विज्ञान एवं प्रौद्योगिकी विभाग
DEPARTMENT OF
SCIENCE & TECHNOLOGY

सत्यमेव जयते

বসু বিজ্ঞান মন্দির

બસુ વિજ્ઞાન મંદિર

BOSE INSTITUTE

(AN AUTONOMOUS INSTITUTE UNDER
DEPARTMENT OF SCIENCE & TECHNOLOGY, GOVT. OF INDIA)

सत्यमेव जयते
Department of Science and Technology
Ministry of Science and Technology
Government of India

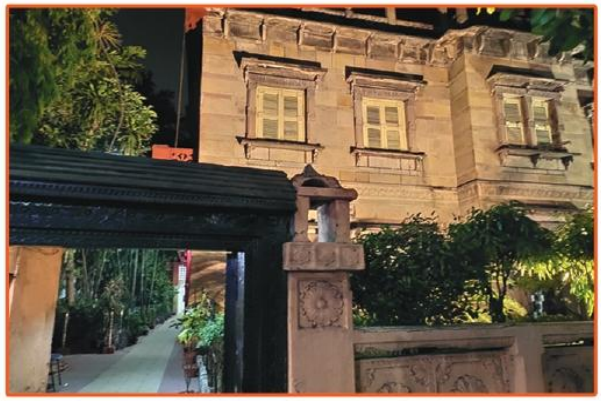
Bose Institute

AN AUTONOMOUS INSTITUTE UNDER DEPARTMENT OF SCIENCE & TECHNOLOGY, GOVT. OF INDIA

Bose Institute

Preamble

Inspired by lofty nationalistic ideals, Sir Jagadish Chandra Bose (1858 - 1937), the father of modern science in the Indian subcontinent, founded the Bose Institute. Acharya J. C. Bose dedicated the Institute to the service of the nation on his sixtieth birthday (November 30'th, 1917), while delivering his famous speech 'The Voice of Life.' Rabindranath Tagore, who was then visiting the USA, composed the soul-stirring "Matri mondiro punya angono" for the occasion. This song is the anthem of the Institute. Bose proclaimed in his speech that this Institute would be "not merely a laboratory but a temple," with its principal aims being the advancement of science and diffusion of knowledge. Swami Vivekananda, Sister Nivedita, Sara Chapman Bull, and Rabindranath Tagore were among those who had consistently inspired and supported J. C. Bose in his endeavours.



Bose Institute Rajabazar

The Main Campus is adjacent to the Rashbehari Siksha Prangan (commonly known as Rajabazar Science College Campus, the University of Calcutta). The building is a heritage one and is of historical importance. Abanindranath Tagore, the founder of modern Indian art, wrote in his memoirs that Bose wanted the Institute building to be one of the finest in the city. Pink sandstones came from Chunar, and the stone artisans were from Benaras. Abanindranath and his equally illustrious student Nandalal Bose generously helped the Institute with its artistic aspects. At the entrance to the building is a marble relief of Sister Nivedita by Padmasri Vinayak Pandurang Karmakar, a renowned sculptor, done on the lines of Nandalal Bose's famous painting of Nivedita, named "The Lady with the Lamp." This campus was the scientific hub for the Institute till the 1990s. This building houses the priceless instruments fabricated and demonstrated by Sir J. C. Bose in the Museum. This century-old campus will be a National Science Museum in the future.

Bose Institute Kakurgachi

Located near Kankurgachi beside the ESI Hospital, first dreamt by Prof. D. M. Bose, the then Director of Bose Institute, during the birth centenary celebration of Acharya J. C. Bose in 1958; he got a favourable nod from Pandit Jawaharlal Nehru, the first Prime Minister of India. During his tenure as the Director (1937-1967), Prof. D. M. Bose introduced new departments, facilities and he envisaged that to keep the standard of the Institute at the national and international level, Bose Institute needed expansion, and the Centenary Building came in operation with many state-of-art laboratories from the 1990s. It was the centre of activities of many pioneering research in Biochemistry, Biophysics, and Molecular Biology till 2020. This campus is presently under renovation for a sprawling students' hostel and guest house.

Bose Institute

Bose Institute Salt Lake

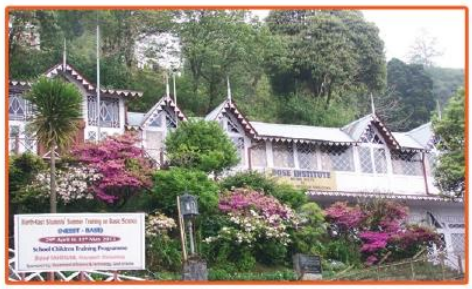
To present Bose Institute before the nation and the scientific world at an even higher level during its centenary in 2017, the Unified Academic Campus was the vision of Prof Sibaji Raha (Director from 2006 - 2016). This new-look building at Salt Lake, Sector V, hosts all the laboratories scattered in erstwhile two campuses and a state-of-the-art research facility. Dr. Manmohan Singh, the then Prime Minister, laid the foundation stone in 2012, and Late Pranab Mukherjee, the President of India, inaugurated this building in 2017. This building has been in operation since 2022.

Bose Institute Madhyamgram

Madhyamgram Experimental Farm, the district 24 Parganas (north), caters to the needs of the Biological Sciences for implementing laboratory research into translational reality. It is an integral part of the research of the plant scientists. The recent addition of a state-of-the-art Central Animal Facility has provided a new feather to the farm.

Bose Institute Falta

Falta Experimental Farm, the district 24 Parganas (south), is a unique location on the bank of the river Ganges. It has a historic Acharya J.C. Bose Bungalow, a building of Portuguese architecture, and the Farm complex. Following the vision of Acharya J. C. Bose, it is a perfect place for the 'dissemination of knowledge.' Bose Institute conducts outreach programs for farmers on Rural Biotechnology.



Bose Institute Darjeeling

The Darjeeling campus of Bose Institute, comprising the Mayapuri and Haimavati buildings and the adjoining land, is another historical place of Bose Institute. The premises were built in 1920 with great love and care by the founder, Acharya J.C. Bose, with aesthetic advice from Rabindra Nath Tagore and Nandalal Bose. Prof. D. M. Bose and Biva Choudhury centered their cosmic ray experiment here. The campus presently hosts a National facility for Astroparticle Physics and Space Science. This campus is also famous for outreach activities of students from the north-eastern states of India.

Bose Institute Shyamnagar

The Shyamnagar Campus of Bose Institute is in the district 24 Parganas (north). Atmospheric Sciences research experiments; microwave scattering, gas detector development, and monitoring ozone and fog are the activities of this campus.

Contents

Theoretical Physics

Prof. Somshubhro Bandyopadhyay

Department of Physical Sciences

- Quantum Information Theory
- Foundations of Quantum Mechanics
- Quantum Gravity

Prof. Suman Kumar Banik

Department of Chemical Sciences

- Theoretical Biology
- Biological Physics

Prof. Rajarshi Ray

Department of Physical Sciences

- Theoretical High Energy Physics

Prof. Soumen Roy

Department of Physical Sciences

- Complex Systems
- Statistical Physics
- Systems Biology (Theory and experiments)

Dr. Pramod Kumar Shukla

Department of Physical Sciences

- Theoretical High Energy Physics, in particular String Theory
- String Phenomenology
- Global Model Building in String Cosmology
- Classifying the Calabi-Yau Geometries

Somshubhro Bandyopadhyay

Professor | Physical Sciences

Serving as Professor at Bose Institute in the Dept. of Physical Sciences. He is also serving as the Dean Academic APairs of the institute.

RESEARCH AREAS

- Quantum Information Theory
- Foundations of Quantum Mechanics
- Quantum Gravity

FOCUS

- Entanglement cost of nonlocal quantum measurements
- Quantum sequence discrimination and applications thereof
- Quantum nonlocality in LOCC state discrimination

PUBLICATIONS

1. Tathagata Gupta, Shayeef Murshid, Vincent Russo, Somshubhro Bandyopadhyay, Optimal discrimination of quantum sequences, Physical Review A 110, 062426 (2024).
2. Somshubhro Bandyopadhyay and Vincent Russo, Locally distinguishing a maximally entangled basis using shared entanglement, Physical Review A 110, 042406 (2024).
3. Tathagata Gupta, Shayeef Murshid, and Somshubhro Bandyopadhyay, Unambiguous discrimination of sequences of quantum states, Physical Review A 109 (5), 052222 (2024).
4. Abhishek Banerjee, Pratapaditya Bej, and Somshubhro Bandyopadhyay, Quantum change point and entanglement distillation, Physical Review A 109 (4), 042407 (2024).
5. Pratik Ghosal, Arkaprabha Ghosal, and Somshubhro Bandyopadhyay, Distribution of quantum gravity induced entanglement in many-body systems, J. Phys. A: Math. Theor. 57, 445302 (2024).
6. Mintu Nandi, Sudip Chattopadhyay, Somshubhro Bandyopadhyay, and Suman Kumar Banik, Channel assisted noise propagation in a two-step cascade, arXiv preprint arXiv:2312.07172 (2023).
7. Debarshi Das and Somshubhro Bandyopadhyay, Quantum communication using a quantum switch of quantum switches, Proceedings of the Royal Society A 478 (2266), 20220231 (2022).
8. Somshubhro Bandyopadhyay, Saronath Halder, and Ritabrata Sengupta, Conditions for local transformations between sets of quantum states, Physical Review A 105 (6), 062212 (2022).
9. Somshubhro Bandyopadhyay and Vincent Russo, Entanglement cost of discriminating noisy Bell states by local operations and classical communication, Physical Review A 104, 032429 (2021).
10. Somshubhro Bandyopadhyay and Saronath Halder, Genuine activation of nonlocality: From locally available to locally hidden information, Physical Review A (Letter) 104 (5), L050201 10 (2021).
11. Somshubhro Bandyopadhyay, Impossibility of creating a superposition of unknown quantum states, Physical Review A (Rapid Communication) 102, 050202 (R) (2020).
12. Pratapaditya Bej, Arkaprabha Ghosal, Debarshi Das, Arup Roy, and Somshubhro Bandyopadhyay, Information-disturbance trade-oP in generalized entanglement swapping, Physical Review A 102, 052416 (2020).
13. Arkaprabha Ghosal, Debarshi Das, Saptarshi Roy, and Somshubhro Bandyopadhyay, Optimal two-qubit states for quantum teleportation vis-à-vis state properties, Physical Review A 101, 012304 (2020).
14. Arkaprabha Ghosal, Debarshi Das, Saptarshi Roy, and Somshubhro Bandyopadhyay, Fidelity deviation in quantum teleportation with a two-qubit state, Journal of Physics A: Math. Theor. 53, 145304 (2020).

Suman Kumar Banik

Professor | Chemical Sciences

Joined Bose institute as an Assistant Professor in 2008 at Dept of Chemistry, became a Professor in 2020, and following the rationalization of departments, he is now serving in the Department of Chemical Sciences. He also served as the Chair of the Dept of Chemistry.

RESEARCH AREAS

- Theoretical Biology/Biological Physics

FOCUS

- Kinetic modeling of gene regulatory network
- Stochastic gene expression and variability
- Fluctuation decomposition in feed-forward loop motifs
- Information transmission in generic biochemical motifs

PUBLICATIONS

1. Momin Md SA, Biswas A, and Banik SK *"Coherent feed-forward loop acts as an e$cient information transmitting motif,"* Phys. Rev. E 101, 022407 (2020)
2. Roy TS, Nandi M, Biswas A, Chaudhury P, and Banik SK *"Information transmission in a two-step cascade: Interplay of activation and repression,"* Theory Biosci. 140, 295 (2021)
3. Roy TS, Nandi M, Chaudhury P, Chattopadhyay S, and Banik SK *"Interplay of degeneracy and non-degeneracy in fluctuation propagation in coherent feed-forward loop motif,"* J. Stat. Mech. 2023, 093502 (2023)
4. Nandi M, Chattopadhyay S, Bandyopadhyay S, and Banik SK "*Channel assisted noise propagation in a two-step cascade*," Chaos 34, 083128 (2024)

Rajarshi Ray

Professor | Physical Sciences

Serving as Professor at Bose Institute in the Dept. of Physical Sciences.

RESEARCH AREAS

- Theoretical High Energy Physics

FOCUS

The current focuses of our research group are

- To study the general thermodynamic properties for strong interactions from theoretical models, as well as contrasting the theoretical results with experimental data
- To study the properties of hadrons and quark-gluon matter in ePective models of strong interaction by contrasting them with certain available first principle results.
- To study the properties of strongly interacting matter in gravitational backgrounds

PUBLICATIONS

1. Consistent approach to study gluon quasiparticles Chowdhury Aminul Islam, Munshi Golam Mustafa, Rajarshi Ray and Pracheta Singha Published in: Phys. Rev. D 106 (2022) 054002
2. Probability distribution for black hole evaporation Pratik Ghoshal and Rajarshi Ray Published in: Phys. Rev. D 105 (2022) 124016
3. Modified Excluded Volume Hadron Resonance Gas Model with Lorentz Contraction Somenath Pal, Abhijit Bhattacharyya, Rajarshi Ray Published in: Nucl.Phys. A 1010 (2021) 122177
4. Finite Temperature Properties of a Modified Polyakov?Nambu?Jona-Lasinio Model Abhijit Bhattacharyya, Paramita Deb, Sanjay K. Ghosh, Soumitra Maity, Sibaji Raha, Rajarshi Ray, Kinkar Saha, and Sudipa Upadhaya Published in Phys.Rev. D102 (2020) no.7, 074006(1-9)
5. Systematics of Chemical Freeze-out Parameters in Heavy-ion Collision Experiments Sumana Bhattacharyya, Deeptak Biswas, Sanjay K. Ghosh, Rajarshi Ray, and Pracheta Singha, Published in Phys.Rev. D101 (2020) no.5, 054002(1-10)

Soumen Roy

Professor | Physical Sciences

Serving as Professor at Bose Institute in the Dept. of Physical Sciences.

RESEARCH AREAS

- Complex Systems
- Statistical Physics
- Systems Biology (Theory and experiments)

FOCUS

- Networks: New measures. innovative applications, comparing networks
- Phase transitions and critical phenomena
- Game theory
- Phage-bacteria interactions, Microbial systems
- Residue Interaction graphs

FUNDED PROJECTS

1 Science and Engineering Research Board, CRG (Interdisciplinary Biological Sciences (2024-2027) Sanction Order No: CRG/2023/006463 - Rs. 4678694

MAJOR ACHIEVEMENTS

- Maintain a unique interdisciplinary lab, which has successfully graduated Ph.D. students simultaneously in mathematical, physical, and biological sciences.
- Member, Planning Commission Task Force on Systems and Synthetic Biology, India's 12'th V-year plan
- Regular Associate, International Centre for Theoretical Physics, Trieste, Italy
- Member of Editorial Board: PLOS ONE, Ind. J. Physics (Springer), Frontiers in Physics
- Research mentioned in multiple textbooks and Parliamentary reports of countries like United Kingdom
- Reviewer for Times Higher Education (THE) and Quacquarelli Symonds (QS) Global University Rankings

PUBLICATIONS AND PATENTS

1. Patent awarded as Principal Inventor: A system and method for analyzing videos of application or function for feature identification of the videos and related application or function*. Roy S *et al*, Patent No. 472279 (2023)
2. Assessing combinatorial diversity of Aureochrome bZIPs through genome-wide screening* Khamaru M *et al*., Cells Tissues Organs [Karger], 213, 133-146 (2024)
3. Special issue on statistical physics and complex systems Dhar D and Roy S, Indian Journal of Physics [Springer], 98, 3753-3755 (2024)
4. Network approach to mutagenesis sheds insight on phage resistance in mycobacteria*, Sinha *S et al.*, Bioinformatics [Oxford], 37, 213-220 (2021)
5. Scale-free networks may not necessarily witness cooperation*, Nath D, Sinha S, and Roy S, Europhysics Letters [IOP], 134, 60002 (2021)
6. Topology dependent payoPs can lead to escape from prisoner's dilemma* Sinha S, Nath D, and Roy S, European Physical Journal B, 94, 80 (2021)

Pramod Kumar Shukla

Assistant Professor | Physical Sciences

Pramod Kumar Shukla is an Assistant Professor in the Department of Physical Sciences, Bose Institute.

RESEARCH AREAS

- Theoretical High Energy Physics, in particular String Theory
- String Phenomenology
- Global Model Building in String Cosmology
- Classifying the Calabi-Yau Geometries

FOCUS

- On moduli stabilization, scanning ux vacua and attempts for de-Sitter realization
- On building in ationary models using the geometries of the Calabi-Yau threefolds
- On robustness of the well-established in ationary models against the (new) sub-leading corrections
- On construction of explicit Calabi-Yau orientifolds “suitable” for string model building.
- Aim to combine the local/global aspects in a single string theoretic framework.

MAJOR ACHIEVEMENTS

- Alexander-von-Humboldt Fellowship for junior researchers (2011-2013).
- Seal of Excellence certificate for a research proposal submitted to the Marie Sklodowska-Curie Actions (H2020-MSCA-IF- 2016), Horizon 2020, European Commission.
- Invited talk titled “A toolkit for global model building in string phenomenology” on Dec. 10, 2023 during Indian String Meeting-2023 at IIT-Bombay.(Youtube: https://www.youtube.com/watch?v=kcMcf5GPJy0)
- Invited Chair for the morning session talks on Dec 13, 2024, the National String Meeting NSM-2024 held during December 09-14, 2024 at IIT Ropar.
- Participated and presented a poster titled "On attempts to find the “right” Calabi Yau for string model building” in “String-Math 2024” held during June 10-14, 2024 at ICTP-UNESCO, Trieste, Italy.

PUBLICATIONS AND PATENTS

1. AbdusSalam S, Gao X, Leontaris G K, and Shukla P* (2025), Systematic exploration of the non-geometric ux landscape, European Physical Journal C (EPJC) 85, 244 (2025); DOI: 10.1140/epjc/s10052-025-13980-x.
2. Biswas S, Leontaris G K, and Shukla P* (2025), Reading-oP the non-geometric scalar potentials with U-dual uxes, Journal of High Energy Physics (JHEP) 01, 153 (2025); DOI: 10.1007/JHEP01(2025)153.
3. Bera S, Chakraborty D, Leontaris G K, and Shukla P* (2024), Global embedding of fiber in ation in a perturbative large volume scenario, Phys. Review D 110, 106009 (2024); DOI: 10.1103/PhysRevD.110.106009.
4. Bera S, Chakraborty D, Leontaris G K, and Shukla P* (2024), In ating in perturbative LVS: global embedding and robustness, J. of Cosmo. and Astro. Physics (JCAP) 09, 004 (2024); DOI: 10.1088/1475-7516/2024/09/004.
5. Prieto D, Quirant J, Shukla P* (2024), On the limitations of non-geometric uxes to realize dS vacua, Journal of High Energy Physics (JHEP) 05, 008 (2024); DOI: 10.1007/JHEP05(2024)008.
6. Leontaris G K, and Shukla P* (2024), Symplectic formulation of the type IIB scalar potential with U-dual uxes, Physical Review D (PRD) 109, 066018 (2024); DOI: 10.1103/PhysRevD.109.066018.
7. Leontaris G K, and Shukla P* (2023), Taxonomy of scalar potential with U-dual uxes, Physical Review D (PRD) 108, 126020 (2023); DOI: 10.1103/PhysRevD.108.126020.
8. AbdusSalam S, Crino C, and Shukla P* (2023), On K3-fibred LARGE Volume Scenario with de Sitter vacua from anti-D3-branes, Journal of High Energy Physics (JHEP) 03, 132 (2023); DOI: 10.1007/JHEP03(2023)132.
9. Shukla P* (2023), On stable type IIA de-Sitter vacua with geometric ux, European Physical Journal C (EPJC) 83, 196 (2023); DOI: 10.1140/epjc/s10052-023-11361-w.

