ANNUAL REPORT

and Audited Statement of Accounts

2023-2024

National Institute of Science Education and Research, Bhubaneswar

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&

Audited Statement of Accounts

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National Institute of Science Education and Research Bhubaneswar

PO- Jatni, District-Khordha, PIN- 752050, Odisha, India
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Chairperson
Post-Graduate Committee of the Institute, NISER

Chairman
Library Committee

Member-Secretary

Dr. Pranay K Swain
Dean of Academic Affairs, NISER

From the Director's Desk

Professor Hirendra Nath Ghosh
Director, NISER Bhubaneswar

As we step on the paddle to move away from the baby steps to take giant strides, another productive and academically rewarding year just whistled by. It is my privilege to present the Annual Report of the National Institute of Science Education and Research (NISER) for the financial year 2023-24. Like previous years, this year also has been marked by incremental progress, resilience, and growth as we strive towards our mission of excellence in science education and research. The academic year 2023-24 brought its share of challenges and opportunities, but our focus on academic rigour and research excellence remained steadfast. The relentless quest for excellence and dedication of the NISER community—our faculty, students, and staff—have allowed us to make significant strides across all fronts, and I am immensely proud of all that we have achieved together.

I am immensely pleased to report that our research activities have continued to flourish pushing the frontiers of cutting-edge scientific research. The volume and quality of research publications by NISER faculty have been exceptional, with numerous papers appearing in frontline high impact international journals. These contributions cut across diverse fields transcending the conventional academic boundaries of biology, chemistry, mathematics, computer science, mathematics, earth and planetary sciences, and humanities and social sciences reflecting the breadth and depth of expertise that NISER houses. We have also seen an increase in collaborative research, supported by funding from various agencies such as the Department of Science and Technology (DST), the Science and Engineering Research Board (SERB), Department of Biotechnology (DBT), to name of few, further cementing our reputation as a leading centre for scientific research.

Our students continue to make us proud with their outstanding achievements. The graduating class of 2023 has maintained NISER's tradition of excellence, with many of them securing places at top universities and research institutions worldwide to pursue their higher studies and research. Our alumni have been inducted to globally respected institutions including the MIT, University of Illinois, TU Wien, Purdue and the Max Planck Institute, among others. Within India, our graduates have made it to leading institutions such as TIFR, IISc, and IITs, reflecting the global and national impact of the education and training they have received here.

In terms of academic offerings, NISER continues to evolve to meet the needs of a rapidly changing scientific landscape. Our Master's Programme in Medical and Radiation Physics, introduced last year, has quickly gained recognition, and the second cohort of students has joined the programme to gain valuable hands-on experience in medical physics, preparing them to contribute to this vital field.

During the year the outreach activities have further expanded, reinforcing our commitment to fostering scientific curiosity beyond our campus. As part of the G20 Jan Bhagidari initiative, NISER hosted several events aimed at engaging school students and teachers in scientific learning. The National Science Day celebrations and the Open Day events were particularly successful, providing young minds with the opportunity to explore the world of science and interact with our researchers and students.

On the infrastructural front, we are pleased to have completed several new state-of-the-art research facilities, which will provide our faculty and students with the resources they need to continue their innovative work. These facilities support advanced research in key areas such as nanotechnology, artificial intelligence, and molecular biology, positioning NISER at the cutting edge of scientific research.

In addition to these advancements, NISER hosted several prominent scientists and academicians over the past year, fostering intellectual exchange and collaboration. The workshops and symposiums organised by various schools, including those on quantum matter and high-energy physics, drew participation from national and international experts, further strengthening our academic standing on the global stage.

As I look back on the year, I must commend the entire NISER community for their unwavering quest for distinction and hunger. Despite the complexities we have faced, we have successfully restored the rhythm of our academic and research activities, ensuring that our progress remains uninterrupted. This reflects the commitment of our faculty, staff, and students in the pursuit of excellence. Looking ahead, NISER remains deeply committed to its mission of advancing science for the benefit of society. With the continued and generous support of the Department of Atomic Energy (DAE), I am confident that NISER will continue to reach newer heights in the coming years. Our goal is to nurture scientific talent, foster research that has a meaningful impact, and contribute positively to the global scientific community. I would like to express my sincere gratitude to the entire NISER community for their dedication and hard work over the past year. I also extend my thanks to the Board of Governors, the Academic Council, and the Department of Atomic Energy for their continued support. Together, we will continue to uphold NISER's values of excellence, innovation, and service to society.

I am sure with the take-aways from the past years and concerted focus on what future holds for us, NISER is ready to embrace the challenges and opportunities that lie ahead, as it continues its journey of scientific discovery and excellence.

Finally, I wish to thank the editorial team for their diligent efforts in compiling this comprehensive Annual Report. Their work is instrumental in capturing the essence of our achievements and progress.

About the Institute

National Institute of Science Education and Research (NISER) is an initiative of the Government of India. The primary objective of the Institute is to train and nurture human resources in the Sciences for the knowledge economies of the future. This is in tune with a general shift in social and national thought that seeks to create new sites of knowledge production centred in our country.

Such a strategic shift in perspective has been necessitated by the realization that the unique circumstances of our nation demand unique scientific and pedagogic responses. Consequently, we are called upon to question and account for conventional categorizations of science, technology, environment, learning, innovation, design and being. The predominant discourse that seeks to structure these superficially hard categories is predicated on justifications that till date have not moved beyond regimes of hierarchy, control and access. These strictures are an inherent feature of "Institutionalized Science" where Newtonian principles of organizing domains of cognition and mechanisms of representation constrain debates on what new conceptualizations of science ought to be like.

More problematically, this stifles the potential for interdisciplinary approaches of learning. This means we continue to think in and with straight jacketed binaries such as natural / artificial, real / virtual or being/ thing. The founding of this Institute is rooted in the understanding that the contexts we inhabit are dynamic and in flux, while we have not begun to think in terms of solutions to most of these problems we realize that they exist and that we need to quickly participate in the process of finding out some answers.

NISER recognizes that modern scientific research is carried out in interstices amongst fuzzy domains and blurred boundaries. This entails encouraging a new scientific culture where members of our community attain to an intellectual agility unconstrained by the limitations of disciplinary conventions from the past. Faculty and Students will be given generous material support in the pursuit to realize this objective. Time and conversational space will be devoted to nascent propositions and hypotheses and the significantly small student-faculty ratio, an eventual full strength of 2000 students and 300 faculty members, manifests the Institutes investment and hope in the future.

Academic Overview

To deliver on the promise, NISER initiated efforts in four major areas of science by establishing School of Biological Sciences (SBS), School of Chemical Sciences (SCS), School of Mathematical (SMS) and School of Physical Sciences (SPS). A School of Humanities and Social Sciences (SHSS) has also been established to understand the positionality of science in a socio-cultural context.

At NISER, students are admitted for a 5-year Integrated MSc (iMSc) program or for a PhD program. In the Integrated M.Sc. program, students learn all core subjects in basic sciences and specific courses in the humanities in the first year, following which they select their stream of choice in the basic sciences. Each school has its own program of core and elective courses and a student can finally graduate with one major and two minors in the areas of their choice. NISER has also added two more schools, one in Computer Sciences and the other one being Earth and Planetary Sciences.

CURRICULUM

The academic curriculum, including the structure of courses, laboratory hours, emphasis to study interdisciplinary subjects etc. have been framed with a vision that NISER will provide strong foundations in subjects of specialization with a broad perspective in fundamental sciences.

In addition to the established programmes in Chemistry, Physics, Mathematics and Biology, NISER has initiated new programmes in Computer Science and Earth and Planetary Sciences. With the help of eminent scientists drawn from across the country, NISER has drawn a road map that will allow it progressively to initiate these new schools and their academic programmes.

NISER recognizes that modern scientific research is carried out in a domain transcending conventional academic boundaries. The undergraduate students and research scholars are being nurtured in the ambience of this scientific culture. Going forward, there would be many centres of research in inter-disciplinary areas opening more and bigger windows for cutting edge scientific research. NISER is offering an integrated integrated MSc. PhD programme in all basic sciences viz. Physics, Chemistry, Mathematics and Biology.

School of Biological Sciences

The School of Biological Sciences (SBS) has been involved in mixing and imparting traditional wisdom with modern technology by developing a research program along with a vibrant teaching curriculum. SBS promotes scholarly and innovative thinking to conduct cutting edge research in diverse areas ranging from molecular to organismic biology. To facilitate the process, the school offers 5-year integrated MSc programme, Integrated PhD program and PhD programme and Post-Doctoral programme to motivate and train students. SBS aims to establish as a center of excellence with its efforts grown up rapidly and signs of its achievements are being noticed at national and international levels in terms of work and student placements.

The school embraces and upholds these fundamental values:

- Striving to achieve excellence in education and research in the field of biological sciences, offering comprehensive training at undergraduate, graduate, doctoral, and post-doctoral levels.
- Creating an effective interdisciplinary learning environment that encompasses diverse areas of modern biology and integrates with other scientific disciplines.
- Preparing its students to stay up-to-date with the latest advancements in scientific research.
- Engaging in high-quality research activities focused on specific areas of biosciences to make a significant impact at both national and international levels.
- Providing professional training to cultivate skilled human resources across the state and country through short-term training courses.
- Endeavoring to develop cutting-edge infrastructure comparable to the best in the world.

Facilities for Research and Teaching

- Confocal Microscope Facility
- DNA sequencing
- Cell culture facility
- Greenhouse
- Fly Laboratory for handling Drosophila

- X-ray diffractometer for protein crystal structure study
- Small animal handling facility
- Radioactivity facility

Courses Offered: Biology-I : Science of Life, Biology-II: Cellular and Genetic basis of life, Microbiology, Biochemistry, Biophysics and Biostatistics, Cell Biology, Genetics, Immunology, Ecology, Molecular Biology, Physiology I (Animal Physiology), Physiology – II (Plant Physiology), Neurobiology, Principles of Drug design, Molecular genetics, Infection and immunity, Advance Molecular Biology, Advanced Biochemistry, Infectious Disease Biology, Enzymology, Virology, Structural Biology, Endocrinology, Plant Development Biology, Quantitative Biology, Bio-Techniques, Molecular Biology Laboratory, Immunology Laboratory, Plant Physiology Lab, Microbiology Laboratory, Cell Biology Laboratory, Genetics Laboratory.

School of Chemical Sciences

The vision of the School of Chemical Sciences is to promote, inspire and nurture the fundamentals as well as applications of chemistry among the 5-year integrated M.Sc. and PhD Students. The School aims to provide ample of opportunities to explore various aspects of chemistry through high-level teaching and cutting-edge research. In order to achieve this goal, the course structure has been set in a manner that it covers the several branches of chemistry from basics to advanced concepts. The School also offers relevant practical courses along with theory courses that give 'hands-on' activities to develop research aptitude and to help students to understand scientific concepts and phenomena in a better way. The project dissertation in the final years of the course gives research exposure to fourth and fifth-year students that enables them to become world leaders in the frontier of the chemistry research. The School has produced many proud alumni who have established themselves and/or are pursuing academic career in premier institutes like BARC, TIFR, IISc, MIT, ETH, YALE and Stanford university to name a few. The School also offers a vibrant PhD programme for the students from all parts of the country. The school has well equipped facilities that enable the PhD students to carry out research in the areas like Synthetic Chemistry, Medicinal Chemistry, Organometallic Chemistry, Polymer Chemistry, Bioinorganic Chemistry, NMR spectroscopy, Ultrafast laser spectroscopy, Catalysis, Material Chemistry, Theoretical & Computational Chemistry.

Facilities for Research and Teaching:

- 700 MHz and 400 MHz Solution and Solid-state NMR spectrometer
- Single crystal and powder X-ray diffractometer
- Femto-second fluorescence upconversion facility
- TCSPC and Fluorimeter
- EPR spectrometer
- CD Spectrometer
- TGA, DSC and BET facility
- High-performance computation facility
- ESI-MS and GC-MS spectrometers
- CHNS analyser

Courses Offered: Theory: Chemistry-I, Chemistry-II, Basic inorganic Chemistry, Reaction Mechanisms in Organic Chemistry, Mathematical Methods for Chemists, Reagents in Organic Syntheses, Main group and Organometallic Chemistry, Quantum Chemistry I, Physical Organic Chemistry, Molecular Spectroscopy and group Theory, Thermodynamics and Electrochemistry, Coordination Chemistry, Chemical Binding, Physical Methods in Chemistry I, Physical Methods in Chemistry II, Chemistry of Heterocyclic and Natural Products, Chemical Rate Processes Practical: Chemistry Laboratory-I, Chemistry Laboratory-II, Inorganic Chemistry Lab, Physical Chemistry Lab I, Bimolecular Chemistry Lab, Organic Chemistry Lab I, Inorganic Chemistry Lab I, Physical Chemistry Lab II, Organic Chemistry Lab II.

School of Computer Sciences

The School of Computer Sciences has been established to provide high quality education and carry out front-line research in various areas related to computer sciences. The school envisages to become a center of international repute for fundamentals of Computer Science. The School offers a PhD program in computer science with a focus on the following areas.

Algorithm, Cryptography, Computational Geometry, Cyber Physical Systems, Information Theory, Machine Learning, Multiparty Secure computation.

Courses Offered: Programming and Data Structures Lab I, Programming and Data Sturctures Lab II.

Theory of Computation, Discrete Structure and Computation, Introduction to Programming, Design and Analysis of Algotrithms, Modern Cryptology, Algorithmic Coding Theory, Complexity Theory, Linear Programming and Combinatorial Optimization, Distributed Network Algorithms.

Computational Geometry, Parameterized Algorithms, Approximation Algorithms, Algorithmic Game Theory, Machine Learning, Advanced Machine Learning, Introduction to Computational Number Theory, Advanced Computational Number Theory & Secure Multiparty Computations.

School of Earth and Planetary Sciences

School of Earth and Planetary Sciences, NISER is a unique research-driven academic center in India that has been established to emerge and excel in high quality and interdisciplinary scientific research works in, Earth Sciences, Atmospheric-Ocean and Planetary Sciences. SEPS has started PhD degree program offering research areas in emerging fields of Earth, Atmospheric and Planetary Sciences. The PhD students undergo one year of coursework which includes introductory courses covering the three disciplines in the first semester, followed by specialized courses in the second semester.

The school offers the following broad areas of research leading to PhD degree:

- Computational geophysics and seismology, Earthquake and landslide mechanics and physics
- Planetary composition and surface process, asteroids and Meteorites in the early solar system
- Astrochemistry, Star and planetary formation
- Atmosdpheric physics, regional hydroclimatology, land-climate coupling
- Exoplanets and Planetary Atmospheres

Courses Offered: SEPS envisions starting its Integrated MSc program in the coming few years. This year, our proposal for the SEPS UG program was submitted to the NISER Academic Council and is currently under review with HBNI. The proposal includes courses on - Heat transfer and thermodynamics; Mathematical methods for EPS; Atomic, molecular and physical chemistry; Electromagnetism; Classical and Celestial Mechanics; Continuum Mechanics; Numerical Methods; High performance computing in transport and wave phenomenon; Inverse Methods; Mineralogy and Crystallography; Petrology; Sedimentology and Stratigraphy; Ore and Economic geology; Geophysics; Seismology; fracture Mechanics; Hydrology; Geochemistry; Time series analysis; Remote Sensing; Astronomy; Cosmochemistry; Planetary Formation; Solar and Exo- solar systems; Astrochemistry and Astrobiology; Exoplanets; Small bodies and Asteroids; Solar Physics and Space Weather; Space Instrumentation and Technology; Radiative Transfer and Planetary Atmospheres; Atmospheric and Oceanic Dynamics; Ocean Biogeochemistry; Atmospheric chemistry and aerosol pollution; Numerical modelling of the Earth system;

Paleontology; Paleclimate; Cloud Microphysics; Terrestrial Biosphere and climate; Weather Prediction; Boundary Layer Meteorology; Tropical Dynamics; Storm Surge Modelling; Star and Planetary Formation; Regional Hydroclimatology; Climate research in the Himalayas; Planetary and small bodies in the early solar system.

The school offers the following broad areas of research leading to PhD degree:

- Petrology and thermo-tectonic evolution of early Earth
- Computational geophysics and seismology, Earthquake and landslide mechanics and physics
- Planetary composition and surface process, Asteroids and Meteorites in the early solar system
- Astrochemistry, Star and planetary formation
- Atmospheric physics, regional hydroclimatology, land-climate coupling
- Exoplanets & Planetary Atmospheres

School of Humanities and Social Sciences

The School of Humanities and Social Sciences (SHSS) at NISER plays a vital role in fostering scientific temper through a holistic and interdisciplinary approach. The school aims to equip students with essential skills such as communication, critical thinking, and teamwork, while also instilling values of integrity, vision, and community involvement. SHSS offers a 5-year Integrated Program emphasizing humanities and social sciences through core and elective courses in areas like sociology, psychology, and economics. This curriculum develops students' understanding of society, self, and contemporary issues, preparing them for responsible global citizenship.

The SHSS also offers a PhD program designed to cultivate high-quality interdisciplinary research in fields such as English, Economics, Philosophy, Psychology, and Sociology. This four-year program combines coursework and original research, culminating in a thesis intended for publication in reputable academic journals. The program, supported by collaborations with institutions like Tata Institute of Social Sciences, prepares graduates for careers in academia and industry, ensuring they contribute meaningfully to scholarly and professional communities.

Courses Offered: Technical communication – I & II, Introduction to Psychology, Introduction to Sociology, Introduction to Economics, History of Science, Sociology of Science and Technology, Science Communication and Citizen, Organizational Behaviour, Applied Behavioural Science, Perspectives on Indian Society, Life and Community in the Urban World.

School of Mathematical Sciences

The School of Mathematical Sciences (SMS) at NISER aims to become a leading centre for mathematics and allied subjects in teaching and research. The school's undergraduate program is designed to develop students' creative and analytical skills, preparing them for successful careers. SMS aspires to excel in its PhD program, focusing on cutting-edge areas of mathematics, with regular seminars featuring prominent mathematicians worldwide.

The curriculum at SMS emphasizes the interdependence of scientific disciplines while ensuring a deep understanding of mathematics. The first two semesters cover a common core, while the third semester onwards focuses on mathematical proofs, logic, number theory, algebra, and other foundational topics. The curriculum includes open electives, advanced courses, and a final project, fostering a well-rounded mathematical education.

The doctoral program at SMS aims to produce scholars with a deep understanding of both foundational and advanced mathematical fields. The four-year PhD program combines coursework and original research, culminating in a thesis intended for publication in scholarly journals. Students are encouraged to engage in seminars and conferences, supported by NISER, to enhance their research skills and professional development.

Facilities for Research and Teaching

- State-of-the-art Computing facility and a High-Performance Computing Cluster for theoretical calculation.

Courses Offered: General Mathematics – I & II, Computation Laboratory – I & II, Analysis-I, II & III, Algebra-I (Group Theory), Discrete Mathematics, Algebra-II (Linear Algebra), Probability Theory, Elementary Number Theory, Algebra-III (Rings and Modules), Differential Equations, Topology, Analysis-IV (Calculus of Several Variables), Algebra-IV (Field Theory), Complex Analysis, Optimization Theory, Differential Geometry, Functional Analysis, Representation of Finite Groups, Measure Theory, Advanced PDE, Advanced Probability and Stochastic Process, Nonlinear Analysis, Commutative Algebra, Advanced Linear Algebra, Information & Coding Theory, Algebraic Topology, Operator Algebra, Harmonic Analysis.

School of Physical Sciences

The 5-year integrated Master of Science (M. Sc.) programme in Physics includes courses from core areas of physics such as Classical Mechanics, Quantum Mechanics, Electromagnetism, Statistical Mechanics and Mathematical Physics. In addition, elective courses based on upcoming areas in physical sciences are also offered for final and pre-final year students. Each semester of the programme includes one laboratory component where the students experimentally verify their theoretical understanding of concepts. For the pre-final year students, the laboratories offer state-of-the-art experimental facilities for addressing open-ended problems in physical sciences research. Final year of the programme includes one project course (depending on the expertise of the available faculty in the school) where the students learn about the various research methodologies and many aspects associated with carrying out active research in physics.

The Ph. D. students undergo one year of course work (spread over two semesters) which includes courses from the core-areas of physics such as Classical Mechanics, Quantum Mechanics, Electromagnetism, Statistical Mechanics, particle physics and condensed-matter physics.

The school offers the following broad areas in physics for carrying out research work leading to a PhD degree.

- High-energy physics (Theoretical) – String theory, Lattice Quantum Chromodynamics
- High-energy physics (Experimental) – Experiments at Large Hadron Collider (LHC), Switzerland
- Condensed-matter physics (Theoretical) – Electronic structure of matter, Colloids, Soft-condensed matter and statistical mechanics, density functional theory etc.
- Condensed-matter physics (Experimental) – Magnetism, superconductivity, low-temperature physics, semi-conductors and nano-fabrication, spectroscopy
- Ultra-cold atoms and Bose-Einstein condensation (Experimental)
- Photonics – Nonlinear optics, Laser Physics, Nano-photonics

Facilities for Research and Teaching

- Scanning Electron Microscope and Lithography
- Ultrafast Time-resolved Spectroscopy for quantum life measurements of molecular dynamics and

Ultracold atoms and BEC facility using atom trapping by lasers

- Facility of Magnetic nanostructures and multilayers

Courses Offered: Core: Mechanics and Thermodynamics, Electricity, Magnetism and Optics, Classical Mechanics, Mathematical Methods I, Electronics, Electromagnetism I, Mathematical Methods II, Quantum Mechanics I, Electromagnetism II, Statistical Mechanics, Quantum Mechanics II, Special relativity, Atoms, Molecules and Radiation, Introduction to Condensed Matter Physics, Nuclei and Particles

Electives: Classical Mechanics-II, Advanced Solid State Physics, Astronomy and Astrophysics, Computational Physics, Quantum Field Theory I, Quantum Optics, Particle Physics, Introduction to Phase-transition and Critical Phenomena, Plasma Physics and Magneto-hydrodynamics, Biophysics, Nonlinear optics and laser, Quantum Information, General Relativity and Cosmology, Soft Condensed matter, Applied Nuclear Physics, Many Body Physics, Quantum and Nano-Electronics, Nonlinear Physics, Chaos, Turbulence, Theory of Magnetism and Superconductivity, Density functional theory of atoms molecules and solids, Quantum Field Theory II

Centre for Medical and Radiation Physics

The Centre for Medical and Radiation Physics at NISER is conducting the following program:

- Master's Program in Medical and Radiological Physics (2 years + 1 year mandatory internship in collaborating hospitals)

Two-year M.Sc. program covers core physics in the 1st year and core medical & radiological physics in the 2nd year. The program has been designed according to the syllabus prescribed by the Homi Bhabha National Institute (HBNI), Mumbai and it has a rigorous curriculum with emphasis on physics, radiology and its medical applications. The master's program is the first of its kind in the State of Odisha. This is also the first of its kind program at the master's level being conducted by an institution of the Department of Atomic Energy, Govt. of India.

For a mandatory one-year internship, the centre is collaborating with All India Institute of Medical Sciences (AIIMS), Bhubaneswar, Odisha, Acharya Harihar Post Graduate Institute of Cancer (AHPGIC), Cuttack, Odisha, and Tata Memorial Centre (TMC) Mumbai, Maharashtra.

The total no. of seats is ten, and the 2nd batch joined the program in the AY 2023-24.

Skills developed by students after completion of the program:

- Safe use of diagnostic and treatment radiation equipment
- Quality assurance of radiation machines, radiation treatment planning and radiation treatment delivery
- In-depth knowledge on the radiation machine structure and function
- Understanding of principles and physical laws governing the biological effects of radiation
- Solution of radiation therapy technology related problems
- Train junior technicians in radiation therapy and trainee oncologists on the relevant aspects of medical physics
- Innovation in radiation therapy technology to enhance safety, improvement of efficacy and cost effective assurance of service

Central Library

Nestled at the heart of the campus, the Central Library stands tall as a beacon of knowledge, offering an unparalleled array of essential resources and specialized services to meet the ever-evolving needs of seekers. With a fervent dedication to fostering discovery, the library maximizes its resources to enrich the academic and professional pursuits of students, faculty, and staff alike.

Spanning an impressive 69,089 square feet, the Library boasts a prime location and a wealth of materials spanning Biology, Chemistry, Mathematics, Physics, Earth & Planetary Sciences, Humanities, and Computer Sciences. Occupying the first and second floors of its grand building, the Central Library provides a bustling hub of activity. With ample seating for up to 400 individuals at a time, it offers a dynamic environment conducive to focused study and groundbreaking research.

LIBRARY HOURS:

Regular Opening Time	9.00 AM to 11.00 PM
Institutional Holidays	9:00 AM to 5:30 PM

LIBRARY AT A GLANCE:

The total collection of the central library as of 31st March 2024 stands as follows:

Type of Resources	Volume
Purchased Books	25105
Gratis Books	1912
Bound Volume Journals	1458
E-Books	10141
Electronic Databases (Bibliographic)	5
Electronic Databases (Full-Text)	26
Electronic Journals	11130
CD/DVD	226
PhD Thesis & MSc. Dissertations	588
Children's Collection	405
Hindi Collection	269
Odia Collection	246
Popular Science Collection	50
Newspapers	07
Magazines	23

"The library is the temple of learning, and learning has liberated more people than all the wars in history." - Carl T. Rowan

The Central Library makes every effort to expand academically by procuring a wide range of renowned magazines and newspapers. These resources have been carefully selected, so users can enhance their learning experience outside of textbooks with up-to-date information on current events as well as research in various disciplines. The following information outlines these sources:

Newspaper: The Samaj (ସମାଜ), The Sambad (ସମ୍ବଦ), The New Indian Express, The Times of India, The Hindu, The Economic Times, Dainik Jagaran(दैनिक जागरण).

Magazines: India Today, The Week, Outlook, Sportstar, Time, Yojana, Frontline, Champak, The Economist, Science Reader, Science Reporter, Discover India, Reader's Digest, Magic Pot, Tinkle, Highlight Champ, Highlight Genies, Tell Me Why, Magic Read & Colour, Student Edge, Bhavana, Physiotimes, Natural Geographic Kids.

LIBRARY SERVICES:

The Central Library Offers The Following Services:

1. Ask Librarian (librarian@niser.ac.in)
2. Reading Area
3. Circulation (Issue, Return, Renewal & Reservation)
4. RFID integrated KIOSK for Self-Check-out and Self Check-in
5. Web-OPAC
6. Overnight Book Lending
7. QR Code
8. Reference and Information Services
9. User Awareness
10. Library Orientation Program
11. Current Awareness Service
12. Document Delivery Services
13. Anti-Plagiarism Software – iThenticate
14. Screen Reader through JAWS Software
15. Subject Guides
16. User Guides
17. Special Collection (Hindi, Odia, Popular Science)
18. Children's Library
19. Publications & Citations
20. Newsletter (Bi-Annual)
21. Information & News Casting
22. Library Website
23. Institutional Digital Repository
24. Indian Research Information Network System (IRINS)

25. Library Brochure
26. National Digital Library of India Membership
27. New Arrivals of Books
28. Research Support: Citation Styles
29. Table of Contents (Print Journals)

INFRASTRUCTURE FACILITIES:

- Air-conditioned reading area accommodating up to 400 users concurrently
- CCTV surveillance for enhanced security
- Central Board Room and Conference Room
- Cashless payment option via UPI for late fee collection
- Computers provided for accessing e-resources
- Wi-Fi connectivity throughout the premises
- Designated silent zone for uninterrupted study
- E-reading section for digital resources
- Scholar's Zone for focused research
- Spacious seminar halls with modern equipment capable of accommodating national and international conferences
- Digital kiosks available for convenient access to the catalog and for book renewal purposes

RESEARCH SUPPORT TOOLS:

- Ithenticate (Turnitin): Originality and plagiarism check software
- Grammarly: Writing support tool
- Web VPN: Enables off-campus access to e-resources through NISER.
- Quick Start Guides: Access Mendeley, Zotero, and RefWorks quick start guides on the website for user convenience.
- SciFinder-n: Offering comprehensive access to scientific information, facilitating efficient exploration and discovery.

