindita Bhadra, from the Department of Biological Sciences received a travel grant from the Association for the Study of Animal Behaviour (ASAB), UK, to attend the ASAB Winter meeting at Edinburgh during 12th and 13th December 2024, where he presented his work. His poster, titled "Scent marking as a social cue: Behavioural responses of free-ranging dogs to conspecific and heterospecific scents" was awarded the first prize in the Early Career Researcher category.

Seminars, Lectures and Colloquia

[DCS Visitor Seminar] Dr. Subhra Kanti Das (Postdoctoral fellow at Cornell University) -- Single-molecule investigations on nucleosome and linker histone dynamics, Date: Wednesday, Dec 04, 2024.

[INSA - IISERK Distinguished Lecture] Prof. Umesh Varshney (IISC Bangalore) -- Genetic analysis of the roles of the initiator tRNA in faithful translation and ribosome maturation in bacteria, Date: Monday, Dec 09, 2024.

[DPS Seminar] Dr. Soumik Bandyopadhyay (Pitaevskii BEC Center, INO-CNR and Department of Physics, University of Trento, Italy) -- Cold atom simulation and thermalisation aspects of holographic quantum matter, Date: Tuesday, Dec 10, 2024.

[Institute Colloquium] Prof. Dirk Volkmer (Chair Professor of Augsburg University, Germany) -- Functional $K_{3,3}$ ("Kuratowski") Building Units in Materials Chemistry: Past, Present, and Future, Date: Wednesday, Dec 11, 2024.

[Institute Colloquium] Prof. L.S. Shashidhara (National Centre for Biological Sciences, Bengaluru) -- Science Education and Research in Independent India: less known stories, unimaginable impact, Date: Wednesday, Dec 11, 2024.

[DPS Seminar] Dr. Uditendu Mukhopadhyaya (IIT Bombay) -- Gate-Defined Quantum Dot arrays as simulators of Fermi-Hubbard model, Date: Tuesday, Dec 17, 2024.

[CESSI Colloquium] Suresh Doravari (IUCAA, Pune) -- Research and Career opportunities in Gravitational Wave detectors, Date: Tuesday, Dec 17, 2024.

[DMS Seminar] Dr. Digjoy Paul (Indian Institute of Science, Bangalore) -- How large is the character degree sum compared to the character table sum for a finite group?, Date: Tuesday, Dec 17, 2024.

[DMS Seminar] Dr. Digjoy Paul (Indian Institute of Science, Bangalore) -- How large is the character degree sum compared to the character table sum for a finite group?, Date: Tuesday, Dec 17, 2024.

[DBS Seminar] Dr. Dipankar Ray -- "Unraveling the importance of ISG15 in driving therapy resistance in cancer" , Date: Tuesday, Dec 17, 2024.

[DBS Seminar] Mr. Sayanuris -- "And the Switch is On: Codon Optimality Unleashes Differential mRNA Stability Above a Threshold Length" , Date: Thursday, Dec 19, 2024.

[DMS seminar] Dr. Soumya Das (Indian Institute of Science,) -- Pullbacks of modular forms and related questions, Date: Monday, Dec 23, 2024.

[Institute Colloquium] Prof. T.K. Chandrashekar (Indian Institute of Technology Bombay) -- Modeling of Huckel, Mobius and Baird Aromaticity using Non-Metal containing Expanded Porphyrins, Date: Friday, Dec 27, 2024.

[DBS Seminar] Dr Rajeshwari Sinha -- "Understanding Antimicrobial Resistance at the Interface of Science and Policy", Date: Friday, Dec 27, 2024.

[Special Lecture] Dr. Tanweer Khan (Atai Life Sciences New York, NY) -- Structure-Based Discovery of Aspartyl Protease Inhibitors for Alzheimer's, Hypertension, Malaria, and Discover of Novel ELN-YEATS inhibitor for Leukemia, Date: Monday, Dec 30, 2024.

[DPS Seminar] Dr. Rajdeep M. Chatterjee (TIFR, Mumbai) -- Unravelling the secrets of the Higgs boson with precision measurements, Date: Monday, Dec 30, 2024.