Bioinformatics & Disease Biology

Prof. Kaushik Biswas

Department of Biological Sciences

- Cancer Biology
- Epigenetic Mechanisms in Cancer
- Tumor Glycobiology
- Tumor Microenvironment

Prof. Zhumur Ghosh

Department of Biological Sciences

- Noncoding RNA and disease biology
- Long Noncoding RNA associated SNPs and cancer risk prediction
- Parental noncoding RNAs and early embryonic development
- Noncoding RNA and stem cell biology

Prof. Subhash Haldar

Department of Biological Sciences

- Tumor microenvironment
- Metabolic reprogramming
- Epigenetic modifications in cancer

Dr. Kuladip Jana

Department of Biological Sciences

- Molecular Reproductive Endocrinology & Toxicology
- Animal Models & Disease Biology
- Drug Development & Delivery
- Diabetes, Aging, Filaria, Leishmania and Cancer

Prof. Bishwanath Maity

Department of Biological Sciences

- G-protein regulation in cellular physiology (particularly in heart and liver)
- Impact of stress responses in vital organs communication
- Development & validation of novel drug delivery platforms (in collaboration)

Prof. Atin Kumar Mandal

Department of Biological Sciences

- Molecular chaperones in protein folding and stress management
- Ubiquitin ligase in protein degradation
- Cellular protein homeostasis/proteostasis

Dr. Utpal Nandi

Department of Chemical Sciences

- CYP regulation
- Pharmacokinetics (PK/ADME)
- Drug discovery and development

Dr. Sudipto Saha

Department of Biological Sciences

- Bioinformatics and Systems Biology
- Lung microbiome dysbiosis in pulmonary diseases
- Mitochondrial dysfunction in pulmonary diseases
- Machine Learning in multi-omics data and Biological Databases

Dr. Nirmalya Sen

Department of Biological Sciences

- Regulation of ETS transcription factors in refractory cancers

Kaushik Biswas

Professor | Biological Sciences

joined Bose Institute as an Assistant Professor in the Division of Molecular Medicine (DMM), promoted to Associate Professor and thereafter Professor, and is currently serving as a Professor in the DBS.

RESEARCH AREAS

- Cancer Biology
- Epigenetic Mechanisms in Cancer
- Tumor Glycobiology
- Tumor Microenvironment

FOCUS

- Delineation of the signaling pathways that lead to ganglioside GM2-mediated epithelial-mesenchymal transition (EMT), DNA damage response and chemo-resistance in tumors.
- How tumor-stromal interactions mediated by ganglioside GM2 contribute to metastasis.
- Uncovering the precise molecular mechanisms underlying aberrant ganglioside expression in cancer.
- Identification of novel microRNA-mRNA interactions crucial in oncogenesis.
- Biodegradable tagging of Eriodictyol for increasing bioavailability and mechanism of its anti-metastatic activity.

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1.	DST-SERB sanctioned project titled "*Mechanism of ganglioside GM2-mediated upregulation of miR-615-5p in targeting oncogenic ID1 in tumorigenesis*".	DST-SERB CRG/2021/004623	₹52,72,000/-	Jan, 2022 - July, 2025.

PUBLICATIONS

1. Debnath, S., Sarkar, A., Mukherjee, D.D., Ray, S., Mahata, B., Mahata, T., Parida, P.K., Das, T., Mukhopadhyay, R., Ghosh, Z. and Biswas, K.* (2022). "Eriodictyol mediated selective targeting of the TNFR1/FADD/TRADD axis in cancer cells induce apoptosis and inhibit tumor progression and metastasis." *Translational Oncology, 21, 101433*. https://doi.org/10.1016/j.tranon.2022.101433.

2. "Khamrui, E., Banerjee, S., Mukherjee, D.D. and Biswas, K.* (2024) "Emerging role of MAPK signaling in glycosphingolipid-associated tumorigenesis. *Glycoconjugate Journal*, 41, 343-360, part of a collection, *Tribute to Professor Sen-Itiroh Hakomori*", https://doi.org/10.1007/s10719-024-10168-5.

3. Sarkar, A., Banerjee, S. and Biswas, K.* (2023). "Multi-dimensional role of gangliosides in modulating cancer hallmarks and their prospects in targeted cancer therapy." *Frontiers Pharmacol.*, 14, https://doi.org/10.3389/fphar.2023.1282572.

4. Ray, A., Sarkar, A., Banerjee, S. and Biswas, K.*(2024) "Non-Canonical Targets of MicroRNAs: Role in Transcriptional Regulation, Disease Pathogenesis and Potential for Therapeutic Targets." *MicroRNA*, 13(2), 83-95, 10.2174/0122115366278651240105071533.

Zhumur Ghosh

Professor | Biological Sciences

Zhumur Ghosh is currently a Professor, Biological Sciences, Bose Institute, was an Associate Professor at the same Department from June 2018 to Dec 2023, Assistant Professor, Bioinformatics Centre, Bose Institute from Jan 2014 to June, Faculty Fellow, of the same department from Nov 2010 to Jan 14; formerly was an Assistant Professor at Indian Institute of Technology (IIT) Guwahati from June 2010 - Nov 2010

RESEARCH AREAS

- Noncoding RNA and disease biology
- Long Noncoding RNA associated SNPs and cancer risk prediction
- Parental noncoding RNAs and early embryonic development
- Noncoding RNA and stem cell biology

FOCUS

The current focuses of our research group are

- Studying the role of long noncoding RNAs and associated SNPs in female cancers prevalent in the subcontinent
- Deciphering the role of parental non-coding RNAs(ncRNAs) in fertilization and embryonic development
- Elucidating the noncoding RNA mediated alterations inducing oncogenicity in stem cell derivatives
- Noncoding RNA mediated Regulatory Networks Modulating sudden and gradual Neurodegeneration

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1.	Co Continuation of the existing Centre of Excellence in Bioinformatics and expanding it as a datacenter involving newer direction of research to address the healthcare and environmental issues of national need (BT/PR40174BTIS/137/45/2022)2.	DBT	₹ 1.88 crores	2022-onwards for 5 years
2	National Network Project of Bose Institute with Indian Statistical Institute and Vidyasagar University (BT/PR40176/BTIS/137/84/2023)	DBT	₹ 1.92 crores	2022-onwards for 5 years

MAJOR ACHIEVEMENTS

2011-2014 Associate Fellow, Indian Academy of Science
2011- Editorial Board, Current Bioinformatics
2017 Member of the National Academy of Science
2018 NASI-Scopus Young Scientists Award, Women in Science
2018 SERB Woman Excellence Award
2022 Associate Editor, Molecular Plant-Microbe Interactions

PUBLICATIONS

1. Mukherjee A, Verma A, Das T, Ghosh B, Ghosh Z. (2024) Circulating microRNAs in Body Fluid: "Fingerprint" RNA Snippets Deeply Impact Reproductive Biology. Reprod Sci. Dec 10. doi: 10.1007/s43032-024-01753-y. Epub ahead of print. PMID: 39658771.
2. Das, G, Das, T, Parida, S, Ghosh, Z. (2023) LncRTPred: Predicting RNA–RNA mode of interaction mediated by lncRNA. IUBMB Life. https://doi.org/10.1002/iub.2778
3. Ghosh B, Sarkar A, Mondal S, Bhattacharya N, Khatua S, Ghosh Z. piRNAQuest V.2: an updated resource for searching through the piRNAome of multiple species. RNA Biol. 2022 Dec 29:1-14. doi: 10.1080/15476286.2021.2010960. Epub ahead of print. PMID: 34965192.
4. Das, T., Deb, A., Parida, S., Mondal, S., Khatua, S. & Ghosh, Z. (2021) LncRBase V.2: An updated resource for multispecies lncRNAs and ClinicLSNP hosting genetic variants in lncRNAs for cancer patients, RNA biology, 1-16. PMID: 33112702.

Subhash Haldar

Assistant Professor | Biological Sciences

Joined as an Assistant Professor in the Department of Biological Sciences at Bose Institute in 2022.

RESEARCH AREAS

- Tumor microenvironment
- Metabolic reprogramming
- Epigenetic modifications in cancer

FOCUS

The current focuses of our research group are

- Activation of RAS and associated metabolic reprogramming in breast cancer.
- In ammasome formation and determination the role of identified in ammasome molecules in chemotherapy resistant Prostate and breast cancer progression.
- Investigating the role of therapy-induced senescence in developing chemo-resistant cancer.

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1	Role of NLRP3 mediated in ammasome in chemotherapy drug resistant prostate cancer	SERB-ANRF (CRG)	₹ 56,44,000/-	October 2024 October 2027

MAJOR ACHIEVEMENTS

- US Patent App. 17/779,716. Publication date: 20/04/ 2023 by S Borah, N Bhowmick, S Haldar. Title: Compositions and methods for treating diseases and conditions by depletion of mitochondrial or genomic dna from circulation.

PUBLICATIONS

1. 1. Prognostic value of circulating mitochondrial DNA in prostate cancer and underlying mechanism. Supriya Borah , Rajeev Mishra , Sananda Dey , Surabhi Suchanti , Neil A Bhowmick , Biplab Giri , Subhash Haldar. *Mitochondrion. 2023 May 19;71:40-49.*

2. Parthenolide-loaded stimuli-responsive cross-linked nanocarrier for targeting and killing triple-negative breast cancer cells. Sananda Dey, Nensina Murmu, Rimi Mukherjee, Arun Mondal, Tanushree Mondal, Subhash Haldar, Mijanur Rahaman Molla, Nabendu Murmu, Biplab Giri. *ACS Applied Nano Materials 7 (11), 12944-12957*

Kuladip Jana

Principal Scientist | Biological Sciences

Joined as "Scientist-C" in 2010, and subsequently promoted to "Senior Scientist" in 2014 and "Principal Scientist" in 2018

RESEARCH AREAS

- Molecular Reproductive Endocrinology & Toxicology
- Animal Models & Disease Biology
- Drug Development & Delivery
- Diabetes, Aging, Filaria, Leishmania and Cancer

FOCUS

- Anti-cancer, Anti-Aging and anti-diabetic drug development from natural resources
- In-vitro and In-vivo screening of diPerent natural product derived small molecules/nano formulations for drug development.
- Functionalized Metal-Organic Frameworks (MOFs) and hydrogels for targeted delivery of anticancer and anti-metastatic agents
- Amino acid-based photosensitive cationic nano-micelle for targeted miRNA delivery for Cancer immunotherapy
- Reproductive and Endocrine dysfunctions in aging related to the exposure of environmental toxicants

FUNDED PROJECTS

Nil

MAJOR ACHIEVEMENTS

- Fellow of Reproduction & Endocrinology (FRE) from SRBCE, 2020
- Fellow of National Environmental Science Academy, New Delhi (FNESA), 2020
- Fellow of "Scholars Academic and Scientific Society" (FSASS), 2021
- Eminent Scientist of the Year Award 2022 from NESA, New Delhi
- Scientists of the Year Award SASE 2023@BHU, Varanasi, 2023
- Fellow of the Association of Researchers & Academicians, India (FARAI), 2023
- Fellow of the Indian Academic Researchers Association (FIARA), 2023
- S Ramanujan Award for Outstanding Scientists from ARAI, 2024
- Prof. K. C. Bose Gold Medal Award from NESA, New Delhi, 2024

PUBLICATIONS

1. Rahaman SKB, Halder S, Roy KP; Halder PK, Debnath U*, Jana K*. (2025) Discovery of new 4-aminoquinoline-thiazolidinone hybrid analogues as anti-proliferative agents inhibiting TLR4-LPS-mediated migration in triple-negative breast cancer cells. Chemical Biology & Drug Design. DOI: 10.1111/cbdd.70089 (In Press).
2. Halder S, Das T, Kushwaha R, Misra AK, Jana K*, Das D*. (2025) Targeted and Precise Drug Delivery Using a GSH-Responsive Ultra-Short Peptide-Based Injectable Hydrogel for Breast Cancer Cure. Materials Horizons, 12: 987- DOI: 10.1039/D4MH00981A
3. Patra R, Halder S, Saha R, Jana K*, Sarkar K* (2024) Highly ERcient Photoswitchable Smart Polymeric Nanovehicle for Gene and Anticancer Drug Delivery in Triple-Negative Breast Cancer. ACS Biomaterials Science & Engineering , 10: 2299–2323 DOI: 10.1021/acsbiomaterials.4c00115
4. Dutta A, Halder S, Bhowmik I, Debnath U, Dhara D, Misra AK*, Jana K*. (2024) A novel sulforaphane analog, disrupts PI3K/Akt pathway and inhibits cancer cell progression via ROS mediated caspase independent apoptosis. ACS Pharmacology & Translational Science, 7: 195-211 DOI: 10.1021/acsptsci.3c00229
5. Karim S, Halder S, Mukherjee S, Debnath U, Misra AK, Jana K*, Das D*. (2023) Glutathione Depleting a Chemoselective Novel Pro-Oxidant Nano Metal-Organic Framework Induced G2/M Arrest and ROS Mediated Apoptotic Cell Death in Human Triple Negative Breast Cancer Cell Line. ACS Applied Materials & Interfaces, 15: 26442-26456. DOI: 10.1021/acsami.3c04209

Biswanath Maity

Professor | Biological Sciences

Joined as Professor at the Bose Institute in June 2024. He was previously employed at the Centre of Biomedical Research (CBMR), Lucknow as Associate Professor.

RESEARCH AREAS

- G-protein regulation in cellular physiology (particularly in heart and liver)
- Impact of stress responses in vital organs communication
- Development & validation of novel drug delivery platforms (in collaboration)

FOCUS

The current focus of our research group -

- G-protein signaling & role of its regulators/activators in stress associated cellular damages (onco-cardiology & diabetic cardiomyopathy)
- How the G-protein signaling mediates diPerent vital organs communication & associated physiological attributes that regulate multi-organ pathologies

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount sanctioned	Duration
1.	R7RGS- G protein beta 5 complex regulates inter-communication of diPerent cardiac cell types to attenuate chemo-induced cardiac pathologies	ICMR	₹ 73,26,600/-	2023 - 2026
2.	R7RGS-CaMKII complex functions to attenuate chemo-induced cardiac fibrosis by regulating Nox2-dependent inter-communication of diPerent cell types	SERB	₹ 56,48,650/-	2023 - 2026
3	FNDC-CaMKII complex facilitate cardiac T-tubule synchro nization through mitigating intercommunication of myocyte-endothelial cells in chemo-induced cardiac pathologies	ICMR-DHR	₹ 98,00,000/-	2024 - 2027

MAJOR ACHIEVEMENTS

INSA Associate Fellow 2024, Ramalingaswami & Ramanujan Fellow (2015)

PUBLICATIONS

1. Kumar M, Sengar AS, Kumar P, MukherjeeS, KumarD, ChatterjeeS, StewartA, Maity B* (2025) FNDC5/irisin mitigates the cardiotoxic impacts of cancer chemotherapeutics by modulating ROS-dependent and -independent mechanisms. Redox Biology
2. Nayak S,..Maity B* & Das P* (2024) Cystine-cored diphenylalanine appended peptide-based self-assembled fluorescent nanostructures direct redox responsive site-specific chemotherapeutic drug delivery. iScience 27,109523
3. Sengar AS, Kumar M, Rai C, Chakraborti S, Kumar D, Kumar P, Mukherjee S, Mondal K, Stewart A, Maity B* (2024). RGS6 drives cardiomyocytes death following nucleolar stress by suppressing Nucleolin/miRNA-21. Journal of Translational Medicine, 22, 204.
4. Basak M, Sengar AS, Das K, Mahata T, ….. Maity B* (2023) A RGS7-CaMKII complex drives myocyte-intrinsic and -extrinsic mechanisms of chemotherapy-induced cardiotoxicity. PNAS 120, 1, e2213537120
5. Das K, Basak M, Mahata T, Biswas S, Kumar P, Mukerjee S, Stewart A, Maity B* (2023) Cardiac RGS7 and RGS11 drives TGFβ1-dependent liver damage following chemotherapy exposure. The FASEB Journal 37:e23064
6. Basak M, Das K, Mahata T, Kumar D, Nagar N, Poluri KM, Kumar P, Das P, Stewart A, Maity B* (2023) RGS7 balances acetylation/de-acetylation of p65 to control chemotherapy-dependent cardiac in ammation. Cellular and Molecular Life Sciences 80, 9:255

Atin Kumar Mandal

Professor | Biological Sciences

Joined as Assistant Professor in 2010 in the Division of Molecular Medicine, Bose Institute, and is currently Professor in the Department of Biological Sciences

RESEARCH AREAS

- Molecular chaperones in protein folding and stress management
- Ubiquitin ligase in protein degradation
- Cellular protein homeostasis/proteostasis

FOCUS

- Understanding the mechanism of Raf kinase quality control in development of pathological conditions such as cancer, cardiac hypertrophy
- Crosstalk between molecular chaperones and ubiquitin ligases in quality control of intrinsically disordered proteins
- Role of Praja1 ubiquitin ligase in maintaining cellular proteostasis
- Role of DNAJ proteins in tumorigenesis of triple negative breast cancer

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1.	A proteome centric view of Praja1 ubiquitin ligase in proteostasis decline and disease manifestation	SERB-ANRF (CRG)	₹ 59,20,992 /-	03/ 2024 - 03, 2027

MAJOR ACHIEVEMENTS

- Travel grant from DST to attend 'Protein Homeostasis in Health and Disease' meeting at Cold Spring Harbor Laboratory, April 17-21, 2018, New York.
- Member of Internal Quality Assurance Cell (IQAC) of Saha Institute of Nuclear Physics, Kolkata

PUBLICATIONS

1. Mukherjee S, Roy S, Mukherjee S, Harikishore A, Bhunia A, and Mandal AK.(2024) 14-3-3 interaction with Phosphodiesterase 8A sustains PKA signaling and downregulates the MAPK pathway. *J Biol Chem*, doi: 10.1016/j.jbc.2024.105725
2. Pariary R, Shome G, Kalita S, Kalita S, Roy A, Harikishore A, Jana K, Senapati D, Mandal B, Mandal AK, Bhunia A. (2024) Peptide-Based Strategies: Combating Alzheimer's Amyloid β Aggregation through Ergonomic Design and Fibril Disruption. *Biochemistry*, doi: 10.1021/acs.biochem.4c00371.
3. Pariary R*, Shome G*, Dutta T, Roy A, Misra AK, Jana K, Rastogi S , Senapati D, Mandal AK, Bhunia A. (2024) Enhancing amyloid beta inhibition and disintegration by natural compounds: A study utilizing spectroscopy, microscopy and cell biology. *Biophys Chem*, doi: 10.1016/j.bpc.2024.107291.*equal contribution
4. Pariary R#, Dolui S#, Shome G#, Mohid SA, Saha A, Ratha BN, Harikishore A, Jana K, Mandal AK*, Bhunia A*, Maiti NC*. (2023) Coomassie brilliant blue G-250 acts as a potential chemical chaperone to stabilize therapeutic insulin *Chem Commun (Camb)*, doi: 10.1039/d3cc01791e.#equal contribution, *Corresponding authors.
5. Ghosh B, Karmakar S, Prasad M, Mandal AK. (2021) Praja1 ubiquitin ligase facilitates degradation of polyglutamine proteins and suppresses polyglutamine-mediated toxicity. *Mol Biol Cell*, doi: 10.1091/mbc.E20-11-0747.