E-RESOURCES:

E-Databases (Bibliographic Databases):

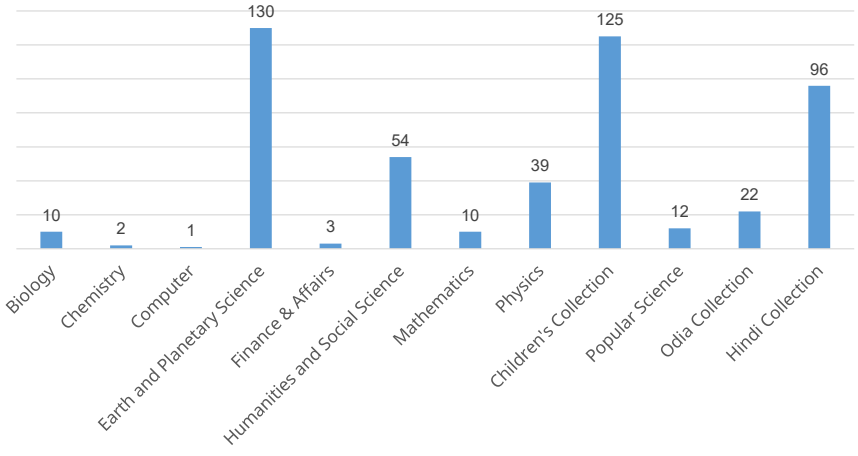
- CCDC – CSD Enterprise License (CCDC)
- MathSciNet (AMS)
- Science of Synthesis (Thieme)
- Sci-Finder-n (CAS- ACS)

E-Journals:

American Association for Cancer Research (AACR), American Association for the Advancement of Science (AAAS), American Chemical Society (ACS), American Economic Association (AEA), American Institute of Mathematical Sciences (AIMS), American Institute of Physics (AIP), American Mathematical Society (AMS), American Meteorological Society (AMS), American Physical Society (APS), American Society for Microbiology (ASM), Annual Reviews, Association for Computing Machinery (ACM), Bioscientifica, BMJ, Cambridge University Press (CUP), Cold Spring Harbor Laboratory (CSHL), De Gruyter, Duke University Press, Elsevier, Emerald, European Mathematical Society (EMS), Heldermann Verlag, IEEE, Institute of Mathematics Polish Academy of Sciences (IMPAN), International Press, IOP Publishing, IOS Press, John Hopkins University Press (JHUP), Journal of Visualized Experiments (JOVE), JSTOR, Khayyam Publishing, Lippincott Williams and Wilkins (LWW), Magnolia Press, Mary Ann Liebert, Mathematical Science Publishers (MSP), Microbiology Society, Optical Society of America (OSA), Oxford University Press (OUP), Portland Press, Princeton University Press, National Academy of Sciences (PNAS), Project Euclid, Rockfeller University Press (RUP), Royal Society of Chemistry (RSC), SAGE, Society for Industrial and Applied Mathematics (SIAM), Society for Neuroscience, Springer Nature, Taylor and Francis (T&F), The Company of Biologists, The Geological Society of America (GSA), The Royal Society, Thieme, Wiley, World Scientific.

E-Books:

- Cambridge University Press (8 titles) – Perpetual Access
- Elsevier (561 titles)
- Oxford University Press (1 title) – Perpetual Access
- Pearson (8 titles) – Perpetual Access
- Springer Link (9567 titles) – Perpetual Access
- Taylor & Francis (4 titles) – Perpetual Access
- Wiley (63 titles) – Perpetual Access
- Thieme (16 titles)



504

books were added to the library's collection in print format.

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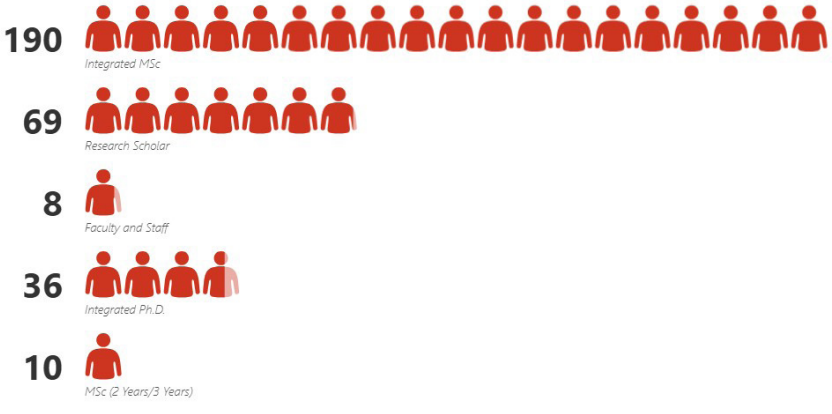
new patrons were added during the 2023-24 period.



Number of document requests fulfilled through the Document Delivery Service.

360

162

MSc Dissertation added to central library repository.

65

PhD Thesis added to central library repository.

Total number of books borrowed from the library

28391

Nationwide librarians from Akashvani Kendra branches visited the NISER Library, exploring resources and engaging in discussions with the Scientific Officers, fostering collaboration and discovering common ground.

Research Overview

SCHOOL OF BIOLOGICAL SCIENCE

Prof. Chandan Goswami

Field of Specialization: Cell biology, Ion channels, Microscopy

Transient receptor Potential (TRP) ion channels are involved in a series of physiological functions and complex sensory events. Mutations and abnormal expressions in TRP channels often leads to pathophysiological conditions known as “channelopathy”. TRP channels are special group of ion channels as these channels has thermo-gating behaviour, i.e. activation by higher or lower temperature. Our lab has focused to dissect out the importance of thermo-sensitive ion channels in different cellular functions, regulation of subcellular organization, organelle functions. For this purpose, we use different cell types ranging from neuron, osteoclasts, osteoblasts, keratinocytes, immune cells and haploid mature gametes. We analyse sequence variations and conservation of these TRP channels in order to understand the importance of critical regions relevant for channel function, regulations and channel gating.

Prof. Palok Aich

Field of Specialization: Systems Biology

The primary objective of Aich lab is to identify core gut microbes that could holistically confer potential health benefits. It is known that we have equivalent number of body cells and resident microbes and the microbial genome (metagenome) component could be 100-fold more than our genomic composition. It is, therefore, logical to think that resident microbiome might regulate our health significantly. Ours and other labs have shown the importance of these microbes in regulating health and various other physiological functions. Among various places in the body gut seems to harboring maximum number of microbes. The results revealed that although there may be trillions of bacteria present in the gut only a handful of them are active to confer benefits. This observation led us to hypothesize that perhaps a handful of microbes are important in maintaining health or protect us while the others are there as a backup. In the lab we perturb gut microbiota by treating with antibiotics, or diet or inducing diseases or disease like conditions in mice models. Some key features we found that certain antibiotic treatments could confer significant health benefits, including the conversion of white adipose tissue into brown adipose tissue. This understanding could potentially lead to the treatment and prophylaxis of obesity and overweight individuals. We have also shown that gut microbial composition and metabolites ("meta" derived from the bacteria) are the future of keeping good health.

Dr. Abdur Rahaman

Field of Specialization: Cell Biology, Biochemistry

Nuclear remodeling is a universal process that occurs in all eukaryotes including human. It is relevant to human health, since a number of known human diseases are linked to nuclear remodelling. Moreover, changes in nuclear size and shape are relevant to cancer, aging and other pathobiological conditions. Therefore, identifying and understanding factors associated with nuclear remodeling will make important contribution not only to basic research but also to understanding these diseases, and could provide potential means for therapeutic intervention.

Tetrahymena undergoes closed mitosis and nuclear envelope expands ~10 folds during specific stages in cell conjugation. Gene manipulation, generation of knockouts, maintenance of lethal alleles and in vivo structure-function analysis are easily achieved in Tetrahymena. This makes it a suitable model organism to study nuclear remodeling.

My group is interested on nuclear remodelling, specifically understanding the mechanism and cell cycle regulation of nuclear envelope expansion. We have recently demonstrated the molecular basis of nuclear recruitment of a nuclear dynamin related protein (Drp6) and provided the mechanism of target membrane selection. We have also uncovered the mechanism of nuclear expansion by Drp6 and investigated the role of microtubules in this process. Our results support a novel mechanism of nuclear expansion. We are also addressing the regulation of nuclear recruitment and nuclear expansion by post-translational modifications of Drp6. We are also investigating the kinase(s) and phosphatase(s) involved in phosphorylating Drp6 and their roles in nuclear expansion.

Dr. Asima Bhattacharyya

Field of Specialization: Host-pathogen interactions, extracellular vesicles, cancer microenvironment, cancer metastasis, cell signalling events, apoptosis, hypoxia, reactive oxygen species.

Gastric cancer (GC) is a leading cause of mortality in the developing nations. One of the primary challenges associated with GC is the lack of early detection markers. Helicobacter pylori, a Gram-negative bacterium thriving in the low-oxygen environment in the human stomach, is implicated in GC development. Similar to other solid tumors originating from epithelial cells, GC spreads through a process known as epithelial to mesenchymal transition (EMT), wherein immotile epithelial cells transform into invasive and motile mesenchymal cells. Within the tumor, regions of hypoxia emerge, fuellingtumor growth, angiogenesis, metastasis, and resistance to therapy. In the intricate landscape of GC, extracellular vesicles (EVs) play a crucial role. These tiny membrane-bound vesicles carry a cargo of proteins, nucleic acids, and lipids, facilitating intercellular communication and influencing various aspects of cancer progression, including metastasis. Understanding the multifaceted molecular mechanisms orchestrated by H. pylori, hypoxia, and EVs in GC progression of paramount importance. Our research group is committed inunravelling these complexities, identifying key pathways and events driving GC advancement and metastasis.

Dr. Debasmita Pankaj Alone

Field of Specialization: Molecular Genetics and Epigenetics

With the shifting demographics towards older age, there is a major concern for age-related disorders. 90% of individuals dying each year are due to age-related causes. Understanding the genome, epigenome and proteome between healthy and diseased state of these individuals pave a way for unravelling bio-markers for early diagnosis and/or therapeutics for various diseases. Our goal is to find these underlying players that change the micro-environmental niche differently in a diseased state during the developmental process of aging and hence are responsible for these age related-disorders. We are currently focusing on understanding the pathomechanism of two neurodegenerative eye disorders (Glaucoma, the leading cause of irreversible World Blindness and Corneal Endothelial Dystrophies) as well as Cancer using a plethora of cellular, biochemical, genetics, genomics and molecular biology techniques involving human samples, Drosophila models as well as in vitro cell lines.

Dr. Harapriya Mohapatra

Field of Specialization: Molecular Microbiology

Striding over the unfavourable condition is intrinsic requirement of all organisms for survival. Single celled bacteria are no exception to this. We are interested in understanding how the bacteria respond to antibiotic and pH stress. The first line of sensing and responding to external stimuli is through membrane proteins. Our finding shows that bacteria can respond to stress in different ways. One of this involves engaging the structures (proteins) intrinsic to cellular functions and survival, while another involves slowing down the cellular metabolism. Thus, our research focuses on developing understanding of two such aspects involving the bacterial membrane proteins and persistence.

We had previously shown (Mishra M, PhD thesis) upregulation of the outer membrane protein TolC in response to antibiotics and pH in Enterobacter cloacae. We are currently expanding the study to understand what role TolC plays in acid survival and how is it regulated?

Dr. Kishore CS Panigrahi

Field of Specialization: Plant developmental Biology

My lab has been instrumental in setting up a state-of-the-art facility for plant signaling research. Major focuses are on Flowering time regulation, circadian clock, and light-mediated developmental responses in model organisms like Arabidopsis, Moss, Rice, and Mung bean. Several of the major focuses of Kish Labare to understand thelight and hormone regulated development, the Role of GI (Gigentia) the master regulator gene's regulation in circadian clock control, flowering time control, and the response in various biotic and abiotic stress,calcium-sensing and studying the post-translational modification of tubulin in physcomitrium patens(Moss) and Effect of Carbon nanoparticles in Rice Physiology and mechanism of action and response in heavy metal toxicity and various stress in Rice, Mungbean and Arabidopsis plant.

Dr. Manjusha Dixit

Field of Specialization: Angiogenesis and Tumorigenesis Regulation

Our research provides significant insights into angiogenesis and cancer progression by identifying new angiogenic regulators and elucidating their mechanisms. This work holds promise for addressing resistance and side effects associated with current

cancer therapies.

FRG1 as a Tumor Repressor and Angiogenic Regulator

Initially, we identified FRG1 as a tumor repressor. Our subsequent investigations revealed that FRG1 plays a crucial role in angiogenesis. Specifically, reduced FRG1 expression in breast cancer cells leads to the activation of FGF2, which subsequently triggers the ERK/AKT pathway in endothelial cells, thereby promoting angiogenesis. While examining the cytoplasmic role of FRG1, we identified EEF1A and IQGAP2 as interaction partners. Previous studies have established the role of IQGAP2 in modulating tumorigenesis and angiogenesis.

The Oncogenic Role of EEF1A2

Our research also delved into the role of EEF1A2, an isoform of EEF1A1, known for its oncogenic properties in cancers. EEF1A2 facilitates metastasis in triple-negative breast cancer by upregulating HIF1A through ERK-Myc and mTOR signaling pathways. In hypoxic conditions, we observed a positive feedback loop between EEF1A2 and HIF1A, correlating with increased microvessel density in patient tissues.

Discovery of a Four-Protein Complex

A significant milestone in our research was the identification of a four-protein complex consisting of IQGAP1, IQGAP2, EEF1A2, and FRG1. This complex plays a critical role in coordinating cancer-related signaling pathways. To exploit this discovery for therapeutic purposes, we are developing cATC-conjugated peptides aimed at targeting this complex. This approach is expected to overcome drug resistance and improve treatment efficacy.

Genetic Variants in SERPINB5 and Gallbladder Cancer

Additionally, we identified single nucleotide polymorphisms (SNPs) in the SERPINB5 gene that are associated with gallbladder cancer in the population of Odisha, India. These SNPs impact gene expression by altering transcription factor binding sites. This finding underscores the necessity for genome-wide association studies specific to this population to better understand the genetic underpinnings of gallbladder cancer.

Through these studies, we aim to advance the understanding of cancer biology and develop novel therapeutic strategies to improve patient outcomes.

Dr. Mohammad Saleem

Field of Specialization: Membrane Biochemistry/Biophysics

We find that the polymerisation forces indeed control the shape and the size of the bud. We show that ESAT-6 can polymerise also inside THP-1 macrophage cells and induce concentration and time dependent apoptosis. Together, we propose a novel mechanism show that concentration dependent polymerisation regulates the rate of phagosomal vesiculation and apoptosis that could explain the observed heterogeneity in the Mtb residence time inside the host phagosome (preprint on biorxiv).

We show that the alpha-Synuclein binds and undergoes the liquid liquid phase separation in the presence of membrane interfaces with a narrow range of membrane potential. We show that the membrane potential can be used as a fine tuner by cells to induce LLPS of alfa-Synuclein at membrane interfaces (manuscript in preparation). Further, we discover that the neuronal membrane environment accelerated the aggregation of fl-tau by minimising the lag & exponential phase of the aggregation. We find that fl-tau starts binding to the membrane in the lag-to-exponential phase transition period. Later, the binding is more intense, indicating the recruitment of oligomers. We also find that fl-tau showed no affinity in its monomeric form. In sharp contrast, the tau oligomers shows early binding, indicating that the initial aggregation stage is essential for the binding to the neuronal membrane interfaces. In the tau-bound state, the fluorescence recovery of membrane lipids significantly diminished to about one-fifth, indicating restricted lipid movement due to the creation of tau oligomer mediate diffusion barrier (work in progress)

Dr. Pankaj Vidyadhar Alone

Field of Specialization: Molecular biology of protein biosynthesis

Protein biosynthesis is an important step in the life cycle of a cell, where genetic information is converted into functional protein information. The selection of an open reading frame is a key function of the translation initiation apparatus and a key regulatory step that controls gene expression. Our research interests are to understand a) The molecular mechanism of start codon recognition & translation fidelity. b) Translational control in molecular medicine and regulation of protein biosynthesis. c) Architecture of translation apparatus, molecular interactions, and supramolecular assembly of translation initiation complex by using a range of genetic, biochemical, and biophysical techniques in the yeast model system.

Dr. Praful Singru

Field of Specialization: Neural circuits and regulation of energy balance

Hypothalamic arcuate nucleus (ARC) has emerged as crucial integrative center in the neural circuitry of energy balance. The neurons of the ARC synthesize sets of orexigenic [neuropeptide Y (NPY) and agouti-related protein (AgRP)] and anorexigenic [cocaine-and amphetamine regulated transcript (CART) and a-melanocyte stimulating hormone (a-MSH)] neuropeptides and project to hypothalamic paraventricular nucleus (PVN). The axons from ARC innervate and regulate thyrotropin-releasing hormone (TRH) synthesizing neurons in medial PVN to regulate energy expenditure. Another distinct group of TRH neurons resides in anterior PVN (PVNa) but its relevance has remained unexplored. Although TRH is fully conserved across the vertebrate phyla, believed to mediate neuronal communication, significance of TRH in the brain of non-mammalian vertebrates and evolutionary emergence of TRH as regulator of energy balance, are not well established. We have been interested in understanding the significance of non-hypophysiotropic TRHergic system in brain, role of neuromdulators/neuropeptides/ion channels in the regulation of TRHergic system and its regulatory pathways, and evolutionarily significance of the peptide.

Dopamine (DA) serve as a neurotransmitter and controls a range of physiological functions and behavior. Using zebra finch as model system, we are exploring the organization and regulation of DAergic system in the brain. We have identified midbrain DA neurons in the ventral tegmental area (VTA) and substantia nigra. Those in are of three types. How these neurons differentially regulates energy balance is not clear. We focus on determining the role of the midbrain DA neurons in energy balance in birds.

Dr. Ramanujam Srinivasan

Field of Specialization: Archaeal and Bacterial Cytoskeleton

The primary focus of the lab's research is the investigation of bacterial cytoskeletal proteins. We have worked on a number of these proteins during the last year, which are detailed below. (i) SopA, a member of the ParA family and plasmid segregating protein, is being studied to determine how the divergent C-terminal helix affects protein structure and function, particularly during polymerization. (ii) We have previously identified a number of ring assembly mutants of the bacterial cell division protein FtsZ, and we are currently employing a variety of cell biology and biochemical techniques to investigate these mutants' potential functional problems in bacteria. (iii) We have also investigated the dynamics and assembly of archaeal actins in eukaryotic cell types. (iv) Using a technique we previously devised to examine bacterial cytoskeletal proteins, we are now able to comprehend the role of ATP hydrolysis dynamics of one of MreB's orthologs from bacteria without cell walls. (v) The technique has also been utilised to research medications that target FtsZ and pinpoint the traits of treatment resistance.

Dr. Rudresh Acharya

Field of Specialization: Protein Crystallography, Protein engineering, De novo protein design

Proteins are workhorses of a cell, engaged in a wide range of task comprising structural stability, cell signaling, catalysis, transporting, molecular printing, membrane fusion, regulation, etc. Understanding the mechanism that underlies the functioning of these molecular gadgets is an intriguing question, and defines the fundamentals of biological processes. This is an interdisciplinary research program and we set out to address the question using X-ray crystallography coupled with biophysical and biochemical approaches.

Our research group is pursuing the following projects:

Viral ion channels: Cation selective channels are present in several enveloped pathogenic viruses (example: Influenza viruses, Chikungunya). Often, the channels are essential for virus life-cycle and production of infectious viruses. Our structural biology group aim to deduce the structure based mechanism for the functioning of the channels. The structures will be of fundamental interest, and provide leading point for the structure based drug design.

Two component systems in bacteria: We are interested in determining the structures of bacterial two component systems (Histidine kinase and its response regulator), a wide spread signal transducers in prokaryotes. Here, our focus is to provide structure-based mechanistic model for sensing and transmission of signal.

Polysaccharide Lyases (PLs): Bacterial polysaccharide lyases catalyze the degradation of the anion polysaccharides in the host extracellular matrix and act as virulence factor. Infection ensue this process. We are exploring the structural basis for the pH dependent functioning of pathologically important polysaccharide lyases from PL-5 class. Further, we aim to design peptide-based inhibitors for this class of PLs.

De novo protein design: Our other research program is de novo protein design, which aim to put our understanding of principles that define protein folding and functioning into test. Here, inspired by nature we seek to design self- assembling scaffolds that harbor tailored functions, and bind co-factors to create new materials.

In above research interests, methods involve protein purification, biochemical assays, screening for crystallization, collecting X-ray diffraction datasets, determining structures, interpretation for structure and biochemical data to explain the mechanism.

Dr. Subhasis Chattopadhyay

Field of Specialization: Immunology

Our current research works focus on Cellular Immune responses associated to experimental immune suppression, viral infection driven immune activation and cellular immune regulation. We are working on cellular function and phenotypes associated to Cell mediated immunity (CMI) of T cells and accessory antigen presenting cells. We are investigating the expression and function of Toll like receptor (TLR) and Transient Receptor Potential (TRP) Channels in CMI and analysing cellular and immunological response(s) of host cells during experimental Chikungunya virus (CHIKV) infection as major projects. Our work unravels the CHIKV driven altered cellular immune response(s) of host cells and its implication towards designing the anti-viral strategies of host cell immunity. Additionally, we study the immunogenic as well as the immuno-regulatory responses of CMI associated to TRP channels and TLRs, which together might have implication towards the altered host cell responses. Research with cell lines, primary cells, in animal model and also with the human blood samples from normal donors with due consents and National guide lines are the prime candidates for such experimental studies. Such understanding will be helpful towards designing immuno-therapeutic strategies to control various diseases.

Our recent research works suggest the possible strategic potentials to design future immunotherapy for Chikungunya virus (CHIKV) infection, cellular immune regulatory pathways associated to TLR and TRP driven inflammation in experimental cell mediated immunity.

In the recent time we have reported the following research findings:

TLR4 is one of the receptors for Chikungunya virus envelope protein E2 and it regulates virus induced pro-inflammatory responses in host macrophages (Mahish et al. 2023), (ii) Transient Receptor Potential Channel A1 (TRPA1) activation and heat shock protein 90 (Hsp90) inhibition synergistically downregulate macrophage activation and inflammatory responses (Radhakrishnan et al. 2023), (iii) Transient Receptor Potential M8 (TRPM8) modulation can alter the phagocytic activity of microglia and induce changes in sub-cellular organelle functions (Shikha et al. 2023), (iv) Chikungunya virus perturbs the Wnt/β-catenin signaling pathway for efficient viral infection (Chatterjee et al. 2023), (v) Salicylic Acid Conjugate of Telmisartan Inhibits Chikungunya Virus Infection and Inflammation (Dash et al. 2023), (vi) Upregulation, Functional Association, and Correlated Expressions of TRPV1 and TRPA1 During Telmisartan-Driven Immunosuppression of T Cells (Mukherjee et al. 2024)

Dr. Tirumala Kumar Chowdary

Field of Specialization: Structural virology

Viral proteins and other biomolecules have unique structural features. The protein complexes that a virus uses for cell-entry, its genome replication and other viral processes inside the cell dynamically change their conformation in a context dependent manner. Understanding the conformation dynamics of viral proteins during receptor-binding, fusion of enveloped virus membrane with cell membrane, and various enzymatic functions is important for developing knowledge for effective therapeutic strategies against human and animal pathogens. My lab's research focuses on understanding the conformational dynamics of viral proteins, protein-nucleic acid complexes during viral entry, genome replication and viral assembly.

Mosquito-borne viruses of the alphavirus and flavivirus groups, such as Chikungunya virus and dengue virus, are of serious health concern, especially for India. Being enveloped viruses, these viruses enter the host cell through a membrane-to-membrane fusion event triggered by proteins present on the viral surface, anchored in the viral lipid membrane envelope. Earlier work from our group has characterized the conformation dynamics of Chikungunya virus envelope proteins upon receptor binding and during the membrane fusion event. We explained how receptor-binding and acidic-pH can trigger the viral envelope proteins to undergo conformation changes effecting viral cell entry. Our recent work, explained the conformation dynamics of the Chikungunya virus and SARS-CoV-2 S-protein dynamics in the membrane environment using molecular dynamics simulations and biochemical studies.

Our work on helicase-cum-protease of dengue virus, NS2b-NS3 complex revealed a mechanism of the helicase activity enhancement upon its interaction with other viral proteins involved in genomic RNA replication.

Dr. V Badireenath Konkimalla

Field of Specialization: Pharmaceutical Biology, Nanodrug delivery

Rational drug discovery and development require a streamlined interdisciplinary effort from researchers working in a specialized area. From active collaboration, the drug discovery process can be and has been significantly shortened by addressing bottlenecks in drug discovery (off-target effects, polypharmacology, and chemoresistance). Our research focuses on some unaddressed questions that could contribute to chemotherapy.

Establishing the bioactivity of a lead molecule (of any origin) from an in vitro study is the start of a long journey in the drug discovery pipeline. The pharmacological effect of the lead molecule observed in vitro may not directly correlate with the in vivo results due to the molecule's physicochemical properties, bio-pharmacokinetics, or structural mimicry. Here, we try to design suitable study models (in silico, in vitro, and/or in vivo) that can progressively help develop a reliable formulation.

Dr. Aniruddha Datta Roy

Field of Specialization: Phylogenetics, Biogeography

My laboratory's primary focus revolves around the field of Macroevolution, with an overarching theme of utilizing phylogenetics to gain insights into the origins and patterns of biodiversity within the Indian subcontinent. While our research predominantly encompasses Systematics, Biogeography, and Phylogeography, we also delve into intriguing ecological inquiries. By combining these disciplines, we aim to develop a comprehensive understanding of the evolutionary processes shaping the rich diversity of species found in our region.

Dr. K. Himabindu Vasuki

Field of Specialization: Plant functional genomics

Tomato is the second most consumed vegetable in the world after Potato. Enhancing nutritional quality of tomatoes not only improves food availability to the growing demands of the world population but also reduce the incidence of health style diseases such as certain types of cancers, inflammations and cardiac diseases. In our lab, we are working on increasing the antioxidant nutrients in tomato fruits, specifically flavanoids and anthocyanins. By utilizing spontaneous purple mutants in tomato, the mechanism of anthocyanin accumulation in the fruit crops would be elucidated. Multiomics approaches including Proteomics combined with metabolomics and transcriptomics would be employed to understand the basis of enhanced fruit coloration in the purple varieties of tomato fruits.

Dr. Rittik Deb

Field of Specialization: Ecology and Evolution

- Impact of anthropogenic noise on eco-evolutionary dynamics of orthopterans – a sentinel taxa to understand biodiversity - We are examining the effect of anthropogenic noise on acoustic communication and its evolutionary consequences using field and laboratory studies.
- Behavioural and neuronal tuning in crickets - In this project, we examine how narrow neuronal tuning can allow crickets to avoid anthropogenic noise, a novel mechanism in signal processing.
- Drivers of alternative reproductive strategy (ART) in crickets- ARTs, when condition-dependent, require information about one's status in the hierarchy. We are trying to understand how this hierarchy is assessed through competition and mate availability in orthopterans.
- Role of gut microbiota in driving host specificity – In this project, we examine a possible co-evolutionary mechanism driving niche expansion in orthopterans.
- Collaborative work with Dr Roy (SBS) - We are examining how ant-mimicking spiders behaviourally mimic the spiders to avoid predation pressure.
- Collaborative work with Dr Mukherjee (ATREE), Dr Mishra (SCPS)- We are developing ML models to classify honeybee images collected through a solar-powered automated camera setup.
- Collaborative work with Dr Agashe (NCBS) – We are examining the role of the gut microbiome in host sexual selection in stored grain pest – red flour beetle. We aim to understand how gut microbiome can help these pests shift across resources.

Dr. Swagata Ghatak

Field of Specialization: Neuroscience and Stem cell research

Our lab is interested in finding the mechanisms that contribute to electrical abnormality in neurological disorders like Alzheimer's Disease (AD). We want to understand how ion channels play a role in neurological disease pathogenesis and whether their modulation can affect their pathophysiology. Further, we are interested in identifying novel drug targets for therapeutic intervention aimed at controlling various neuronal diseases like AD. The discovery of new drug targets is important because of high failure rate of novel drugs to cure AD in clinical trials and low efficacy of existing drugs towards treatment of AD. We use human induced Pluripotent Stem cell (hiPSC) derived brain cell models and transgenic animal models to study the various aspects of neurological disorders like AD.

Research work done till now-

- We have established an in vitro model for AD using rat primary neuron-astrocyte co-cultures and pure astrocyte cultures. Aβ42 oligomers are added to the cultures 3/24/48 hours prior to experimentation to mimic AD pathology. We have observed reactive astrogliosis in our AD model characterized by increased GFAP in astrocytes. We also observed impaired glutamate uptake by astrocytes in the presence of toxic Aβ42 oligomers.
- We observe increased TREK1 and TASK3 ion channel expression in clusters in the presence of Aβ42 oligomers in both neurons and astrocytes.
- We observed that hyperexcitability and intracellular calcium increase due to Aβ42 oligomers caused increase in TREK1 and TASK3 expression
- We observed that the increase in TREK1 expression is caused by activation of cAMP-PKA pathway by Aβ42 oligomers
- We observed that the increase in TASK3 expression is caused by activation of calcineurin pathway by Aβ42 oligomers.
- We will now understand whether the expression is changed at the transcription level or recruitment of TREK1 to the membrane has increased using pharmacological blockers of transcription and/ translation.
- Further we will use siRNA against TREK1 interacting proteins to understand their role in change in TREK1 expression.