Utpal Nandi

Associate Professor | Chemical Sciences

Joined Bose Institute as Associate Professor at the Department of Chemical Sciences in 2024. He was Senior Scientist at Pharmacology Division of CSIR-Indian Institute of Integrative Medicine, Jammu (2015-2024).

RESEARCH AREAS

- CYP regulation
- Pharmacokinetics (PK/ADME)
- Drug discovery and development

FOCUS

- Understanding the role of CYP2J2/EETs axis in combating breast cancer pathogenesis.
- Identification of potential CYP inhibitor for to improve bio-eRcacy of chemotherapeutic drugs.
- ADME/PK intervention to expand druggability of NCE.

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1	Combating uoroquinolone-resistant in MRSA by novel antistaphylococcalisatin-di indolyl derivatives	ICMR	₹ 71.68 L	04/24 – 03/27

MAJOR ACHIEVEMENTS

- Member of ACS, RSC, ISSX, ASPET. SBC(I), ISMAS, NASI,SBC(I), ISMAS, NASI,
- Editorial Board Member of 'Recent Advances in Anti-Infective Drug Discovery' 2020-2023.
- Associate Editorial Board Member of 'Drug Metabolism and Bioanalysis Letters', 2020-2023.
- Fellow of Indian Chemical Society (FICS), 2022.

PUBLICATIONS

1. Cham P.S., Singh A., Jamwal A., Singh R., Anand R., Manhas D., Sharma S., Singh V.P., Nandi U.*, Singh S.K.*, Singh P.P.* (2024). Discovery of ring-annulated analogues of cannabidiol as potential anticancer agents: synthesis and biological evaluation. ACS Med Chem Lett 15:1832doi: 10.1021/acsmedchemlett.4c00233
2. Manhas D., Dhiman S., Kour H., Kour D., Sharma K., Wazir P., Vij B., Kumar A., Sawant S.D., Ahmed Z., Nandi U* (2024). ADME/PK insights of crocetin: a molecule having an unusual chemical structure with druglike features. ACS Omega 9: 21494.doi: 10.1021/acsomega.4c02116
3. Cham P.S., Kotwal P., Sharma K., Dhiman S., Singh L., Singh V.P., Kumar A., Nandi U.*, Singh P.P.* (2024). Cannabidiol-based prodrugs: synthesis and bioevaluation. ACS Med Chem Lett 15: 221.doi: 10.1021/acsmedchemlett.4c00233
4. Jamwal A., Chand J., Dash A., Bhatt S., Dhiman S., Wazir P., Singh B., Goswami A.*, Nandi U*(2023). Glabridin plays dual action to intensify anti-metastatic potential of paclitaxel via impeding CYP2C8 in liver and CYP2J2/EETs in tumor of an orthotopic mouse model of breast cancer. Chem Biol Interact 382: 110605.doi: 10.1016/j.cbi.2023.110605
5. Bhardwaj M., Gour A., Ahmed A., Dhiman S., Manhas D., Khajuria P., Wazir P., Mukherjee D., Nandi U* (2023). Impact of disease states on the oral pharmacokinetics of EIDD-1931 (an active form of molnupiravir) in rats for implication in the dose adjustment. Mol Pharm 20: 14.doi: 10.1021/acs.molpharmaceut.3c00314
6. Manhas D., Bhatt S., Rai G., Kumar V., Bharti S., Dhiman S., Jain S.K., Sharma D.K., Ojha P.K., Gandhi S.G., Goswami A., Nandi U* (2023). Rottlerin renders a selective and highly potent CYP2C8 inhibition to impede EET formation for implication in cancer therapy. ChemBiol Interact 380: 110524.doi: 10.1016/j.cbi.2023.110524

Sudipto Saha

Associate Professor | Biological Sciences

Joined Bose Institute as a DBT-Ramalingaswami Re-entry Fellow at the Bioinformatics Division in 2012. He served as an Assistant Professor between 2016-2020 in the same division and then as an Associate Professor in the Department of Biological Sciences.

RESEARCH AREAS

- Bioinformatics and Systems Biology
- Lung microbiome dysbiosis in pulmonary diseases
- Mitochondrial dysfunction in pulmonary diseases
- Machine Learning in multi-omics data and Biological Databases

FOCUS

The current focuses of our research group are

- Dissecting the role of lung mitochondrial dysfunction and identifying mitochondrial protein targets in chronic asthma.
- Study the role of lung microbiome dysbiosis and microbial metabolites -host protein interactions in Chronic Obstructive Pulmonary diseases (COPD).
- Study the antimicrobial drug-resistant gene mutation patterns in asthma and multi-drug-resistant tuberculosis (MTB).
- Application of Machine learning in genomics and metagenomics datasets and developing biological databases and online prediction servers

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount sanctioned	Duration
1	Continuation of the existing Centre of Excellence in Bioinformatics and expanding it as a data center involving the newer direction of research to address the healthcare and environmental issues of national need – BIC at Bose Institute, Kolkata. Joint PI	DBT-IndiaI	₹ 1,87,54,131/-	April, 2022-March, 2027
2	Epidemiological survey on tribal communities of Dinajpur District in North Bengal to develop a knowledgebase on disease predisposition for estimating disease etiology. Co-PI	CMR	₹ 30,000/-	April 2023-March 2026
3	National Network Project of Bose Institute with Indian Statistical Institute and Vidyasagar University. (BT/PR40176/BTIS/137/84/2023), Joint PI	DBT-India	₹ 65,52,400 /-	April 2023-March 2028

MAJOR ACHIEVEMENTS

- Received a project grant from Osaka University of 500,000 JPY for short-term visits (2025-2026).
- International Travel Award by Asia Pacific Bioinformatics Network (APBioNET) to attend Asia & Pacific Bioinformatics Joint Conference (APBJC), 2024 in Okinawa, Japan
- International Travel Support by DST-SERB to attend InCoB-2023 in Brisbane, Australia

PUBLICATIONS

1. Das J, Bhattacharjee S, Saha S. mitoPADdb: A database of mitochondrial proteins associated with diseases. Mitochondrion. 2024 78:101927. doi: 10.1016/j.mito.2024.101927.

2. Bhattacharjee S, Saha B, Saha S. Symptom-based drug prediction of lifestyle-related chronic diseases using unsupervised machine learning techniques. Comput Biol Med. 2024 174:108413. doi: 10.1016/j.compbiomed.2024.108413.

Nirmalya Sen

Assistant Professor | Biological Sciences

Joined Bose Institute as Assistant Professor in November 2022 in the Division of Molecular Medicine. Currently a member of Department of biological Sciences.

RESEARCH AREAS

- Regulation of ETS transcription factors in refractory cancers

FOCUS

The current focus of our research group are

- Understanding the mechanism of ETS-mediated chemoresistance in Triple Negative Breast Cancer.
- Transcriptional regulation of mitochondrial dynamics in cancers by ETS transcription factor.
- Studying transcriptional landscape of breast cancer in the West Bengal cohort population.
- Metabolic reprogramming induced by ERG transcriptional axis in prostate cancer

FUNDED PROJECTS

Nil

MAJOR ACHIEVEMENTS

- Ramalingaswami Fellowship (2018-2023), SERB-ECR grant (2019-2022)
- Organizer of Regional Young Investigator Meeting (RYIM)-Kolkata, 2023
- Invited speaker for 43rd IACR (Indian Association for Cancer Research) annual conference at IISER, PUNE.
- Developed An anti-cancer peptide database (dbACP: A Comprehensive Database for Anticancer Peptides) with a collaborator from IIIT, Allahabad (https://dbacp.iiita.ac.in/)

PUBLICATIONS

Articles:

1. Ankan Ghosh, Aiindrila Dhara, Sourav Ghosh, Khulem Stellone Singh, Nirmalya Sen, Anindya Halder. A comparative analytical study on outcome of secondary peritonitis using Mannheim's Peritonitis Index in geographically diverse Indian patients. Turk J Surg , July 2023 (https://doi.org/10.47717/turkjsurg.2023.6043
2. Aiindrila Dhara, Imlimaong Aier, Ankush Paladhi, Pritish Kumar Varadwaj, Sumit Kumar Hira, Nirmalya Sen. PGC1 alpha coactivates ERG fusion to drive antioxidant target genes under metabolic stress. Communication Biology (Nature) Article no: 5:416, 1-11, May 2022

Book Chapter and conference proceedings:

1. Reactive Oxygen Species & Cancer: Split Self APair. Sangramjit Mondal, Aiindrila Dhara, Debkumar pal, Nirmalya Sen, Book Chapter11, Book title: The Role of Reactive Oxygen Species in Health and Disease; NOVA Science publishers, (Published Feb 12, 2024) DOI: https://doi.org/10.52305/TRSI2511
2. Computational approaches to determine stem cell fate. Aiindrila Dhara, Sangramjit Mondal, Ayushi Gupta, Princy Choudhary, Sangeeta Singh, Pritish Kumar Varadwaj, Nirmalya Sen. Book Chapter 19, Book title: Computational Biology for Stem Cell Research; Academic Press, Elsevier (Published, Jan 19, 2024) https://doi.org/10.1016/B978-0-443-13222-3.00017-4
3. Role of Apoptosis in Cancer: War of the Worlds, Therapeutic targets and strategies. Aiindrila Dhara, Ramandeep Kaur, Rajarshi Chattopadhyay, Souhadri Das, Shuvam Pal and Nirmalya Sen. Book Chapter 9, Book title: Apoptosis and Human Health: Understanding Mechanistic and Therapeutic Potential; Springer Nature (published December 2024) (DOI https://doi.org/10.1007/978-981-97-7905-5)
4. Prabhat Tripathi, Nirmalya Sen, P. Varadwaj. Exploring the In uence of DiPerentially Expressed Long Common Non-Coding RNAs on Palbociclib Resistance in Breast Cancer Cell Lines. IEEE 8th International Conference on Information and Communication Technology, Dec- 2024. DOI:10.1109/CICT64037.2024.10899602

Biology of Microbes

Dr. Abhrajyoti Ghosh

Department of Biological Sciences

- Archaeal stress response and adaptation
- Type II toxin-antitoxin modules in thermoacidophilic archaea
- Archaeal heat shock protein machinery
- Cell-cell communication in the natural environment and the role of anthropogenic stressors

Dr. Anupama Ghosh

Department of Biological Sciences

- Plant microbe interactions
- Virulence mechanisms of fungal phytopathogens
- Defense mechanisms of host plants against pathogen infection
- Plant beneficial microbes

Prof. Wriddhiman Ghosh

Department of Biological Sciences

- Geomicrobiology
- Microbial Adaptation
- Ancient Ecosystems

Prof. Jayanta Mukhopadhyay

Department of Chemical Sciences

- Transcription
- Gene Regulation

Prof. Kaustuv Sanyal

Department of Biological Sciences

- Cell cycle regulation
- Genome indexing
- Sequence and structural assembly of genomes
- Drug resistance mechanisms in fungal pathogens

Prof. Srimonti Sarkar

Department of Biological Sciences

- Machinery for protein degradation and intracellular protein sorting of the parasitic protist *G. lamblia*
- Investigate the role of the vacuole of *Saccharomyces cerevisiae* in withstanding increasing ethanol concentration during alcoholic fermentation

Prof. Subrata Sau

Department of Biological Sciences

- Virulence factors and virulence regulators of pathogenic bacteria

Abhrajyoti Ghosh

Associate Professor | Biological Sciences

Joined Bose Institute as a DST Ramanujan Fellow in 2014, served as an Assistant Professor at the Department of Biochemistry between 2016-2020 and currently Associate Professor at the Department of Biological Sciences.

RESEARCH AREAS

- Archaeal stress response and adaptation
- Type II toxin-antitoxin modules in thermoacidophilic archaea
- Archaeal heat shock protein machinery
- Cell-cell communication in the natural environment and the role of anthropogenic stressors

FOCUS

The current focus of our research group includes

- Understanding stress response and adaptation mechanics in thermoacidophilic and halophilic archaea.
- Functional characterization of VapBC-type II toxin-antitoxin modules of Sulfolobus acidocaldarius.
- Functional characterization and cross-talk of minimal heat shock machinery in archaea.
- Molecular mechanisms of growth promotion in host plants by plant growth-promoting rhizobacteria.
- Exploring cell-cell communication between organisms in natural environments, considering the in uence of human-driven impacts.

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount sanctioned	Duration
1.	Functional characterization and interaction of archaeal prefoldin and small heat shock protein 14 with the Group II Chaperonin (Hsp60)	DBT, Govt. of India	₹ 76,00,000/-	2025-2028
2.	Microplastics in ballast water as an emerging vector for bacterial pathogens and Harmful Algal Bloom species: a potential risk to the marine environment and human health	DBT, Govt. of India	₹ 49,37,278/-	2024-2027

MAJOR ACHIEVEMENTS

- Recipient of Vigyan Sera Protiva award in 2022 in the VIGYAN UTSOV organized by Central Calcutta Science & Culture Organization for Youth (CCSCOY) in co-operation with the Department of Science & Technology And Biotechnology,
- Selected as the Ramanujan Fellow by the Department of Science and Technology (DST), India (2013).
- Selected as UGC-Assistant Professor through the UGC-Faculty Recharge Program (UGC-FRP) in 2012.

PUBLICATIONS

1. Gupta, S, Sinha, S, Bhakta, K, Bhowmick, A, Ghosh, A.* (2025) Unravelling the role of the A domain and N-terminal alpha-helices of FtsY in archaeal signal recognition particle. International Journal of Biological Macromolecules 306(4):141645. doi.org/10.1016/j.ijbiomac.2025.141645
2. Bhowmick A, Recalde A, Bhattacharyya C, Banerjee A, Das J, Rodriguez-Cruz UE, Albers S, Ghosh A.* (2024) Role of VapBC4 toxin-antitoxin system of Sulfolobus acidocaldarius in heat stress adaptation. mBio 0:e02753-24. doi.org/10.1128/mbio.02753-24
3. Dey, D, Chakravarti, R, Bhattacharjee, O, Majumder, S, Chaudhuri, D, Ahmed, KT, Bhattacharya, B, Gautam, A, Singh, R, Gupta, R, Ravichandiran, V, Chattopadhyay, D, Ghosh, A, Giri, K, Roy, S, Ghosh, D. (2024) A mechanistic study on the tolerance of PAM distal end mismatch by SpCas9. Journal of Biological Chemistry 300(7): 107439. doi.org/10.1016/j.jbc.2024.107439
4. Bhakta, K, Roy, M, Samanta, S, Ghosh, A.* (2024) Functional diversity in archaeal Hsp60: a molecular mosaic of Group I and Group II chaperonin. FEBS Journal. 291(19): 4323-4348. doi.org/10.1101/2024.01.14.575554

Anupama Ghosh

Associate Professor | Biological Sciences

Joined Bose Institute as a DST INSPIRE Faculty in 2013, served as an Assistant Professor at the Division of Plant Biology between 2016-2020 and currently Associate Professor at the Department of Biological Sciences.

RESEARCH AREAS

- Plant microbe interactions
- Virulence mechanisms of fungal phytopathogens
- Defense mechanisms of host plants against pathogen infection
- Plant beneficial microbes

FOCUS

The current focus of our research group includes

- Functional characterization of secreted ePector proteins of *Ustilago maydis* and their contribution to fungal pathogenesis
- Role of small heat shock proteins in the pathogenic development of *Ustilago maydis*.
- Extracellular vesicle mediated cell-cell communication between *Ustilago maydis* and its host plant *Zea mays* during infection.
- Molecular mechanisms of growth promotion in host plants in association with plant growth promoting rhizobacteria.

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1.	Investigating the role of Hsp20 in the pathogenic development of *Ustilago maydis*	SERB-DST (CRG)	₹ 29,61,495/-	2022 - 2025

MAJOR ACHIEVEMENTS

- Fulbright Nehru Academic and Professional Excellence Award, 2023
- Early Career Research Award, 2018
- DST INSPIRE Faculty Award, 2013

PUBLICATIONS

Selected publications:

1. Mitra A, Bhakta K, Kar A, Roy A, Mohid Sk A, Ghosh A, Ghosh A*. Insight into the biochemical and cell biological function of an intrinsically unstructured heat shock protein, Hsp12 of *Ustilago maydis*. Molecular Plant Pathology 2023, doi: 10.1111/mpp.13350.
2. Acharya U, Das T, Ghosh Z and Ghosh A*. Defense surveillance system at the interface: response of rice towards *Rhizoctonia solani* during sheath blight infection. Molecular Plant Microbe Interactions, 2022, Vol 35(12), 1081-1095, doi: 10.1094/MPMI-07-22-0153-R.
3. Bhattacharya C, Banerjee S, Acharya U, Mitra A, Mallick I, Haldar A, Haldar S, GhoshA*, Ghosh A*. Evaluation of plant growth promotion properties and induction of antioxidative defense mechanism by tea rhizobacteria of Darjeeling, India. Scientific Reports 2020, Vol 10 (1), 1-19, doi: 10.1038/s41598-020-72439-z.
4. Mukherjee D, Gupta S, GhoshA, Ghosh A*. *Ustilago maydis* secreted T2 ribonucleases, Nuc1 and Nuc2 scavenge extracellular RNA. Cellular Microbiology 2020, Vol 22 (12), doi: 10.1111/cmi.13256.

Wriddhiman Ghosh

Professor | Biological Sciences

Joined as Assistant Professor in Microbiology on 15-Jan-2014, and is currently a Professor in the Department of Biological Sciences, Bose Institute, since Jan-2024.

RESEARCH AREAS

- Geomicrobiology, Microbial Adaptation, and Ancient Ecosystems

FOCUS

We explore the biogeochemical and biophysical windows of opportunity that sustain life at the entropic and bioenergetic extremities of the Earth's biosphere (analogs of ancient ecosystems on Earth, and potential extra-terrestrial locations). Our studies are centered on these biophysically-extreme habitats:

- the geochemically peculiar hot spring systems of the Indian Trans-Himalayas;
- the sulfidic (anoxic) sediments of oxygen-starved territories of the marine realm; and
- Trans-Himalayan lake, and desert, ecosystems that remain frozen for one third of a year

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1	Continuation of the existing Centre of Excellence in Bioinformatics … BIC at Bose Institute, Kolkata	DBT	₹1,38,47,000	2022 - ongoing

MAJOR ACHIEVEMENTS

- Discovered strictly aerobic microbial life, alongside molecular footprints of microbes having potentials for O_2 production without light (dark O_2), within an anoxic (sulfidic) marine sediment system.
- Revealed that phylogenetic relatives of diverse mesophilic bacteria thrive consistently in the boiling uid discharged by a number of Trans-Himalayan sulfur-borax spring systems; we further discovered that environment-guided rudimentary thermophilicity develops in natural populations of mesophilic bacteria that get stochastically introduced to these hydrothermal systems by local geodynamic forces.
- Co-convened symposia within the Goldschmidt Conferences of 2023 and 2024 held at Lyon and Chicago respectively (Goldschmidt is the premier conference of Geochemistry organized annually by the European Association of Geochemistry and the Geochemical Society, USA).
- Conferred honorary membership of the European Association of Geochemistry for 2023-24 and 2024-25.

PUBLICATIONS

1. Mondal N, Dutta S, Chatterjee S, Sarkar J, Mondal M, Roy C, Chakraborty R, Ghosh W* (2024) Aquificae overcomes competition by archaeal thermophiles, and crowding by bacterial mesophiles, to dominate the boiling vent-water of a Trans-Himalayan sulfur-borax spring. PLoS One 19: e0310595 doi: 10.1371/journal.pone.0310595.
2. Sarkar J, Mondal M, Bhattacharya S, Dutta S, Chatterjee S, Mondal N, N S, Peketi A, Mazumdar A, Ghosh W* (2024) Extremely oligotrophic and complex-carbon-degrading microaerobic bacteria from Arabian Sea oxygen minimum zone sediments. Archives of Microbiology 206: 179. doi: 10.1007/s00203-024-03875-y.
3. Mondal N, Roy C, Chatterjee S, Sarkar J, Dutta S, Bhattacharya S, Chakraborty R, Ghosh W* (2022) Thermal endurance by a hot-spring-dwelling phylogenetic relative of the mesophilic *Paracoccus*. Microbiology Spectrum 10: e01606-22. doi: 10.1128/spectrum.01606-22.
4. Mazumdar A and Ghosh W (2022) Systems Biogeochemistry of Major Marine Biomes. A monograph of Marine Geobiology published by John Wiley & Sons, Incorporated, Hoboken NJ (USA). doi: 10.1002/9781119554356.

Jayanta Mukhopadhyay

Professor | Chemical Sciences

Joined Bose institute as an Assistant Professor in 2008 at Dept of Chemistry, became a Professor in 2020, and following the rationalization of departments, he is now serving in the Department of Chemical Sciences. He is also serving as the Chair of the Central Instrumental facility (CIF).

RESEARCH AREAS

- Transcription, Gene Regulation

FOCUS

- Mechanism of gene regulation by various transcriptional factors and sigma factors in prokaryotes.
- Identify and characterize inhibitors of *M. tuberculosis* gene expression.

FUNDED PROJECTS

Science and Engineering Research Board, Department of Science and Technology, Govt of India. *IRPHA* SERB/IPA/2020/000414, 2019-2025 (CoPIJayanta Mukhopadhyay)

MAJOR ACHIEVEMENTS

Member of Society of Microbiology, USA

PUBLICATIONS

1. Tewary A, Prajapati RK, and Mukhopadhyay J.*Mechanism of d Mediated Transcription Activation in Bacillus subtilis: Interaction with a CTD of RNA Polymerase Stabilizes d and Successively Facilitates the Open Complex Formation*, *Journal of Molecular Biology* 435 (2023) 168366
2. Chakraborty AK, Saha S, Kousik K, Samanta T, Gautam S, Mukhopadhyay J. A saponin-polybromophenol antibiotic (CU1) from Cassia fistula Bark Against Multi-Drug Resistant Bacteria Targeting RNA polymerase. *Current Research in Pharmacology and Drug Discovery*(2022) 3: 100090.
3. Dutta A, Rudra P, Banik SK, Mukhopadhyay J. Evidence of robustness in a two-component system using a synthetic circuit. (2020) *J Bacteriol*. 202 (4) e00672-19.
4. Bhawsinghka N, Dutta A, Mukhopadhyay J, Das Gupta SK. A transcriptomic analysis of the mycobacteriophage D29 genome reveals the presence of novel stoperator-associated promoters in its right arm, (2018) *Microbiology* Sep; 164(9):1168-1179.
5. Prajapati RK, Sur R, Mukhopadhyay J. A Novel function of δ factor from Bacillus subtilis as a transcriptional repressor (2016) J Biol Chem. 291(46): 24029-24035.

Kaustuv Sanyal

Professor | Biological Sciences

Kaustuv Sanyal is Professor and former Chair of Molecular Biology and Genetics Unit at JNCASR, Bangalore and is currently serving as Director, Bose Institute on deputation for five years since 2/5/2024. He has active laboratories at JNCASR and BI.

RESEARCH AREAS

- Cell cycle regulation
- Genome indexing
- Sequence and structural assembly of genomes
- Drug resistance mechanisms in fungal pathogens

FOCUS

- Crosstalk between DNA replication and chromosome segregation machinery
- Analysis of spindle pole body components in Candida albicans
- Functional and structural evolution of genomes in fungal pathogens
- Comparative genomics and 3D genome assembly
- Aneuploidy and drug resistance in fungal pathogens.

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1.	Crypto-Division: Discovering non-canonical mechanism of genome transmission in the human fungal pathogen Cryptococcus neoformans	Wellcome Trust, UK	₹ 600 L (4.1M GBP)	96 months from start date
2.	Leveraging Candida albicans D-amino acid oxidase inhibition to protect the host from fungal infections.	DBT	₹ 100L	36 months from start date
3	Targetting an essential Candida-specific protein to develop antifungals	ICMR	₹ 149L	02/25 - 02/28
4	Tracing the evolutionary transition of nucleosome assembly	DBT-DFG	₹ 137L	05/24 - 05/27
5	Elucidation of the kinetochore architecture in a basidiomycete yeast *Cryptococcus neoformans*	ICMR	₹ 38.5L (146 L)	04/22 - 04/25
6	JC Bose Fellowship	SERB/ANRF	₹ 95L	09/20 - 09/25

MAJOR ACHIEVEMENTS

- GN Ramachandran Gold Medal, CSIR, India for the year 2022
- Sun Pharma Research Foundation Award- Medical Sciences, Basic Research for the year 2022
- J C Bose National Fellowship, Science and Engineering Research Board, India 2020-25
- Tata Innovation Fellowship, Dept. of Biotechnology, India 2017 - 2020
- National Bioscience Award, Dept. of Biotechnology, India 2012 – 2015
- Elected Fellow of American Academy of Microbiology, INSA, IAS, NASI, Guha Research Council

PUBLICATIONS

1. Sanyal K*, Narayanan A (2025) Ploidy plasticity drives fungal resistance to azoles used in agriculture and clinics. PLOS Biology doi: 10.1371/journal.pbio.3003083 (in press)
2. Reza MH, Aggarwal R, Verma J, Podh NK, Chowdhury R, Mehta G, Manjithaya R, Sanyal K* (2025) Autophagy-related protein Atg11 is essential for microtubule-mediated chromosome segregation. PLOS Biology doi: 10.1371/journal.pbio.3003069 (in press)
3. Polisetty SD, Bhat K, Das K, Clark I, Hardwick KG, Sanyal K* (2025) The dependence of shugoshin on Bub1 kinase activity is dispensable for the maintenance of spindle assembly checkpoint response in Cryptococcus neoformans. PLOS Genetics 21: e1011552. doi 10.1371/journal.pgen.1011552.
4. Reza MH*, Dutta S, Goyal R, Shah H, Dey G*, Sanyal K* (2024) Expansion microscopy reveals characteristic ultrastructural features of pathogenic budding yeast species. J Cell Sci 137: jcs262046 doi:10.124/jcs.262046.
5. Narayanan A, Reza MH, Sanyal K* (2024) Behind the scenes: centromere-mediated genomic innovations in fungal pathogens. PLOS Pathogens 20: e1012080. doi: 10.137/journal.ppat.1012080.

Srimonti Sarkar

Professor | Biological Sciences

Joined Bose Institute as an Associate Professor in the Dept. of Biochemistry, prior to which she was an Assistant Professor at IISER-Kolkata. She has served as the Chairperson of the Dept. of Biochemistry and the Dean of Student APairs. Following the rationalization of departments, she is a member of the Dept. of Biological Sciences, where she is currently serving as the Chairperson for almost two years.

RESEARCH AREAS

- Machinery for protein degradation and intracellular protein sorting of the parasitic protist *G. lamblia*
- Investigate the role of the vacuole of *Saccharomyces cerevisiae* in withstanding increasing ethanol concentration during alcoholic fermentation

FOCUS

- Posttranslational modifications driving protein targeting in *Giardia*
- Molecular interactions underlying the assembly of membrane-deforming complexes of *Giardia*
- Interactomes of moonlighting proteins associated with unique subcellular structures of *Giardia*
- Regulation of yeast's vacuole fission machinery during ethanol stress

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1.	Deciphering the cellular functions of the multiple paralogues of GINSF and GlaSNAPs of *Giardia lamblia* (CRG/2022/001594/BHS)	ANRF	₹ 48,51,790	October 2023 onwards for 3 years

MAJOR ACHIEVEMENTS

- Member, Academic Council, Indian Association for Advancement of Science
- Member, Research Advisory Committee, Dept. of Biochemistry, Calcutta University
- Member, Research Advisory Committee, Dept. of Genetics, Calcutta University
- Member, Research Advisory Committee, Dept. of Microbiology, Kalyani University
- Member, Academic Sub-committee, West Bengal Joint Entrance Examinations Board

PUBLICATIONS

1. Das A, Ray A, Ray Chaudhuri N, Mukherjee S, Ghosh Dastidar S, Ghosh A, Ganguly S, Jana K, Sarkar S (2025) Binary protein interactome mapping of the Giardia lamblia proteasome lid reveals extra proteasomal functions of GlRpn11. FEBS J. doi: 10.1111/febs.70027
2. Maiti A, Sarkar S, Sil KA (2023) Biphasic Autophagy: A Solution to Cigarette Smoke-Induced Autophagy Conundrum. Clin Res Pulmonol doi.org/10.47739/2333-6625/1061
3. Maity, A., Saha, N., Shukla, A., Sarkar, S., and Sil A.K. (2021). Cigarette smoke aPects ESCRT-mediated vacuolar activity in Saccharomyces cerevisiae. Toxicol Lett. doi: 10.1016/j.toxlet.2020.12.008.

Subrata Sau

Professor | Biological Sciences

Joined the erstwhile Department of Biochemistry, Bose Institute in 2000 as a Lecturer. Before his promotion to the current position of Professor in 2020, he served as Senior Lecturer, Assistant Professor, Associate Professor, and Professor for diPerent time periods during 2003- 2020.

RESEARCH AREAS

- Virulence factors and virulence regulators of pathogenic bacteria.

FOCUS

- Mechanism of interaction between a staphylococcal anti-sigma factor and the cognate proteins.
- Structure, function, and stability of the staphylococcal capsule-producing enzymes.
- Structure, function, and stability of a staphylococcal cyclophilin.
- Structure, function, and stability of a Mip-like virulence factor from *Escherichia coli*.
- Development of unfolding-based assay systems suitable for screening anti-virulence agents.

PUBLICATIONS

1. Chakraborty T, Polley S, Ray Chaudhuri N, Sinha D, Bhattacharjee A, Saha P, Sau K, Ghosh Dastidar S, Sau S* (2024) A staphylococcal capsule-producing enzyme that unfolds via multiple intermediates predominantly exists as the trimers at low concentrations. J Biomol Struct Dyn. Dec 13:1-15. doi: 10.1080/07391102.2024.2438364.
2. Basak P, Dastidar DG, Ghosh D, Chakraborty T, Sau S, Chakrabarti G (2024) Staphylococcus aureus major cell division protein FtsZ assembly is inhibited by silibinin, a natural avonolignan that also blocked bacterial growth and biofilm formation. Int J Biol Macromol. 2024 Aug 31;279(Pt 2):135252. doi: 10.1016/j.ijbiomac.2024.135252.
3. Sinha D, Naskar P, Chakraborty T, Datta AB, and Sau S* (2025) The conserved Asp 23 of a staphylococcal anti-anti-sigma factor is required to optimally preserve its structure, phosphorylation, and interaction with a cognate anti-sigma factor. J Basic Microbiol (Under revision).
4. Seal S, Chakraborty T, Polley S, Paul D, Banerjee N, Sinha D, Dutta A, Chatterjee S, Sau K, Ghosh Dastidar S, Sau S* (2023) Modeling and monitoring the ePects of three partly conserved Ile residues in the dimerization domain of a Mip-like virulence factor from Escherichia coli. J Biomol Struct Dyn. Oct 30:1-14. doi: 10.1080/07391102.2023.2274978.
5. Chakraborty T, Banerjee N, Sinha D, Seal S, Chatterjee S, Sau S* (2023) The cofactors and domains of a staphylococcal capsule-producing enzyme preserve its structure, stability, shape, and dimerization ability. J Biochem. 173:471-486. doi: 10.1093/jb/mvad014.
6. Seal S, Banerjee N, Mahato R, Kundu T, Sinha D, Chakraborty T, Sinha D, Sau K, Chatterjee S, Sau S* (2023) Serine 106 preserves the tertiary structure, function, and stability of a cyclophilin from Staphylococcus aureus. J Biomol Struct Dyn. 41:1479-1494. doi: 10.1080/07391102.2021.2021992.
7. Chakraborty T, Polley S, Sinha D, Seal S, Sinha D, Mitra SK, Hazra J, Sau K, Pal M, Sau S* (2022) Structurally distinct unfolding intermediates formed from a staphylococcal capsule-producing enzyme retained NADPH binding activity. J Biomol Struct Dyn. 40:9126-9143. doi: 10.1080/07391102.2021.1924269.
8. Sinha D, Sinha D, Banerjee N, Rai P, Seal S, Chakraborty T, Chatterjee S, Sau S* (2022) A conserved arginine residue in a staphylococcal anti-sigma factor is required to preserve its kinase activity, structure, and stability. J Biomol Struct Dyn. 40:4972-4986. doi: 10.1080/07391102.2020.1864475.
9. Sinha D, Sinha D, Dutta A, Chakraborty T, Mondal R, Seal S, Poddar A, Chatterjee S, and Sau S* (2021) Alternative Sigma Factor of Staphylococcus aureusInteracts with the Cognate Antisigma Factor Primarily Using Its Domain 3. Biochemistry.60:135–151. doi: 10.1021/acs.biochem.0c00881.
10. Sinha D, Chakraborty T, Sinha D, Poddar A, Chattopadhyaya R, Sau S* (2021) Understanding the structure, stability, and anti-sigma factor-binding thermodynamics of an anti- anti- sigma factor from Staphylococcus aureus. J Biomol Struct Dyn. 39: 6539- 6552 . doi: 10.1080/07391102.2020.1801511.

Chemistry & Chemical Biology

Dr. Anup Ghosh

Department of Chemical Sciences

- Spectroscopy (Steady State/Time Resolved Fluorescence, Infrared)
- Surface Chemistry, Solvation Dynamics, Peptide Synthesis
- Small Molecule Interaction with Biological Molecules

Dr. Basudeb Maji

Department of Biological Sciences

- Chemical Biology &Biotechnology
- Drug discovery
- Synthetic Biology
- Genome engineering
- Chemo-preventive development

Prof. Anup Kumar Misra

Department of Chemical Sciences

- Glycoscience
- Carbohydrate synthesis
- Bioorganic and Medical Chemistry

Prof. Debaraj Mukherjee

Department of Chemical Sciences

- Organic Synthesis and Medicinal Chemistry
- Carbohydrate Chemistry
- Photoredox Chemistry

Dr. Amit Kumar Paul

Department of Chemical Sciences

- Theoretical and Computational Chemistry
- Unimolecular Reaction Dynamics
- Chemical Processes in Condensed Phase System
- Electronic Non-adiabatic Dynamics
- Machine Learning in Reaction dynamics

Anup Ghosh

Assistant Professor | Chemical Sciences

Joined Bose institute as an Assistant Professor at the Dept of Chemical Sciences in 2022

RESEARCH AREAS

- Physical Chemistry: Spectroscopy (Steady State/Time Resolved Fluorescence, Infrared)
- Surface Chemistry, Solvation Dynamics, Peptide Synthesis, Small Molecule Interaction with Biological Molecules

FOCUS

- Surface Structure Analysis of Peptide coated Nanoparticles for targeted drug delivery
- Structural and dynamics study of biomolecules by employing spectroscopic and theoretical approach
- The spectroscopic and theoretical approach to understand the mechanism of drug penetration through lipid bilayer.
- Therapeutic peptide synthesis to bind G-Quadruplex for inhibiting DNA replication

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount sanctioned	Duration
1	Ultrafast 2D-IR spectroscopy on the structural dynamics of DNA/G-Quadruplex	DST, Govt of India	₹ 3500000/-	01/01/2019 - 31/12/2024

MAJOR ACHIEVEMENTS

- Inspire Faculty Fellowship

PUBLICATIONS

1. Ghosh, A. Vibrational Coupling on Stepwise Hydrogen Bond Formation of Amide I. J. Phys. Chem. B 2019, 123,7771-7776.
2. Chakrabarty, S.; Maity, S.; Darshana, Y.; Ghosh, A. Surface Directed Disparity in Self Assembled Structures of Small Peptide -L-Glutathione on Gold and Silver Nanoparticles. Langmuir 2020, 36, 11255−11261.
3. Chakrabarty, S.; Deshmukh, S.; Barman, A.; Bagchi, S.; Ghosh, A. On-OP Infrared Absorption of S=O Vibrational Probe of Dimethyl Sulfoxide. J. Phys. Chem B 2022, 126, 4501-4508.
4. Chakrabarty, S.; Barman, A.; Ghosh, A. Anomalous Infrared Absorbance of S=O/ C=O: A perturbation Study of α C-H/D. J. Phys. Chem. B, 2022 126, 5490-5496.
5. Chakrabarty, S.; Ghosh, A. Inconsistent Hydrogen Bond Mediated Vibrational Coupling of Amide I. RSC Advances 13 (2), 1295-1300
6. Chakrabarty, S.; Barman, A.; Ghosh, A. A Disparity in Solvatochromism of C=O and S=O Vibrational Probe: A Study of Structurally Similar Acetone and Dimethyl Sulfoxide. J. Mol. Liquids, 2023, 382, 122005.
7. Sakpal, S.;Chakrabarty, S.; Reddy, K. D., Deshmukh, S H.; Biswas, R,; Bagchi, S.; Ghosh, A. Perturbation of Fermi Resonance on Hydrogen-Bonded> C=O: 2D IR Studies of Small Ester Probes. J. Phys. Chem. B, 2024,128, 4440-4447.