Significance and Impact-

The proposed research can provide a mechanistic insight into contributors of electrical abnormality in AD. Further, it may identify K2P as novel drug targets for therapeutic intervention aimed at controlling AD pathophysiology. The discovery of new drug targets is important because of high failure rate of novel drugs to cure AD in clinical trials and low efficacy of existing drugs towards treatment of AD. The first research work published emphasizes the contribution of brain metabolites in controlling expression of TREK1 in disease conditions like stroke and will further help in understanding how TREK1 is modulated in AD. The second research work is about the development of a technique that will enable us to understand how the proteome of AD neurons changes when activity parameters of the same neurons change at single cell level.

Dr. Saurabh Chawla

Field of Specialization: Veterinary and Lab Animal Sciences

Played a pivotal role in establishing the National Centre for Animal Research and Experimentation (NCARE), a premier facility dedicated to advancing scientific research while adhering to the highest ethical standards in the use of laboratory animals. As part of the School of Biological Sciences, we ensure regulatory compliance and exemplary animal welfare. My work supports diverse research groups in areas such as toxicology, toxicopathology, cancer biology, and the safety and efficacy testing of newly synthesized materials. By managing the housing of different strains of transgenic, knockout (KO), and immunocompromised animals, me and my team help enhance research methodologies and promote scientific excellence.

Dr. Bathrachalam Chandramohan

Field of Specialization: Molecular Genetics and Wildlife Genomics

Pigmentation in mammals, which determines the color of skin, hair, and eyes, is a complex trait controlled by multiple genes and regulatory pathways. It primarily involves the synthesis and distribution of melanin, a pigment produced by specialized cells called melanocytes. Two types of melanin, eumelanin (responsible for brown to black colors) and pheomelanin (responsible for yellow to red colors), contribute to the wide range of pigmentation patterns seen across mammalian species. I am trying to understand the role of MC1R and Agouti genes in pigmentation pattern in mammals including wild mammals.

SCHOOL OF CHEMICAL SCIENCES

Prof. Hirendra N. Ghosh

Field of specialization: Nanomaterials, photonics, and ultrafast spectroscopy

Research focuses on developing innovative systems for advancing white-light emission and examining the dynamics of charge transfer in nanocomposites and hetero-structures, particularly for solar energy utilization with the help of different sate of the art Ultrafast Spectroscopic Techniques which include Femtosecond pump-probe spectrometer detecting the transients UV-Vis-NIR region and Terahertz spectroscopy. We conduct extensive studies on perovskite, 2D, plasmonics materials and their hetero-structures, investigating carrier cooling, transient mobility, and defect-mediated enhancements in photoconductivity. Additionally, our research explores ultrafast electron and hole transfer dynamics in various nanocrystals, employing advanced ultrafast pump-probe techniques to understand their optoelectronic properties. Our work also delves into quantum dot, 2D, plasmonic materials which contributes to a comprehensive understanding of charge transfer mechanisms across diverse materials. Overall, we advances the field of materials science, with significant implications for sustainable technologies and optoelectronics.

Prof. Chidambaram Gunanathan

Field of Specialization: Organometallic Chemistry, Catalysis and Organic Chemistry

The development of simple and general catalytic methods using abundant base metal catalysts for the deoxygenation of organic compounds for the valorization of biomass and chemical synthesis remains a formidable challenge. Cobalt pincer-catalyzed reductive deoxygenation of aldehydes, ketones, alcohols, and ethers to their corresponding alkanes is reported. Biomass-derived compounds were deoxygenated to their corresponding methylarenes. This catalytic system employs diethylsilane as a reductant and requires a substoichiometric amount of base.A simple base, KOH-catalyzed cross-coupling of primary and secondary alcohols is reported in which the primary alcohols play the role of alkylation reagents. EPR and mechanistic studies confirmed the involvement of radical and ketone intermediates formed from primary and secondary alcohols, respectively, leading to the formation of β-alkylated secondary alcohols.

A simple catalytic method for self-coupling of secondary alcohols leading to the synthesis of β-branched ketones under mild conditions is reported. Well-defined ruthenium pincer complex catalyzed the reactions. A catalytic method for the direct synthesis of oximes from alcohols and hydroxyl amine hydrochloride salt is reported. Ruthenium-catalyzed site selective α-alkylation of β-naphthols using both arylmethanols and aliphatic alcohols as alkylating agents is reported in which water is the only byproduct. Mechanistic investigations indicate that the reactions proceed via aldehyde intermediates. DFT studies revealed that the base and in situ generated water play important roles in catalysis.

Prof. Himansu Sekhar Biswal

Field of Specialization: Laser Spectroscopy and Computational Chemistry

Currently, the group is working on 4 major problems.

- Unusual non-covalent interactions in biomolecules.
- Implications of amino acid based ionic liquids in catalytic activity, stability, dissolution, and storage of DNA, RNA and proteins.
- Excited state proton transfer and photo-dynamic therapy mediated through sulfur and selenium-centered hydrogen bonds.
- Chirality transfer and chiral recognition.
- Scientific instrumentation such as Time-of-Flight Mass Spectrometry (TOF-MS) and Velocity Map Imaging (VMI) to carry out research in high resolution gas phase laser spectroscopy.

The group uses experimental techniques such as frequency and time-resolved fluorescence spectroscopy, gas phase laser spectroscopy, NMR MI-VCD etc. and theoretical methods such as electronic structure calculation, molecular dynamics, docking etc., to investigate the mentioned problems at the molecular level.

Prof. Moloy Sarkar

Field of Specialization: Fluorescence Spectroscopy

Several important physical insights in terms ofunderstanding the behaviour of some nanostructured materialsin absence and presence of analytes of interest have been obtained from the current study. And because of these the works are published in 07 Scientific Journals of International repute. Several students (comprising of both M.Sc and PhDs) have also got training on various aspects of Material Sciences Spectroscopy and Microscopic techniques.Also got invitation to delivertalks in prestigious conferences

such as in Trombay Symposium for Radiation and Photochemistry Conference (TSRP),Mumbai; NAMOSBIO, IISER Kolkata, in International Green Chemistry Conference, UOL, Ladakh etc. Became Guest Editor for the Journal Chemical Physics Impact. Running two Research projects successfully. Also acted as reviwers for PhD thesis and several manuscripts from various Journals.

Title of the Research: Understanding the behaviour of some new fluorescent nanostructured materials through steady state and time resolved fluorescence spectroscopy and confocal fluorescence microscopy.

Research over view: During this period, we have mainly concentrated on understanding the fundamentals behind the photophysical response of different organic and inorganic fluorescent nano scale systems in absence and presence of analyte of Interests. In particular, we have tried to investigate whether the photophysical response of fluorescent metal and QDs can be explained on the basis of the mechanism of the photo-processes that usually happens in case of Organic dye molecular systems. This has been achieved by resorting to various steady state and time resolved fluorescence measurements along with electron and fluorescence microscopic studies. Investigation have revealed that surface chemistry associated with the nanoparticles plays important in governing the photophysical response of fluorescent inorganic nano particles, and this aspect should be considered before ascribing mechanism to the photo-process associated with them.

Prof. Prasenjit Mal

Field of Specialization: Organic Chemistry

- Visible Light Photocatalysis in Organic Synthesis

Prof. Sanjib Kar

Field of Specialization: Bioinorganic chemistry

Corrole, a contracted porphyrin analog is recently gaining a lot of research interest. One possible reason for choosing corrole over porphyrin is that corrole stabilizes metals in a one-unit higher oxidation state than its porphyrin analog, and it can in principle "store" more electrons that the porphyrin unit. Corroles are trianionic, however, retain their aromaticity fully. All these properties have led to an intense research interest in corrole chemistry. The knowledge of the redox properties and the electronic structures of these metal complexes will enrich our fundamental understanding of these intriguing classes of molecules. Additionally, these studies might provide new materials for the optoelectronic industry. The investigations of the metal-oxo species will generate important know-how for all branches of oxidation catalysis, a process that is highly sought after in the chemical industry.

Dr. Arindam Ghosh

Field of Specialization: NMR Spectroscopy, MRI contrast agents, Machine Learning in spectroscopy

- Design of novel MRI CEST contrast agents.
- Understanding of the mechanism of CEST contrast and investigation of the role of hydrogen bonding
- Carbon quantum dots as a novel class of CEST MRI contrast agents.
- Use of AI and ML for developing novel signal processing techniques for NMR spectroscopy.

Dr. Bhargava B.L.

Field of Specialization: Theoretical and Computational Chemistry

Molecular simulations provide insights into the structure and dynamics of a system at atomic level helping to understand the system from a microscopic perspective. Using molecular simulations, it is possible to carry out controlled (virtual) experiments at extreme conditions without safety issues involved in carrying out the actual experiments. We use ab initio methods and empirical potential based molecular dynamics and Monte Carlo techniques to study condensed phases of materials. We explore structural and dynamical properties of materials that are of potential use. For systems exhibiting aggregation behavior beyond the length scales accessible to the atomistic simulations, coarse grained MD simulations are used. Biological systems such as proteins and lipids are also studied using molecular dynamics.

Dr. Chandra Shekhar Purohit

Field of Specialization: Organic chemistry

During this period, my group has established few protocols for synthesising higher ordered linear and radial catenanes. We have utilised cobalt metal templation and click reaction to achieve this complex synthesis. Also, various un-natural nucleobase derivative have been synthesize and their metal complexing properties and biological activity such as anti-carcinogenic properties is under investigation.

Dr. Nagendra Kumar Sharma

Field of Specialization: Syntheses and Biochemical Evaluations of Modified Peptides and Nucleic acid (DNA/RNA) Analogues

Nucleic acid (DNA/RNA) and protein/peptides interactions play critical roles for the regulation of gene expressions in living systems. The regulation of target specific gene is new avenue for the development therapeutic drug candidates. However, many challenges persist for employing as drugs from native DNA, RNA and peptides molecules such as site specific delivery, stability and off target effects. Thus the structural modifications of DNA/RNA/Peptides are attempted to improve the major hurdles using as drugs. My research group emphases on the synthesis of rationally designed DNA/RNA/peptides analogues and biochemical evaluations using NMR/UV-Vis/ Fluorescence/ESI-Mass techniques. Recently my group synthesised various amino acids/peptides/DNA/RNA analogues for tuning the peptide and nucleic acids structural conformations to improve binding affinity and other biochemical features which are essential to prepare the potential drug candidates.

Dr. S. Peruncheralathan

Field of Specialization: Synthetic Organic Chemistry

Our research group is at the forefront of organic synthesis, developing innovative methodologies to create complex organic molecules with applications in pharmaceuticals and material science. We specialize in novel reactions such as organocatalytic dearomatization, palladium-catalyzed domino heteroarylation, and PIFA-mediated intramolecular dearomatization. Employing advanced catalytic systems and adhering to green chemistry principles, we aim to enhance reaction efficiency and environmental sustainability. Our significant contributions include synthesizing novel compounds like pyrazolines and benzothienoquinolones, which are pivotal in drug discovery, and developing pyrazole polymers for sensor technologies, illustrating our impact on both health and environmental sectors.

Dr. Sharanappa Nembenna

Field of Specialization: Inorganic Chemistry (Main Group Chemistry, Organometallics and Catalysis)

Our research group is currently focusing on developing catalysts derived from cheaper, Earth-abundant, less toxic, and biocompatible main group elements such as zinc, magnesium, calcium, aluminum, and gallium for various organic transformations. We have synthesized a new class of heterobimetallic complexes, and we are presently investigating their catalytic properties. Additionally, we have created a series of bis-guanidinate supported boron complexes. Notably, we have made significant progress with bis-guanidinate supported magnesium complexes, the findings of which will be published soon.

Dr. Upakarasamy Lourderaj

Field of Specialization: Theoretical and Computational Chemistry

We are interested in the computational studies of the processes that happen during a chemical reaction. We use classical trajectories simulations as a tool to study the dynamics of chemical reactions. The simulation results are compared with experiments. Broadly, we work on the following topics:

- Mechanisms and dynamics of chemical reactions
- Chemical reactions at interfaces
- Development of methods and algorithms for ab initio direct dynamics simulations
- Machine learning in chemical dynamics

Dr. Bishnu Prasad Biswal

Field of Specialization: Materials Chemistry

My research group focuses on developing new materials and investigating their property for potential applications. Our research theme is a combination of experimental chemistry, material science and engineering. In a recent finding, we developed a novel triple-layerdual interfacial (TLDI) approach for the simultaneous fabrication of two different COFMs from a single system. This approach is time and solvent-efficient, and a greener alternative to the traditionally adopted interfacial approach. For the application of COFMs as semiconductors in optoelectronics, it is imperative to understand the underlying physical processes, hence, to study the charge carrier dynamics in COFMs, time-dependent THz spectroscopy was employed. The COFMs exhibit excellent transmittance (80%) at THz frequencies, accompanied by high intrinsic THz conductivity (100 S/m) [Adv. Mater. 2024, 36, 2312960]. For establishing functionalized COFs and COFMs in optoelectronic devices, we also studied in detail their electrical conductivity [J. Phys. Chem. C, 2023, 127, 17, 8352–8361] and NLO response[Mater. Adv., 2024, 5, 1017-1021]. For the first time, to eliminate the thermo-optic nonlinearities, an ultra-short pulse was used to map the third-order NLO responses of a series of cyclotriphosphazene-based organic frameworks. The progress of COFs as an emerging class of NLO materials also has been summarized in a minireview article

[Angew. Chem. Int. Ed., 2023, 62, e202218974]. Our group has recently developed a new class of material and named nanoparticle organic networks (NONs), by bridging the concepts of nanoparticle and reticular chemistry. Taking advantage of the processability of NONs and inherent conductivity of the MNPs, NONs were introduced in the semiconducting polymer (SP)-based field effect transistors (FETs) [Chem. Mater., 2024, 36, 3, 1536–1546].

Dr. Arun Kumar

Field of Specialization: Organometallic Chemistry, Secondary Bonding Interaction, Flue Gas Sequestration (Energy and Sustainability)

Focused on the design, synthesis, and structural analysis of novel organometallic derivatives of tellurium, with an emphasis on their potential applications.

Aimed at developing sustainable synthetic methodologies, specifically investigating how secondary bonding interactions contribute to supramolecular self-assembly and structural diversity.

Concentrated on climate change, sustainability, and energy systems, with a focus on creating chemical technologies to capture and sequester greenhouse gases like CO2 and other pollutants (e.g., SO2, NOx, O2, O3, and small molecules).

Priyanka Pandey

Field of Specialization: Polymer Chemistry

SCHOOL OF COMPUTER SCIENCES

Dr.Aritra Banik

Field of Specialisation: Algorithms Design

Dr. Aritra Banik is a researcher with a broad focus on algorithms, particularly specializing in parameterized algorithms and approximation algorithms. My work primarily explores the development and analysis of efficient algorithmic techniques to tackle computationally intensive problems across various domains.

Dr.Subhankar Mishra

Field of Specialisation: Machine Learning

Working on CoreML with specific interests in privacy in graph neural networks, reduction in parameter count and inference time for the models and implicit representations of objects. Other areas of interest include autonomous driving, cultural heritage and health sciences.

Dr. Manoj Mishra

Field of Specialisation: Secure Multiparty Computation

The work being done attempts to provide communication lowerbounds for computing functions privately, across multiple users.

Dr. Anup Kumar Bhattacharya

Field of Specialisation: Algorithms, Theoretical Computer Science

Dr. Anup Kumar Bhattacharya worked on designing sublinear algorithms for the moment estimation problem and noisy k-means++ problem.

SCHOOL OF EARTH AND PLANETARY SCIENCES

Dr. Liton Majumdar

Field of Specialization: Exoplanets Formation, their Atmospheres & Interiors, Ground and Space-based Astronomical Observations, Astrochemistry

My research interests are at the interfaces of Observational Astrophysics, Molecular Astrophysics/ Astrochemistry, and Exoplanetary Science - primarily focused on understanding how exoplanets form and evolve by studying protoplanetary disks, planet formation, and planetary atmospheres. I am also interested in the application of machine learning, especially in developing and deploying deep learning techniques for the detection and characterization of exoplanets using large observational datasets or grids of theoretical models.

Dr. Guneshwar Thangjam

Field of Specialization: Planetary surface composition and spectroscopy

Understanding planetary formation and evolution, including our unique home - the planet Earth's, is one of the prime science objectives of Planetary Science. In this context, information of planetary surface composition plays an important role to reveal not only the surface characterization but also the sub-surface and interior composition and their formation mechanism allowing to construct the overall evolutionary history. Therefore, study of surface composition and the geology of various planetary bodies are being carried out along with participation and collaboration at national and international platform (i.e., active participation in NASA Dawn mission to the largest asteroids Vesta and Ceres; ISRO Chandrayaan-2 mission to the Moon, etc.). Besides, study of planetary analogue samples and the meteorites or space rocks are also one of the major

activities to decipher the early solar physico-chemical and geologic conditions.

Dr. Jaya Khanna

Field of Specialization: Atmospheric Physics

Research in this group focuses on tropical regional climatology, as impacted both by the land surface and atmospheric controls. We are interested in questions such as – what role do forests play in convective triggering? what are the climatic impacts of landuse change?, what is the role of atmospheric water vapor in causing heat stress over tropical land areas?, what is the role of atmospheric water vapor on convective activity? The underlying theme of most of these studies is to understand the nature and climatic impacts of convection. We investigate tropical rainforests, Himalayan forests and dry tropical land regions to address the above questions. We utilize both observational and modelling tools to investigate these questions. We have recently also started collecting our own surface flux, hydrological and plant physiological data in the Himalayan forests to understand the impact of vegetation on convection in this high topographical setting.

Dr. Jayesh Mahendra Goyal

Field of Specialization: Exoplanets, Planetary Atmospheres, Climate Science

Research in Dr. Goyal's NISER Planetary Atmospheres group focuses on observing and interpreting the observations of various exoplanet atmopheres by developing and applying theoretical atmospheric models as well as data reduction pipelines. His group is extensively involved in interpreting the observations from the James Webb Space Telescope and the Hubble Space Telescope. They are also exploring the possibility of utilising the TANSPEC instrument on Devasthal Optical Telescope in Nainital for exoplanet studies. In one of his recent publications with collaborators published in Astrophysical Journal letter, they detected Quartz clouds in the atmosphere of an exoplanet. In another study published in Nature they characterized the atmosphere of WASP-18b using its emission spectra in great details. Recently, an observing proposal by Dr. Goyal's team at NISER was selected to investigate the potential of the TANSPEC instrument on ARIES Devasthal 3.6 Optical Telescope (DOT) for exoplanet atmosphere studies. With one of the Master's student he constrained the albedo of six exoplanets (Arora & Goyal, in review) and with his PhD student, he is investigating the effects of host star abundances on the exoplanet atmosphere, highlighting the importance of adopting stellar abundances while modelling exoplanet atmospheres (Baghel & Goyal, in prep). Dr. Goyal is also part of Astronomical Society of India (ASI) and ISRO's Exoplanet working group to draft a vision document guiding the Exoplanet research in India in the short, medium and long-term future. As one of the deliverables of his successful SERB SRG Grant, Dr. Goyal's team has started building an adaptable planetary atmosphere model that could be used to model and interpret observations of any planetary atmosphere, including solar system planets and even Earth.

Dr. Pathikrit Bhattacharya

Field of Specialization: Geophysics

Friction evolution under variable normal stress (experimental, theory) – I worked with experimentalists from the United States Geological Survey and Brown University to understand whether the evolution of frictional strength under variable normal stresses is sensitive to microscopic variations in the bonding quality across frictional interfaces. We developed theoretical models which could be utilized to measure these tiny variations in interfacial 'quality' directly from mechanical data.

Times-of-failures of landslides in response to rainfall events (theory, observation) – In collaboration with Krishnendu Paul, PhD student co-supervised with Santanu Misra at IITK, we derived closed-form analytical solutions for the mechanical response of a landslide mass in response to idealized pore-pressure histories. We also showed that observed times-to-failures can be reproduced for many Indian landslides when forced with real precipitation histories preceding these landslides.

Interplay between aseismic and seismic slip within a seismic swarm in Western India (observations) – With PhD student Ratna Bhagat and collaborators in ISRO and NGRI we relocated earthquakes and inferred aseismic slip within an earthquake swarm in Western India to understand the processes through which aseismic interacts with seismicity in the intraplate setting. Our inferences suggest the role of deep crustal fluids within the swarm which seem modulate both the aseismic slip and seismicity migration.

Dr. Priyadarshi Chowdhury

Field of Specialization: Earth Sciences

Understanding the evolution of continental crust and geodynamics on early Earth using petrology, geochemistry and numerical thermomechanical modelling.

Dr. Surya Snata Rout

Field of Specialization: Cosmochemistry

My present research is focused on these topics:

(a) Paleoflux of extraterrestrial materials falling on Earth: Under this project I and my group members are studying chromite/spinel grains from sedimentary rocks from different time periods to empirically estimate the flux of meteorites falling in the past. One of the main goal of our study is to find any extraterrestrial link to the Permain-Triassic mass extinction event.

(b) Measuring the exposure ages of grains on surface of asteroids: The interaction of galactic- and solar cosmic rays with materials in space leads to formation of defects or amorphization within their crystal structure. The trail of amorphization is known as cosmic ray or solar flare tracks. We are using chemical etching methods to reveal these tracks within grains present in specific meteorites which have sampled materials from the surface of their parent asteroids. The density and nature of the tracks and the concentration of spallation produced noble gases within these grains will tell us their duration of exposure to space radiation and also to any variation in cosmic rays and solar wind flux in the past.

(c) Origin and evolution of carbon-rich asteroids and isotopic evolution of protoplanetary disc: Some type of meteorites (e.g. CI and CM) are assumed to have been derived from carbon-rich asteroids and these meteorites show extensive reaction between water and minerals. We are investigating the physical and chemical conditions during this reactions within the parent asteroids of these meteorites. In addition we are also studying the isotopic concentration of different phases which might have escaped this reaction and represent the pristine materials from which our solar system formed. We aim to understand the evolution and delivery of volatile materials in the solar protoplanetary disc by comparing our data with numerical models.

SCHOOL OF HUMANITIES AND SOCIAL SCIENCE

Dr. Pranay Swain

Field of Specialization: Social Development (Education, Health and Livelihood), Science-Society Interface, Contemporary Social Issues and Social Transformation

- Taking the conceptualization of teachers' life world forward encompassing various existing theories, we wish to draw more insights from empirical evidences and contextualize lifeworld and offer implementable stakeholder centric policy interventions. We have also added the recent initiatives of OAV into our fold of investigation to understand the push/pull factors and the roles of teachers.
- Human-wildlife conflict does not seem to wither away any time soon. Its impact on the wellbeing of people on the margin worldwide remains a concern for conservation scientists, policy makers as well as social scientists. Although tangible losses from such conflicts are well documented, hidden health consequences and community-based mitigation mechanisms remain under-researched. We intend to carry forward the existing work and bring out sustainable mechanisms for wildlife conservation and human-wildlife coexistence in the shared landscape.
- Waste is culturally constructed and hence subjective to individuals who generate and manage it (Pongracz, 2002). With rapid urbanization and population growth resulting in substantial increase in waste generation in urban areas, solid waste management falls short of the desired level and the existing mechanisms do not appear so efficient and adequate (Kaza et al., 2018). There is a need to make substantial improvement in the waste management practices prevailing in the city to raise the standards of health, sanitation and urban environment. We have been investigating various sociological aspects of waste segregation and littering behaviour at household level and intend to bring out evidence-based approach that can be leveraged for public policy.
- Sowa Rigpa, or the Amchi system of medicine that is deeply rooted in Buddhist teachings and religion, is a central concept to Tibetans and Ladakhi. It is a medical system promoting the health of the people and acts as a politico-social mechanism to regulate the daily life and food habits of the people, which are strategies contributing to the social success of society. Medical systems are embedded cultural, social, political, and economic surroundings of

the societies they are practiced in. They cannot be considered uncoupled from these parameters, including as well as their geographical and climatic settings as further influences (Besch, Florian 2006). Our research endeavour attempts to understand the role of Amchi medicine in promoting the overall health of the community, to understand the correlation between the Amchi system and its association with the indigenous Identity, and to explore the role of political associations and religious practices on the Amchi medical system.

- Another ongoing research, though at a very nascent stage, investigates the intricate interplay between climate change, global sea-level rise (SLR), and the impacts of sea-level rise on the coastal regions of India. Through an interdisciplinary approach, we attempt an overview of the global consequences of SLR on coastal communities, exploring economic, social, and environmental impacts on agriculture, communities, and coastal areas. Sea level rise and climate change are causing significant challenges to coastal habitats and human health, such as deforestation, fertilizer runoff from agricultural lands, and untreated sewage (Barbier et al., 2011). With this backdrop we intend to examine the displacement of communities, impact on food security, infrastructure, tourism and ecological loss based on a comprehensive empirical study. The study emphasizes sustainable preservation of coastal ecosystems and the development of climate-resilient infrastructure, and aims to offer a detailed understanding of the evolving landscape of coastal livelihoods, providing valuable insights for adaptive strategies, policy formulation, and sustainable development. Ultimately, it aims to contribute to the scientific discourse by shedding light on the complex dynamics between climate change, SLR, and coastal communities, guiding efforts toward a resilient and sustainable future.
- The experiences of vaccination programmes worldwide during the COVID-19 pandemic tell us that massive vaccination still remains one of the most important preventive measures for a virus of this kind. The crisis of such extraordinary magnitude required fast-tracking and production of vaccines at an unprecedented pace and rolling out mass vaccination programmes for making rapid immunization possible. Albeit small in number, existing research suggests that there is a complex web of social factors embedded within the community structures that adversely shape perceptions and acceptance of vaccines. Muridzo et al. (2023) discussed four social determinants of COVID-19 vaccination: vaccination priority groups, vaccination hesitancy due to myths, social exclusion, and corruption. To promote inclusive and sustainable vaccination, it would be beneficial to identify and understand the empirically grounded and evidence based social determinants and their association with hesitant individuals (Waszkiewicz, et al., 2022).
- Objectives: The objectives are two-pronged: (i) to understand the social determinants of vaccine acceptance or resistance and (ii) to propose structures for effective communication and sustainable vaccine campaigns. The empirical study is envisaged to generate implementable insights and policy recommendations from quantitative and qualitative data gathered through survey and interviews among respondents from representative population cutting across demographics and population segments.
- Envisaged Outcome: To effectively promote vaccination, the government should extend vaccine education, to reduce the level of vaccine hesitancy or reluctance. The survey results may help public health authorities to prepare a more effective communication materials, and vaccination campaigns and guidelines.

Dr. Amarjeet Nayak

Field of Specialization: Speculative Fiction, Translation Studies, Postcolonial Studies, Popular Culture

The research work with my postdoc scholar examines the intersection of culture and ecocriticism in literary studies using Hubert Zapf's model of three interrelated discursive procedures. It assumes that literary forms inherently reflect ecological agendas within cultural systems. It explores theoretical backgrounds, and discusses the corpora of Himalayan and Sundarban literature, addressing a research gap in their ecocritical and cultural study. This research focuses on works by Stephen Alter and Amitav Ghosh, emphasizing the regions' ecological and multicultural diversity. With my PhD scholars, our research work has focused on diverse areas such as Purulia Chhau as a cultural text, exploration of the idea of a quest for home in J. M. Coetzee's Jesus trilogy novels, study of select historical fiction from Northeast India, etc.

Dr. Amarendra Das

Field of Specialization: Just Energy Transition, Tribal Education, Post Disaster Need Assessment, Regional Disparity, Natural Resource Management, Environmental and Ecological Economics, Public Finance

Established DST Centre for Policy Research on Energy Transition and Tribal Education.

Generation of energy, especially from fossil fuels, is a major contributor to the global warming and climate change. Several international treaties are aiming to reduce the carbon emission from energy production by transitioning towards cleaner sources of energy. At COP 26, the Prime Minister of India has announced to cut down the carbon emission drastically and achieve net zero emission by 2070. In this context we need to understand the drivers of energy transition in India and most suitable economic instruments to achieve the just transition. Eastern Indian, which rich in minerals face a unique situation to achieve just energy transition. How can eastern Indian states achieve the just energy transition? Our ongoing research aims to answer these questions.