Basudeb Maji

Assistant Professor | Biological Sciences

Joined as an Assistant Professor at Bose Institute in December 2022

RESEARCH AREAS

- Chemical Biology, Biotechnology, Drug discovery, Synthetic Biology, Genome engineering, Chemo-preventive development

FOCUS

The current focuses of our research group are

- *Synthetic Biology based Anti-infective Drug Development* We are developing synthetic biology methods for precision anti-infective agent discovery in bacteria. Our primary targets are multidrug-resistant pathogenic bacteria like MRSA and Mycobacterium tuberculosis
- *CRISPR-Cas, Genome engineering, Functional Genomics* We focus on developing functionally enhanced CRISPR systems for their broader and practical application in gene editing. We employ protein engineering and chemogenetics for precise cellular gene editing and investigate their ePect on gene functions for prospective gene therapy applications
- *Synthetic Organic Small Molecules and Anticancer Drug Development* We work on developing synthetic small molecules and chemical biology methods for developing targeted chemotherapy. We employ small-molecule probes to decipher the role of various oncoproteins and inhibit their tumorigenic functions.

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1	High-throughput in vivo Biosynthetic Cyclic Peptide Development Targeting CRISPR Adaptive Immunity in Pathogenic Bacteria to Enhance Bacteriophage Therapy against AMR	DBT	₹ 100 Lakhs	April, 2025 - March, 2028

MAJOR ACHIEVEMENTS

- 2021 Ramalingaswami Re-entry Fellowship DBT, GoI
- 2016 Partners Innovation Discovery Award Brigham and Women's Hospital, MA, USA

PUBLICATIONS

1. Design and Synthesis of Nucleic Acid Nano-environment Interactome-Targeting Small Molecule PROTACs and Their Anticancer Activity. Sadiya Tanga, Arkadeep Karmakar, Arpita Hota, Paramita Banerjee and Basudeb Maji. *Nanoscale*, 2024, Nanoscale, 2024,16, 12502-12509.

2. Cysteine-independent CRISPR-associated protein labeling for presentation and co-delivery of molecules toward genetic and epigenetic regulations. Sadiya Tanga, Arpita Hota, Arkadeep Karmakar, Paramita Banerjee, and Basudeb Maji,* *Chembiochem*, 2024, e202400149.

3. CRISPR-based Precision Molecular Diagnostics for Disease Detection and Surveillance. Akshara Kulkarni, Sadiya Tanga, Arkadeep Karmakar, Arpita Hota, and Basudeb Maji*, *ACS Applied Bio Materials*, 2023, 6, 10, 3927–3945.

Anup Kumar Misra

Professor | Chemical Sciences

Joined Bose Institute in 2008 as an Assistant Professor in the Div. of Molecular Medicine, prior to which he was an Senior Scientist at CSIR-Central Drug research Institute(CDRI)-Lucknow. He has served as the Chairman of the Div. of Molecular Medicine and the Dean R&D. Following the rationalization of departments, he is a member of the Dept. of Chemical Sciences, where he is currently serving as the Chairman.

RESEARCH AREAS

- Glycoscience, Carbohydrate, Bioorganic and Medical Chemistry.

FOCUS

- Development of synthetic reaction methodologies.
- Chemical synthesis of complex oligosaccharides.
- Synthesis and bio-evaluation of natural product inspired small molecules.

FUNDED PROJECTS

Nil

MAJOR ACHIEVEMENTS

- Fellow of West Bengal Academy of Science and Technology, 2016.
- Editorial Board member of Elsevier: Tetrahedron, Tetrahedron Letters and Carbohydrate Research 2023.
- Visiting scientist to University of Debrecen, Hungary [INSA-HAS] (April-June 2015)
- Dr. H.C. Srivastava young scientist award (ACCTI) 2014
- Visiting scientist to Abo Akademy, Finland [DBT-Academy of Finland] (Aug-Oct. 2013)
- Visiting scientist to University of Konstanz, Germany [INSA-DFG] (March-May 2009), 2009
- DST Ramanna Research Fellowship, 2007
- CSIR Young Scientist Award in Chemical Sciences, 2005.

PUBLICATIONS

1. Abhijit Rana, Satyajit Halder, Rittika Chakraborty, Utsab Debnath, Kuladip Jana, Anup Kumar Misra, Novel aryl (dithioglycosyl)methane derivatives as anti-proliferative agents, *Bioorganic chemistry* 2025, *154*, 108030.
2. Abhijit Rana and Anup Kumar Misra, Synthesis of the tetrasaccharide repeating unit corresponding to the *O*-antigen of *Providencia alcalifaciens* O7:H7 strain, *Synthesis* 2025, *57*, published online.
3. Samim Sahaji, Abhijit Rana and Anup Kumar Misra, Convergent synthesis of the pentasaccharide repeating unit of the cell wall K116 capsular polysaccharide of *Acinetobacter baumannii*, *Tetrahedron* 2025, *176*, 134537
4. Abhijit Rana and Anup Kumar Misra, Synthesis of the hexasaccharide repeating unit corresponding to the cell wall *O*-antigen of *Providencia alcalifaciens O9:H8* strain, *Synthesis* 2024, *56*, 1200-1206.
5. Abhijit Rana and Anup Kumar Misra, Convergent synthesis of the pentasaccharide repeating unit corresponding to the cell wall *O*-polysaccharide of *Salmonella Milwaukee* (group U) O:43 strain, *Carbohydrate Research* 2024, *542*, 109176..
6. Novel Sulforaphane Analog Disrupts Phosphatidylinositol-3-Kinase-Protein Kinase B Pathway and Inhibits Cancer Cell Progression via Reactive Oxygen Species-Mediated Caspase, A Dutta, S Halder, I Bhaumik, U Debnath, D Dhara, AK Misra, K Jana, ACS Pharmacology & Translational Science 2023, 7, 195-211.

Debaraj Mukherjee

Professor | Chemical Sciences

Joined Bose Institute in 2022 as Professor in the Dept. of Chemical Sciences. He was Principal Scientist and HOD of NPC division of CSIR-IIIM, Jammu.

RESEARCH AREAS

- Organic Synthesis and MedChem, Carbohydrate Chemistry, Photoredox Chemistry.

FOCUS

- Development of novel methods for O-/C-/N-glycosylation, transition metal and/or photo-redox catalyzed C-C bond formation, C-H activation, and non-infringing routes for the synthesis of APIs.
- Nucleoside synthesis, synthesis of oligosaccharide mimetics, and carbohydrate-fused bicyclic systems containing medium-ring to macrocyclichavepromising therapeutic potential.
- Natural product-inspired small moleculeleads in the areas of cancer, neurodegenerative disease, and antiviral and antimicrobial chemotherapeutics

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1	A Novel Approach to the Construction of N-alkylated Hydroxylaminolnterglycosidic Linkages: Application in the synthesis of Esperamicin-calicheamicin cores.	ANRF, PI	₹ 40L	36 months (31/03/2025)
2	Repurposing of antiviral drugs for COVID-19.	CSIR-HCP, PI	₹ 1 Cr	36 months from start date
3	Synthesis of Dapagli ozin and sofosbuvir by novel glycosylation.	SERB, PI	₹ 40L	48 months from start date
4	Discovery of anticancer Leads from Carbohydrate precursors using MCR.	SERB, PI	₹ 25L	36 months from start date

MAJOR ACHIEVEMENTS

- Received ACCT(I) Excellence in Carbohydrate Research Award-2024 sponsored by PfP,Houston, Texas, USA and Dr. H C Srivastava Memorial Award-2019 by the ACCTI at Lucknow university
- Received "CSRI Bronze Medal-2023" by the Chemical Research Society of India at JNU
- Received "2020 Professor D.K. Banerjee Memorial Lecture Award" at Pfizer Symposium organized by Indian Institute of Science, Bangalore, February 2020.
- Received the DST Boyscast fellowship for exchange program with Professor. David Crich, Wayne State University, USA (Nov,2011-Nov,2012).

PUBLICATIONS

Patents (Principal-Inventor) and Publications

- A process for the preparation of N4-hydroxycytidine and its derivatives. Patent granted US 2024/0239832 A1, 2024.
- Synthesis of Gli ozins via Palladium-Catalyzed Stereoselective Oxidative Coupling ofGlycals with Aryl Halides. Patent grantedUS app. patent No. US18/558298, 2024
- Rasool, B.; Kundu, S.; Zargar, I. A.; Mukherjee, D*. "DMSO–$K_2S_2O_8$mediated iodine-free conversion of glycal C-3 ether to 3-enopyranones: synthesis of furo[3,2-c]pyrans" Chem. Commun., 2025,61, 137-140

Amit Kumar Paul

Associate Professor | Chemical Sciences

Joined Bose Institute as Associate Professor at the Department of Chemical Sciences in 2024. He was Associate Professor at NIT Meghalaya since 2023..

RESEARCH AREAS

- Theoretical and Computational Chemistry
- Unimolecular Reaction Dynamics
- Chemical Processes in Condensed Phase System
- Electronic Non-adiabatic Dynamics
- Machine Learning in Reaction dynamics

FOCUS

The current focuses of our research group are

- Unimolecular dissociation dynamics of phenol dimerin reference to the experimental work by T. Ebata and group.
- Association/dissociation reaction of benzene and hexa uorobenzenein a bath of 1000 N2 molecules, to understand the role of environment of the chemical processes.
- Development of machine-learning based potential energy surfaces and also to find out convenient descriptor as well as technique to achieve good training and testing results.
- Electronic non-adiabatic dynamics of diazirine to carbene and molecular nitrogen

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1	On-the-Fly Chemical Dynamics Simulations in Gas and Condensed Phase Molecular Systems Using Machine Learning Approach	SERB-DST (CRG	₹48,11,400/-	Dec. 2022 – Dec. 2025

MAJOR ACHIEVEMENTS

- Member of Editorial Board, International Journal of Chemical Kinetics, 2023 – 2026
- "Excellent Research Contribution" Award for the year 2022-23 from NIT Meghalaya
- Five best poster prizes by the group members in national or internation conferences, 2022-2025
- Best Masters' thesis of NIT Meghalaya given to the group members in 2022 and 2023
- Member of Indian Chemical Society
- Member of Chemical Research Society of India

PUBLICATIONS

1. Roy Chowdhury P, Deb B, Kawade, M, Paul, A. K., Patwari, G. N. Local dynamics drive the C–CX_3 (X = H and F) bond photodissociation in acetylacetones, *J. Chem. Phys.* 2025: 162, 064305
2. Deb B, Mahanta H, Baruah N P, KhardewsawM, Paul, A. K. "On the intramolecular vibrational energy redistribution dynamics of aromatic complexes: A comparative study on C_6H_6–C_6H_5Cl, C_6H_6–$C_6H_3Cl_3$, C_6H_6–C_6Cl_6 and C_6H_6–C_6H_5F, C_6H_6–$C_6H_3F_3$, C_6H_6–C_6F_6". J. Chem. Phys. 2024: 160 :024307
3. Deb, B., Ngamwal Anal S. R., Mahanta H, Yogita, Paul, A. K. "Unimolecular dissociation of C6H6–C6H5Cl, C6H6–C6H3Cl3, and C6H6–C6Cl6 complexes using machine learning approach", *J. Chem. Phys.* 2023: 158, 194104.
4. Agarwal A, Baruah P. J., Ahamed S. S., Baruah S, Paul, A. K. "Post-Transition State Direct Dynamics Simulations on the Ozonolysis of Catechol in an N_2 Bath and Comparison with Gas-Phase Results"*J. Phys. Chem. A* 2023, 127, 32, 6804–6815.

Environmental Science

Prof. Abhijit Chatterjee

Department of Chemical Sciences

- Atmospheric chemistry
- Atmospheric aerosols
- Air pollution and air quality
- Greenhouse gases

Dr. Sanat Kumar Das

Department of Physical Sciences

- Atmospheric Physics
- Atmospheric Microbiology
- Atmospheric Modeling and Remote Sensing

Abhijit Chatterjee

Professor | Chemical Sciences

Joined Bose institute as an Assistant Professor in 2014 at Dept of Physics, became a Professor in 2023, and following the rationalization of departments, he is now serving in the Department of Chemical Sciences. He is also serving as the In-charge of the Darjeeling campus of Bose Institute.

RESEARCH AREAS

- Atmospheric chemistry; Atmospheric aerosols; Air pollution and air quality; Greenhouse gases

FOCUS

- *Exploring eastern Himalaya:* Aerosol pollution and air quality; Carbonaceous aerosols and their light absorption; cloud condensation nuclei (CCN) activation; Aerosol scavenging and nutrient deposition; Exchange of Greenhouse gas between biosphere and atmosphere
- *Aerosols chemistry over di$erent ecosystem:* Size-segregated aerosol chemistry; Brown Carbon aerosols; Impact of transported biomass burning plume; aerosols and oxidative potential
- *India's aerosol pollution:* Long-term trend, current scenario and future prediction: State and city-level study; Impact of aerosol pollution over IGP on Himalayan air quality

FUNDED PROJECTS

"National Carbonaceous Aerosol Program" funded by MoEFCC [as PI].

MAJOR ACHIEVEMENTS

- Nodal Faculty for West Bengal, National Clean Air Program, GoI (since 2019)
- Expert member, Kolkata Climate Action Plan, Govt. of West Bengal
- Editorial Board Member: "Aerosol and Air Quality Research" and "Earth and Space Chemistry (American Chemical Society)

PUBLICATIONS

1. Abhinandan Ghosh, Monami Dutta, Abhijit Chatterjee. Contrasting features of winter-time PM2.5 pollution and PM2.5-toxicity based on oxidative potential: A long-term (2016–2023) study over Kolkata megacity at eastern Indo-Gangetic Plain. Science of The Total Environment, 2024, 954, 176640,
2. Monami Dutta, Abhinandan Ghosh, SudhirKumar Sharma, TuhinKumar Mandal, *Abhijit Chatterjee*. CCN activation of ultrafine biogenic-WSOC under restricted anthropogenic emissions: A study over eastern Himalaya in India: *Atmospheric Research,* 2023, 287,106704,
3. Mukherjee, S., Singh, G.K., Dutta, M., Srivastava, V., Qadri, A.M., Gupta, T. and *Chatterjee, A*. PM2.5 pollution exceeding Indian standard over a semi-urban region at eastern IGP: Chemistry, meteorological impact, and long-range transport. *Science of The Total Environment*, 2023, 898, 165415.
4. Monami Dutta and *Abhijit Chatterjee*. A deep insight into state-level aerosol pollution in India: Long-term (2005–2019) characteristics, source apportionment, and future projection (2023). *Atmospheric Environment*, 2022, 289, 119312,

Sanat Kumar Das

Associate Professor | Department of Physical Sciences

Serving as Associate Professor at Bose Institute in the Dept. of Physical Sciences.

RESEARCH AREAS

- Atmospheric Physics
- Atmospheric Microbiology
- Atmospheric Modelingand Remote Sensing

FOCUS

The current focuses of our research group are

- Air Pollution and Human Health
- Himalayan and Polar Airborne Microorganisms
- Extreme Weathers and Air Quality

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1	Investigation of urban airborne bacteria and their impact on human health over metropolitan cities of Indo-Gangetic Plain in India as PI	DST	₹ 1.40 Crs	2025-2028
2	Revealing bioaerosol movements within the area spanning eastern Himalayas and coastal Bay of Bengal as PI	SERB	₹ 38.14 lakhs	2022-2025
3	Investigation of alteration of Airborne Microbial Diversity by long-range transport of continental aerosols over Arctic as PI	MoES	-	2023-2024

MAJOR ACHIEVEMENTS

- DST-SERB Ramanujan Fellowship during Oct 2013- Oct, 2018
- Received MEXT Scholarship sponsored by Japanese Government for Visiting Scientist at Disaster Prevention Research Institute, Kyoto University, Japan during Jul - Aug 2014
- Visiting Scientist at Department of Physics, University of New Brunswick, Canada during Mar 2014
- Resident Scientist, UNEP Regional Resource Center for Asia and the Pacific (RRC.AP), Hanimaadhoo, Maldives during Feb- Jun 2010
- Post-Doctoral Fellow at National Taiwan University, Taipei, Taiwan, India during 2011-2013
- Post-Doctoral Fellow at National Atmospheric Research Laboratory, Gadanki, India during 2010-2011
- Post-Doctoral Fellow at Physical Research Laboratory during Oct 2008-Feb 2010
- Member of DST FIST Subject Expert Committee - Earth & Atmospheric Sciences Areas (2020-2023)
- Representing Institute of Repute (IoR) under the National Clean Air Mission, the Ministry of Environment, Forest and Climate Change (MoEFCC); and Central Pollution Control Board (CPCB)
- Guest Associate Editor in 'Atmosphere and Climate' of International Peer-Reviewed Journal named Frontiers in 'Environmental Science' (IF:4.581, Citescore: 4.4) with the research topic of 'The Importance of Air-borne Microorganisms: Why do we Need to Advance our Understanding?

SELECTED PUBLICATIONS

1. S. R. Saikh, M. A. Mushtaque, A. Paramanick, J. K. Prasad, D. Roy, S. Saha, and Sanat Kumar Das#; Fog caused distinct diversity of airborne bacterial communities enriched with pathogens over central Indo-Gangetic plain in India, Heliyon, 2024.
2. S. R. Saikh, M. A. Mushtaque, and Sanat Kumar Das#; A Study on the Understanding of Chemical Compositions of Deposited Fog Water over Central Indo-Gangetic Plain in India. Aerosol and Air Qual. Res. 24, 230098, 2024
3. S. R. Saikh and Sanat Kumar Das#; Fog induced alteration in air-borne microbial community- A study over central Indo-Gangetic Plain in India, Applied and Environmental Microbiology, 89, 1, 1-16, 2023
4. Sanat Kumar Das#, A. Chatterjee, S. K. Ghosh, S. Raha, " An integrated campaign for investigation of winter-time continental haze over Indo-Gangetic Basin and its radiative ePects", Science of The Total Environment,533, 15, 370-382, 2015.
5. Sanat Kumar Das#, A. Chatterjee, S. K. Ghosh, S. Raha, "Fog-Induced Changes in Optical and PhysicalProperties of Transported Aerosols over Sundarban, India", Aerosol and Air Quality Research, 2015.