Natural disasters are causing enormous damages and losses to the households, market, government and nature. At COP 27, member countries have agreed to create a Loss and Damage fund. However, the existing methodologies for the estimation of damages and losses have a number of limitations. In our research we are reviewing the gaps in the existing methodologies for the estimation of damages, losses and needs for building back better. We are also documenting the coping strategies of farmers against various natural disasters.

Economic theories point out that democratic nations provide inclusive growth and autocratic nations provide exclusive growth. However, it is observed that India in spite of being a democratic nation has wide regional disparity. States ruled by stable governments also suffer from wide regional disparity. How do we explain this phenomenon? In our ongoing research we try to understand the role of formal and informal institutions in explaining the regional disparity within democratic states.

Economic valuation of natural resources is essential for its conservation and sustainable management. For non-renewable resources we need to take into consideration the negative externalities of mineral extraction and opportunity costs of mineral use while using them for the present generation. Integrated environmental and economic accounting of mineral resources provides the framework of sustainable wealth accounting. In our ongoing research we are doing the integrated environmental and economic accounting of selected mineral resources of India and calculating the genuine savings of major Indian states.

Conservation of ecosystems is crucial to achieve sustainable development. Rich biodiversity not only ensures resilience of the nature but also the humanity. Economic valuation of ecosystem services helps in the realisation of services provided by the nature. Thus it helps in the conservation of sensitive ecosystems. Payments for ecosystems would incentivise the conservators of ecosystem services. In our current research we are establishing the interlinkages between agroecosystems and other ecosystems and doing the valuation of agroecosystems.

Dr. Joe Varghese Yeldho

Field of Specialization: Urban Spaces and African American Literature

Figural representations of dwelling and Habitation in African American urban narratives.

Dr. Rooplekha Khuntia

Field of Specialization: Psychology

Recent research centred around developing a psychometric instrument to assess Unconditional Self-acceptance (USA). Although the construct USA is regarded as a source of psychological strength and has been found to have positive impact on the overall wellbeing of individuals, there is little empirical data to support this claim. The study also sought to explore certain correlates of USA both in the personal and professional domains of life.

Ongoing research aims to create a visual based method for comprehending the attachment pattern and emotional understanding of institutionalized children. The care that children receive in their formative years is most crucial for their development. In the absence of primary caregivers, institutions have a significant impact on the emotional development of vulnerable children. Although there is an increasing number of children requiring care and protection in our country, the establishment of quality foster care system is still in its early stages, resulting in a greater reliance on institutional care. Given the psychosocial significance of quality caregiving, the present research aims to explore the interplay of sociodemographic and psychosocial aspects of the child, caregivers and institutions and their impact on the emotional development of these children.

SCHOOL OF MATHEMATICAL SCIENCE

Prof. Brundaban Sahu

Field of Specialization: Number Theory

- Using a simple extension of Ramanujan-Serre derivative map we give a general method to derive triple convolution sums of the divisor functions.
- We study nonvanishing of kernel functions, Poincare series and Dirichlet series associated with Jacobi forms of matrix index.
- We establish a converse theorem for Jacobi forms of half-integral weight.

Dr. Anil Kumar Karn

Field of Specialization: Order theoretic Functional Analysis

To understand the order theoretic aspect of a C*-algebra, it is imperative to know order unit spaces which sit on the fence of commutative and non-commutative theories of C*-algebras. A better knowledge of the geometry of order unit spaces should in turn lead to a non-commutative version of Kakutani theorem. It may be recalled that the Kakutani theorem for M-spaces provide an order theoretic characterization of commutative C*-algebras.

Dr. Binod Kumar Sahoo

Field of Specialization: Incidence Geometry

My research work is related to the characterization of minimum size blocking sets in the n-dimensional projective space PG(n,q) over a finite field of order q with respect to certain lines having nicegeometric descriptions, namely the external, tangent and secant lines with respect to a quadric in PG(n,q).

Dr. Deepak Kumar Dalai

Field of Specialization: Cryptography and Boolean function

- Study of cryptographically significant Boolean functions
- Cryptanalysis of Stream ciphers

Dr. Jaban Meher

Field of Specialization: Modular forms

We have worked on the zeros of Koecher-Maass series attached to Siegel modular forms of degree 2. In a joint work, we have proved that Koecher-Maass series attached to certain Siegel modular forms of degree 2 have infinitely many zeros on the critical line.

Dr. Kamal Lochan Patra

Field of Specialization: Algebraic graph Theory

- Graphs associated with groups: We study properties of several types of graphs associated with different finite groups.
- Centrality in connected graphs: We study different central parts of connected graphs and some related indices.

Dr. Manas Ranjan Sahoo

Field of Specialization: Partial Differential Equations

The existence, uniqueness, and regularity of solutions to the Cauchy problem posed for a nonhomogeneous viscous Burger's equation were shown by Chung, Kim, and Slemrod [J. Differential Equations 257 (2014), no. 7, 2520–2542.] by assuming suitable conditions on initial data. Moreover, they derived the asymptotic behavior of solutions to the Cauchy problem by imposing additional conditions on initial data. We obtained the same asymptotic behavior of solutions to the Cauchy problem without imposing additional conditions on the initial data.

Dr. Panchugopal Bikram

Field of Specialization: Operator algebra and ergodic theory

My research area is operator algebra and Ergodic Theory. I study one-parameter family of endomorphisms on von Neumann algebras and structure theory of von Neumann algebras, Connes's classifications theory of type III factors and various other properties of type III factors and various dynamical systems on von Neumann algebras. I also study various ergodic properties of dynamical systems.

Dr. Ritwik Mukherjee

Field of Specialization: Enumerative Geometry

I work in the topic of enumerating singular curves in projective spaces. A notorious obstacle to achieving this goal is the problem of excess intersection theory. Recently (along with my collaborators), we found a new way of looking at enumerative problems, which can often bypas the issue of excess intersection theory. We have been able to enumerate rational curves with an m-fold point for a general m, when in the past this question had only been solved for m=3; even the case of m=4 was essentially unapproachable.

Dr. Sanjay Parui

Field of Specialization: Harmonic Analysis

My board research area is Euclidean Harmonic Analysis. Dunkl operators are generalization of partial derivatives and there is a parallel analysis associated with Dunkl operators analogues to Fourier analysis. It is very natural to extend classical results of Fourier analysis in the context of Dunkl analysis. I have studied boundedness of Fourier multiplier theory both linear and bilinear in Dunkl set up which generalizes some of the results of classical Fourier multiplier operators. It is to be noted due to the intrinsic nature of Dunkl translation operator proofs of many classical results need new techniques and ideas.

Presently I am interested in working with semi noncommutative harmonic analysis which is a very active research area at present.

Dr. Sutanu Roy

Field of Specialization: Quantum groups, Operator Algebras, Noncommutaive Geometry

We have constructed anyonic quantum permutation groups. They are examples of braided compact quantum groups over finite cyclic groups. We have shown that they capture braided (generalized quantum) symmetries of finite spaces. In the similar spirit, we have constructed braided quantum symmetries of graph C*-algebras.

Dr. Anupam Pal Choudhury

Field of Specialization: Partial Differential Equations

- Exploring general hyperbolic systems in the framework of the space of functions of fractional bounded variation.
- Studying stability issues in Inverse problems

Dr. Dinesh Kumar Keshari

Field of Specialization: Functional Analysis

We consider analytic Hilbert modules H over the polynomial ring consisting of holomorphic functions defined on a G- space Ω in C^m. We investigate the question of which of these are homogeneous under the natural action of the group G lifted to H. In a departure from the past studies of such questions, here we don't assume transitivity of the group action. The main result is that the unitary invariants like the curvature and the reproducing kernel of a homogeneous analytic Hilbert module are now determined from their restriction to what we call a fundamental set Λ for the group action. In case, the group action is transitive, Λ is a singleton. Applying the techniques, we study the analytic Hilbert modules based on the symmetrized bi-disc G_2 and its homogeneity under the automoprhism group of G_2.

Dr. K. Senthil Kumar

Field of Specialization: Number Theory

The famous unsolved Lehmer's problem asks for a universal lower bound of the form 1+c with c>0 for the non-zero algebraic numbers different from the roots of unities. In two joint works with my PhD student, we obtain several new lower bounds for Mahler's measure of some large class of algebraic numbers.

I proved some new transcendence results for the values of Weierstrass z zeta and Sigma functions at algebraic numbers. Recently, I extended these results to the Serre and Jacobi theta function. Our results are more general and apply to several quasi-periodic functions and theta functions.

Dr. Kaushik Majumder

Field of Specialization: Combinatorics

- Pursuing research work on the lower bound of Ramsey numbers.
- Pursuing preliminary research work on the Random matrices.

Dr. Nabin Kumar Jana

Field of Specialization: Probability Theory

For mathematician probabilistic intuition can be treated as tool for many subjects including Mathematics. I am working on to apply this notion which is known as probabilistic methods to variety of subjects.

Dr. Ramesh Manna

Field of Specialization: Harmonic Analysis

I worked with operators for which curvature plays an important role. In particular, I worked on local smoothing of Fourier integral operators with application to the wave equation and maximal operators. I also worked on Hardy's inequalities for Ornstein-Uhlenbeck operator and fixed time estimates for the Hermite semigroup. I continue my research on several operators of modulation spaces which play an important role in the study of harmonic analysis and PDE.

Dr. Chitrabhanu Chaudhuri

Field of Specialization: Algebraic Geometry

I work in Teichmuller theory and Enumerative geometry. Both topics are related to Moduli of Riemann surfaces and have connections with various different areas of mathematics and theoretical physics.

Dr. Krishanu Dan

Field of Specialization: Algebraic Geometry

My work is related to the linear series of higher dimensional varieties: Seshadri Constants and Syzygy bundles. Seshadri constants play an important role to recognize local behavior of varieties and it's very very hard to compute. Getting effective bounds for Seshadri constant is a very active area of research. Stability of Syzygy bundles is another aspect that I'm interested in. While the results are known over curves and surfaces, no general results are known for higher dimensional varieties. Finding a good bound for surfaces is challenging. This is an ongoing work with my PhD student.

Dr. Rekha Biswal

Field of Specialization: Representation theory of affine Kac-Moody algebra

I have been thinking about identifying characters of Demazure modules with well-known symmetric functions. Characters of level one Demazure modules are proven to be specialised Macdonald polynomials which has been studied extensively by large number of mathematicians in different settings. However not much is Known in case Demazure modules of arbitrary level. Very recently I figured that Characters of arbitrary level Demazure modules might be connected to well Known symmetric functions known as LLT polynomials and I have been trying to further explore this connection.

Dr. Sudhir Kumar Pujahari

Field of Specialization: Number Theory

I have been interested in arithmetic and statistics of Fourier coefficients of modular forms and relational points of varieties. Moreover, I have also been interested in zeros of L-functions or Dirichlet series. One of the main focuses of my research has been in the neighborhood of Sato-Tate conjecture. The Sato-Tate conjecture says that the normalized eigenvalues of Hecke operators are equidistibuted in $[-2,2]$ with respect to the Sato - Tate measure. In this direction, I have been interested in a finer version of Sato-Tate conjecture. More explicitly, we have been studying Sato-Tate conjecture in arithmetic progressions. Regarding the zeros of Dirichlet series, we have investigated the zeros of derivatives of Rieman zeta function.

Dr. Sumana Hatui

Field of Specialization: Representation theory

The theory of projective representations emerged as a tool for investigating the structure of a finite group, and became one of the central areas of algebra, with important connections to several areas of study such as topology, Lie theory, Mathematical physics, and Quantum mechanics.

My work is related to the construction of irreducible projective representations of groups. We gave new tools to construct projective representations for different kind of groups. This will give a new direction for the mathematicians working in this area.

Dr. Tushar Kanta Naik

Field of Specialization: Algebra (Group theory and related topics)

The classification of finite dimensional nilpotent Lie algebras is an important topic in the subject of Lie theory. We classified finite dimensional nilpotent Lie algebras with two centralizer dimensions over a finite filed, and obtained several partial results over arbitrary field.

The virtual braid group, the virtual twin group, and the virtual triplet group are extensions of the symmetric group, which are motivated by the Alexander-Markov correspondence for virtual knot theories. The kernels of natural epimorphisms of these groups onto the symmetric group are the pure virtual braid group, the pure virtual twin group, and the pure virtual triplet group, respectively. We investigated commutator subgroups, pure subgroups and crystallographic quotients of these groups.

SCHOOL OF PHYSICAL SCIENCE

Prof. Sudhakar Panda

Field of Specialisation: String theory

- A generalized scalar thermal operator representation in real time formalism has been constructed.
- Aspects of quantum entanglement in de Sitter space has been investigated in the context of string theory

Prof. Bedangadas Mohanty

Field of Specialisation: Experimental High Energy Physics and Dark Matter Group

Group Members:

Dr. Ranbir Singh	Dr. Varchaswi Kashyap
Ms. Mouli Chaudhuri	Mr. Prottay Das
Ms. Swati Saha	Mr. Sudipta Das
Mr. Bappaditya Mandal	Mr. Sawan
Ms. Sarjeeta Gami	Ms. Dipanwita Mandal

Research Overview

The group is involved in research activities related to heavy-ion physics experiments, ALICE at Large Hadron Collider (LHC), CERN, STAR experiment at Relativistic Heavy Ion Collider (RHIC), BNL, and CBM experiment Facility for Antiproton and Ion Research, GSI, and the dark matter experiment SuperCDMS. We are involved in both physics analyses and detector hardware and our main contributions are discussed below.

ALICE

A Large Ion Collider Experiment (ALICE) at the Large Hadron Collider (LHC) is a dedicated heavy-ion experiment. The primary physics goal of ALICE is the study of strongly interacting matter at extreme conditions of temperature and/or energy densities, where a deconfined phase of QCD matter called quark-gluon plasma (QGP) forms. Our group is involved in various physics analyses with main focus on the measurements of hadronic resonance production in different collision systems, correlations and fluctuations, and ultra-peripheral collision studies. We have performed systematic studies of resonance production in different collision systems at various center-of-mass energies and contributed in establishing the rescattering effect during the hadronic phase of heavy-ion collisions. Another physics goal in ALICE is to search for the evidence of strong magnetic field and large angular momentum produced in ultrarelativistic heavy-ion collisions. For these studies we are involved in the polarization measurement of vector mesons. We are also looking for the exotic resonances with parton structure different from baryons and mesons.

STAR

The STAR experiment at the Relativistic Heavy-Ion Collider (RHIC) facility primarily aims to understand the properties of strongly interacting matter formed, study the dynamics, mechanism of particle production and explore the Quantum ChromoDynamics (QCD) phase diagram in heavy-ion collisions. Event-by-event fluctuations of conserved quantities in string interactions, such as, baryon number (B), strangeness (S) and electric charge (Q) have been predicted as sensitive observables in probing the QCD phase diagram, particularly the nature of underlying phase transitions of matter created in high-energy nuclear collisions and the QCD critical point associated with the phase transition. Fluctuations measured via the higher moments/cumulants of event-by-event multiplicity distributions of net-proton, net-kaon and net-charge are expected to show large fluctuations near the QCD critical point. A beam energy scan program (BES-I & II) was carried out at STAR to perform such studies. The high statistics data collected at a range of collision energies allows us to precisely explore the QCD phase diagram and hunt for the QCD critical point. Currently, we have performed precise measurement of cumulants of net-particle distributions from BES-II data for Au+Au collision at $\sqrt{s_{NN}}$ = 7.7 GeV and 9.2 GeV.

SuperCDMS

SuperCDMS is a direct dark matter search experiment that uses cryogenic solid state detectors to look for nuclear recoil signals from dark matter. In SuperCDMS, NISER is currently involved in detector calibration, characterization, testing and background studies.

1. We are currently working on extending the background models to set limits on the existence of ALPs (Axion Like Particles) and dark photons.
2. The next generation HVeV (High Voltage Electron Volt) detectors are being studied using the Compton step analysis. The analysis is under internal collaboration review.

Hardware activities

1. Resistive Plate Chambers or Plastic scintillators for ALICE3 MuonID system:

The ALICE experiment at CERN is planning to upgrade its detector in the coming years. One of its crucial subsystems is the muon ID system. We are in the process of studying the feasibility of using Resistive Plate Chambers and plastic scintillators with Silicon Photomultipliers for the system. A hybrid RPC has been constructed and its characteristics are being studied for eco-friendly operation. In parallel, simulation studies are being done on an RPC based geometry for the system.

2. ALICE upgrade project Forward Calorimeter (FoCal)

A forward calorimeter is proposed in the ALICE upgrade

for Run 4. ALICE-India collaboration has intended to contribute the electromagnetic part of the calorimeter. Our group is participating in the R&D of n-type silicon pad array detector. A fully functional Si-detector lab has been established at NISER. We have fabricated 8x9 n-type Si-PAD detector in collaboration with Bharat Electronics Ltd., Bengaluru. These detectors are successfully tested with LED and Sr-90 source in the NISER lab and with charged pion and electron beams at Proton Synchrotron (PS) facility at CERN. Two papers based on the detector design, fabrication, lab test, and detector performance in the test beam are now archived.

Prof. Sanjay Kumar Swain

Field of Specialisation: Experimental High Energy Physics

- Study of exclusive non-leptonic decay of Bs->JpsiKs: arXib: 2404.14267
- Study of angular observables in exclusive Bc decays; arXiv 2312. 17114 (submitted to PRD and the reference comments are being prepared)
- Search for Magnetic Monopole using data collected with NOvA neutrino experiment at Fermilab, under committee review
- Study of Seasonal variation of multi muon events using the data collected with NOvA detector, under committee review

Several coauthored papers from CMS as mention in the link below:
https://cms-results.web.cern.ch/cms-results/public-results/publications/CMS/index.html

Prof. Subhankar Bedanta

Field of Specialisation: Condensed Matter Physics

Spintronics is an emerging field of research to understand various physical phenomena and underlying physics in search of extremely low-power devices in the modern era. We've worked on a variety of fields this year, including domain wall dynamics, skymions in thin films, spin pumping, organic spintronics, magnon-magnon coupling, ferromagnet (FM)/fullerene system on flexible substrate, synthetic antiferromagnets (SAF), spin-orbit torque (SOT), flexible spintronics etc.

Spin pumping is now being observed in many FM/HS systems where HS is the high spin-orbit coupling material, such as transition metal dichalcogenides (TMD), antiferromagnets (AFM), and ferrimagnets (FiMs). In our group, we have investigated spin pumping in La0.67Sr0.33MnO3/Pt, NiFe/Mn2Au, NiFe/IrO2, CFB/MoS2, TmIG/Pt, YIG/Pt, etc. We have also taken advantage of spinterface (interface of a FM and organic semiconductor) to enhance the spin pumping in CoFeB/β-W systems. Magnon-magnon coupling has also been explored in FiM/FiM systems.

Further, our group focuses on domain and skyrmion dynamics. Recently, we have stabilized skyrmions in Pt/Co/Pt and Pt/Co/Re thin films at room temperature (RT). We have successfully optimized synthetic antiferromagnetic (SAF) thin film using Ir or Ru as a spacer layer and synthetic ferimagnets thin film using Co/Gd. Recently, we have stabilized skyrmions in Pt/Co/Ir and Pt/Co/Gd thin films at room temperature (RT). We have observed high density skyrmion for Pt/Co/Ir system. Our group also focuses on strain-dependent studies on magnetic properties. We have achieved an enhanced DW velocity under compressive strain which is very promising for device application viewpoint. We have created a spin orbit torque (SOT) set-up to investigate the anomalous Hall effect in the FM/heavy metal systems. In addition to the experimental works, we also perform OOMMF and MuMAX simulations to understand various modelled systems to mimic a few experimental results.

Dr. A. V. Anil Kumar

Field of Specialisation: Theoretical Condensed Matter Physics

The group led by Dr. Kumar aims to understand the complexity in understanding the interaction between charged colloidal particles in solutions in order to unravel some basic physics. Their research activity is described below.

The interactions between charged colloidal particles in solution can be complex and varied. One particularly interesting case is when the particles attract one another at small separations, but repel at larger separations. These competing interactions lead to very rich phase behaviour in these systems like formation of cluster fluids. Our investigations on a highly size-asymmetric binary colloidal mixtures shows that counter ion distributions around the colloidal particles are nonlinear and this leads to highly non-additive interactions between the two components. In such an asymmetric mixture, even though likely charged, larger colloidal particles form a cluster fluid which is in very good agreement with experimental findings. Similar effects may be observed in the case highly charge-asymmetric mixtures also. We are investigating the effect of this charge/size polydispersity in colloidal

mixtures on phase behaviour and dynamical properties using classical molecular simulation methods such as Monte Carlo and molecular dynamics. (This work is being carried out in collaboration with Prof. J. Horbach at German Aerospace Center (DLR), Köln, Germany).

Dr. Ajaya Kumar Nayak

Field of Specialisation: Condensed Matter Experiment

In the following a summary of the primary research work performed in the last one year is discussed.

Topological antiskyrmion in D2d symmetric Mn–Ni–Ga single crystalline device:

Antiskyrmions are topologically protected nontrivial chiral spin configurations with a topological charge of -1 and are considered as excellent candidates for the future high density memory devices due to their stable magnetic texture. The D2d crystal symmetry of the inverse tetragonal Heusler system allows the formation of chiral helix propagating in the [100] or [010] directions. Application of magnetic field gives rise to the stabilization of antiskyrmion in the system. In our work, we show the presence of two distinct Hall signals in the single crystalline Hall devices of a D2d symmetric antiskyrmion host Mn2NiGa system. When the magnetic field is applied along the [001] direction, a dip-like anomaly in the Hall resistivity data is observed, signifying the presence of topological Hall signal originating from the antiskyrmion phase. Contrary, the in-plane device exhibits an aberrant hump-like feature in the Hall resistivity data that can be tuned with applying a rotating magnetic field. We have demonstrated that the hump-like anomaly emerges from the existence of a two-component anomalous Hall effect arising due to the presence of twinning microstructure. Our study provides an important insight into the stability and evolution of the antiskyrmion phase under the oblique magnetic fields and helps in decoupling of anomalous Hall signals in the non-topological magnetic phases.

Large anomalous Hall effects in electron doped kagome magnet Mn3Sn:

The observation of large anomalous Hall effect (AHE) in certain non-ferromagnetic/ferrimagnetic materials suggest that the magnetization of the system is not a critical component for the realization of the anomalous Hall effect (AHE). In fact, the presence of a non-coplanar magnetic state can give rise to some additional component to the anomalous Hall effect. In this direction, we have studied the effect of electron doping on the AHE of the antiferromagnetic (AFM) Mn3Sn. Owing to the geometrical frustration in the kagome lattice, Mn3Sn displays a triangular antiferromagnetic order. This AFM phase can be understood considering the exchange interaction within the Heisenberg model. We have carried out a detatiled theoretical and experimental study to demonstrate that the presence of higher-order exchange interactions corresponding to multiple hopping between different Mn-sites. With the help of Density Functional Theory calculations, we show that the higher-order exchange terms prefer an out-of-plane alignment of the Mn moments, resulting in a canted magnetic state, further established by neutron diffraction study in the electron-doped Mn3Sn samples. Interestingly, we find a large scalar spin chirality (SSC) induced Hall signal that can be significantly tuned with the degree of non-coplanarity in the system. We carry out 60 T magnetic and Hall resistivity measurements to demonstrate the role of canted magnetic structure induced SSC in the observed Hall signal. We also illustrate a simultaneous manipulation of two-component order in the system, where the anomalous Hall effect (AHE) arising from the in-plane triangular AFM order can switch its sign without affecting the Hall signal generated by the higher-order interaction stabilized SSC. The present study opens up a new direction to explore novel quantum phenomena associated with the coexistence of multiple magnetic orders and their prospective use in AHE-based devices.

Dr. Amaresh Kumar Jaiswal

Field of Specialisation: Theoretical High Energy Nuclear Physics

Relativistic dissipative fluid dynamics, Relativistic kinetic theory and transport models, Thermal and blast wave models, High-energy heavy ion collisions and QCD matter.

Dr. Anamitra Mukherjee

Field of Specialisation: Theoretical Condensed Matter Physics

We are working on: (i) application of a novel approach to study finite temperature properties of the Hubbard model (ii) We are developing a new method for calculating few-body Green's function on interacting many particle ground states at partial filling. (iii) We are applying slave particle theories to study the interplay of interaction and topology in low dimensional systems (iv) Application of spin wave study for Resonant inelastic X-ray spectroscopy (v) Finite temperature study of spin-liquids in generalized Kitaev model.

Dr. Colin Benjamin

Field of Specialisation: Theoretical Condensed Matter Physics, Quantum Information Theory, Game Theory

Theoretical nanoscience: Quantum noise and their applications, Pairing symmetry of unconventional and topological Superconductors.

Quantum Information: Quantum walks and single particle entanglement, Quantum cryptography and Topological Physics.

Game theory: Cooperative behavior in the thermodynamic limit.

Dr. Kartikeswar Senapati

Field of Specialisation: Experimental Condensed Matter physics

Overall Theme of Research:

Study of Josephson Devices and Josephson coupled Superconducting films.

Description: We fabricate nanoscale Josephson Devices such as Junctions and SQUIDs using various lithographic processes and study their transport behaviour at low temperatures. Along this line we have undertaken the following experiments in the last year.

(a) Research on the Detection of Rashba-Edelstein effect using Josephson junctions and SQUIDs was concluded and published. We showed that Josephson junctions can be assigned an arbitrary phase using the Rashba-Edelstein interface which may be useful for quantum computation circuits.

(b) Using focused ion beam based local irradiation technique we have managed to create Josephson barriers in superconducting NiBi3 nanowires. Characteristic Josephson behavior has been verified using magnetic field dependent Fraunhofer measurement.

(c) One ongoing project is focusing on combining spin-orbit interactions and ferromagnetic interactions for generation of triplet supercurrent in vertical nanoscale junctions.

Along with the device related work, we are also investigating superconductivity in NiBi3 nanoscale structures. In this direction we are performing the following experiments.

(a) We successfully fabricated single crystal superconducting nanowires of NiBi3 using physical vapor deposition and also measured a single nanowire to demonstrate superconductivity. This work has been published too.

(b) We have shown that inter-grain Josephson coupling can lead to negative magnetoresistance and Magnetoresistance oscillations in superconducting nanowires. This work is under review and uploaded to the ArXiv (https://arxiv.org/pdf/2305.00958).

Dr. Nishikanta Khandai

Field of Specialisation: Astrophysics and Cosmology

The broad areas of research I am working on are listed below.

- Constraining the Stellar Mass Function of Gas Rich Galaxies in the local Universe.
- Measuring the clustering of Gas Rich Galaxies in the local Universe.
- The dependance of dark matter halo shapes on the index of the power spectrum.
- Understanding the Properties of Metal Absorbers in the IGM and CGM
- The detection of Gravitational Waves from Supermassive Blackhole Mergers in next generation detectors.
- The dissociation of gas and dark matter profiles in galaxy mergers.
- Studying high redshift galaxies and quasars in the era of JWST.

Dr. Prasanjit Samal

Field of Specialisation: Density Functional Theory

Our DFTQSG research activity is focused on theoretical and computational condensed matter physics, primarily studying the electronic structure of atoms, molecules, and solids employing density functional methods, machine learning, and high-throughput techniques. We are involved in developing methods and scientific software. Materials design, including computing electronic, magnetic, and structural properties and responses from first principles using density functional theory and other suitable quantum many-body techniques, is the primary part of my research. Our developments, exploration, investigation and studies contribute to the exciting field of computational material science that covers all the emerging multidisciplinary fields and brings together the priority areas of condensed matter physics, materials sciences, materials chemistry, chemical and mechanical engineering and data science. We aim to transfer the experimental and practical material research into the first principal based model by using proper approximations that rely on microscopic to macroscopic dimensionality. The main vision of our

research is based on the computation realization of the material properties and manipulating the electronic structure from proper understanding that having societal benefit, e.g. in electronics, device, and energy-related problems.

Dr. Pratap Kumar Sahoo

Field of Specialisation: Experimental Condensed Matter Physics

Ion beam-induced modification, 2D materials, Nanowires and nano-particle synthesis for photonic, plasmonic application.

The group led by Dr. Pratap K. Sahoo is devoted to experimental investigations in two major areas: (a) ion-matter interactions for new material engineering for optoelectronic and photonic applications, (b) multifunctional properties of nanomaterials such as 2D materials, ZnO nanorods, TiO2 nanorods for device applications. The highlights of my research activities along these two directions are as follows:

(a) Ion matter interactions for materials engineering:

Ion-matter interactions are beneficial for various phase synthesis and materials engineering. The nuclear and electronic energy deposition in the materials is mainly responsible for such material modifications. In case of high energy > 5 MeV, the energy deposition can raise the temperature up to 1000 kelvin in the materials along an ion track of radius 2-10 nm, which can alter the properties of the material drastically. One can continuously tune the implantation energy, leading to various energy-dependent effects on the host material, ranging from nanoscale pattern formation, ion beam-induced mixing, ion beam-induced crystallization, and functionalization etc.

(b) Multifunctional properties of nanomaterials:

We are focused on 2D materials like TiSe2, NbSe2, Bi2Se3 etc, nanoparticles, and nanowires which is largely driven by the possibility of useful functionalization of these nano-systems. In addition to their application in functional devices, the nanoscale systems also offer a possibility to do fundamental studies in the quantum regime. We have picked one of the most well-established nanorod systems like ZnO, TiO2, for fundamental studies and for novel device fabrication.

Dr. Prolay Kumar Mal

Field of Specialisation: Experimental High Energy Physics, Collider Physics

The Standard Model (SM) of Particle Physics is the theoretical framework explaining the dynamics of the subatomic particles viz., quarks, leptons and gauge bosons, and their interactions. The discovery of the SM Higgs boson by the LHC experiments (ATLAS and CMS) has finally culminated the long-standing puzzle of electroweak symmetry breaking (at least within the context of the SM). However, in spite of its great accuracy in explaining the wide range of experimental data over the past few decades, it has several shortcomings (e.g., no dark matter candidate, mass hierarchy problem, etc.) and it is believed to be a low-energy limit of a more fundamental theory.

Dr. Mal's primary research focuses on the understanding of the basic mechanism responsible for the electroweak symmetry-breaking and to probe new physics beyond the standard Model (BSM) of Particle physics. He works with the CMS detectors at the Large Hadron Collider (LHC) involving the top quark and Higgs boson. Presently, he and his group members are looking for the new physics signatures involving the vector-like quarks (VLQ), which can potentially stabilize the Higgs mass at the electroweak scale. At the LHC, VLQs are can be produced through both strong and electroweak interactions. Extensive searches for the VLQs have been performed with the LHC Run II dataset at $\sqrt{s}$=13 TeV, but no statistically significant excess over the SM background have been observed.

In addition, he is leading the NISER-CMS group in terms of CMS detector upgrade program scheduled in next few years. For the High Luminosity operations of the LHC (HL-LHC) the CMS Outer Tracker (OT) would completely be replaced with a new Silicon pixel/strip detectors to cope up with the enhanced interaction rates. Here numerous OT detector modules are planned to be assembled, integrated and tested at NISER, before being transported to CERN for commissioning into the CMS experimental cavern. The facility set up and successful prototyping of such silicon detectors have been completed under the leadership of Dr. Mal, while 2-3 years long production phase for CMS tracking detectors is expected to start soon.

Dr. Shamik Banerjee

Field of Specialisation: High energy physics, String theory

My works have important applications in the S-matrix Bootstrap programme. The central goal of the bootstrap programme is to calculate scattering amplitudes or S-matrix elements using constraints following from general principles like locality, unitarity, causality etc. In particular one does not know the Lagrangian of the theory beforehand. Therefore the standard techniques do not work. Now, in some cases the system under study may have large amount of symmetry. This

happens specifically in two dimensions where the symmetry group may also become infinite dimensional. In these cases one can sometimes compute correlation functions exactly. So how is this related to the scattering amplitudes of a four dimensional theory? The connection is through holography which states that in asymptotically flat space time the scattering amplitudes are the same as the correlation functions of a two dimensional field theory. We do not yet know the Lagrangian of the theory but the theory enjoys an infinite dimensional symmetry called the W-algebra. In our work we have classified the two dimensional theories theories which are W-invariant and have written down the differential equations which the correlation functions of these theories have to satisfy.

Before our work only two theories, MHV sector and the self-dual gravity, were known to be W-invariant. Our work, for the first time, shows that there are an infinite number of such theories whose correlation functions are exactly calculable within three hundred words.

Dr. Sumedha

Field of Specialisation: Statistical Physics

Phase diagram of random field spin models: We have formulated a new method to solve field disorder magentic systems and have been using them to get the phase diagram and behaviour of these very important class of models, which have wide applicability in both condensed matter and high energy physics. Specifically: 1. we have been studying spin-1 models elucidating the multi-critical points in their phase diagrams. (With PhD student Soheli Mukherjee). Some parts are already published; 2. We have studied at m=2 vector spin models in the presence of magnetic and crystal field disorders and obtained the phase diagrams for different disorder distributions (with Mustansir Barma, TIFR Hyderabad). 3. We have studied a class of repulsive spin-1 models and studied the ensemble inequivalance in these systems (with PhD student Soheli Mukherjee and short term visitor Raj Kumar Sadhu). (Published).

Hysteresis response: We have studied hysteresis response in higher spin magnets, solving the model on tree graphs (with undergrad student B.E. Aldrin and former postdoc Dr. Abdul Khaleque)

New entropic cluster algorithm for extended hard core exclusions models: We have devised new algorithm for a class of hard exclusion models, for which existing algroithms are not very efficient due to hard core constraint (with Dr. Jetin Thomas (ex student and short term visiting scholar at NISER) and Dr. Asweel Ahmed and Prof. R. Rajesh (both IMSC, Chennai) and Dr. Dipanjan Mandal (postdoc Warwick university, UK).

Dr. Victor Roy

Field of Specialisation: High energy heavy-ion collisions

During the period April 2023 - March 2023, we carried out research primarily on (i) the effect of time-dependent longitudinal forces on the evolution of nuclear matter produced in high energy heavy-ion collisions expanding longitudinally according to Bjorken flow and (ii) the effect of baryon stopping on the electromagnetic field at low energy heavy-ion collisions s using Monte Carlo Glauber model.

Dr. Yogesh Srivastava

Field of Specialisation: String Theory, Black Holes

In the past year, I have worked on two projects. First one is about identifying the hair modes for BMPV black holes in the near-horizon limit and developing a CFT interpretation for these hair modes. With my student Subhodip Bandyopadhyay and Prof. Amitabh Virmani , I have done the complete identification of hair modes for 4 dimensional and 5 dimensional black holes. In the process, we obtained a very close connection with some of the work on deformed AdS_3 holography done by Strominger and his collaborators. We are also working on finding hair modes for the microstate geoemtries (called fuzzballs). We also found connections with non-relativistic Schrodinger geometries in 3 dimensions. In another work, with my PhD student (Late) Swayamsidha Mishra and Prof. Sudipta Mukherji from IOP Bhuabneswar, I have completed our work on Quantum fields on Milne spacetime with conical defect in the context of holography. We managed to calculate 2-point functions for AdS-Milne(in Minkowski as well as conformal vacuum states) with defects. We also used AdS-CFT dictionary to find the corresponding CFT correlators. We are currently finishing our work on calculating the drag force on D1-strings in AdS in presence of conical defects.

Dr. Ashis Kumar Nandy

Field of Specialisation: Theoretical condensed matter physics and material science

The exploration of “unconventional physics” driven by spin-orbit coupling (SOC) is a major research thrust in modern material science and condensed matter physics. This field investigates surprising and exciting phenomena arising from engineered materials that utilize SOC effect. This coupling creates a low energy connection between a material’s spin and its orbital motion, leading to entirely new phases of matter.

Imagine 'chiral spin structures'–swirling patterns of magnetism that exist in real space (like topological textures and chiral domain walls) or even in momentum space (like novel surface states in quantum materials). These are just some examples of the possibilities that arise from SOC interacting with low-dimensional materials or materials with broken symmetry. My research explores this exciting world using a multi-scale theoretical framework. We begin by employing first-principles electronic structure calculations based on density functional theory (DFT) or model Hamiltonians to understand the fundamental physics at play. Building on this foundation, we perform advanced micromagnetic theory, Monte-Carlo simulations, and large-scale Atomistic Spin Dynamics simulations to shed light on the static and dynamic properties of these fascinating new material phases. Through the exploration of SOC across materials, my research seeks to unlock novel material properties with the potential to transform future applications.

Dr. Kush Saha

Field of Specialisation: Theoretical Condensed Matter Physics

Our group has a broad range of interests in condensed matter physics, with a specific focus on the physics of ultracold atomic gas loaded in optical lattices, topological phases of matter, and Dirac semimetals. Over the past several months, we have been involved in proposing non-trivial lattices with flat bands. We have recently proposed a 3D lattice model that can host an exact flat band with a non-trivial Hopf invariant. We have also demonstrated that both exact and nearly flat bands with both 2D Chern and 3D Hopf invariants can be realized in another distinct 3D lattice model. This requires introducing specific hopping along the orthogonal direction of a simple two-orbital 2D Chern insulator in the presence of in-plane nearest-neighbor and next-nearest-neighbor hopping among different orbitals.

In another project, we have been interested in probing changes in the Fermi surface topology, i.e., Lifshitz transition, using a light pulse. In particular, we have demonstrated that across such a transition point, the response of a quantum system in the presence of a weak light pulse may differ significantly compared to the response away from the saddle point. Using density matrix formalism and the time-dependent Schrödinger equation, we have found persistent and oscillatory particle currents even after one full pulse cycle. Interestingly, away from the saddle point, the magnitude of the oscillatory particle current reduces significantly. We have found that the reason for this unique feature in the particle current is attributed to the interband coherent transition near the saddle point. We believe this feature can be used as a diagnostic to probe topological Lifshitz transition.

Dr. Luke Robert Chamandy

Field of Specialisation: Physics (Astrophysics)

- Galactic magnetic fields
- Interacting binary stars
- Planets orbiting stellar remnants

Dr. Najmul Haque

Field of Specialisation: High Energy Physics (Theory), Heavy-ion Physics

During 2023-2024, I have worked on several directions.

In article JHEP 05 (2023) 171, we have studied the NLO quark self-energy and dispersion relation. The LO quark self-energy and dispersion relations are formulated by Brateen and Pisarski long ago. Those LO results are used to study the various observables. For the first time, we have extended the LO quark self-energy to NLO and studied the quark dispersion relation and damping rate.

In article Phys.Lett.B 838 (2023) 137714, we calculated the diffusion coefficient of heavy quarks using the Gribov-Zwanziger gluon propagator. The heavy quark diffusion coefficient is one of the most essential ingredients for the Langevin description of heavy quark dynamics. In the temperature regime relevant to the heavy ion collision phenomenology, a substantial difference exists between the lattice estimations and the corresponding leading order (LO) result from the hard thermal loop (HTL) perturbation theory. Moreover, the indication of poor convergence in the next-to-leading order (NLO) perturbative analysis has motivated the development of several approaches to incorporate the non-perturbative effects in the heavy quark phenomenology. In this work, we estimate the heavy quark diffusion coefficient based on the Gribov-Zwanziger prescription and we find our estimation has less dependency of the renormalization scale and leading order results are closed to the lattice estimation.

Moreover the study of quarkonium suppression in a deconfined nuclear matter. During 2023-2024, we have studied the heavy-quarkonium potential in non-trivial environment. We studied the heavy quarkonium potential in presence of magnetic field and we found that the effect of magnetic field to the quarkonium potential is negligible. Additionally, when

there is a relative motion between a quarkonium and the medium, we have found that the realpart of the potential becomes positive quickly as distanceincreases with velocity, more prominent in the direction of quarkonium motion than perpendicular.

Dr. Satyaprasad P. Senanayak

Field of Specialisation: Semiconductor Device Physics

The research of my group is majorly focused on fundamental understanding of the charge transport and photo-physics of organic semiconductors, perovskites, self-assembled nano-structures and 2D materials. These unconventional semiconductors exhibit a rich variety of transport phenomena and disorder mechanisms which are not exhibited by inorganic semiconductors such as silicon. We utilize a range of electrical, spectroscopy, microscopy and structural characterization to obtain a microscopic understanding of the processes/instabilities in these materials. Understanding developed from these studies is then applied into developing high efficient photovoltaic, ultra-bright LEDs, low power flexible electronics and improved medical diagnostic technology.

Dr. Shovon Pal

Field of Specialisation: Ultrafast THz optics and quantum materials

The conventional weakly correlated systems are often described by the interaction of a single electron with its environment, for example, semiconductors. In contrast, the properties of the so-called strongly correlated states are determined by the collective interaction of many electrons via their charges and spins. The complexity that arises from such interactions between many particles gives rise to many fascinating phenomena. This covers the long-range magnetic order to recent discoveries like superconductivity, colossal magnetoresistance, and topological magnetic or electric states. Owing to their multi-particle nature, the microscopic understanding of the ground state with such dominant strong-correlation phenomena is a demanding task. For a thorough understanding, it is thus indispensable, however, to go away from the ground state and study the dynamical behaviour of such systems.

On one hand, the functionality of a device always results from bringing it away from its ground state. Nevertheless, studying the non-equilibrium behaviour of the ground state reveals the microscopic processes at work, stabilizing a strongly correlated state. Over the last years, various experimental and theoretical tools have been rapidly improving, and the field of strong-correlation dynamics is now in the process of establishing itself as a new and powerful branch in condensed-matter research. Because of the emerging nature of the field, research activities are still ambiguously diverse. Important advances are made in certain directions but at the same time, other aspects of crucial significance are disregarded — an overarching coherence of the field yet needs to be established.

Dr. Tapan Mishra

Field of Specialisation: Condensed matter theory

We work on theoretical quantum condensed matter physics. In particular in the field of quantum computation, quantum simulations, quantum phase transitions, ultracold atoms, localization transition, quantum walk, non-Hermitian systems.

Dr. Tuhin Ghosh

Field of Specialisation: Astrophysics and Cosmology

The group led by Dr. Tuhin Ghosh focuses on certain aspects of Galactic Astrophysics and Cosmology. Our group research themes are the following:

- Development of traditional and advanced statistical tools like Wavelet Phase Harmonics and apply for astrophysical component separations.
- Constraining the large-scale regular magnetic field using Fourier mode analysis of external galaxies (like M31 and NGC6946) using multi wavelength radio observations.
- Forecasting the science goals and capability of CMB Bharat experiment (proposed ISRO mission) and PASIPHAE survey.

Dr. V Ravi Chandra

Field of Specialisation: Condensed Matter Theory

We have continued a detailed investigation of the role of spin wave interactions on the magnon spectrum of general spin Hamiltonians on the pyrochlore lattice. This builds on our recently published results of the magnon spectra of pyrochlore slabs with Heisenberg exchange, Dzyaloshinskii-Moriya interaction and spin-ice anisotropy. We plan to investigate the stability of magnon excitations, the possibility of spontaneous magnon decays, the modification of thermal hall conductivity, and the effect on the topologically non-trivial edge states when magnon interactions are included. Preliminary results indicate that the two magnon continuum responsible for magnon decay is

separated by a gap from the single magnon spectrum for antiferromagnetic exchange but for ferromagnetic exchage the continuum has overlaps with the single magnon spectrum. An initial set of programs to provide a more detailed characterisations of magnon interactions in these systems have been written and are being benchmarked.

We have initiated investigations into the theoretical analysis of magnetic specific heat of the candidate spin liquid phase in the spin-1/2 Kagome antiferromagnet. Some of the recent specific heat measurements on Herbertsmithite, one of the widely investigated materials for spin liquid studies found deviations from the low temperature power laws of specific heat resulting from several candidate theories of gapless spin liquids. Motivated by this we plan to study the nature of the specific heat of the Kagome antiferromagnet at low temperatures, the physical origin of its second low temperature peak, and the effect of impurities and Dzyaloshinskii-Moriya interactions. We have concluded initial investigations based on exact diagonlisation of small clusters and are in the process of developing programs for evalution of bulk quantities like the specific heat of frustrated quantum magnets in the thermodynamic limit using tensor network/MPS approaches.

Finally, we have concluded our project demonstrating the validity of the Chayes-Chayes-Fisher-Spencer (CCFS) criterion for a wide class of one dimensional disordered systems exhibiting many body localisation. The result of this project which were under review got accepted for publication in Phys. Rev. B. recently.

Dr. Narayan Rana

Field of Specialisation: Theoretical high energy physics

In the last academic year,

- We computed the theoretical predictions for the second order (NNLO) QCD corrections to the semi-inclusive deep inelastic scattering process, achieving a milestone. These theoretical predictions will be very important for the upcoming electron-ion collider (EIC) at BNL in the US.
- We have computed quarkonic contributions to massive form factors in three loop in QCD, an important element in top quark physics.
- We also have computed color-planar contributions to the heavy-light form factor which is an important ingredient in the precision computations in flavor physics.

Dr. Sudakshina Prusty

Field of Specialization: Experimental Condensed Matter Physics

Dr. Saralasrita Mohanty

Field of Specialization: Material Science

Through my work in Topological Physics, Topolectrical Circuits, and Teaching Lab Development, I aim to advance both the scientific understanding of topological systems and the education of future physicists and engineers. I am passionate about pushing the boundaries of research in topological materials while ensuring that students acquire the knowledge and skills needed to explore these fields. My research on topolectrical circuits has provided flexible and controllable platforms for understanding topologically protected states, quantum spin Hall effects, and topological phase transitions. Moving forward, my research will continue to focus on the intersection of topological insulators and topolectrical circuits, with an emphasis on developing practical applications for robust quantum devices and low-power electronics. Alongside my research, I am committed to advancing physics education through the development of innovative lab experiments and curricula that seamlessly integrate theoretical concepts with practical experimentation.

Dr. Varchaswi K S Kashyap

Field of Specialization: High Energy Physics (Detectors and Instrumentation)

My experience is in detector simulation and instrumentation for high energy physics and rare event experiments. Currently I am involved in the Super Cryogenic Dark Matter Search (SuperCDMS), Mitchell Institute Neutrino Experiment at Reactor (MINER) and A Large Ion Collider Experiment (ALICE) where we look for direct interactions of Dark Matter, coherent elastic scattering of neutrinos and muon Identification in heavy-ion collisions respectively. I am also working towards developing detectors for societal applications like Muography and Imaging.

CENTRE FOR MEDICAL AND RADIATION PHYSICS

Dr. Ganesh Jagannath Tambave

My field of expertise is R&D on Silicon substrate based radiation detectors which are used in societal application such as medical imaging and in nuclear and particle physics experiments. At NISER, I am working on development of test infrastructure for the silicon detectors (Si pad array, Si Photomultipliers etc.) fabricated in collaboration with Bharat Electronics

Limited (BEL), Bangalore and Semiconductor Laboratory (SCL), Mohali. The Si pad array detectors are fabricated for the first time in India on 6 inch diameter wafer. These detectors are successfully tested using LED light and radiative source at NISER Si lab as well as with high energy (GeV range) electron and pion beams at proton synchrotron test beam facility, CERN, Geneva.

Dr. Shuddha Shankar Dasgupta

My expertise is in the field of detector hardware mainly working on design, development, and characterizing Micro Pattern Gaseous Detectors (MPGDs) based single-photon detectors with THGEM + Micromegas based hybrid technology for societal applications and high-energy physics experiments. In the NISER, I am working on creating a low-rate, large-area imaging detector for societal applications based on THGEM technology, which can be sensitive in resolving a difference in single photons, translating to better image contrast with less exposure. That can be used to treat patients with lesser doses, or more images can be taken for the same given dose. A prototype chamber is being built.

Dr. Raveendrababu Karnam

My expertise is in the developing and characterization of Resistive Plate Chambers (RPC) and their usage to the muon imaging applications, and calorimeter detectors. Resistive Plate Chambers (RPC) are chosen as the tracking detector elements. At NISER, I have participated in building the RPC development and characterization facility at CMRP, and been involved in the development of cosmic-ray muon telescopes for societal applications. The applications include nuclear safety and security, border controls, to investigate railway tunnels if any shafts/voids present, for cultural heritage archaeological surveys, etc. A muon telescope is being developed in modular form using four modules.

Mr. Kirti Prakash Sharma

My field of expertise is in Electronics Circuit design, simulation, PCB design & fabrication, and testing. At NISER, I am working on development and testing of readout electronics for imaging and nuclear physics detectors. The work involves the fabrication of readout electronics for Si-pad array detectors intended to be used in calorimetry and imaging applications in collaboration with the Indian industries. First batch of PCBs are developed and fabricated in India to read out the Si-detector signals. The electrical performance results of PCBs are found to be satisfactory. These PCBs will be tested with the Si-pad array detector developed and fabricated in India in collaboration with Bharat electronics Limited (BEL).

Mr. Lalatendu Mishra

My field of expertise is medical physics, radiation therapy treatment planning, quality assurance of treatment delivery machines, workflow management and biological effect of ionising radiation on the tissues. At NISER, I am working on the establishment of a Gamma Irradiation Chamber Facility for small scale industrial and research irradiation. This Gamma Irradiation Chamber GC-5000 Contains Co-60 radioactive sources. This facility can be used to test the radiation hardness of materials, test the radiation detector response, preparation of new samples for the Chemical dosimetry purpose. In future, I will be working on the establishment of NABL Accreditation Calibration Laboratory, to calibrate the therapy level dosimeters. This facility will be equipped with a Co-60 based teletherapy unit and a brachytherapy unit (Compatible with both Co-60 and Ir-192 radioactive sources).

Mr. Rakesh Kumar Bhatta

My field of expertise is medical physics and worked as a Radiological Safety Officer in a cancer hospital. My expertise is in Dosimetry and Quality Assurance of Medical Linear Accelerators. At NISER, I am planning to improve the quality of the Dosimetry and Personal Monitoring by using Thermo Luminescence Dosimeters. I will also be contributing in setting up Secondary Standard Dosimetry Laboratory and Radioanalytical Laboratory in NISER.

Mrs. Nijun Mishra

My field of expertise is medical physics and radiation safety. I have worked as a Radiological Safety Officer in the cancer hospital and developed significant expertise in treatment planning and dosimetry that is needed in radiotherapy workflow. Future plan is to establish a radioanalytical laboratory dedicated to detecting radioactive contamination in various consumable and non-consumable products. This initiative aims to ensure public safety by monitoring radiation levels in everyday used items.

Publications

BOOKS

Dr. Shyamasree Ghosh

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Dr. Bishnu P. Biswal

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Prof. Chandan Goswami

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Bergauer, T., Chatterjee, S., Damanakis, K., ... Zhokin, A. (2023). Search for the Higgs boson decay to a pair of electrons in proton-proton collisions at √s=13TeV. Physics Letters. Part B, 846(137783), 137783. doi: 10.1016/j.physletb.2023.137783

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CMS Publication: *https://cms-results.web.cern.ch/cms-results/public-results/publications/CMS/index.html*

Dr. Shamik Banerjee

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Dr. Sumedha

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Dr. Victor Roy

240. Gangadharan, R., Panda, A. K., & Roy, V. (2024). Study of early time attractor with longitudinal forces with Bjorken symmetry. Physical Review D, 109(7), 074020. doi: 10.1103/PhysRevD.109.074020

Dr. Ashis Kumar Nandy

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Dr. Kush Saha

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Dr. Luke Robert Chamandy

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Dr. Najmul Haque

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Dr. Satyaprasad P. Senanayak

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Dr. Shovon Pal

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Dr. Tapan Mishra

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Mishra, P. K. (2023). Quench-induced chaotic dynamics of Anderson-localized interacting Bose-Einstein condensates in one dimension. Physical Review A, 107(5), 053320. doi: 10.1103/PhysRevA.107.053320

Dr. Tuhin Ghosh

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Dr. V Ravi Chandra

276. Jyothis, V. V., Patra, B., & Chandra, V. R. (2024). Magnon bands in pyrochlore slabs with Heisenberg exchange and anisotropies. Journal of Physics: Condensed Matter, 36(18), 185801. doi: 10.1088/1361-648X/ad21aa

Dr. Narayan Rana

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Dr. Varchaswi K S Kashyap

280. Albakry, M. F., Alkhatib, I., Alonso, D., Amaral, D. W. P., Aralis, T., Aramaki, T., ... & Runge, J. (2023). First measurement of the nuclear-recoil ionization yield in silicon at 100 eV. Physical review letters, 131(9), 091801. doi: 10.1103/PhysRevLett.131.091801

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Centre for Medical and Radiation Physics

Dr. Ganesh Jagannath Tambave

1. Aehle, M., Alme, J., Arata, C., Arsene, I., Bearden, I., Bodova, T., Tambave, G., ... & Zillien, S. (2024). Performance of the electromagnetic and hadronic prototype segments of the ALICE Forward Calorimeter. Journal of Instrumentation, 19(07), P07006. doi: 10.1088/1748-0221/19/07/P07006

2. Aehle, M., Alme, J., Barnaföldi, G. G., Blühdorn, J., Bodova, T., Borshchov, V., Tambave, G.,... & Zillien, S. (2023). Exploration of differentiability in a proton computed tomography simulation framework. Physics in Medicine & Biology, 68(24), 244002. doi: 10.1088/1361-6560/ad0bdd

3. Schilling, A., Aehle, M., Alme, J., Barnaföldi, G. G., Bodova, T., Borshchov, V., ... & Zillien, S. (2023). Uncertainty-aware spot rejection rate as quality metric for proton therapy using a digital tracking calorimeter. Physics in Medicine & Biology, 68(19), 194001. doi: 10.1088/1361-6560/acf5c2

Awards & Professional Activities

AWARDS AND RECOGNITION

Prof. Hirendra Nath Ghosh
Fellow of the Indian National Academy of Engineering.

Prof. Bedangdas Mohanty
Doctor of Science (Honoris Causa), Sambalpur University, Odisha, by Governor of Odisha.

Prof. Himansu Sekhar Biswal
Fellow of the Royal Society of Chemistry (FRSC), UK.

Dr. Manjusha Dixit
Article selected for Cover page in FEBS Open Bio, FEBS Press. doi: 10.1002/2211-5463.13428

Dr. Shyamasree Ghosh
Woman Scientist Award 2022, Biotech Research Society of India, (BRSI) Awarded in November 2023.

Dr. Bishnu Prasad Biswal
Odisha Young Scientist Award 2021, Odisha Bigyan Academy, DST, Govt. of Odisha [Received on 18.01.2024].

Prof. RC Tripathy Memorial Award 2023, Odisha Chemical Society (OCS) [Received on 05.01.2024].

Dr. Priyadarshi Chowdhury
My article in Nature Reviews Earth and Environment was featured for the journal's COVER PAGE (Volume 4, Issue 5, May 2023).

Dr. Surya Snata Rout
Awarded the Transnational Access (TNA) in the framework of the EXCITE (Horizon 2020) research infrastructure. Access to TEM and FIB at Wolfson Electron Microscopy Suite (WEMS), University of Cambridge, UK. Duration: 2022-2023.

Awarded beamtime at the P05 beamline at the PETRA III synchrotron radiation source at DESY (Hamburg, Germany) for microtomography experiments. Proposal: I-20221317 'Chromite grains in Antarctic micrometeorites: Constraining flux of extraterrestrial materials to Earth'.

Awarded beamtime at the Helmholtz-Zentrum Dresden-Rosendorf, Germany for ion irradiation experiments (Proposal No: 19001801-ST) and at RRCAT, Indore for synchrotron infrared spectroscopy experiments (IBR/4450/2023-04-16/INDUS-1/BL-6).

Dr. Rekha Biswal
"Odisha Young Scientist Award" for the year 2022 in the category of "Odia Scientist working outside the state of Odisha", on 5th Dec 2023 by Odisha Bigyan Academy.

Dr. Shuddha Shankar Dasgupta
Co-Coordinator for the Work Package 6 (WP6) in DRD1 collaboration.

POSITIONS HELD IN PROFESSIONAL BODIES

Dr. Asima Bhattacharyya
- Member, Policy Network, Biochemical Society, UK
- Member, Minimal information for studies of extracellular vesicles (MISEV2023) consortium.

Dr. Debasmita Pankaj Alone
- Co-opted Member, expert committee in Life Sciences on SRG, NPDF & ECRA schemes, SERB
- Member, Local Research Advisory Committee (LRAC), Multidisciplinary Research Unit (MRU), SCB Medical College, Cuttack.
- Subject Expert, Board of Studies (BOS) Meeting for UG Syllabus revision, Department of Biotechnology, Odisha University of Technology and Research, Bhubaneswar.

Dr. Harapriya Mohapatra
- Reviewer, Current Microbiology, PLoS One, Frontiers in Microbiology, BMC Microbiology.

Dr. Aniruddha Datta Roy
- Member, Indian Evolutionary Biologists Society, 2024.
- Regional coordinator for South Asia, IUCN SSC skinks specialist group, 2023.

Dr. Rittik Deb
- Reviewer, BMC Evolutionary Biology, Current Zoology, Microbial Ecology.