Experimental Physics

Dr. Saikat Biswas

Department of Physical Sciences

- Physics of particle detectors
- Instrumentation for experimental HEP
- Study of cosmic ray
- Imaging

Prof. Supriya Das

Department of Physical Sciences

- Characterisation of matter at extreme conditions
- R&D with particle detectors
- Cosmic rays

Prof. Dhruba Gupta

Department of Physical Sciences

- Nuclear Reactions and Astrophysics
- Exotic Nuclei

Dr. Sidharth Kumar Prasad

Department of Physical Sciences

- Experimental High Energy Nuclear Physics

Prof. Achintya Singha

Department of Physical Sciences

- Quantum materials and devices
- Raman and optical spectroscopy
- Excitons, optoelectronics and valleytronics
- Supercapacitor
- Surface Enhanced Raman Spectroscopy (SERS)

Saikat Biswas

Associate Professor | Physical Sciences

Serving as Associate Professor at Bose Institute in the Dept. of Physical Sciences.

RESEARCH AREAS

- Physics of particle detectors
- Instrumentation for experimental HEP
- Study of cosmic ray
- Imaging

FOCUS

- Stability study of gaseous detectors
- Rate handling capacity of gaseous and scintillation detectors
- Study of cosmic ray
- R&D of radiation detectors using Indigenous materials
- Development of electronics

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1	CBM-MuCh (PI)	DST-DAE	₹ 10.22 Cr	3 years from September 2024
2	ALICE Project – 3: Indian participation in the ALICE experiment at CERN, Geneva (Member)	DAE-DST		Until December 2026

MAJOR ACHIEVEMENTS

- DST International travel grant to attend the 11th Pisa Meeting on Advanced Detectors, Pisa, Italy, 2009
- European Union grants to participate the 4th MC-PAD Training Event, Micro-pattern gas and Photodetectors, CERN, Geneva, Switzerland, 2011
- DST-SERB Ramanujan Fellowship, November 2012 to November 2017
- Press Information Bureau (PIB), Govt. of India and DST highlighted our work "New milestone in indigenous development of gaseous detector important for mega science FAIR project in Germany" in February 2025

PUBLICATIONS

1. S. Chatterjee, U. Frankenfeld, C. Garabatos, J. Hehner, T. Morhardt, C. J. Schmidt, H. R. Schmidt, A. Lymanets, and S. Biswas*, Spark probability measurement of a single mask triple GEM detector. Nuclear Instruments and Methods in Physics Research A 977 (2020) 164334.
2. S. Chatterjee, A. Sen, S. Roy, K. Nivedita G, A. Paul, S. Das and S. Biswas*, Study of charging up ePect in a triple GEM detector. 2020 JINST 15 T09011 doi:10.1088/1748-0221/15/09/T09011. [ArXiv: 2007.11444]
3. S Roy, S Jaiswal, S. Chatterjee, A Sen, S Das, S K Ghosh, S Raha, V M Lysan, G D Kekelidze, V V Myalkovsky and S. Biswas*, Stability study and time resolution measurement of straw tube detectors. Pramana - J. Phys. (2021) 95:50.
4. A Sen, S Chatterjee, S Roy, R Biswas, S Das, S K Ghosh and S Biswas*, Cosmic ray ux and lockdown due to COVID-19 in Kolkata - Any correlation?. Pramana - J. Phys. (2021) 95:64.
5. A Sen, S Chatterjee, S Das, S K Ghosh and S Biswas*, A new technique of linseed oil coating in bakelite RPC and the first test results. Nuclear Instruments and Methods in Physics Research, A 1024 (2022) 166095.

Supriya Das

Professor | Physical Sciences

Serving as Professor at Bose Institute in the Dept. of Physical Sciences.

RESEARCH AREAS

- Characterisation of matter at extreme conditions
- R&D with particle detectors
- Cosmic rays

FOCUS

The current focuses of our research group are

- Hadron production at correlation/ uctuation at high baryon densities.
- Development of Muon Chamber Detector system for CBM experiment.
- Study of cosmic ray air shower at mountain altitude.

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1	Indian Participation in ALICE Experiment at CERN	DAE-DST	₹5,73,50,000/-	November, 2021–October, 2026

PUBLICATIONS

1. Jet modification in absence of QGP-medium: the role of multiparton interactionsand color reconnection - Prottoy Das, Abhi Modak, Debjani Banerjee, Rathijit Biswas, Supriya Das, Sanjay K. Ghosh, Sibaji Raha and Sidharth Kumar Prasad; Published in Chinese Journal of Physics C 48 (2024) 013105.
2. Development of a water-based cooling system for the Muon Chamber detector system of the CBM experiment - Sumit Kumar Kundu, Saikat Biswas, Subhasis Chattopadhyay, Supriya Das, Anand Kumar Dubey, Chandrasekhar Ghosh, Ajit Kumar, Ankhi Roy, Jogender Saini, Susnata Seth, Sidharth Kumar Prasad; Nucl. Instr. and Meth. A 1050 (2023) 168143
3. Charging-up ePect and uniformity study of a single mask triple GEM detector - S. Chatterjee, A. Sen, S. Das, S. Biswas; Nucl. Instr. and Meth. A 1049 (2023) 168110

Dhruba Gupta

Professor | Physical Sciences

Dhruba Gupta joined Bose Institute as Assistant Professor in 2008, promoted to Associate Professor in 2013 and to Professor in 2019. He is the Chairman of the Department of Physical Sciences since 15/5/2023.

RESEARCH AREAS

- Nuclear Reactions and Astrophysics
- Exotic Nuclei

FOCUS

- Breakup reactions of the unstable nucleus ^{7}Be on a light target like ^{12}C
- Study of the $^{12}C(\alpha,\gamma)^{16}O$ reaction in Stellar Nucleosynthesis
- Cosmological Lithium Problem in Big Bang Nucleosynthesis

MAJOR ACHIEVEMENTS

- PI and spokesperson for experiment with ^{7}Be radioactive beam at HIE-ISOLDE, CERN
- Invited review article for the European Physical Journal special topics issue on "Nuclear Astrophysics" (Springer).
- National Organizing Committee member of the "International Symposium on Nuclear Astrophysics (ISNA23)" at MAHE, Manipal, Karnataka
- Delivered invited plenary talks at CERN-ISOLDE, DAE Symposium, ISNA, IUAC, IEM etc
- Member of the international collaboration for experiments at GANIL radioactive beam facility in France.
- Students selected with full funding from Euroschool to attend "Euroschool on Exotic Beams 2024" at Jyväskylä, Finland; from CERN to attend ISOTDAQ 2024 at USTC, Hefei, P.R. China; from Joint Institute for Nuclear Astrophysics - Center for the Evolution of the Elements (JINA-CEE), to attend "Astrophysics with Radioactive Isotopes (AwRI)" conference in Budapest, Hungary.
- Students received best poster prize and best oral presentation in symposia.

PUBLICATIONS

1. Gupta D (2024) The ^{7}Be destruction reactions and the cosmological lithium problem. Eur Phys J Spec Top 233: 2823. doi: 10.1140/epjs/s11734-024-01277-1.
2. Ali SM, Gupta D, Kundalia K, Maity S, Saha SK, Tengblad O, Ovejas JD, Perea A, Martel I, Cederkall J, Park J, Moro AM (2024) Study of the ^{7}Be(d,^{3}He)^{6}Li* reaction at 5 MeV/u. Phys Lett B 853: 138673. doi: 10.1016/j.physletb.2024.138673.
3. Kundalia K, Gupta D, Ali SM, Saha SK, Tengblad O, Ovejas JD, Perea A, Martel I, Cederkall J, Park J, Szwec S, Moro AM (2022) Study of elastic and inelastic scattering of ^{7}Be + ^{12}C at 35 MeV. Phys Lett B 833: 137294. doi: 10.1016/j.physletb.2022.137294.
4. Ali SM, Gupta D, Kundalia K, Saha SK, Tengblad O, Ovejas JD, Perea A, Martel I, Cederkall J, Park J, Szwec S (2022) Resonance excitations in ^{7}Be(d,p)^{8}Be* to address the cosmological lithium problem. Phys Rev Lett 128: 252701. doi: 10.1103/physrevlett.128.252701.
5. Gupta D (2024) Nuclear Astrophysics at Bose Institute. EPJ Web Conf 297: 01005. doi: 10.1051/epjconf/202429701005.
6. Mitra R, Gupta D, Maity S, Samanta S, Kundalia K, Ali SM, Saha SK, Tengblad O, Perea A, Martel I, Cederkall J (2024) Breakup reactions from ^{7}Be + ^{12}C at 5 MeV/u. EPJ Web Conf 297: 02005. doi: 10.1051/epjconf/202429702005.

Sidharth Kumar Prasad

Associate Professor | Physical Sciences

Dr. Sidharth Kumar Prasad is an Associate Professor in the Department of Physical Sciences, BI

RESEARCH AREAS

Experimental High Energy Nuclear Physics

FOCUS

The current focuses of our research group are:

1. Understanding the strong interaction and characterization of QGP: Study of jet production, jet properties, jet-medium interactions and global observables in hadronic and nuclear collisions
2. Phenomenological study of particle and jet production using theoretical Monte Carlo models
3. Instrumentation and detector hardware for high energy physics experiment

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1	ALICE Project – 3: Indian participation in the ALICE experiment at CERN, Geneva	DAE-DST	₹ 5,73,50,000/-	2021-2026

MAJOR ACHIEVEMENTS

- Convener, Physics Analysis Group–Jet Substructure, ALICE Collaboration (Oct. 2023 – till date)
- Chairman, Physics Board, ALICE-STAR-India Collaboration (January 2025 – till date)
- Deputy Spokesperson, ALICE-STAR-India Collaboration (January 2023 – December 2024)
- Physics Coordinator, ALICE-STAR-India Collaboration (January 2021 – December 2022)
- Three best oral and Two best poster awards by the group members in national conferences
- External experts in two PhD committees and reviewer in three national conferences
- One of our publications is highlighted in CERN Courier July/August 2023 edition

SELECTED PUBLICATIONS

1. Acharya, S. et al. (ALICE Collaboration), "Multiplicity dependence of charged-particle intra-jet properties in pp collisions at 13 TeV", *Eur. Phys. J. C 84 (2024) 1079*
2. Acharya, S. et al. (ALICE Collaboration), "Inclusive photon production at forward rapidities in pp and pPb collisions at 5.02 TeV", *Eur. Phys. J. C 83 (2023) 661*
3. Acharya, S. et al. (ALICE Collaboration), "Measurements of the groomed and ungroomed jet angularities in pp collisions at $\sqrt{s} = 5.02$ TeV", Journal of High Energy Physics 05 (2022) 061
4. S. K. Kundu, S. Biswas, S. Chattopadhyay, S. Das, A. K. Dubey, C. Ghosh, A. Kumar, A. Roy, J. Saini, S. Seth, and S. K. Prasad, "Development of a water-based cooling system for the Muon Chamber detector system of the CBM experiment", *Nuclear Instrumentations and Methods A 1050 (2023) 168143*
5. S. K. Saha, D. Sarkar, S. Chattopadhyay, A. I. Sheikh, and S. K. Prasad, "Study of medium modified jet shape observables in Pb–Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV using EPOS and JEWEL event generators", *Nucl. Phys. A 1006 (2021) 122064*
6. D. Banerjee, S. Paul, P. Das, A. Modak, A. Budhraja, S. Ghosh, and S. K. Prasad, "EPect of magnetic field on jet transport coeRcient q-hat", Pramana-J. Phys. 97 (2023) 206
7. S. K. Saha, D. Sarkar, S. Chattopadhyay, A. I. Sheikh, and S. K. Prasad, "Study of medium modified jet shape observables in Pb–Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV using EPOS and JEWEL event generators"; Nucl. Phys. A 1006 (2021) 122064

Achintya Singha

Professor | Physical Sciences

Achintya Singha is a Professor in the Department of Physical Sciences, Bose Institute.

RESEARCH AREAS

- Quantum materials and devices
- Raman and optical spectroscopy
- Excitons, optoelectronics and valleytronics
- Supercapacitor
- Surface Enhanced Raman Spectroscopy (SERS)

FOCUS

- Light-matter interaction at low dimension
- Spin-valley physics and Interlayer exciton in 2D materials
- Understanding phonons and their couplings with various other quasiparticles in quantum materials
- Development of eRcient broadband IR photodetectors
- Development of energy storage devices
- Development of SERS based biosensors

MAJOR ACHIEVEMENTS

- Member of the Expert Committee (PAC) of Teachers Associateship for Research Excellence (EC-TARE), Science and Engineering Research Board (SERB), Government of India (2021 to 2024).
- Member of the Empowerment and Equity Opportunities for Excellence in Science (EMEQ)-Task Force Committee, Science and Engineering Research Board (SERB), Government of India (2023)
- Member of the Board of Studies (UG), Department of Physics, Midnapore College, from 2020 to present.
- Ph.D. student Chumki Nayak received first prize at 39th Young Physicists' Colloquium (YPC-2024) organized by the Indian Physical Society.
- Three Ph.D. students received Outstanding Student Award from Bose Institute in last two years.

PUBLICATIONS AND PATENTS

1. Bhattacharya T S, Patra S, Singha SS, Mitra S, Mahadevan P*, Singha A* (2025) Optical intensity driven mid-gap transitions in few-layer MoS_2. Physical Review B 111, 115412 doi:10.1103/PhysRevB.111.115412.
2. Nayak C, Masanta S, Ghosh S, Moulick S, Pal AN, Bose I, Singha A* (2024) Valley polarization and photocurrent generation in transition metal dichalcogenide alloy $MoS_{2x}Se_{2(1-x)}$. Physical Review B 109, 115304. doi:10.1103/PhysRevB.109.115304.
3. Nayak C, Masanta S, Monga S, Paul S, Bera S, Mondal S, Bhattacharya S*, Singha A* (2024) Tailoring photoluminescence in MoSSe alloys through gold nanostructure coupling: In uence of midgap states and localized surface- plasmon resonance, Physical Review B, 109, 125306. doi:10.1103/PhysRevB.109.125306.
4. Masanta S, Nayak C, Agarwal P, Das K, Singha A* (2023) Monolayer Graphene–MoSSe van der Waals Heterostructure for Highly Responsive Gate-Tunable Near-Infrared-Sensitive Broadband Fast Photodetector, *ACS Applied Materials & Interfaces* 15, 11, 14523 doi:10.1021/acsami.2c20707.
5. Raha S, Biswas S, Doherty J, Mondal PK, Holmes J D, Singha A* (2022) Lattice dynamics of $Ge_{1-x}Sn_x$ alloy nanowires, Nanoscale 14, 19, 7211doi:10.1039/D2NR00743F.
6. Raha S, Srivastava D, Biswas S, Garcia-GA., Karttunen A J, Holmes JD, Singha A* (2021) Probing lattice dynamics in ST12 phase germanium nanowires by Raman spectroscopy, Appl. Phys. Lett. 119, 232105 doi:10.1063/5.0066744.
7. Mitra S, Srivastava D, Singha SS, Dutta S, Satpati B, Karppinen M, Ghosh A, Singha A* (2020) Tailoring phonon modes of few layered MoS_2 by in-plane electric field, npj 2D Materials and Application 4, 6 doi:10.1038/s41699-020-0138-y.
8. Bhattacharya TS, Mitra S, Singha S S, Mondal P K, Singha A (2019) Tailoring light-matter interaction in WS_2–gold nanoparticles hybrid systems, Physical Review B 100 , 235438 doi:10.1103/PhysRevB.100.235438.

Plant Biology

Prof. Shubho Chaudhuri

Department of Biological Sciences

- Plant Development
- Plant stress response
- Plant Epigenetics

Prof. Gaurab Gangopadhyay

Department of Biological Sciences

- Molecular marker-assisted crop breeding
- Plant Molecular Biology and Biotechnology
- Plant-microbe interaction
- Quorum-sensing mechanism of microbes

Prof. Pallob Kundu

Department of Biological Sciences

- Plant stress biology
- Tomato plant pathogen interaction
- Biotechnology for climate resilient crops

Shubho Chaudhuri

Professor | Biological Sciences

Professor and former Chair of Division of Plant Biology, Bose Institute and is currently a faculty member of Department of Biological Sciences at Bose Institute

RESEARCH AREAS

- Plant Development
- Plant stress response
- Plant Epigenetics

FOCUS

The current focuses of our research group are

- Understanding the role of Plant specific nuclear Architectural proteins, ARID-HMG, in pollen development.
- Elucidating the role of Plant Trithorax factor, ULTRAPETALA, in rice development.
- Understanding the genetic and epigenetic factors responsible for chilling stress response in two contrasting genotypes of indica rice

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1	Molecular characterization of factor(s) regulating transcription of MYB21 and MYB24 genes in Jasmonic acid signalling pathway during pollen development.	ANRF-CRG	₹ 43,99,747/-	06/23 to 06-2026

MAJOR ACHIEVEMENTS

- Fellow of West Bengal Academy of Science and Technology, 2023

SELECTED PUBLICATIONS

1. Sonal Sachdev, Ruby Biswas, Adrita Roy, Ayantika Nandi, Vishal Roy, Sabini Basu, Shubho Chaudhuri* (2024). The Arabidopsis ARID–HMG DNA-BINDING PROTEIN 15 modulates jasmonic acid signaling by regulating MYC2 during pollen development. Plant Physiology , https://doi.org/10.1093/plphys/kiae355
2. R Biswas, S Chaudhuri* (2024). AtHMGB15 regulates tapetal apoptosis in pollen development and actin dynamics during pollen germination in Arabidopsis. Plant Reproduction https://doi.org/10.1007/s00497-024-00505-x
3. Jinia Chakrabarty, Rukshar Parveen, Sambit Datta, Byapti Ghosh, Vishal Roy, Zhumur Ghosh, Shubho Chaudhuri* (2024). ULTRAPETALA 1 regulates the growth and development of rice plants to promote resilience to salinity stress. Environmental and Experimental Botany https://doi.org/10.1016/j.envexpbot.2024.105780
4. P Dasgupta, P Prasad, SK Bag, S Chaudhuri* (2022). Dynamicity of histone H3K27ac and H3K27me3 modifications regulate the cold-responsive gene expression in Oryza sativa L. ssp. Indica. Genomics https://doi.org/10.1016/j.ygeno.2022.110433
5. R Mallik, P Prasad, A Kundu, S Sachdev, R Biswas, A Dutta, A Roy, J Mukhopadhyay, S K Bag, S Chaudhuri* (2020). Identification of genome-wide targets and DNA recognition sequence of the Arabidopsis HMG-box protein AtHMGB15 during cold stress response. Biochimica et Biophysica Acta (BBA)-Gene Regulatory Mechanisms. https://doi.org/10.1016/j.bbagrm.2020.194644
6. P Dasgupta, A Das, S Datta, I Banerjee, S Tripathy, S Chaudhuri* (2020). Understanding the early cold response mechanism in IR64 indica rice variety through comparative transcriptome analysis. BMC Genomics. https://doi.org/10.1186/s12864-020-06841-2

Gaurab Gangopadhyay

Professor | Biological Sciences

Joined Bose Institute as an Assistant Professor of Botany in 2008, promoted to Associate Professor in Division of Plant Biology (DPB) in 2012, Professor of DPB since 2019, and promoted to Professor of Department of Biological Sciences in October 2024.