Dr. Swagata Ghatak
- ICMR Investigator Initiated Small Research grant, ICMR, India 2023

Prof. Chidambaram Gunanathan
- Convener, Board of Studies for Integrated Masters Programme, Homi Bhabha National Institute.

Prof. Himansu Sekhar Biswal
- Member, Board of Studies, Chemistry, HBNI
- Life Member, Indian Photobiology Society (IPS)
- Member, Board of Studies, Chemistry, CET, Odisha
- Member, Board of Studies, Chemistry, Berhampur University, Odisha

Dr. Nagendra Kumar Sharma
- Reviewers, Organic and Biomolecular Chemistry, The Journal of Organic Chemistry, ACS Omega, New Journal of Chemistry, Organic Letters.

Dr. Bishnu Prasad Biswal
- Head of Max Planck Partner Group at NISER Bhubaneswar, Max Planck Society, Germany.

Dr. S. Perunheralathan
- Chairperson, Under-Graduate Committee of the Institute.

Dr. Liton Majumdar
- Visiting Researcher Fellowship, Leverhulme Centre for Life in the Universe (LCLU), University of Cambridge, UK, December 2023.
- Visiting Associate, IUCAA, Pune, India, August 2024 to July 2027
- International Astronomical Union (IAU) Grant of £2000 for participation in Kavli-IAU S383 meeting.
- Visiting Scientist Grant of $10000 from NASA Jet Propulsion Laboratory, Caltech, USA.

Dr. Amarendra Das
- Secretary, Odisha Economic Association.
- Resource Person, Odisha State Higher Education Council, Odisha Higher Education Program for Excellence and Equity Project (OHEPEE).
- Member, Committee for selection of 6th cohort of DST-STI Policy, DST, GoI, February 19, 2024.

Prof. Bedangdas Mohanty
- Deputy Spokesperson, ALICE Collaboration at CERN. [The Collaboration has 2000 scientists from 40 countries and 170 institutes. Tenure: 2023-2025.]
- Member, SERB- SUPRA Committee of Department of Science and Technology, Government of India.
- Convenor, Board of Students Physical Sciences, HBNI.

Prof. Sanjay Kumar Swain
- Spokesperson, India-CMS

Dr. Sumedha
- Simons Associate, ICTP, Trieste, Italy (2020-2025).

Dr. Satyaprasad P Senanayak
- Executive Member of the Governing Body of the Perovskite Society of India.

Dr. Tapan Mishra
- SERB-STAR, SERB, 16th May 2023.

Dr. Tuhin Ghosh
- Visiting associateship of IUCAA (2021-2024).

INVITED / CONTRIBUTED LECTURES AND TALKS

Prof. Chandan Goswami
- Title: TRP channels in sub-cellular organelle structure and functions: Importance in mitochondrial and lysosomal biology, Departmental seminar, Anna University, Chennai. 4th Oct 2023.
- Title: TRP channels in sub-cellular organelle structure and functions: Importance in mitochondrial and lysosomal biology. Departmental seminar talk, LVPEI, Hyderabad. 9th Dec 2023.
- Title: TRP channels in sub-cellular organelle structure and functions: Importance in lysosomal biology, Department of Microbiology, S.B.R. Govt. Autonomous college, Berhampur. 15th Nov. 2023.

Prof. Palok Aich
- Invited Talk (Virtual): MicrobioTx: where Metabolome and Microbiome melth to health. April 18, 2024. Dr. Reddy's Laboratory.
- Webinar: Microbiome and Women's Health, March 21, 2024.
- Chintan Shivir, March 4-9, 2024, ICTS-TIFR, Bengaluru, India.
- Invited Talk: Sarcopenia: Present & Future Perspectives, Dept of Physiology, AIIMS-Bhubaneswar, Jan 20, 2024.
- Webinar: Microbiome 101, Dec 15, 2023, MicrobioTx Health Pvt Ltd.
- Panelist: ILS Start-up Summit 2023. Sep 26, 2023. ILS Bioincubation, ILS.
- Invited Talk title: A simple biological algorithm may be much more bizarre than how you learned and what you thought. Sep 19, 2023. Biotechnology Department, Utkal University.

- Invited talk title: Perturbation is the key to understand roles of gut microbiota. 4th International Genomics Analysis and Technology Conference (GATC), April 7-9, 2023, inStem, Bangalore.
- Invited Talk title: Science, Society and Communication. National Conference on Science in Everyday Life. March 24-25, 2023. School of Humanities and Social Sciences, NISER Bhubaneswar, India.
- Talk Title: A Journey to find signature microbiome via metabolome: Exploring Gut-adipose-brain axis by perturbation Homi Bhabha National Institute Theme Meeting on Life Sciences. Feb 16-17, 2023. Saha Institute of Nuclear Physics, Kolkata, India.

Dr. Abdur Rahaman

- Invited talk in the Organelle Biogenesis and Membrane Trafficking at NBRC Manesar 9-11 Nov 2023.
- Invited to give a lecture at Ciliate Molecular Biology Conference, Institute of Human Genetics, Montpellier, 26 – 29 June 2023.

Dr. Asima Bhattacharyya

- Invited talk: "The enigma of ROS regulation in Helicobacter pylori-mediated gastric adenocarcinoma by SIAH2 protein." 3rd International Conference on Frontiers in BiologicalSciences (InCoFIBS 2023). Department of Life Science, NIT Rourkela, 5-7 Oct 2023.
- Delivered a talk as a chief guest on "Human gastric carcinogenesis: knowing about a pathogen and the host response". Awareness program on Microbial Infections.School of Paramedics and Allied Health Sciences. CUTM, Odisha, 27 Sep 2023.
- Invited webinar talk delivered on "Mysteries of ROS regulation in Helicobacter pylori-mediated gastric cancer. 5th Edition of webinar on GASTROENTEROLOGY & HEPATOLOGY, organized by gastroenterology-hepatology.org, March 20, 2024.

Dr. Debasmita Pankaj Alone

- Fuchs endothelial corneal dystrophy: Insights from human studies to re-establishing a mice model, 23rd Mar, 2024, National Seminar on "Recent Innovations in Animal Science Research" Dept. of Zoology, U.N. (Auto) College of Science and Tech., Adaspur& Zoological Society of Odisha (Invited Talk).
- Gene regulation of ageing disorders, Prananath College, Khordha, 24th November, 2024 (Invited Talk).
- Novel Genetic and Epigenetic regulators in the Pathogenesis of Pseudoexfoliation Glaucoma, 10th -12th Jan, 2024, 46th All India Cell Biology Society Annual Conference, ACTREC, TMC, Navi Mumbai (Invited Talk).
- Genetic and epigenetic regulation into the pathogenesis of Pseudoexfoliation glaucoma, 92nd Annual Meet of the Society of Biological Chemists, 18th Dec 2023 (Poster).
- Cancer: A multifactorial Disease, 9th Jun, 2023, Science Movement, Subhadra Charitable Trust, at Cohen International School, Jatni (Invited Talk).
- Deciphering Autophagic Disruption in pseudoexfoliation: Homocysteine Metabolites Orchestrating microRNA-Mediated Changes in lysosomal function. Sahoo L, Mohanty PP, Alone DP. Quarterly Union for Academic Discourse SBS-Symposium, NISER, 27th January 2024 (Flash Talk + Poster).
- Development of an in vivo based platform for screening the anti-glioma potential of therapeutic candidate drugs and their underlying molecular aspect. Sulava S., Mallik M., Alone DP., Quarterly Union for Academic Discourse SBS-Symposium, NISER, 27th January 2024 (Flash Talk + Poster).
- Genetic association of intergenic variant rs918980 along with upregulation of ELMO1 and GPR141 in Fuchs Endothelial Corneal Dystrophy. Sharma S, Basak SK, Das S, Alone DP. 46th All India Cell Biology Society Annual Conference, ACTREC, TMC, Mumbai, 10th - 12th January 2024 (Poster).
- Deciphering Autophagic Disruption in pseudoexfoliation: Homocysteine Metabolites Orchestrating microRNA-Mediated Changes in lysosomal function. Sahoo L, Mohanty PP, Alone DP. 46th All India Cell Biology Society Annual Conference, ACTREC, TMC, Mumbai, Abstract book page 71, 10th - 12th January 2024 (Platform presentation).

Dr. Harapriya Mohapatra

- Title: "Noncanonical antimicrobial resistance mechanisms in bacteria", 4th International Conference on Contemporary Antimicrobial Research 2023 (ICCAR 2023), November 16-18, 2023, Assam University, Silchar, Assam, India.

Dr. Manjusha Dixit

- Unveiling the Dual Role of Eukaryotic Elongation Factor EEF1A2: A Novel Angiogenic Player in Breast Cancer.8th World Cancer Congress18th - 20th March, 2024 | JNU Convention Centre, JNU, New Delhi, India.
- Unveiling the Dual Role of FRG1: Implications for Breast Cancer Progression and Angiogenesis.

MOLECULAR AND GENOMIC TECHNIQUES IN CANCER STUDIES (MAGTICS-2023)" during 24th - 28th July 2023. Department of Life Science, National Institute of Technology, Rourkela, India.

- From FRG1 to EEF1A2: Regulators of multiple cancer hallmarks. SBS MEET, 3 February 2024, NISER.

Dr. Mohammad Saleem

- Pinch it like Mtb: ESAT-6's phagosome play. Invited talk at first DBS symposium held at IISER Berhampur. March 16-18, 2024.
- Pinch it like Mtb: ESAT-6's phagosome play. Invited talk at National Bioengineering Conference –2023 organized by the Dept of Biotechnology &Biomedical Engineering, NIT Rourkela, November 9-11, 2023.

Dr. Pankaj Vidyadhar Alone

- Quarterly Union for Academic Discourse (QUAD) Bhubaneswar-NISER Cellular Structure-Function and Homeostasis, 27th Jan 2024. eIF2β zinc-binding domain anchors to the eIF2γ subunit through the guanine nucleotide-binding interface to promote Met-tRNAiMet binding".

Dr. Praful Singru

- International symposium on recent trends in comparative endocrinology and physiology: from brain to behaviour, Dept. of Zoology, SP Pune University, Pune.

Dr. Subhasis Chattopadhyay

- Invited talk at Institute of Advanced Virology, Bio 360 Life Sciences Park, Thonnakkal, Trivandrum, Kerala on 27th December, 2023.
- Invited talk at First DBS Symposium during 16th -17th March 2024. Department of Biological Sciences (DBS) at Indian Institute of Science Education and Research (IISER) Berhampur, Odisha, India.
- Invited talk at Centre for DNA Fingerprinting and Diagnostics (CDFD), Hyderabad on April 2nd 2024.
- Invited talk at 25th INDO-US Flow Cytometry Workshop on Flow Cytometry and its Applications in Biology, 3rd-4th February, 2024, Babasaheb Bhimrao Ambedkar University, Lucknow-226025, India.

Dr. V Badireenath Konkimalla

- (Invited lecture) 29th Indo-US International Conference on Latest Trends & Global Opportunities in Nanotechnology & Pharmaceutical Aspects. Mar 9-10, 2024. Organized by the College of Pharmaceutical Sciences, Puri, Odisha. India.
- (Oral presentation) International Conference on Traditional Medicine &Phytopharmaceuticals (ICTMP) & 11th International Congress of Society of Ethanopharmacology (SFEC 2024). Feb 16-18, 2024. Organized by CSIR-IIIM, Jammu. India.
- (Invited lecture) NextGen Therapeutics: Multidisciplinary Research Approaches for Drug Development and Delivery" Bridging the Gaps: From Drug Discovery to Patient Care. 7th NIPiCON 2024. Feb 7-9, 2024. Organized by Nirma University, Ahmedabad. India.
- (Invited lecture) PharmExpo& National Conference on Current Trends in Drug Development. Nov 17-19, 2023. Organized by UDPS, Utkal University, Odisha. India.
- (Invited lecture) International Conference on Biomedical Materials & Technology – 2023 (BioTEX 2023). Nov 29 – Dec 01, 2023. Organized by Indian Institute of Technology (IIT)-Delhi, STERMI and SBOAI, India.
- (Invited lecture) 3rd International Conference on Nanomaterials in Biology (ICNB 2023). Nov 19– 22, 2023. Organized by Indian Institute of Technology (IIT)-Gandhinagar and SMRS, Jaipur.(Online)
- (Invited lecture) Online workshop on "Protein Modelling: A Rational Tool for Drug Discovery and Development." 31st Oct - 2nd Nov 2023. Bioinformatics Centre (BIC), Dept. of Pharmaceutical Sciences and Drug Research, Punjabi University, Patiala, India.
- (Invited lecture) Smart Nanotechnology Solutions to Address Autoimmunity and Chronic Inflammatory Conditions with Special Reference to Rheumatoid Arthritis. Sept 16–17, 2023. Autoimmunity and Inflammation – A new epidemic. 7th annual meeting of Society of Inflammation Research (SIRCON-2023). Organized by Indian Institute of Science (IISc), Bengaluru, India.

Dr. Aniruddha Datta Roy

- Talk title: "Not quite Gondwanan: Indian skink biogeography" Invited talk at Mizoram University, April 2023.

Dr. K. Himabindu Vasuki

- Talk on "Towards generating anthocyanin rich tomatoes" at SBS meet, NISER Feb 2024.

Dr. Rittik Deb

- Invited talk at RAASVB, an international conference in Visva-Bharati, Santiniketan, 2024.
- Invited talk in "Understanding Behaviour" international conference at IISER, Kolkata, 2023.

- Invited talk in "Animal Behaviour Symposium" (international) at IISc, Bangalore, 2023.
- Talk in "SBS Day @ NISER". 2024.
- Invited talk at student symposium "La Vida" IISER Berhampore. 2023.
- Invited talk and resource person at FDP North Orissa University. 2023.

Dr. Swagata Ghatak

- 'Understanding Mechanisms by which Hyperexcitability Modulates K2P Ion Channels'. SBS day, February 3rd, 2024.

Dr. Saurabh Chawla

- The role of animal experiments in bridging bench-side to bedside" at Centurion University Presentation (2023).
- Imparted training on "Monoclonal Antibodies" under DST STUTI ICT at SOA University (2023).

Prof. Chidambaram Gunanathan

- Ammonia and its Importance to Mankind. *Motivation Lecture* delivered on 19th Dec' 2023 to School students at School of Basic Sciences, IIT Bhubaneswar, Bhubaneswar.
- Sustainable Catalytic Transformations. Delivered the Lecture on 15th Dec' 2023 in 20th International Conference on Modern Trends in Inorganic Chemistry (MTIC- XX) during December 14-17, 2023 at IISc Bengaluru.
- Sustainable Catalysis Enabled by Metal-Ligand Cooperation. Delivered the Lecture on 13th Dec' 2023 in *Indo-French conference* at IISER Thiruvananthapuram, India from 10th to 13th Dec' 2023.
- Sustainable Catalytic Transformations. Delivered the Lecture on 9th Dec' 2023 in 3rd *International Symposium on Main-group Molecules to Materials* (MMM) from 09th to 11th Dec 2023 at IIT Hyderabad.
- Sustainable Catalytic Transformations. Delivered the Lecture on 26th Oct' 2023 in 2nd *International Conference on Frontiers in Chemical Sciences (ICFCS-2023)* at the Department of Applied Chemistry, Karunya Institute of Technology and Sciences, Coimbatore, Tamil Nadu, India during October 26-27th, 2023.
- Green Catalytic Transformations. Delivered the Lecture on 26th Sept 2023 in *Recent Advances in Chemical Sciences,* at St Xavier's College, Palayamkottai.

Prof. Himansu Sekhar Biswal

- "Weak Interactions with Strong Consequences: Insights from the Photochemistry of Small Molecules and Proteins" November 18-20, 2023, "Emerging Smart Materials in Applied Chemistry (ESMAC-2023)."Kalinga Institute of Industrial Technology(KIIT), Bhubaneswar, INDIA.
- "Spectroscopy and Theoretical Studies to Understand Sustainable Chemistry and Chemical Biology" December 12, 2023, "4th OCS One-Day Extended Lecture Series 2023."Odisha University of Technology and Research (OUTR), Bhubaneswar, INDIA.
- "Biomolecular Structure and Stability with Ionic Liquid" February 25-27, 2024, Lecture Workshop on "Chemical Sciences For Sustainable Development", Salipur Autonomous College, Cuttack, INDIA.
- "Supramolecular Chemistry and Photochemistry of Sulfur and Selenium Containing Molecular Probes", March 2-4, 2024, "Recent Trends In Chemical Sciences (RETICS-2024)" Sambalpur University, Sambalpur, INDIA.
- "Carbon and Carbo-Hydrogen Bonding for Future Materials: Insights from Molecular Spectroscopy and Computational Studies", March 19, 2024, "Recent Trends on Prospective Applications of Advanced Materials-2024 (RTPAAM-2024)" Fakir Mohan University, Balasore, INDIA.

Prof. Molay Sarkar

- Gave an invited Talk in Green Chemistry International Conference at University of Ladakh (LEH campus), in July 2023.
- Invited to give an invited Lecture in TSRP 2024, BARC, Mumbai.
- Invited to give a talk in NAMOSBIO conference in IISER Kolkata in 2024.

Prof. Prasenjit Mal

- "Visible Light Photocatalysis in Organic Synthesis" SERB sponsored National Seminar on "Sustainable Development in Chemical Sciences" on August 17-18, 2023, Department of Chemistry, Mugberia Gangadhar Mahavidyalaya, West Bengal.
- "Visible Light Photocatalysis in Organic Synthesis" 4th International Conference on Emerging Smart Materials in Applied Chemistry (ESMAC-2023) & Interdisciplinary Science for Sustainability, November 18-20, 2023 at KIIT and CSIR-IMMT campuses.

Prof. Sanjib Kar

- Invited speaker at the ICOC-2023 Goa Conference.

Dr. Chandra Shekhar Purohit

- Homo-Dimetalic Silver Purine Complexes as

Neuromorphic Materials, Indian photobiology society, during Nov. 18th-20th, 2023.

- MOFs in future electronics: Story of a silver purine complexes, OCS-ONEDAY EXTENDED LECTURE SERIES 2023, during 4th December 2023.

Dr. Nagendra Kumar Sharma

- Loquitur 2022, IISER-Berhampur, Odisha) India.
- CFOS-2022 conference. IIT-Roorkee (UK) India.
- RTCS2022, IIT (ISM) Dhanbad, (Jharkhand), India.
- 1st HBNI-NISER meeting-2023, NISER Bhubaneswar, India.
- Indian Peptide Society-2023, BIIT-Pilani, Goa campus, Goa, India.
- NCRACS-2023, Department of Chemistry, University of Berhampur.
- Dept. of Chemistry, ITER, Siksha 'O' Anusandhan Deemed to be University, BBSR.

Dr. S. Peruncheralathan

- Delivered an invited talk at the Inter IISER-NISER Chemistry Meet, held February 23-25, 2024, at IISER Kolkata, India.
- Delivered an invited talk at the 6-Day FDP on Perspectives of Recent Research in Chemistry on August 1, 2023, held at the School of Advanced Sciences, VIT, Vellore, India.

Dr. Sharanappa Nembenna

- Talk Title "Zinc CatalyzedHydroelementation of Unsaturated Organic Substrates" delivered at 20th International Conference on Modern Trends in Inorganic Chemistry (MTIC-XX), Indian Institute of Science, Bangalore, India 14th-17th December 2023.
- Talk Titled "Molecular Zinc(I) Dimers and Zinc(II) Hydrides: Synthesis and Catalytic Applications" delivered at the 3rd International Conference on Main-group Molecules to Materials (MMM III) during Indian Institute of Technology (IIT) Hyderabad, India 09-11, December 2023.
- Flash Talk titled "Guanidinate Stabilized Main-Group Metal Hydrides: Synthesis and Catalytic Applications" Delivered at The 3rd International Conference on Organometallics and Catalysis (ICOC) held in Goa, India, from October 30 to November 2, 2023.

Dr. Upakarasamy Lourderaj

- Molecular Dances, Outreach talk, April 2023.
- Dynamical Effects in the Thermal Deazetization of 1-pyrazolines, Advances in Spectroscopy and Dynamics, IISc Bangalore, November 2023.
- Dynamical Effects in the Thermal Deazetization of 1-pyrazolines, Organics in Space, IIST Thiruvanthapuram, January 2024.

Dr. Bishnu Prasad Biswal

- Invited talk at DCS MEET-2024, IISER Berhampur, Odisha, Mar. 2024.
- Invited talk at ICFMPT-2024, IOP Bhubaneswar, Odisha, Mar. 2024.
- Invited talk at FMCS, ICT Bhubaneswar, Odisha, Jan. 2024.
- Invited talk at MTM-OCS, Ravenshaw University, Cuttack, Odisha, Jan. 2024.
- Invited talk at MRSI-AGM, IIT BHU, Varanasi, Dec. 2023.
- Invited talk at RCSRT-OCS, Dhenkanal (Auto.) College, Dhenkanal, Odisha, Nov. 2023.
- Invited Lecture (Resource Person) for FDP, MSCB University, Baripada, Odisha, May 2023.
- Invited talk at Kashmir University, Kashmir, May 2023.
- Invited talk at NBL, NIT Srinagar, Kashmir, May 2023.

Dr. Subhankar Mishra

- Speaker at Artificial Intelligence in Oral Health Science: from basics to clinical applications, AIIMS Delhi, March 18-22, 2024.
- Talk on "AI and Machine Learning", NISER for NMIET B-School, Feb 28, 2024.
- Panelist on "Collaborative academic and industrial research in India: past, present and future', ACM ARCS 2024, Feb 09, 2024.
- 'Neural Networks at a Fraction', IIIT Bhubaneswar, Jan 29, 2024.
- Machine Learning - Transformers, ACM India Winter School on Algorithmic Foundations of Data Science, Dec 21-22, 2023.
- Skill Development Training on 'Big Data Analysis' conducted by Department of Agricultural Statistics, College of Agriculture, OUAT, Bhubaneswar, Dec 5-14, 2023.
- 'AI / ML powered platform for 3D geospatial mesh models of heritage monuments through crowdsourcing', La Fondation India's 6th Anniversary, Nov 21, 2023.
- 'Navigating the Digital World: Algorithm Literacy and Data Literacy in the Age of Artificial Intelligence', UNESCO HQ, Paris Sept 06, 2023.

- 'Cyber Security', Cyber Security for Police Officials @ Police Headquarters, Sikkim, RBI Gangtok July 18, 2023.
- 'AI and Computer Vision', Computer Vision and Intelligent Transportation Systems, IIT Bhubaneswar, June 16, 2023.
- 'Machine Learning and Deep Learning', See Yourself in Cyber, Reserve Bank of India (RBI), June 09, 2023.
- Cyber Security in BFSI Sector, New research and emerging techniques', See Yourself in Cyber, Reserve Bank of India (RBI) May 27, 2023.
- Machine Learning in MatLab, Faculty Development Program, Maharaja Sriram Chandra Bhanja Deo University, Baripada Odisha May 16, 2023.

Dr. Manoj Mishra

- ACM Winter School on Algorithmic Foundations of Data Science.

Dr. Anup Kumar Bhattacharya

- Winter school on "Algorithmic Foundations of Data Science" sponsored by ACM India at NISER in December 2023.

Dr. Liton Majumdar

- Unveiling the Origins and Atmospheres of Exoplanets, March 6, 2024, ASIAA Colloquium, Academia Sinica Institute of Astronomy and Astrophysics (ASIAA), Taipei, Taiwan. (Invited).
- Unravelling the mysteries of exoplanets: Origins, Atmospheres, and Interiors, December 14, 2023, University of Manchester, UK. (Invited).
- Unveiling the Origins, Atmospheres, and Interiors of Exoplanets, December 12, 2023, Imperial College London, UK. (Invited).
- Linking planetary atmospheres to planet formation, December 7, 2023, Leverhulme Centre for Life in the Universe, University of Cambridge, UK. (Invited).
- Worlds Without End: Exoplanets, Habitability, and the New Frontier, November 2, 2023, SPASE: Space, Planetary, Astronomical Sciences & Engineering Colloquium, IIT Kanpur, India. (Invited).
- Constraining the initial conditions for exoplanet formation, July 18, 2023, Astrophysics Colloquium, NASA Jet Propulsion Laboratory (JPL), Pasadena, USA. (Invited).
- Linking Atmospheres of HD209458b with its formation, 2023 Kavli – IAU Astrochemistry Symposium - Astrochemistry VIII - From the First Galaxies to the Formation of Habitable Worlds, 10-14 July 2023. (Contributed).

Dr. Pathikrit Bhattacharya

- Pathikrit Bhattacharya, Kattumadam Sreejith, Vineet Gahalaut, Adhaina Susan James, Subhasish Mukherjee, Ratna Bhagat, and Ritesh Agrawal, 2023, Interplay between aseismic and seismic slip in an earthquake swarm in Western India, EGU General Assembly 2023 (contributory talk).

Dr. Priyadarshi Chowdhury

- Invited Talk on 'When and how did Earth's earliest continents first emerge above the oceans?', European Geophysical Union (EGU) General Assembly, Venue: Vienna, April 2023.
- Invited Talk on 'Orogenesis on early Earth was controlled by lithospheric peeling' at the 6th International Archean Symposium (6ias), Venue: Perth, July 2023.
- Invited talk on 'Metamorphic cooling rates, diffusion chronometry & early Earth tectonics: Examples from Southern India' at a National Workshop on Geodynamic Evolution of South India-Eastern Ghats-Antarctica: Current perspectives and future prospects, NCESS Venue: Thiruvananthapuram, Ministry of Earth Sciences, September 2023.

Dr. Surya Snata Rout

- Invited Plenary Talk: -02/2024: "Cosmochemistry and meteorite studies". Astronomical Society of India Meeting 2024. IISc Bangalore.

Dr. Pranay Swain

- Translating thoughts into words: The importance of keeping things short and simple. Siksha O Anusandhan University, Bhubaneswar, 18 Feb 2024.
- Fostering public trust in Science: Remember the hits and forget the misses, 4th KSFH Sociological Lecture Series, School of Social, Financial and Human Sciences, KIIT University, 16 January, 2024.
- State level consultation workshop on Policy coherence in food, land and water resources, organised by the Department of Agriculture and Farmers' Empowerment of Govt. of Odisha on 14th Dec 2023, Bhubaneswar.
- International conference on Purvodaya perspectives: reflections on regional connectivity, 2-3 December, Bhubaneswar, The Energy Forum in collaboration with the Confederation of Indian Industry.
- What is this thing called Science, Apeejay School, Bhubaneswar, 04 November 2023.

- NEP 2020: Some reflections, Regional Institute of Education, Bhubaneswar, 25 July 2023.

Dr. Amarjeet Nayak

- Invited talk on "Speculative Fiction" at Indian Institute of Technology Bhubaneswar, 18th March, 2024.

Dr. Amarendra Das

- "Evolution of Odisha's Economy" at the Induction Training of OFS Probationers 2021 batch on January 05, 2024.
- "Implications of Fiscal Policies for Biodiversity Conservation in India" in the BFN Conference on Economic Incentives that affect Biodiversity organised by International Academy for Nature Conservation Isle of Vilm, Germany during June 13-16, 2023.
- Convergence in Public Policy (invited lecture) for the Induction Training Programme of OFS(Ps) on May 30, 2023 at Gopabandhu Academy of Administration, Bhubaneswar.
- Attended International Conference on The Social Economic and Institutional Aspects of Land and Ecosystem Restoration Jointly organised by Indian Institute of Forest Management, G20 Global Land Initiative, United Nations Convention to Combat Desertification, Azim Premji University, at Azim Premji University, Bengaluru on April 27-29, 2023.
- Role of Supply Chain in Making India $5 trillion Economy (invited) at Indian Institute of Material Management on Material Management Day Celebration at NALCO Nagar Branch, Bhubaneswar on April 23, 2023.

Dr. Joe Varghese Yeldho

- Stand up Comedy and the Phenomenology of Teaching, IISER Mohali, August 2023.
- The Cat in our midst: Poe, Freud and the English Teacher, IISER Mohali, January 2024.

Dr. Rooplekha Khuntia

- Invited Talk on 'Mother Tongue Teaching and Learning and it's Role in Nation Building: A Cognitive Perspective', Utkal University, 13th September, 2023.
- Invited Talk on 'Behavioural Changes Towards a Sustainable Future : A Step Forward', Kendriya Vidyalaya, 26th November, 2023.
- Conducted a session on 'Research Ethics : Intellectual Honesty, Research Integrity, Ethics and Plagiarism', Berhampur University, 09th March, 2024.

Prof. Brundaban Sahu

- A simple extension of Ramanujan-Serre derivative map and some applications, 32 mes Journees Arithmetiques, (July 3–7, 2023), Universite de Lorraine, Nancy, France.
- Two lectures on Words and Transcendence - I (August 7-12, 2023), Kerala School of Mathematics, Kozhikode.

Dr. Anil Kumar Karn

- Delivered a talk entitled "Orthogonality in ordered vector space" held at Ljubljana, Slovenia during July 10-14, 2023.
- Delivered a talk entitled "On the geometry of an order unit space" in the international conference "Conference of Order Structures with Applications" held at Kenitra, Morocco during February 5-9, 2024.

Dr. Binod Kumar Sahoo

- "Blocking sets of secant lines in PG(n,q)" at the Inter IISER–NISER Mathematics Meet-2023, September 29 - October 1, 2023, organized at the School of Mathematical Sciences, NISER.
- "On the minimum cut-sets of the power graph of a finite cyclic group" at the 10th Slovenian International Conference on Graph Theory, June 18 - 24, 2023, at Kranjska Gora, Slovenia.

Dr. Jaban Meher

- Multiplicity one results in the theory of modular forms, International seminar on topology, analysis and applications (ISTAA-2024), North Bengal University, Siliguri, West Bengal (12–14 March, 2024).
- Multiplicity one results in the theory of modular forms, 51st Annual conference of Orissa Mathematical Society, Fakir Mohan University, Balasore, Odisha (2–3 March, 2024).
- Determination of Siegel modular forms from their Hecke eigenvalues, Mathematics days, NISER, Bhubaneswar (8–9 September, 2023).

Dr. Kamal Lochan Patra

- A conjecture on different central parts of binary trees, 10th Slovenian Conference onGraph Theory, 18 - 24 June 2023, Kranjska Gora, Slovenia.
- Vertex connectivity of power graph of a finite cyclic group, Mathematics Day at SMSNISER, 8-9 Sep 2023, NISER Bhubaneswar, India.
- Diagonalization of matrices and beyond, Teacher Training Programme in Mathematics,2 - 5 Nov 2023, NISER Bhubaneswar, India.

- On the minimum cut-sets of the power graph of a finite cyclic group, 38th Annual Conference on Ramanujan Mathematical Society, 22nd - 24th Dec 2023, IIT Guwahati, India.

Dr. Manas Ranjan Sahoo

- Inter-IISER-NISER Mathematics Meet, One-dimensional pressureless gas dynamics model in the quarter plane, SMS, NISER, October 1, 2023.
- Mathematics Day-2023, Variational approach to Burgers equation, SMS-NISER, September 9, 2023.
- NSCPIM-2K23, Initial boundary value problem for 1D scalar conservation laws with strictly convex flux, Berhampur University, Odisha, October 19, 2023.
- Workshop for Refresher course in Mathematics, Cauchy problem for 1st order PDEs and weak solution concept, Bharthidasan University (online mode), October 31, 2023.
- IMS-2023 (89th annual conference of Indian Mathematical Society), Initial boundary value problem for 1D scalar conservation laws with strictly convex.
- flux, BITS-PILANI, Hyderabad Campus, December 23, 2023.
- Symposium, Initial boundary value problem for 1D scalar conservation laws with strictly convex flux, IISER TVM, February 3, 2024.

Dr. Panchugopal Bikram

- Non-Commutative Ergodic theory, ISI Delhi, 26, Feb-2nd March, 2024.

Dr. Ritwik Mukherjee

- “Conference on vector bundles” held at TIFR in March 2024.

Dr. Sanjay Parui

- Talk title : Boundedness of Differential Transforms for Dunkl Heat Semigroups Venue, IIT Guwahati, Date 21st December 2023.

Dr. Sutanu Roy

- Anyonic quantum permutation groups, Functional Analysis seminar (online), University of California San Diego on 30 January, 2024.
- Anyonic quantum permutation groups, International Conference on Spectral and Approximation Theory (ICSAT-2023), Cochin University of Science And Technology, Kerala on 27 November, 2023.
- Ordinary and braided quantum symmetries of finite graphs, Stat-Math Unit, Indian Statistical Institute Bangalore on 23 November, 2023.
- Braided quantum groups and quantum symmetries in the C*-algebraic framework, Department of Mathematics, Indian Institute of Technology Bombay on 16 October, 2023.
- Anyonic quantum symmetries of finite spaces, Stat-Math Unit, Indian Statistical Institute Kolkata on 19 July, 2023.
- Braided quantum symmetries of graph C*-algebras, North Atlantic Noncommutative Geometry Seminar (online) on 5 April, 2023.
- Quantum symmetries of finite spaces, Mathematics Online Seminar Series (MOSS), Indian Institute of Science Education and Research Berhampur on 1 April, 2023.

Dr. Anupam Pal Choudhury

- Series of lectures on “Differential Equations” at SOPM 2023 held at NISER.
- Series of lectures on the theme “Differential equations through the lens of dynamical systems” from 5th to 8th JuIy, 2023 at Ramakrishna Mission Vidyamandira, Belur Math.

Dr. Dinesh Kumar Keshari

- "Operator Analysis - A renaissance“ held in Bangalore, May 2023.
- On pi-Day celebration, Department of Mathematics, Sambalpur University- 14-03-2024.

Dr. K. Senthil Kumar

- Delivered a series of lectures on graduate Linear Algebra, Summer Outreach Program in Mathematics (20 May-08 June 2024), NISER, Bhubaneswar.
- Invited speaker in the workshop “Words and Transcendence - II”, Harish-Chandra Research Institute, 06 -15 Feb 2024.
- Invited as a keynote speaker on Complex Analysis AFS-I, Gitam University, Bangalore Campus, 04-30, December 2023.
- Invited speaker in the conference “ICCGNFRT-2023”, KSOM, October 26-30, 2023.
- Gave a talk on Gelfond-Schneider theorem in the workshop on Words and transcendence, KSOM.

Dr. Kaushik Majumder

- A series of invited lectures were delivered at DMS, IISER Kolkata, with the theme/title “Application of the second moment probabilistic method in Combinatorics” on May 29, June 2 and June 9, 2023.
- An invited lecture delivered at the Department of Mathematics, Jadavpur University, titled “ The lower

bound of Ramsey numbers", on June 8, 2023.

- A series of lectures on "Basic Probability Theory" were delivered at NISER Bhubaneswar from June 26 to July 21, 2023.
- An invited lecture delivered at the IISER-NISER meet titled " The Szemerédi regularity Lemma" on August 31, 2023.

Dr. Nabin Kumar Jana

- Probability Theory: Joint Random Variables, BISSP, NISER Bhubaneswar, July 10 - 14, 2023 (Contributory).
- What is PROUT?, Rabindra Bharati University, January 30 – 31, 2024.

Dr. Ramesh Manna

- Fixed time estimates for Hermite semigroup in Lebesgue and modulation spaces at BITS-Pilani, Hyderabad Campus, 89th Annual Conference of the IMS-2023.
- Fractional Fourier transform, Modulation space and related topic at Niser, Inter-IISER-NISER-Math-Meet 2023 (IINMM 2023).
- Talks at SMS Mathematics Days: Introduction to the local smoothing for the Fourier integral operator at Niser, 2023.

Dr. Krishanu Dan

- "Linear System of Curves" at TCG Crest, Kolkata, July, 2027.

Dr. Rekha Biswal

- "Ideals in the enveloping algebras of affine Kac-Moody algebras", Kiel University, Germany, July 27, 2023.
- "Ideals in the enveloping algebras of affine Kac-Moody algebras", Inter IISER-NISER Meet, National Institute of Science Education and Research, Bhubaneswar, India., Oct 1, 2023.
- "Ideals in the enveloping algebras of affine Kac-Moody algebras", Uppsala University, Sweden, June 13, 2023.
- "Ideals in the enveloping algebras of affine Kac-Moody algebras", Seminar talk at IISc Bangalore, Nov 17, 2023.

Dr. Sudhir Kumar Pujahari

- 2023 (26th-30th October) International conference on class group of number fields and related topics, Statistics of Hurwitz class numbers and trace of Frobenious of elliptic curves.
- 2023 (26th-30th June) HKU Number Theory Day, Sato-Tate conjecture in arithmetic progressions.
- 2023 (April 21st) IISER Tirupati, A central limit theorem in Number theory.
- 2024 (20th - 24th May) 36th Automorphic Forms Workshop, Oklahoma State University, Sato-Tate conjecture in arithmetic progressions for certain families of elliptic curves.
- 2023 (3rd - 7th July) 32èmes Journées Arithmétiques, Sato-Tate conjecture in arithmetic progressions for certain families of elliptic curves.
- 2022 (20th - 24th June) Equidistribution and Arithmetic Dynamics, Oklahoma State University,, Sato-Tate Conjecture in Arithmetic Progressions for Certain Families of Elliptic Curves.

Dr. Tushar Kanta Naik

- 3 lectures + 2 tutorials on Combinatorial Group Theory, Workshop on Group Theory and Around, HRI, December 2023.

Prof. Bedangadas Mohanty

- Baryon fluctuation in baryon rich QCD matter, 1st Workshop on Baryon Dynamics from RHIC to EIC, Center for Frontiers in Nuclear Science (CFNS), Stony Brook University, USA, Jan 22-24, 2024.

On behalf of ALICE:

- (Poster presentation) Correlations of net-charge, net-kaon and net-proton in Pb-Pb collisions at $\sqrt{s_{NN}}$ = 5.02 TeV with ALICE, Swati Saha, on behalf of ALICE collaboration. XXXth International Conference on Ultra-relativisticNucleus-NucleusCollisions(QM2023), Houston, Texas, 77010, USA, Sep 3 - Sep 9, 2023.
- (Parallel talk) Correlations among net-charge, net-kaon and net-proton at LHC energies with ALICE, Swati Saha, on behalf of ALICE collaboration. 67th DAE Symposium on Nuclear Physics, Indian Institute of Technology, Indore, Madhya Pradesh, India, Dec 9 - Dec 13, 2023.
- (Parallel talk) Investigating Local Parity Violation in Strong Interactions at LHC Energies, Prottay Das, on behalf of ALICE collaboration. 2nd workshop on dynamics of QCD matter, Niser, Jatni, Odisha, India, Oct 7 - Oct 9, 2023.

On behalf of STAR:

- (Parallel talk) Search for QCD Critical Point: Recent Results from STAR BES-I Program and Status of BES-II, Bappaditya Mondal, on behalf of STAR collaboration. 67th DAE Symposium on Nuclear Physics, Indian Institute of Technology, Indore, Madhya Pradesh, India, Dec 9 - Dec 13, 2023.

On behalf of SuperCDMS/MINER:

- (Parallel talk) Investigating Compton steps in SuperCDMS Si HVeV detectors, Sudipta Das, on behalf of SuperCDMS collaboration. XVIII International Conference on Topics in Astroparticle and Underground Physics (TAUP2023), University of Vienna, Austria, Aug 28 - Sep 1, 2023.
- (Poster presentation) Calibrating SuperCDMS Si HVeV Detectors Using Compton Steps for Low Mass Dark Matter Searches. Sudipta Das, on behalf of SuperCDMS collaboration. 67th DAE Symposium on Nuclear Physics, Indian Institute of Technology, Indore, Madhya Pradesh, India, Dec 9 - Dec 13, 2023.

Any other Talk (Theory/Model/Simulation):

- (Talk) Study of cumulants and its ordering in 2D Pott's model, Swati Saha. Aspects of the QCD Phase Diagram, Indian Institute of Science Education and Research, Bhopal, Madhya Pradesh, India, Nov 18 - Nov 20, 2023

Prof. Sanjay Kumar Swain

- International Conference on New Frontiers in Physics 2023, Kolymbari, Greece, 10-23 July 2023.
- International Conference on Heavy Quarks and Leptons 2023, TIFR, Mumbai, Nov 28- Dec 2, 2023.

Prof. Subhankar Bedanta

- Invited talk on "Magnetism at the interfaces and in nanostructures for future spintronic applications" at CV Raman Global University, Bhubaneswar, in April 2023.
- Invited talk on "Spin-to-charge conversion with various quantum materials" at Institute of Solid State Physics (ISSP) at The University of Tokyo, Japan in May 2023.
- Invited talk on "Organic spintronics- a new playground for exciting physics" at Forschungszentrum Juelich, Germany in October 2023.
- Invited talk as the 1st Special CMSM-ERATO Joint Seminar entitled "Exchange bias properties and spin to charge conversion in with various antiferromagnetic systems" at National Institute of Materials Science (NIMS), Tsukuba, Japan, in May 2023.
- Invited talk "Magnetism at the interfaces and in nanostructures for future spintronics applications" at North Odisha University, Baripada in May 2023.
- Invited talk "Magnetism at the interfaces and in nanostructures for future spintronic applications" at the SRM Institute of Science & Technology, Chennai in December 2023.
- Invited talk "Magnetism at the interfaces and in nanostructures for future spintronic applications" at Uppsala University, Sweden in September 2023.

Dr. Ajaya Kumar Nayak

- Stabilization of Merons/Antimerons in D2d Symmetric Mn-Pt(Pd)-Sn-In System, invited talk in the ICMAGMA international conference, Hyderabad, December 2023.
- Effect of non-collinear magnetic ordering in stabilization of antiskyrmion phase in D2d symmetric Mn-Pt(Pd)-Sn-In system, Invited talk in MRSI-2023 conference, Varanasi, December 2023.
- Topological magnetic quasiparticles in D2d Symmetric Mn-Pt(Pd)-Sn-In System, Invited talk in Indo-French bilateral workshop on Room temperature magnetic skyrmions and their application (IF-WoRMS 2024), IIT Delhi, March 2024.

Dr. Amaresh Kumar Jaiswal

- "Spin Polarization and Relativistic Spin-Hydrodynamics", Meeting on the physics of ALICE, CBM and STAR (MPACS) 2024, VECC Kolkata, January 29-30, 2024. (Invited).
- "Flow fluctuations and kinetic freeze-out at SPS energies", Workshop on Physics Performance Studies at NICA (NICA 2023), Virtual via ZOOM, December 25-27, 2023. (Invited).
- "Pseudogauge freedom and spin operator algebra in relativistic spin-hydrodynamics", Discussion meeting on Aspects of the QCD phase diagram, IISER Bhopal, November 18-20, 2023. (Invited).
- "Relativistic spin-(magneto)hydrodynamics", India-JINR workshop 2023, Dubna, Russia, October 16-19, 2023. (Invited).
- "Quasiparticle Cosmology", 2nd Workshop on Dynamics of QCD Matter, NISER, October 07-09, 2023.
- "Quasiparticle Cosmology", VECC Physics Group Seminar, VECC Kolkata, September 04, 2023. (Invited).
- "Relativistic spin-(magneto)hydrodynamics", ISMD 2023, Gyöngyös, Hungary, August 21-26, 2023. (Contributory).
- "Relativistic spin-(magneto)hydrodynamics", MAGIC 2023, Kovalam Kerala, March 28-April 1, 2023. (Invited).
- "Relativistic spin-(magneto)hydrodynamics", HHHPS 2023, IIT Gandhinagar, March 24-25, 2023. (Invited)
- "Relativistic spin-magnetohydrodynamics", ICPAQGP Puri, February 7-10, 2023. (Contributory)

- "Relativistic spin-(magneto)hydrodynamics", HEP Seminar Series, NISER, January 20, 2023.
- "Relativistic spin-(magneto)hydrodynamics", Free Meson Seminar, TIFR Mumbai, January 12, 2023. (Invited)

Dr. Anamitra Mukherjee

- Young Investigators Meet on Quantum Condensed Matter Theory 2023, IISER Bhopal.
- Strongly correlated physics conference at HRI.
- Strong correlation & superconductivity meeting IISER Kolkata.

Dr. Colin Benjamin

- Invited talk in IISER, Kolkata, "On two applications of quantum walks" in QIQT 2023, on 29th May 2023.
- Invited talk in Winter school on evolutionary game theory, Shiv Nadar University, Delhi, December 2023 on "Analytical drivers of cooperative behavior", Dec. 22, 2023.
- Invited Talk in the Summer internship program of NISER in June-July 2023 on "Quantum Computers"

Dr. Kartikeswar Senapati

- Coupling interfacial spin-orbit phenomena to Josephson effect in planar devices, Invited Talk at "Quantum Matter heterostructures" conference at IIT Hyderabad, 18 -20 July 2023.
- Magnetic flux quantum as a spin sensor, Invited Talk at "Annual Conference on Quantum Condensed Matter" at NISER, Bhubaneswar, 27-30 Nov 2023.
- Rashba-Edelstein effect via Josephson nano-Junctions and SQUIDs, Invited Talk at "Materials Research Society of India conference" at IIT BHU, 12-15 Dec 2023.

Dr. Nishikanta Khandai

- The distribution of Cold Gas in the Local Universe, 11 May 2023, Largest Cosmological Surveys and Big Data Science, ICTS, Bangalore.

Dr. Prasanjit Samal

- Challenges ahead of ML-DFT: Additions within and beyond the Jacob's Ladder of DFT from Semilocal through Dielectric Dependent Hybrids @ NAMMA Psi-k Workshop in Bangalore, India by IISc & JNCASR

Dr. Pratap Kumar Sahoo

- Raman Thermometry and Bandgap Tunability in 10H-SiC Thin, ICNMAT- NTU, Singapore, 26-30 June 2023
- Film for Beta-voltaic Device Applications Charge Density Waves activated excitons in 2D materials by low-energy ion implantations, IIT Hydrabad, 18-20 July 2023
- Defects activated excitons and magnetism in 2D quantum materials, IOP Bhubaneswar, 27 - 30 November 2023
- Nanoscale Surface tracks induced Ferromagnetism by low energy ion irradiated 2D-Materials, GG University, New Delhi, 6-10 Nov 2023
- Tuning Charge Density wave and bandgap opening by ion-implanted 2D-Materials, IIT BHU, 12-15 Dec 2023
- 2D-CDW materials for SERS and photocatalytic Applications, ICFMPT- Petroleum institute Bhubaneswar, 14-16, March 2024
- Plasmon-induced Charge Density Wave, SERS, and Photocatalytic Enhancement in 2D -TiSe2 Nanocrystals, SNU, New Delhi, 20-23, March 2024.

Dr. Proloy Kumar Mal

- "Standard Model Physics at the LHC" International Conference on High Energy Physics & Astroparticle Physics, Saha Institute of Nuclear Physics, Kolkata, Dec 11-15, 2023.

Dr. Shamik Banerjee

- Celestial Kickoff Workshop, 26/10/2023 - 29/10/2023, Department of Physics, Harvard University, USA.
- Amplifying Gravity At All Scales, 26/06/2023 - 21/07/2023, Nordita, Stockholm, Sweden
- Indian Strings Meeting 2023, 10/12/2023- 16/12/2023, IIT Mumbai.
- Non-perturbative methods in Quantum Field Theory and String Theory, 29/01/2024- 02/02/2024, HRI, Allahabad.

Dr. Sumedha

- Joint CMSP-QLS seminar: Multiple phase transitions in spin-1 models with quenched random fields, on 12th. June 2023 at ICTP, Trieste, Italy.
- Random field spin models (Invited), on 08 December 2023 at. RRI, Bangalore in the conference on "Frontiers in Statistical Physics".

Dr. Victor Roy

- Talk title: Unusual effectiveness of hydro and some pertinent questions, Venue: IIT Gandhinagar, India, Date: 2-9 January, 2024.
- Talk title: Early time attractor solution under force, Venue: JINR, Dubna, Russia, Date: 16-19 October, 2023.

Dr. Yogesh Kumar Srivastava

- Black Hole Hair in String Theory, HRI Prayagraj, 20/3/2024.

Dr. Kush Saha

- Invited talk in the "Conference of Condensed Matter, Materials Science and Statistical Physics (CMMSSP-2023)', Presidency University, Kolkata, 28-29 April, 2023.
- Contributed talk in the international seminar and workshop on "Control of Ultrafast (Attosecond and Strong field) Precesses Using Structured Light (cupusl23)", MPIPKS, Dresden, Germany, 26 June- 14 July, 2023.
- Invited talk (Online) in the India-JINR workshop on elementary particle and nuclear physics, and condensed matter, Joint Institute of Nuclear Physics, Dubna, Russia, 16-18 October, 2023.

Dr. Luke Robert Chamandy

- Online seminar: "Common Envelope Evolution: What we are learning from 3D global hydrodynamic simulations", Hamburg Observatory, Hamburg, Germany, 3 May, 2023.
- Seminar: "What we have learned from 3D hydrodynamical Simulations of Common Envelope Evolution", Université de Montréal, Montreal, Canada, 1 June, 2023.
- Seminar: "What we have learned from 3D hydrodynamical Simulations of Common Envelope Evolution", Rochester Institute of Technology, Rochester, USA, 5 June, 2023.
- Contributed talk: "How negative feedback and the ambient environment limit the influence of recombination in common envelope evolution", European Astronomical Society Annual Meeting, Krakow, Poland, 12 July, 2023.

Dr. Najmul Haque

- Talk titles: (i) Heavy quarks and quarkonium in thermal QCD medium, (ii) Diffusion coefficient of heavy quarks in light of Gribov-Zwanziger action at WHEPP XVII, IIT Gandhinagar, 2nd Jan - 11th Jan, 2024 (Invited)
- "Non-perturbative resummation at finite temperature field theory" presented in Yonsei University on 8th Nov, 2023. [Invited]
- "Heavy-quarkonium potential: Theoretical study" presented in 4th Heavy Flavour Meet 2023, Goa on 3rd Nov, 2023[Invited].
- "Heavy quarkonium potential in presence of magnetic field" presented in India-JINR workshop [online] on 16th Oct, 2023 [Invited].
- "QCD mesonic screening masses using Gribov quantization", presented in DTP, TIFR on 29th Sep, 2023. [Invited]
- "QCD mesonic screening masses: Beyond perturbative study" presented in 52nd ISMD, Gyöngyös, Hungary on 23rd Aug, 2023. [Contributory]

Dr. Satyaprasad P. Senanayak

- Invited talks in the Specified Conferences at IACS Kolkata, IISER Kolkata, NISER Bhubaneswar, IIT Kharagpur.

Dr. Shovon Pal

- Microscopy of terahertz exchange resonance nonlinearities in a ferrimagnetic insulator, National Conference on Quantum Condensed Matter 2.(QMAT), NISER Bhubaneswar, India, 27 - 30 November 2023. (Invited)
- THz driven ultrafast processes in quantum materials, Tutorial talk, 10th theme meeting on Ultrafast Sciences (UFS), NPL Delhi, India, 24 - 27 November 2023. (Invited)
- THz driven ultrafast processes in quantum materials, Colloquium talk, IIT (ISM) Dhanbad, India, 11 September 2023. (Invited)
- THz driven ultrafast processes in quantum materials, Students' Conference on Advances in Photonics Engineering (SCAPE), IIT Bhubaneswar, India, 06 June 2023. (Invited)
- THz driven ultrafast processes in quantum materials, Indo-French Conference on Frontiers in Photonics and Meta-materials (IFCFPM), Mahindra University, India, 20 - 22 April 2023. (Invited)

Dr. Tapan Mishra

- Re-entrant localization in quasiperiodic lattices, Discussion meeting on Periodically and quasi-periodically driven complex systems, ICTS-TIFR, Bangalore, 12-23 June 2023.
- Understanding quantum phases of interacting bosons with quantum walk, Conference one Quantum Information and Quantum Technology, IISER Kolkata (Online), 15th May, 2023.
- Non-trivial doublon formation in the quench dynamics of interacting particles, Discussion meeting on Stability of quantum matter in and out of equilibrium, ICTS-TIFR, Bangalore, January 2024.
- Realising interaction induced Thouless charge pump,

NISQ seminar, Google quantum AI, Santa Barbara USA (online), 15th March 2024.

- Physics at ultracold temperatures, National seminar on Advanced in Physics, Pattamundai College, Odisha, 16th March 2024.
- Realm of ultracold temperatures, National Science Day talk, DRDO, Chandipur, Odisha, 28 Feb 2024.
- Re-entrant localization in quasiperiodic lattices, 1st Annual Physics Symposium, IISER Berhampur, 26-27 October 2023.

Dr. Tuhin Ghosh

- "Extragalactic science with submm facility" - ASI workshop, IISc, 31st January 2024 (Invited).
- "Application of Bayesian Inference to disentangle CMB foregrounds" - RRI Bangalore, 29th January 2024.
- "Modelling magnetic field of M31 using radio observations" - ENS France, 28th June 2023.
- "Application of Bayesian Inference to disentangle CMB foregrounds" - Banyuls-sur-mer France, 15th June 2023 (Contributory).

Dr. V. Ravi Chandra

- Bulk and surface magnons in a class of spin models on the pyrochlore lattice, Delivered at the meeting "Excursions in condensed matter physics" held in January 2024 at IISc Bangalore. (Invited).

Dr. Narayan Rana

- NNLO QCD corrections to semi-inclusive DIS, Loops and Legs in Quantum Field Theory, 18th April, 2024
- Second order QCD corrections to SIDIS : Technicalities, Probing Hadron Structure at the Electron-Ion Collider, 8th February, 2024.
- Mixed QCD-EW two-loop amplitudes for charged current Drell-Yan production, RADCOR 2023, 29th May, 2023.
- Mixed QCD-EW two-loop amplitudes for Drell-Yan production, Universität Hamburg, 28th May 2024.
- Mixed QCD-EW two-loop amplitudes for Drell-Yan production Max Planck Institute, Garching, Munich.

Dr. Saralasrita Mohanty

- Visited the Department of Physics, S. V. M. autonomous college, Jagatsinghpur, Odisha, delivered an Invited talk on "Biomimetic Materials" and interacted with the students 29/04/2023.

Dr. Varchaswi K S Kashyap

- V. K. S. Kashyap. Introduction to particle accelerators and its medical applications. Particle Therapy Master Class, National Institute of Science Education and Research Bhubaneswar, Jatni, Khordha-752050, India. Mar. 2024.
- V. K. S. Kashyap. Muon Identifier- ALICE 3: Activities and plans in India. 4th ALICE Upgrade Week, Torino. Dec. 2024.

Dr. Shuddha Shankar Dasgupta

- Invited talk on "Aging of Photocathodes and Exploration of Novel PC Materials" deliver in online mode to 3rd International Conference on Detector Stability and Aging Phenomena in Gaseous Detectors (6-10 November 2023).
- Invited talk on "Prospects of the EIC India group" in the EIC-Asia Workshop held in National Cheng Kung University,
- Taiwan from January 29 – 31, 2024. Delivered in online mode.
- Invited talk on "Potential detector and hardware participation of Indian groups in ePIC at EIC" in International School and Workshop on Probing Hadron Structure at the Electron-Ion Collider (QEIC III) held at ICTS Bengaluru, India from 5 – 9 February 2024.

Mr. Rakesh Kumar Bhatta

- Invited talk on "Introduction to Ionizing Radiation and Its application in Medicine" at Nimapara Autonomous College, Nimapara on the eve of National Science Day on 28th February 2024.

JOURNAL EDITORSHIP

Prof. Chandan Goswami

- Guest Associate Editor, Frontiers in Membrane Physiology and Membrane Biophysics.
- Review Editor, Frontiers in Molecular and Cellular Reproduction

Prof. Palok Aich

- Editor-in-Chief, Microenvironment and Microecology Research, TMR Publishing Group, New Zealand.
- Guest editor, Metabolites (Special issue).
- Editorial Board, Medicine in Microecology, Elsevier, USA.
- Associate Editor, Frontiers of Cellular and Infection Microbiology (Microbiome in Health And Disease), USA.

Dr. Asima Bhattacharyya
- Editorial Board Member, Current Research in Physiology, Elsevier

Dr. Harapriya Mohapatra
- Guest Associate Editor, Frontiers in Cellular and Infection Microbiology section Molecular Bacterial Pathogenesis.

Dr. Kishore CS Panigrahi
- Review Editor, Plant Biotechnology, Frontiers in Plant Science.

Dr. Manjusha Dixit
- Guest Editor, Scientific Reports: Angiogenesis in health and disease, 2023.
- Guest Editor, Scientific Reports: Autophagy and anti-tumour immunity, 2023.

Dr. Ramanujam srinivasan
- Associate Editor, Resonance, IASc

Dr. Subhasis Chattopadhyay
- Associate Editor, Frontiers in Immunology, 2023
- Review Editor, Frontiers in Cellular and Infection Microbiology

Dr. Aniruddha Datta Roy
- Editor, Zootaxa, Magnolia Press, Auckland, New Zealand.
- Editor, Resonance Journal of Science Education, Indian Academy of Sciences.
- Editor, Hamadryad, Madras Crocodile Bank trust and Centre for Herpetology.