RESEARCH AREAS

- Molecular marker-assisted crop breeding
- Plant Molecular Biology and Biotechnology
- Plant-microbe interaction
- Quorum-sensing mechanism of microbes

FOCUS

The current focuses of my research group are to understand:

- *Phytoplasma*-associated Retrograde Metamorphosis in Sesame.
- Endophytic microbes in sesame for pathogen tolerance.
- The potential of EGCG to disrupt the quorum-sensing machinery of *Chromobacterium violaceum*.

ONGOING EMR PROJECTS

Nil

MAJOR ACHIEVEMENTS

- The germplasm of Sesame (INGR22090) developed by us has been registered by the Plant Germplasm Registration Committee (PGRC) of Indian Council of Agricultural Research (ICAR).
- A research story entitled "New Microbe reverting sesame owers to vegetative state identified" is published in DST STRIDES (vol. 5, issue 6) (https://dst.gov.in/new-microbe-reverting-sesame- owers-vegetative-state-identified)

PUBLICATIONS

Molecular marker-assisted breeding

1. Dutta D, Prasad R, Gangopadhyay G (2022) Inter-specific hybrid sesame with high lignan content in oil reveals increased expression of sesamin synthase gene. The Nucleus 65:7–18 (Published online 19 May, 2021. https://doi.org/10.1007/s13237-021-00354-3)
2. Dutta D, Harper A, Gangopadhyay G (2022) Transcriptomic analysis of high oil-yielding cultivated white sesame and low oil-yielding wild black sesame seeds reveal diPerentially expressed genes for oil and seed coat colour. The Nucleus (Published online on 04.05.2022. https://doi.org/10.1007/s13237-022-00389-0)

Plant Molecular Biology and Biotechnology

1. Awon VK, Dutta D, Banerjee S, Pal S and Gangopadhyay G (2024) Integrated metabolomics and transcriptomics analysis highlight key pathways involved in the somatic embryogenesis of Darjeeling tea. BMC Genomics 25:207 (Published online on 23.02.2024. https://doi.org/10.1186/s12864-024-10119-2)

Plant-microbe interaction

1. Banerjee S, Gangopadhyay G (2024) Untargeted Metabolomics Reveals Altered Pathways in *Phytoplasma*-Infected Sesame Plants. Plant Molecular Biology Reporter (Published online on 04.03.2024. https://doi.org/10.1007/s11105-024-01440-x)

Quorum-sensing mechanism of microbes

1. Sikdar B, Mukherjee S, Bhattacharya R, Raj A, Roy A, Banerjee D, Gangopadhyay G and Roy S (2024) The anti-quorum sensing and biofilm inhibitory potential of *Piper betle* L. leaf extract and prediction of the roles of the potent phytocompounds. Microbial Pathogenesis 195:106864 (Published online on 15.08.2024. https://doi.org/10.1016/j.micpath.2024.106864)

Pallob Kundu

Professor | Biological Sciences

Joined Bose Institute as Assistant Professor in the erstwhile Division of Plant Biology in Jan 2009. Currently serving as a Professor in the Department of Biological Sciences, the Dean, Student APairs, and Scientist In charge of the Falta Experimental Farm

RESEARCH AREAS

- Plant stress biology
- Tomato plant pathogen interaction
- Biotechnology for climate resilient crops

FOCUS

The current focuses of our research

1. Role of mediators of cell death, such as NB-LRRs and metacaspases, in early blight disease development.
2. Exploring roles of miRNAs in shaping tomato pathogen stress-response under changing climatic condition.
3. Mechanisms of signal perception, regulation of expression, and biological functions of membrane-bound NAC transcription factors in tomato (NAC MTFs).
4. Generation of stress-resilient crops by biotechnological approaches.

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1	Coordinated molecular events in stress sensing, activation and performance of SlNACMTF3 for shaping the stress response in tomato.	SERB-DST (CRG)	₹ 46,25,000/-	December 2023 December 2026

MAJOR ACHIEVEMENTS

- Four students received the best poster award in diPerent symposiums
- Completed three projects, SEED DST, DBT and SERB as PI, including Rs. 14 crores grant for rural biotechnology related research and outreach activities.
- Reviewer of national and international publications and grant proposals.

PUBLICATIONS

- Mukherjee A, Jodder J, Chowdhury S, Das H, Kundu P. A novel stress-inducible dCas9 system for solanaceous plants. Int J Biol Macromol. 2025 Mar 27; 308(Pt 3):142462. doi: 10.1016/j.ijbiomac.2025.142462.
- Chowdhury S, Mukherjee A, Singh R, Talukdar S, Basak S, Das R, Mal S, Kundu P. Tomato miR398 knockout disrupts ROS dynamics during stress conferring heat tolerance but hypersusceptibility to necrotroph infection. Plant Mol Biol. 2025 Feb 24;115(2):35. doi: 10.1007/s11103-025-01563-z.
- Basak S, Paul D, Das R, Dastidar SG, Kundu P. A novel acidic pH-dependent metacaspase governs defense-response against pathogens in tomato. Plant Physiol Biochem. 2024;213:108850. doi: 10.1016/j.plaphy.2024.108850.
- Talukdar S, Mal S, Kundu P. Physico-chemical features and functional relevance of tomato rhomboid proteases. Int J Biol Macromol. 2024 Jun;272(Pt 1):132681. doi: 10.1016/j.ijbiomac.2024.132681.
- Chowdhury S, Mukherjee A, Basak S, Das R, Mandal A, Kundu P. Disruption of tomato TGS machinery by ToLCNDV causes reprogramming of vascular tissue-specific TORNADO1 gene expression. Planta. 2022 Sep 12;256(4):78. doi: 10.1007/s00425-022-03985-1.
- Dey S, Sarkar A, Chowdhury S, Singh R, Mukherjee A, Ghosh Z, Kundu P. Heightened miR6024-NLR interactions facilitate necrotrophic pathogenesis in tomato. Plant Mol Biol. 2022 Aug;109(6):717-739. doi: 10.1007/s11103-022-01270-z.

Structural Biology

Prof. Anirban Bhunia

Department of Chemical Sciences

- Structural Biology
- Biophysical Chemistry
- Medicinal Chemistry
- NMR

Prof. Subhrangsu Chatterjee

Department of Biological Sciences

- G-Quadruplex Structure and Dynamics
- G-Quadruplex and i-motif homeostasis
- Thermostable Insulin Formulation
- Interference of regulatory genes in Cancer

Prof. Shubhra Ghosh Dastidar

Department of Biological Sciences

- Theoretical and Computational Biology and Bioinformatics
- Protein Structure and dynamics
- Thermodynamic landscapes of Biological processes
- Allosteric regulations in proteins and in their complexes with others

Prof. Ajit Bikram Datta

Department of Biological Sciences

- Structural Biology
- Ubiquitin-proteasome system
- Post-translational modification of proteins
- Structure-function relationships of protein kinases

Dr. Smarajit Polley

Department of Biological Sciences

- High resolution mechanism of signal transduction and pathophysiology
- Structural studies: CryoEM and X-ray crystallography
- Chemical Genetics: Exploring the substrate space of protein kinases
- Protein design and directed evolutio

Anirban Bhunia

Professor | Chemical Sciences

Joined Bose institute as an Assistant Professor in 2011 at Dept of Biophysics, became a Professor in 2020, and following the rationalization of departments, now serves in the Department of Chemical Sciences. He was Chair of the Department of Biophysics from 2021 to 2023.

RESEARCH AREAS

- Structural Biology
- Biophysical Chemistry
- Medicinal Chemistry
- NMR

FOCUS

- Invisible NMR for investigating Amyloid formation
- Membrane induced amyloid pathogenicity and inhibitor design
- Antifungal peptides to treat fungal ocular infections
- Studying the biomedical applications of peptide self-assembly by forming hydrogels
- Herbolomics: A research front for sustainable future

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount sanctioned	Duration
1.	Rational Design and structure function analysis of antimicrobial peptides tailored to treat fungal Ocular infections	Velux Stiftung, Switzerland	₹ 340L (3.7 Euro)	December 2023 December 2026
2.	Leveraging Candida albicans D-amino acid oxidase inhibition to protect the host from fungal infections.	DBT	₹ 100 L	08/23 – 07/27 36 months
3	Centre of Excellence in Bioinformatics and expanding its datacentre	DBT	₹ 187 L	03/22 – 03/27
4	Developing novel peptide antibiotics to eradicate biofilms formed by ESKAPE pathogens	VAJRA faculty scheme/ ANRF		02/25 – 12/25

MAJOR ACHIEVEMENTS

- "NMRS - Prof. S. Subramanian's 60th Birthday Lecture Award" for the year 2017
- Government-Private collaborative international project, Velux Stiftung, Switzerland for the year 2023
- VAJRA faculty scheme of ANRF, DST, Govt of India for the year 2025

PUBLICATIONS

1. Dhanda G, Singh H, Gupta A, Mohid SK, Biswas K, Mukherjee R, Mukherjee S, Bhunia A, Nair NN, Haldar J. (2025) Dual-Functional Antibiotic Adjuvant Displays Potency against Complicated Gram-Negative Bacterial Infections and Exhibits Immunomodulatory Properties. ACS Central Science11(2):279-293.doi: 10.1021/acscentsci.4c02060.
2. Sarkar D, Khan AH, Polepalli S, Sarkar R, Das PK, Dutta S, Sahoo N, Bhunia A* (2024) Multiscale Materials Engineering via Self-Assembly of Pentapeptide Derivatives from SARS CoV E Protein. Small2024:e2404373. doi: 10.1002/smll.202404373.
3. Roy S, Bhogapurapu B, Chandra S, Biswas K, Mishra P, Ghosh A, Bhunia A (2024) Host antimicrobial peptide S100A12 disrupts the fungal membrane by direct binding and inhibits growth and biofilm formation of Fusarium species. J Biol Chem. 300(3):105701. doi: 10.1016/j.jbc.2024.105701.
4. Pariary R, Shome G, Kalita S, Kalita S, Roy A, Harikishore A, Jana K, Senapati D, Mandal B, Mandal AK, Bhunia A* (2024) Peptide-Based Strategies: Combating Alzheimer's Amyloid β Aggregation through Ergonomic Design and Fibril Disruption. Biochemistry 63(19):2397-2413.doi: 10.1021/acs.biochem.4c00371.
5. Pariary R, Dolui S, Shome G, Mohid SA, Saha A, Ratha BN, Harikishore A, Jana K, Mandal AK*, Bhunia A*, Maiti NC* (2023) Coommassie brilliant blue G-250 acts as a potential chemical cheparone to stabilize therapeutic insulin. Chemical Communications. 59: 8095-8098. doi: https://doi.org/10.1039/D3CC01791E

Subhrangsu Chatterjee

Professor | Biological Sciences

Currently a Professor at the Department of Biological Sciences, Bose Institute, Kolkata

RESEARCH AREAS

- G-Quadruplex Structure and Dynamics
- G-Quadruplex and i-motif homeostasis
- Thermostable Insulin Formulation

Interference of regulatory genes in Cancer

FOCUS

- LINC00273 as an inducer of EMT, Chemoresistance, Stemnessand Metastasis in Cancer.
- Promoter G-Quadruplex interference in the transcriptional fate of HNRNPK gene.
- Development of c-MYC and VEGF promoter G-Quadruplex targeting peptides.
- Understanding PD1 promoter G-Quadruplexes in PD1-PDL1 axis formation in Cancer.

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1.	BT/PR30192/BRB/10/1915/2020 Transcriptional regulation of human Telomerase (hTERT) by chromatin remodeling protein SMAR1	DBT, Govt of India	₹ 16 Lac (Total 88 Lac)	July 2024-July 2027

MAJOR ACHIEVEMENTS

- Elected Reviewer by European Research Council (ERC) for high impact grants.
- Certified Reviewer of American Chemical Society (ACS).
- Elsevier press declared that 2 of his articles (including the invention of Thermostable version of Insulin) were linked to the United Nations Sustainable Development Goals, helping to tackle some of the world's greatest challenges.
- Six students earned PhD degree from this lab in last 5 years.

PUBLICATIONS

1. Bose D., Panda S., Banerjee N., Chatterjee S*. Dynamic G-Quadruplexes in the Rous Sarcoma Virus Genome: ScaPolds for Protein Interaction and Potential Anti-Viral Targets. ChemBioChem 2025, e202400941. DOI: 10.1002/cbic.202400941.
2. Banerjee N, Roy L, Panda S, Roychowdhury T, Chatterjee S*. In Silico-Designed G-Quadruplex Targeting Peptide Attenuates VEGF-A Expression, Preventing Angiogenesis in Cancer Cells. Chemical Biology & Drug Design. 2024 Dec. DOI: 10.1111/cbdd.70018.
3. Chatterjee O, Jana J, Panda S, Dutta A, Sharma A, Saurav S, Motiani RK, Weisz K, Chatterjee S*.Remodeling Ca2+ dynamics by targeting a promising E-box containing G-quadruplex at ORAI1 promoter in triple-negative breast cancer. Cell Calcium. 2024 Aug 12;123:102944. doi: 10.1016/j.ceca.2024.102944. Epub ahead of print. PMID: 39191092; PMCID: PMC76163
4. Panda S, Roychowdhury T, Dutta A, Chakraborty S, Das T, Chatterjee S*. ALTering Cancer by Triggering Telomere Replication Stress through the Stabilization of Promoter G-Quadruplex in SMARCAL1. ACS Chem Biol. 2024 Jul 19;19(7):1433-1439. doi: 10.1021/acschembio.4c00285. Epub 2024 Jul 3. PMID: 38959478.
5. Pallabi Sengupta, Ananya Roy, Laboni Roy, Debopriya Bose, Satyajit Halder, Kuladip Jana, Gopeswar Mukherjee, Subhrangsu Chatterjee*. Long non-coding intergenic RNA, LINC00273 induces cancer metastasis and stemness via miRNA sponging in triple negative breast cancer. International Journal of Biological Macromolecules, 274, 2024, 132730, ISSN 0141-8130.

Shubhra Ghosh Dastidar

Professor | Biological Sciences

Joined Bose Institute in as an Assistant Prof., promoted to Associate Prof. in 2015 and then to Professor in 2020.

RESEARCH AREAS

- Theoretical and Computational Biology and Bioinformatics
- Protein Structure and dynamics
- Thermodynamic landscapes of Biological processes
- Allosteric regulations in proteins and in their complexes with others

FOCUS

- Molecular mechanism of αβ-tubulin dimer to stabilize or destabilize itself in the microtubules
- Computation of thermodynamic landscape of allosteric changes in proteins
- Applications of Machine Learning methods to overcome the limitations of standard modeling methods.

ONGOING EMR PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1.	Bioinformatics Centre at Bose Institute, [Role: PI and Coordinator]	DBT	₹ 1.9 Cr (Approx.)	Mar 2022 - Mar, 2027
	National Network Project of Bose Institute with Vidyasagar University and ISI Kolkata [Role: PI and Coordinator]	DBT	₹ 1.9 Cr (Approx.)	Jan 2024 - Jan 2029

MAJOR ACHIEVEMENTS

- Approximately 25 invited talks and session chairs in various conferences/seminars during 2022-2025
- Associate Editor, Frontiers in Molecular Biosciences

SELECTED PUBLICATIONS

1. Basak P, Ray Chaudhuri N, Basu D, Ganguly D, Ghosh Dastidar S. (2024) Molecular origin of the diPerential stabilities of the protofilaments in diPerent polymorphs: molecular dynamics simulation and deep learning. J Biomol Struct Dyn. Nov 17:1-17. doi: 10.1080/07391102.2024.2427364.
2. Ray Chaudhuri N, Ghosh Dastidar S. (2024) Adaptive Work ows of Machine Learning Illuminate the Sequential Operation Mechanism of the TAK1's Allosteric Network. Biochemistry; 63(11):1474-1492. doi: 10.1021/acs.biochem.3c00643.
3. Basu D, Ghosh Dastidar S. (2023) Molecular Dynamics and Machine Learning reveal distinguishing mechanisms of Competitive Ligands to perturb α,β-Tubulin. Comput Biol Chem ;108:108004. doi: 10.1016/j.compbiolchem.2023.108004.
4. Ray Chaudhuri N, Ghosh Dastidar S. (2023) Allosteric Boost by TAB1 on the TAK1 Kinase Favorably Sculpts the Thermodynamic Landscape of Activation. J Chem Inf Model; 63(1):224-239. doi: 10.1021/acs.jcim.2c00778.
5. Paul D, Basak P, Ghosh Dastidar S. (2022) Remote communication between unstructured and structured regions of Bcl-2 tunes its ligand binding capacity: Mechanistic insights. Comput Biol Chem.;100:107736. doi: 10.1016/j.compbiolchem.2022.107736.
6. Basu D, Majumdar S, Mandal N, Ghosh Dastidar S. (2022) Mechanisms of in uence of the microtubule over-stabilizing ligands on the structure and intrinsic dynamics of α,β-Tubulin. Comput Biol Chem.;96:107617. doi: 10.1016/j.compbiolchem.2021.107617.
7. Paul D, Basu D, Ghosh Dastidar S. (2021) Multi-conformation representation of Mpro identifies promising candidates for drug repurposing against COVID-19. J Mol Model.;27(5):128. doi: 10.1007/s00894-021-04732-1.
8. Sinha S, Ghosh Dastidar S. (2020) Shifting Polar Residues Across Primary Sequence Frames of Transmembrane Domains Calibrates Membrane Permeation Thermodynamics. Biochemistry; 59(45):4353-4366. doi: 10.1021/acs.biochem.0c00536.

Ajit Bikram Datta

Professor | Biological Sciences

RESEARCH AREAS

- Structural Biology
- Ubiquitin-proteasome system
- Post-translational modification of proteins
- Structure-function relationships of protein kinases

FOCUS

- Structural diversity in Ubiquitin E3 ligases.
- Analysis of E3-E2 interactions and their specificity.
- Plasticity in E3-E2 recognitions.
- E2 Specificity determinants in Ubiquiting activating enzymes.

FUNDED PROJECTS

Nil

MAJOR ACHIEVEMENTS

- INSA Young Scientist
- Recipient of DST Ramanujan Fellowship and Wellcome Trust-DBT India Alliance Intermediate Fellowship.

Smarajit Polley

Assistant Professor |Biological Sciences

Joined Bose Institute in 2016 as a Wellcome Trust DBT India Alliance Intermediate Fellow and subsequently as an Assistant Professor in the Department of Biophysics, Bose Institute in 2018. Following the rationalization of departments in 2023, he is currently an Assistant Professor in the Department of Biological Sciences.

RESEARCH AREAS

- High resolution mechanism of signal transduction and pathophysiology
- Structural studies: CryoEM and X-ray crystallography
- Chemical Genetics: Exploring the substrate space of protein kinases
- Protein design and directed evolution

FOCUS

- Understanding the Biochemical and Structural Basis of Signaling Modularity of Protein Kinases in Their Biological Context: IKK and DLK kinase pathways
- Understanding the Structural basis of cancer promoting function of p53 GoF (Gain of Function) mutants
- Enzymatic remediation of environmental pollutants: directed evolution and design of Azo reductases
- CryoEM analyses of macromolecular complexes

FUNDED PROJECTS

Sl. No.	Title	Sponsoring Agency	Amount Sanctioned	Duration
1.	Setting up a State-of-the-Art CryoEM Regional/National Facility in Eastern Region at Bose Institute: Transforming the Structure-guided Drug Discovery and Therapeutics Research Landscape in India	ANRF-DST-IRHPA	₹ 37,15,20,224/-	Dec, 2020 - Dec, 2025

MAJOR ACHIEVEMENTS

- Wellcome Trust DBT India Alliance Intermediate Fellowship, 2016-2022
- Ramalingaswamy Re-entry Fellowship, 2015 (relinquished to accept India Alliance fellowship).

SELECTED PUBLICATIONS

1. Borar P, Biswas T, Chaudhuri A, Huxford T, Chakrabarti S, Ghosh G & Polley S* (2025) Dual-specific autophosphorylation of kinase IKK2 enables phosphorylation of substrate IκBα through a phosphoenzyme intermediate. *eLife.* https://doi.org/10.7554/eLife.98009.2

2. *Book chapter:* Structural biology of protein kinases and their regulation. Samrat Mitra, Pranita Ray, Prateeka Borar & Smarajit Polley* BOOK TITLE: CRYO - ELECTRON MICROSCOPY IN STRUCTURAL BIOLOGY
Publisher: Taylor & Francis Publishing Group Of CRC Press, USA. DOI: 10.1201/9781003326106

Extramural Projects

Title of the Project	Principal Investigator	Granting Agency	Fund
National Carbonaceous Aerosols Programme (NCAP) WGIII: Carbonaceous Aerosols Emmissions, Source appointment and Climate effects	Prof. Abhijit Chatterjee	MoEFCC	106Lakhs
Setting up a State-of-the-Art CryoEM Regional/National Facility in Eastern Region at Bose Institute: Transforming the Structure-guided Drug Discovery and Therapeutics Research Landscape in India	Dr. Smarajit Polley (PI) Dr. Atin K. Mandal (Co-PI) Dr. Jayanta Mukhopadhyay (Co-PI)	SERB	3715 Lakhs
India's participation in the construction of the Facility for Antiporton and Ion Research (FAIR) at Darmstadt, Germany	DIRECTOR, BOSE INSTITUTE	DST & DAE	6150 Lakhs
Mechanism of ganglioside GM2-mediated regulation of miR-15-5p in targeting oncogenic ID1 to mediate tumorigenesis	Prof. Kaushik Biswas	SERB	52.72 Lakhs
Investigating the role of HSP20 in the pathogenic development of Ustilago maydis	Dr. Anupama Ghosh	SERB	29.61 Lakhs
Continuation of the existing Centre of Excellence in Bioinformatics and expanding it as a datacenter involving newer direction of research to address the heathcare and environmental issues of national need -BIC at Bose Institute, Kolkata	Prof. Shubhra Ghosh Dastidar	DBT	187.54 Lakhs
National Network Project of Bose Institute with Indian Statistic Institute and Vidyasagar University	Prof. Shubhra Ghosh Dastidar	DBT	65.52 Lakhs
Indian participation in the ALICE Experiment at CERN	Prof. Supriya Das	DST & DAE	57.35 Lakhs
Revealing bioaerosol movements within the area spanning eastern Himalayas and coastal Bay of Bengal	Dr. Sanat Kr. Das	SERB	38.14 Lakhs
A Novel Approach to the Construction of N-alkylated Hydroxylamino-Interglycosidic Linkages from glycal epoxides : Application in the synthesis of esperamicin-calicheamicin cores	Prof. Debaraj Mukherjee	SERB	34.77 lakhs
Epidemiological Survey on Tribal Communities of Dinajpur District in North Bengal to Develop a Knowledgebase on Disease Predisposition for Estimating Disease Etiology	Dr. Sudipto Saha	ICMR	0.30 Lakhs
Molecular Characterization of factors(s) regulating transcription of MYB21 and MYB24 genes in Jasmonic acid signalling pathway during pollen development	Prof. Shubho Chaudhuri	SERB	43.99 Lakhs
Rational design and structure-function analysis of antimicrobial peptides tailored to treat fungal Ocular infections	Prof. Anirban Bhunia	Velus Stiftung (Switzerland)	340 Lakhs
Cancer Cell-specific CRISPR-based Gene-Editing and Transcriptional Regulation to Reduce on-target Genotoxicity in Gene-therapy	Dr. Basudeb Maji	SERB	14.77 Lakhs
Deciphering the cellular functions of the multiple paralogues of GINSF and GlaSNAPs of *Giardia lamblia*	Prof. Srimonti Sarkar	SERB	48.51 Lakhs
Transcriptional regulation of human Telomerase (hTERT) by chromatin remodelling protein SMAR1	Prof. Subhrangsu Chatterjee	DBT	16 Lakhs
A proteome centric view of Prajal ubiquitin ligase in proteostasis decline and disease manifestation	Prof. Atin Kumar Mandal	SERB	59.20 Lakhs
Coordinated molecular events in stress sensing, activation and performance of SINACTMTF3 for shaping the stress response in tomato	Prof. Pallob Kundu	SERB	46.24 Lakhs
On-the-Fly Chemical Dynamics Simulations in Gas and Condensed Phase Molecular Systems Using Machine Learning Approach	Dr. Amit Kumar Paul	SERB	
FNDC-CaMKII complex facilitate cardiac T-tubule synchronization through mitigating intercommunication of myocyte-endothelial cells in chemo-induced cardiac pathologies	Prof. Biswanath Maity	ICMR	98.73 Lakhs
Role of NLRP3 mediated inflammosome in chemotherapy drug resistant prostate cancer	Dr. Subhash Haldar	SERB	56.44 Lakhs
Microplastics in ballast water as an emerging vector for bacterial pathogens and Harmful Algal Bloom species: a potential risk to the marine environment and human health	Dr. Abhrajyoti Ghosh	DBT	49.37 Lakhs
Functional characterization and interaction of archaeal prefoldin and small heat shock protein 14 with the Group II Chaperonin (Hsp60)	Dr. Abhrajyoti Ghosh	DBT	Sanctioned
High-throughput in vivo Biosynthetic Cyclic Peptide Development Targeting CRISPR Adaptive Immunity in Pathogenic Bacteria to Enhance Bacteriophage Therapy against AMR	Dr. Basudeb Maji	DBT	Sanctioned
Leveraging Candida albicans D-amino acid oxidase inhibition to protect the host from fungal infections.	Prof. Kaustuv Sanyal (PI) Prof. Anirban Bhunia (Co-PI)	DBT	Sanctioned

Outreach programmes

Following the footsteps of Acharya J C Bose, our illustrious founder, Bose Institute is constantly engaged in the 'dissemination of knowledge' through various outreach programmes. The faculty members always attend groups of school, college, and university students in popular and technical lectures that follow their standards and demonstrate hands-on experiments during lab visits.

Some of the notable programmes of students' visits to diPerent campuses of Bose Institute during 2024-April 2025 are as follows: Schools - Anjuman Islamia Girls' High School, Kolkata (26.06.2024), La Martiniere for Girls School, Kolkata (31.07.2024), Jawahar Navodaya Vidyalaya, Paschim Medinipur under the DST "Vigyan Jyoti Scheme" (18.09.2024), Delhi Public School Howrah (07.04.025); Colleges - Gurudas College, Kolkata (07.06.2024), Lady Brabourne College, Kolkata (28.06.2024), Bethune College, Kolkata (17.12.2024), Sri Shikshayatan College, Kolkata (07.01.2025); Universities: Gauhati University, Guwahati (25.01.2024), Assam Agricultural University (12.02.2024), Dhanamanjuri University, Manipur (14.05.2024), Sambalpur University, Odisha (05.11.2024), Berhampur University (03.03.2025).

Following the mandate of DST's Scientific Social Responsibility (SSR) programme, Bose Institute has organized a few notable events: St. Anthony's College, Shillong, as a part of their Institutional Study Tour on 08.01.2025, and the Undergraduate Chemistry students of four Colleges under CU on 14.01.2025.

Participation of Bose Institute in the National events:

- Participation at the Mega Event of IISF 2023, held at Faridabad from 17th to 20th January 2024,
- Organization of the National Space Day celebration at the UAC, Bose Institute on 20.08.2024,
- Participation at the 27th National Science Exhibition at the Science City, Kolkata, from 11th to 14th September 2024,
- Organization of the Curtain Raiser Event for IISF-2024 at the UAC, Bose Institute on 08.11.2024,
- Participation at the Mega Event of IISF 2024, held at IIT, Guwahati, from 30th November to 3rd December 2024; DST received the Best Pavilion award in the Expo,
- Participation at the Mega Exhibition 'Aspiring Odisha' at Mayurbhanj, Odissa, from 12th to 14th December 2024; Bose Institute received the Outstanding Participation award,
- Participation in the Mega Exhibition "Radiant Jharkhand" at Jamshedpur, Jharkhand, from 20th to 22nd February 2025; Bose Institute received the 'Outstanding Participation' award for their stall and scientific demonstration.




Bose Institute

PUBLICATION

May, 2024 to till date (09-04-2025)

Sl. No.	Month	Month wise No. of Publication	Month wise Average Impact Factor
1.	May-2024	22	4.89
2.	June-2024	14	4.70
3.	July- 2024	14	5.29
4.	August-2024	24	4.43
5.	September- 2024	20	4.44
6.	October- 2024	20	4.265
7.	November -2024	12	5.15
8.	DECEMBER-2024	16	4.62
9.	January-2025	12	7.41
10.	February-2025	11	4.77
11.	March-2025	12	3.18
12.	April-2025	02	2.6
13.	May-2025-	03	7.7
14.	June-2025	04	8.9
15.	July-2025	01	2.8
16.	Book Chapter	15	
17.	Conference Proceedings	09	
		Total-	211

Bose Institute

Publication Details –May, 2024 to till date (09-04-2025)

Sl. No.	Publication Name	Publication Details	Impact Factor:
	May-22		
1.	Bej, P., & Banerjee, A. (2024). Activation of entanglement in generalized entanglement swapping.	*Physical Review A, 109*(5). doi:10.1103/PhysRevA.109.052437 May 2024	2.971
2.	Acharya, S., Adamová, D., Aglieri Rinella, G., Agnello, M., Agrawal, N., Ahammed, Z., . . . Zurlo, N. (2024). Photoproduction of K+K- Pairs in Ultraperipheral Collisions.	*Physical Review Letters, 132*(22). doi:10.1103/PhysRevLett.132.222303 Publication Date: May 2024	8.6
3.	Bhattacharjee, S., Saha, B., & Saha, S. (2024). Symptom-based drug prediction of lifestyle-related chronic diseases using unsupervised machine learning techniques.	*Computers in Biology and Medicine, 174*. doi:10.1016/j.compbiomed.2024.108413 May 2024	4.0
4.	Dey, S., Murmu, N., Mukherjee, R., Mondal, A., Mondal, T., Haldar, S., . . Giri, B. (2024). Parthenolide-Loaded Stimuli-Responsive Cross-Linked Nanocarrier for Targeting and Killing Triple-Negative Breast Cancer Cells.	*ACS Applied Nano Materials, 7*(11), 12944-12957. doi:10.1021/acsanm.4c01506 May 2024	6.14
5.	Dolui, S., Roy, A., Pal, U., Kundu, S., Pandit, E., N Ratha, B., . . . Maiti, N. C. (2024). Raman Spectroscopic Insights of Phase-Separated Insulin Aggregates.	*ACS Physical Chemistry Au, 4*(3), 268-280. doi:10.1021/acsphyschemau.3c00065 May 2024	3.7
6.	Ghosal, P., Ghosal, A., Ghosh, S. B., & Mukherjee, A. (2024). Locally unidentifiable subset of quantum states and its resourcefulness in secret password distribution.	*Physical Review A, 109*(5). doi:10.1103/PhysRevA.109.052617 May 2024	2.971
7.	Ghosh, N., Mahalanobish, S., & Sil, P. C. (2024). Reprogramming of urea cycle in cancer: Mechanism, regulation and prospective therapeutic scopes.	*Biochemical Pharmacology*. doi:10.1016/j.bcp.2024.116326 May 2024	5.3
8.	Ghosh, S., Das, S. K., Sinha, K., Ghosh, B., Sen, K., Ghosh, N., & Sil, P. C. (2024). The Emerging Role of Natural Products in Cancer Treatment.	*Archives of Toxicology*. doi:10.1007/s00204-024-03786-3 May 2024	4.8
9.	Ray Chaudhuri, N., & Ghosh Dastidar, S. (2024). Adaptive Workflows of Machine Learning Illuminate the Sequential Operation Mechanism of the TAK12 s Allosteric Network.	*Biochemistry, 63*(11), 1474-1492. doi:10.1021/acs.biochem.3c00643 Published online14 May 2024	2.9
10.	Prieto, D., Quirant, J., & Shukla, P. (2024). On the limitations of non-geometric fluxes to realize dS vacua.	*Journal of High Energy Physics, 2024*(5). doi:10.1007/JHEP05(2024)008 Published May 2024	4.6
11.	Gupta, T., Murshid, S., & Bandyopadhyay, S. (2024). Unambiguous discrimination of sequences of quantum states.	*Physical Review A, 109*(5). doi:10.1103/PhysRevA.109.052222 Published 22 May 2024	2.6
12.	Kundu, M., & Misra, A. K. (2024). Preparation of glycosyl disulfides and sulfides via the formation of glycosyl Bunte salts as thiol surrogates.	*TETRAHEDRON, 158*. doi:10.1016/j.tet.2021.132242 Published 30 May 2024	2.1
13.	Maity, S., Dey, D., Ghosh, A., Masanta, S., De, B. K., Kunwar, H. S., . . .Datta, S. (2024). Manipulating Spin-Lattice Coupling in Layered Magnetic Topological Insulator Heterostructure via Interface Engineering.	*Advanced Functional Materials*. doi:10.1002/adfm.202402544 Published: 10 May 2024	18.5
14.	Mazumder, S., Bindu, S., Debsharma, S., & Bandyopadhyay, U. (2024). Induction of mitochondrial toxicity by non-steroidal anti-inflammatory drugs (NSAIDs): The ultimate trade-off governing the therapeutic merits and demerits of these wonder drugs.	*Biochemical Pharmacology*. doi:10.1016/j.bcp.2024.116283 Available online 13 May 2024	5.8
15.	Mondal, S., Acharya, U., Mukherjee, T., Bhattacharya, D., Ghosh, A., & Ghosh, A. (2024). Exploring the dynamics of ISR signaling in maize upon seed priming with plant growth promoting actinobacteria isolated from tea rhizosphere of Darjeeling.	*Archives of Microbiology, 206*(6). doi:10.1007/s00203-024-04016-1 Published 29 May, 2024	2.6
16.	Sahaji, S., & Kumar Misra, A. (2024). Convergent Synthesis of a Pentasaccharide Containing a Rare Sugar 4-amino-4-deoxy-D-fucose Related to the Cell Wall O-polysaccharide of Acinetobacter baumannii 90.	*ChemistrySelect, 9*(17). doi:10.1002/slct.202401208 First published: 02 May 2024	1.9
17.	Tanga, S., Karmakar, A., Hota, A., Banerjee, P., & Maji, B. (2024). Design and synthesis of nucleic acid nano-environment interactome-targeting small molecule PROTACs and their anticancer activity.	*Nanoscale*. doi:10.1039/d4nr01006j First Published 31 May 2024	6.7
18.	Acharya, S., Adamová, D., Adler, A., Aglieri Rinella, G., Agnello, M., Agrawal, N., . . . Zurlo, N. (2024). Measurement of inclusive charged-particle jet production in pp and p-Pb collisions at (Formula presented.).	*Journal of High Energy Physics, 2024*(5). doi:10.1007/JHEP05(2024)041 Published on May 2024	5
19.	Acharya, S., Adamová, D., Aglieri Rinella, G., Agnello, M., Agrawal, N., Ahammed, Z., . . . Zurlo, N. (2024). Multiplicity-dependent production of Σ(1385)± and Ξ(1530)0 in pp collisions at s = 13 TeV.	*Journal of High Energy Physics, 2024*(5). doi:10.1007/JHEP05(2024)317 Published on May 2024	5
20.	Acharya, S., Hernandez, R. A., Adamová, D., Adler, A., Adolfsson, J., Agguiaro, D., . . . Zurlo, N. (2024). ALICE upgrades during the LHC Long Shutdown 2.	*Journal of Instrumentation, 19*(5). doi:10.1088/1748-0221/19/05/P05062 Published on May 2024	1.3
21.	Acharya, S., Adamová, D., Aglieri Rinella, G., Agnello, M., Agrawal, N., Ahammed, Z., . . . Zurlo, N. (2024). Search for jet quenching effects in high-multiplicity pp collisions at (Formula presented.) TeV via di-jet acoplanarity.	*Journal of High Energy Physics, 2024*(5). doi:10.1007/JHEP05(2024)229 Published on May 2024	5
22.	Acharya, S., Adamová, D., Aglieri Rinella, G., Agnello, M., Agrawal, N., Ahammed, Z., . . . Zurlo, N. (2024). Light-flavor particle production in high-multiplicity pp collisions at s= 13 TeV as a function of transverse spherocity.	*Journal of High Energy Physics, 2024*(5). doi:10.1007/JHEP05(2024)184 Published: 15 May 2024	5
	June-14		
23.	Acharya, S., Adamová, D., Agarwal, A., Aglieri Rinella, G., Aglietta, L., Agnello, M., . . . Zurlo, N. (2024). Systematic study of flow vector fluctuations in sNN =5.02 TeV Pb-Pb collisions.	*Physical Review C, 109*(6). doi:10.1103/PhysRevC.109.065202 Publication Date: June 2024	3.1

Sl. No.	Publication Name	Publication Details	Impact Factor:
24.	Acharya, S., Adamová, D., Aglieri Rinella, G., Agnello, M., Agrawal, N., Ahammed, Z., . . . Zurlo, N. (2024). Observation of abnormal suppression of f0(980) production in p–Pb collisions at sNN = 5.02 TeV.	*Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics, 853*. doi:10.1016 /j.physletb.2024.138665 Publication Date: June 2024	4.4
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