Dr. Swagata Ghatak
- Topic editor, Frontiers in Neuroscience- Neurodegeneration, (Topic: Olfactory Dysfunction in Neurodegenerative Diseases; Press: Frontiers Media).

Prof. Chidambaram Gunanathan
- Editorial Board Member, Journal of Chemical Sciences (2023-2025).

Prof. Moloy Sarkar
- Guest Editor of Chemical Physics Impact (Elsevier).

Dr. Bishnu Prasad Biswal
- Associate Editor, Frontiers in Chemistry, Frontiers Media SA.

Dr. Pathikrit Bhattacharya
- Handling Editor, Seismica
- Review Editor, Solid Earth Geophysics – Frontiers in Earth Science.

Dr. Priyadarshi Chowdhury
- Editorial Board Member, Geology, Geological Society of America.

Dr. Pranay Swain
- Editorial Board member, Educational research and Evaluation, Taylor and Francis.
- Member, Editorial Advisory Board, Explorations, Indian Sociological Society.

Dr. Amarendra Das
- Associate Editor, Odisha Economic Journal, Odisha Economic Association

Dr. Binod Kumar Sahoo
- Editorial Board Member, Innovations in Incidence Geometry

Prof. Bedangadas Mohanty
- Editorial Board Member, International Journal of Modern Physics E, World Scientific Publishing.
- Editorial Board Member, Proceedings of the Indian National Science Academy, Springer Publishing.
- Editorial Board Member, Nuclear Science and Techniques, Springer Publishing.

Prof. Subhankar Bedanta
- Associate Editor, Journal of Superconductivity and Novel Magnetism.
- Editorial Advisory Board member, Journal of Magnetism and Magnetic Materials.
- Associate Editor, Frontiers in Nanotechnology.
- Associate Editor, Frontiers in Physics.

Dr. Pratap Kumar Sahoo
- Guest Editor, Frontiers in Physics - Frontiers Media Publisher.
- Topic Editor, Frontiers in Materials Science - Frontiers Media Publisher.

CONFERENCES / WORKSHOPS / SEMINARS / WEBINARS

Participation

Prof. Chandan Goswami

- ISPP-EMBO 2024 at NISER, 9-12th Jan 2024.
- QUAD Mini Symposium-2024 on Cellular Structure-Function and Homeostasis. NISER. 27th Jan.

Dr. Abdur Rahaman

- Chair, 5th Annual BioGroup-India Meeting 2023 JNCASR, Bangalore 17th – 18th July 2023.

Dr. Asima Bhattacharyya

- Invited talk: "The enigma of ROS regulation in *Helicobacter pylori*-mediated gastric adenocarcinoma by SIAH2 protein." 3rd International Conference on Frontiers in Biological Sciences (InCoFIBS 2023). Department of Life Science, NIT Rourkela, 5-7 Oct 2023
- Delivered a talk as a chief guest on "Human gastric carcinogenesis: knowing about a pathogen and the host response", Awareness program on Microbial Infections. School of Paramedics and Allied Health Sciences. CUTM, Odisha, 27 Sep 2023.
- Delivered a talk on "The rise of extracellular vesicles (EVs) from cellular trashes to useful biotechnology tools" at a workshop on "Future diagnostic tools, informatics & AI; Possibilities in healthcare, agriculture and Industries" at Trident School of Biotech Sciences, Bhubaneswar, on 12th February 2024
- Invited webinar talk delivered on "Mysteries of ROS regulation in Helicobacter pylori-mediated gastric cancer. 5th Edition of webinar on GASTROENTEROLOGY & HEPATOLOGY, organized by gastroenterology-hepatology.org, March 20, 2024.

Dr. Debasmita Pankaj Alone

- Attended the Board of Studies (BOS) Meeting for UG Syllabus revision for the Department of Biotechnology, Odisha University of Technology and Research, Bhubaneswar as a subject expert on 13th April, 2024.
- Attended Understanding Institutional Ethics Committee Functions and Regulations on 15th April, 2024 at NISER.

Dr. Harapriya Mohapatra

- Hitkarsh Kushwaha and Harapriya Mohapatra. "Determining topology of bacterial MATE efflux pump protein EmmdR", at 92nd Annual Meeting of the Society of Biological Chemists (India), held from 18th to 20th December 2023 at BITS Pilani, Goa campus.
- Shashank Patole and Harapriya Mohapatra. "Overview of cellular pathway activity using transcriptome data Klebsiella pneumoniae persister cells", at 92nd Annual Meeting of the Society of Biological Chemists (India), held from 18th to 20th December 2023 at BITS Pilani, Goa campus.
- Jiban Mishra and Harapriya Mohapatra. "Characterization of antibiotic induced resistant mutants of Klebsiella pneumoniae", at 92nd Annual Meeting of the Society of Biological Chemists (India), held from 18th to 20th December 2023 at BITS Pilani, Goa campus.
- Sanchari Chowdhury and Harapriya Mohapatra. "Understanding the role and regulation of TolC under acid stress condition in Enterobacter spp.", at 92nd Annual Meeting of the Society of Biological Chemists (India), held from 18th to 20th December 2023 at BITS Pilani, Goa campus.
- Hitkarsh Kushwaha and Harapriya Mohapatra. "Predicted flexible regions in the EmmdR efflux pump are oriented towards the periplasmic and cytoplasmic sites" at 3rd International Conference on Antimicrobial Resistance, Novel Drug Discovery and Vaccine Development: Challenges and Opportunities, held from 18th-20th March by SRM University at India Habitat Centre, New Delhi.

Dr. Manjusha Dixit

- 8th World Cancer Congress 18th - 20th March, 2024. JNU Convention Centre, JNU, New Delhi, India.
- Molecular And Genomic Techniques In Cancer Studies (MAGTICS-2023)" during 24th- 28th July 2023. Department of Life Science, National Institute of Technology, Rourkela, India.
- Quarterly Union For Academic Discourse (QUAD-1) Cellular Structure-Function and Homeostasis. Jointly organized by ILS and SBS-NISER, NISER, 27th January 2024.

Dr. Mohammad Saleem

- Cell Symposia: Infection biology in the age of the microbiome. 7th- 9thJune, 2023. Paris, France. Organizers: Institute Pasteur/UCLA/MPI Developmental Biology. (abstract selected for poster).

Dr. Pankaj Vidyadhar Alone

- EMBL-Heidelberg meeting on protein synthesis and translational control 6th -10th Sept 2023 on Interaction of the eIF2β zinc-binding domain to the eIF2γ GTP binding interface promotes tRNAi binding.

- Society of Biological Chemist India- Goa 18th -20th Dec 2023. eIF2β zinc-binding domain interacts with the eIF2γ subunit through the GTP binding interface to promote tRNAi binding.

Dr. Subhasis Chattopadhyay

- 25th INDO-US Flow Cytometry Workshop on Flow Cytometry.

Dr. Aniruddha Datta Roy

- 59th Annual Meeting of the Association for Tropical Biologyand Conservation, July 2nd-6th, 2023, Coimbatore, India
- Hands-on workshop on molecular Phylogenetics, Mizoram April 2023.

Dr. K. Himabindu Vasuki

- EMBO-ISPP 2024, Organized at NISER, ODISHA.

Dr. Rittik Deb

- RAASVB, an international conference in Visva-Bharati, Santiniketan, 2024.
- "Understanding Behaviour" international conference at IISER, Kolkata, 2023.
- "Animal Behaviour Symposium" (international) at IISc, Bangalore, 2023.

Dr. Swagata Ghatak

- Participated in NCBS Annual Talks 2023: Patterns in Biology, Venue: NCBS, Bangalore, Date: 23th to 25th January 2023 as session chair and poster judge.

Dr. Shyamasree Ghosh

- EMBO: ISPP2024 Workshop organized by NISER, SBS at NISER, 09 - 12 January 2024
- Safety Talks: NISER Pathani Samatha Auditorium: 9th September: Biology 2:30 pm to 3:30 pm
- Talk on Entrepreneurship by Prof. Deepa Ghosh: Mar 11, 2024 2:30pm - 3:50pm
- Second P. K. Parija Lecture in Life Sciences at NISER, Talk by Prof Raghavendra Gadagkar on 20th March 2024.
- All talks in SBS-Meet 2024 on 3rd February 2024.

Dr. Saurabh Chawla

- DST STUTI ICT at SOA University (2023).
- Session on "Recent trends on animal experimentation" organised by Centurion Capacity and Competency Development Center (CCCDC) at Centurion University Bhubaneswar Campus 2023.

Prof. Moloy Sarkar

- Gave a talk in conference (SIS1 meeting) at NISER.
- Gave an invited Talk in *Green Chemistry International Conference* at University of Ladakh (LEH campus), in July 2023.
- Invited to give an invited Lecture in TSRP 2024, BARC, Mumbai.
- Invited to give a talk in NAMOSBIO conference in IISER Kolkata in 2024.

Prof. Prasenjit Mal

- "$CsPbBr_3$ as Visible Light Photocatalysis in Organic Synthesis" Hybrid "International Conference on Organometallics andCatalysis" (ICOC-III), from 30th October (1:00 PM) to 2nd November (2:00 PM)-2023 at the 'The ZuriWhiteSands, Goa Resort & Casino' located in Goa, India.
- "$CsPbBr_3$ as Visible Light Photocatalysis in Organic Synthesis" Hybrid Halide Perovskites (HyPe) 2023: December 22nd and 23rd, 2023, IACS, Kolkata.
- "Visible Light Photocatalysis in Organic Synthesis" GITAM Chemistry Research Conference 2023 (GCRC 2023), 7th to 9th December, Vishakhapatnam Campus.
- "Visible Light Photocatalysis in Organic Synthesis" Inter IISER-NISER Chemistry Meet during February23-25, 2024 at IISER Kolkata.
- "Visible Light Photocatalysis in Organic Synthesis" March 23rd, 2024, IISER Berhampur Chemistry Meet 2024.

Dr. Arindam Ghosh

- Invited session chair, Machine Learning for Molecular Sciences – 2024, Thiruvananthapuram, India.

Dr. Chandra Shekhar Purohit

- FORCE IICS, Kathmandu, during 28th – 30th Sept 2023.

Dr. Nagendra Kumar Sharma

- Loquitur 2022, IISER-Berhampur, Odisha) India
- CFOS-2022 conference. IIT-Roorkee (UK) India
- RTCS2022, IIT (ISM) Dhanbad, (Jharkhand), India
- 1st HBNI-NISER meeting-2023, NISER Bhubaneswar, India
- Indian Peptide Society-2023, BIIT-Pilani, Goa campus, Goa, India.
- NCRACS-2023, Department of Chemistry, University of Berhampur
- Dept. of Chemistry, ITER, Siksha 'O' Anusandhan Deemed to be University, BBSR.

Dr. Sharanappa Nembenna

- Modern Trends in Inorganic Chemistry (MTIC-XX), Indian Institute of Science, Bangalore, India 14th -17th December 2023.

- 3rd International Conference on Main-group Molecules to Materials (MMM III) during Indian Institute of Technology (IIT) Hyderabad, India 09-11, December 2023.
- 3rd International Conference on Organometallics and Catalysis (ICOC) held in Goa, India, from October 30 to November 2, 2023.

Dr. Upakarasamy Lourderaj

- Advances in Spectroscopy and Dynamics, IISc Bangalore, November 2023.
- International Conference on Molecular Energy Transfer in Complex Systems (iCOMET), Jaipur, November 2023.
- Theoretical Chemistry Symposium, IIT Madras, December 2023.
- Organics in Space, IIST Thiruvanthapuram, January 2024.
- Spectroscopy and Dynamics of Molecules and Clusters (SDMC), November 2024.
- Machine Learning for Science, Thiruvananthapuram, January 2024.

Dr. Bishnu Prasad Biswal

- DCS MEET-2024, IISER Berhampur, Odisha, Mar. 2024.
- ICFMPT-2024, IOP Bhubaneswar, Odisha, Mar. 2024.
- FMCS, ICT Bhubaneswar, Odisha, Jan. 2024.
- MTM-OCS, Ravenshaw University, Cuttack, Odisha, Jan. 2024.
- MRSI-AGM, IIT BHU, Varanasi, Dec. 2023.
- RCSRT-OCS, Dhenkanal (Auto.) College, Dhenkanal, Odisha, Nov. 2023.

Dr. Aritra Banik

- ACM India Annual Event, Feb 8 to Feb 10 2024.

Dr. Pathikrit Bhattacharya

- European Geosciences Union General Assembly 2023.
- American Geophysical Union Fall Meeting 2024.

Dr. Priyadarshi Chowdhury

- EGU General Assembly (Invited), Vienna, 23rd to 28th April, 2023.
- 6th International Archean Symposium (Invited), Perth, 25 to 27th July 2023.
- NCESS National Workshop (Invited), Thiruvananthapuram, 11th-12th September 2023.

Dr. Pranay Swain

- Whose life is it anyway?: Perceived challenges of sex reassignment surgery among transgender people, International Seminar On Inequalities, Othering and Violence in Everyday Life, Cluny Women's College, Kalimpong, 23-24 November 2023, RC-28 of the Indian Sociological Society.
- Precarity of Contract Teachers: A Qualitative Analysis of Lived Experiences, XX ISA World Congress of Sociology, Melbourne, 25 June -01 July 2023, RC-04: Sociology of Education.
- Human-Elephant Interactions: Perspectives of Young Stakeholders on Conflict Mitigation and Conservation, XX ISA World Congress of Sociology, Melbourne, 25 June -01 July 2023, WG-05 Session- Environmental Crisis/Justice, Global Frameworks and Local Actions: An Agenda for Sustainable Development.
- State-level Consultation Workshop on Policy Coherence in Food, Land, and Water Systems: Case study of Odisha' on Thursday, Council on Energy, Environment and Water (CEEW) and International Water Management Institute (IWMI), 14 December 2023.

Prof. Brundaban Sahu

- 32 mes Journées Arithmétiques, (July 3–7, 2023), Université de Lorraine, Nancy, France
- Words and Transcendence - I (August 7-12, 2023), Kerala School of Mathematics, Kozhikode.
- Words and Transcendence - II (February 6--15, 2024), HRI, Prayagraj.
- DAE FUTURE ROADMAP VISION 2047 - CHINTAN SHIVIR (March 5--9, 2024), ICTS, Bengaluru.
- Inter IISER-NISER Math Meet 2023 (September 29-October 1, 2023), NISER Bhubaneswar.

Dr. Anil Kumar Karn

- International conference "Positivity XI" held at Ljubljana, Slovenia during July 10-14, 2023.
- International conference "Conference of Order Structures with Applications" held at Kenitra, Morocco during February 5-9, 2024.

Dr. Jaban Meher

- International seminar on topology, analysis and applications (ISTAA-2024), North Bengal University, Siliguri, West Bengal (12–14 March, 2024).
- 51st Annual conference of Orissa Mathematical Society, Fakir Mohan University, Balasore, Odisha (2–3 March, 2024).

Dr. Kamal Lochan Patra

- 10th Slovenian Conference on Graph Theory (18 - 24 June 2023), Kranjska Gora,Slovenia.
- 38th Annual Conference on Ramanujan Mathematical Society (22nd - 24th Dec 2023)IIT Guwahati, India.

Dr. Anupam Pal Choudhury

- Inter IISER-NISER Mathematics Meet (IINMM) 2023 at NISER.

Dr. K. Senthil Kumar

- Words and transcendence, KSOM, August 07--12, 2023.
- "ICCGNFRT-2023", KSOM, October 26-30, 2023.
- Words and Transcendence - II", Harish-Chandra Research Institute, 06 -15 Feb 2024.

Dr. Kaushik Majumder

- Basic Instructional School on Stochastic Processes at NISER Bhubaneswar from June 26 to July 21, 2023.
- IISER-NISER meet at NISER Bhubaneswar from September 29 to October 1, 2023.

Dr. Nabin Kumar Jana

- International Seminar on The Vedic Tradition and Shrii Shrii Anandamurtiji: In Modern Perspectives, Rabindra Bharati University, Kolkata, January 30 -- 31, 2024.

Dr. Ramesh Manna

- Attend workshop on "Representation theory of real Lie groups and Automorphic forms" and a conference at HRI, Prayagraj, Harish-Chandra centenary celebrations at HRI, October 2023.
- Attend ICTS program "Modern trends in Harmonic Analysis" at ICTS-TIFR, Bengaluru, July, 2023.

Dr. Chitrabhanu Chaudhuri

- Workshop on Geometry Analysis and Mathematical Physics at NISER (24 Jul - 2 Aug 2023).
- Inter IISER-NISER Math Meet at NISER (29 Sep - 1 Oct 2023).

Dr. Rekha Biswal

- Conference: Taipei conference on representation theory VII, Dec 18-22, 2023, Institute of Mathematics, Academia Sinica, Taipei, Taiwan.
- Workshop: Kac-Moody Geometry (July 24-28, 2023) Kiel University, Germany.
- Conference: Representation Theory in Lyon (June 25-July 1, 2023), University of Lyon, France.
- Conference: Harish Chandra Representation theory and harmonic analysis, Oct 8-15, 2023.

Dr. Tushar Kanta Naik

- Workshop on Group Theory and Around, HRI, December 2023.

Prof. Bedangdas Mohanty

Dark Matter, MINER:

- Investigating Compton steps in SuperCDMS Si HVeV detectors. *PoS* TAUP2023 (2024) 077, S. Das, on behalf of the SuperCDMS Collaboration.
- Calibrating SuperCDMS Si HVeV Detectors Using Compton Steps for Low Mass Dark Matter Searches. Proceedings of the DAE Symp. on Nucl. Phys. 67 (2023). S. Das, on behalf of the SuperCDMS Collaboration.

ALICE:

- Correlations among net-charge, net-kaon and net-proton at LHC energies with ALICE. Proceedings of the DAE Symp. on Nucl. Phys. 67 (2023). S. Saha, on behalf of the ALICE Collaboration.

STAR:

- Search for QCD Critical Point: Recent Results from STAR BES-I Program and Status of BES-II. [STAR Collaboration], Proceedings of the DAE Symp. on Nucl. Phys. 67 (2023). B. Mondal, on behalf of STAR Collaboration.

Other:

- Reduction in radioactivity-induced backgrounds using a novel active veto detector for rare event search experiments, SciPost Phys.Proc. 12 (2023) 017, Mouli Chaudhuri et al.
- Development and testing of Si pad array detectors for possible applications in Electromagnetic calorimeter, DAE Symp.Nucl.Phys. 67 (2024) 1209-1210, Sawan, G. Tambave, K. P. Sharma, R. Singh and B. Mohanty.

Prof. Sanjay Kumar Swain

- ICNFP2023, Kolymbari, Greece, 10-23 July 2023.
- HQL 2023, TIFR, Mumbai, Nov 28- Dec 2, 2023.

Prof. Subhankar Bedanta

- Keynote talk on "Antiferromagnets for Spintronics" at 13th Annual Symposium on Magnetics-2023 organized by IEEE Magnetics Singapore Chapter, October 2023
- Invited talk on "Spin to charge conversion with various antiferromagnetic systems" at ICMAGMA 2023 conference organized by DMRL, Hyderabad, in December 2023.
- Invited talk on "Strain-driven magnetic properties of perpendicular anisotropic thin films: towards flexible spintronics" at National Conference on "Recent Advances in Materials and Particle Physics", hosted

by the PG Department of Physics at Berhampur University in November 2023.

- Invited talk on "Spin pumping with heavy metals, topological insulators and antiferromagnets" at INTERMAG 2023 conference held at Tohoku University, Sendai, Japan in May 2023.
- Invited talk on "Quantum materials for spin-orbit torque based applications"at International Conference on Materials for Energy & Sustainable Development held at Jawaharlal Nehru University, New Delhi, in October 2023.
- Invited talk on "Oxides for future magnon-spintronics based devices" at International Conference Spin Caloritronics XII held at National Institute of Materials Science (NIMS), Tsukuba, Japan, in May 2023.
- Invited talk "Nanomagnetism and Spintronics" at Physics of Quantum Matter School 2023, at NISER Bhubhaneshwar held in May 2023.
- Invited talk "Enhanced Magnetic Anisotropy and Spin-to-Charge Conversion in MoS2/ CoFeB Heterostructures" at Quantum Matter Heterostructure (QMH)-2023 conference held at IIT Hyderabad in July 2023.
- Invited talk "Magnetism at the interfaces and in nanostructures for future spintronic applications" at Odisha Physics Cluster held at IISER Berhampur, Berhampur held in October 2023.

Dr. Amaresh Kumar Jaiswal

- Meeting on the physics of ALICE, CBM and STAR (MPACS) 2024, VECC Kolkata, January 29-30, 2024.
- Workshop on Physics Performance Studies at NICA (NICA 2023), Virtual via ZOOM, December 25-27, 2023.
- Discussion meeting on Aspects of the QCD phase diagram, IISER Bhopal, November 18-20, 2023.
- India-JINR workshop 2023, Dubna, Russia, October 16-19, 2023.
- ISMD 2023, Gyöngyös, Hungary, August 21-26, 2023.
- MAGIC 2023, Kovalam Kerala, March 28-April 1, 2023.
- HHHPS 2023, IIT Gandhinagar, March 24-25, 2023.
- ICPAQGP Puri, February 7-10, 2023.

Dr. Colin Benjamin

- QIQT 2023, in IISER, Kolkata, June 2023
- Winter school on evolutionary game theory, Shiv Nadar University, Delhi, December 2023.

Dr. Kartik Senapati

- Quantum Matter heterostructures conference at IIT Hyderabad, 18 -20 July 2023.
- Annual Conference on Quantum Condensed Matter at NISER, Bhubaneswar, 27-30 Nov 2023.
- Materials Research Society of India conference at IIT BHU, 12-15 Dec 2023.

Dr. Nishikanta Khandai

- Largest Cosmological Surveys and Big Data Science ICTS, Bangalore, 10-12 May 2023.

Dr. Prasanjit Samal

- NAMMA Psi-k Workshop in Bangalore, India by IISc & JNCASR Annual Conference on QUANTUM CONDENSED MATTER National Institute of Science Education & Research, Bhubaneswar.

Dr. Sumedha

- "International Conference on Nonlinear Science & Applications" at the Indian Institute of Technology Bhubaneswar from 12th to 14th October 2023 as Invited Chair.
- "Frontiers in Statistical Physics", 03-08 December 2023 at RRI, Bangalore as Invited Speaker.

Dr. Victor Roy

- Workshop on High Energy Physics Phenomenology (WHEPP) January 2 - 9, 2024 at IIT Gandhinagar.
- India-JINR workshop on elementary particle and nuclear physics, and condensed matter research, October 16-19 2023.

Dr. Yogesh Kumar Srivastava

- Indian String Meeting 2023, IIT Bombay 10-16th December.

Dr. Kush Saha

- Conference of Condensed Matter, Materials Science and Statistical Physics (CMMSSP-2023), Kolkata, 28-29 April, 2023, Control of Ultrafast (Attosecond and Strong field) Precesses Using Structured Light (cupusl23), MPIPKS, Dresden, Germany, 26 June- 14 July, 2023.

Dr. Luke Robert Chamandy

- Online seminar: "Common Envelope Evolution:What we are learning from 3D global hydrodynamic simulations", Hamburg Observatory, Hamburg, Germany, 3 May, 2023.
- Seminar: "What we have learned from 3D hydrodynamical Simulations of Common Envelope Evolution", Université de Montréal, Montreal, Canada, 1 June, 2023.

- Seminar: "What we have learned from 3D hydrodynamical Simulations of Common Envelope Evolution", Rochester Institute of Technology, Rochester, USA, 5 June, 2023.
- Contributed talk: "How negative feedback and the ambient environment limit the influence of recombination in common envelope evolution", European Astronomical Society Annual Meeting, Krakow, Poland, 12 July, 2023.

Dr. Najmul Haque

- The Workshop in High Energy Physics Phenomenology (WHEPP) XVII organised by IIT Gandhinagar during 2nd Jan - 11th Jan, 2024.
- The 52nd International Symposium on Multiparticle Dynamics in Gyöngyös, Hungary during Aug 21-26, 2023.
- India-JINR workshop on elementary particle and nuclear physics, and condensed matter research [online] organised by JINR, Dubna, Russia during 16th - 19th Oct, 2023.
- Meeting on the physics of ALICE, CBM and STAR (MPACS) 2024, VECC Kolkata, January 29-30, 2024.

Dr. Satyaprasad P Senanayak

- Hybrid Perovskite Conference, 2023, IACS Kolkata.
- NamoSBio Conference, 2023, IISER Kolkata.
- International Conference on Functional Material, 2023, IIT Kharagpur.
- QMAT Conference, 2023, NISER, Bhubaneswar.
- DST-Conference on Energy Policy Research, 2023, NISER, Bhubaneswar.

Dr. Tapan Mishra

- Periodically and quasi-periodically driven complex systems, ICTS-TIFR, Bangalore, 12-23 June 2023.
- Quantum Information and Quantum Technology, IISER Kolkata (Online), 15th May, 2023.
- Stability of quantum matter in and out of equilibrium, ICTS-TIFR, Bangalore, January 2024.
- NISQ seminar, Google quantum AI, Santa Barbara USA (online), 15th March 2024.
- National seminar on Advanced in Physics, Pattamundai College, Odisha, 16th March 2024.
- National Science Day talk, DRDO, Chandipur, Odisha, 28 Feb 2024.
- 1st Annual Physics Symposium, IISER Berhampur, 26-27 October 2023.
- QMAT, NISER, Bhubaneswar 27-30 November 2023.

Dr. Tuhin Ghosh

- Institute Seminar – ENS Paris – 28 June 2023.
- From Galaxy to Big Bang – Banyuls sur mer France, 12-16th June 2023.
- Institute Seminar - RRI Bangalore – 29 Jan 2024.
- 42nd Annual ASI meeting – IISc Bangalore, 31 Jan – 4 Feb 2024.

Dr. Narayan Rana

- Loops and Legs in Quantum Field Theory 2024, Luther hotel, Lutherstadt Wittenberg, Germany (14th April - 19th April, 2024).
- Probing Hadron Structure at the Electron-Ion Collider ICTS, Bangalore, India (5th Feb - 9th Feb, 2024).
- Workshop in High Energy Physics Phenomenology (WHEPP XVII) IIT Gandhinagar, Gandhinagar, India (2nd Jan - 11th Jan, 2024).
- RADCOR 2023 Crieff Hydro Hotel, Crieff, Scotland (28th May - 2nd June, 2023).

Dr. Sudakshina Prusty

- 8th International Conference on Women in Physics (ICWIP 2023), Virtual mode, 10th -14th July 2023, poster on "Designing a teaching grade phase contrast microscope on an optical bench"
- Satellite Workshop on "Combating biases & improving institutional culture", 9th July 2023

Dr. G. Santosh Babu

- Vigyan Pratibha Resource generation camp, 19th to 22nd June 2023, NISER.

Dr. Saralasrita Mohanty

- Saralasrita Mohanty, Charge Transport in Organic-Inorganic Heterostructure Devices, National Conference on recent advances in Physics and Ballistics (RAPAB-2024) 10th -11th February 2024.
- Attended the education workshop "Engaging Students with Realistic Virtual Physics Labs", organized by American Association of Physics Teacher, Thursday, February 22, 2024.
- Jabed Umar, Dikar Subhaya Arvind,,Saralasrita Mohanty,Tapan Mishra Topological Properties of coupled SSH chain in an Electrical circuit", QMAT conference-23, 27th-30th November NISER Bhubaneswar (Poster presentation).

Organized

Prof. Chandan Goswami

- Co-convener of International Symposium on Plant Photobiology (ISPP-EMBO-2024) meeting. At NISER. 9-12th Jan 2024.

Dr. Debasmita Pankaj Alone

- Convener, 1st Quarterly Union of Academic Discourse (Mini Symposium) on 27th Jan, 2024 NISER, Bhubaneswar.

Dr. Mohammad Saleem

- Organelle Biogenesis and Membrane Traffick meeting, NBRC Manesar, October, 2023 (Coorganized by NRBC, IISER Pune and NISER Bhubaneshwar).

Dr. K. Himabindu Vasuki

- Co-Convener for EMBO-ISPP 2024 international Conference, organized at NISER, Bhubaneswar from January 9-12 2024.

Dr. Nagendra Kumar Sharma

- 1st HBNI-NISER meeting-2023, NISER Bhubaneswar, India.

Dr. Priyanka Pandey

- Organized Training sessions by Experts on CV, UV-VIS, TGA, NMR for SCS users.

Dr. Aritra Banik

- ACM India Annual Event, Feb 8 to Feb 10 2023.

Dr. Manoj Mishra

- ACM Winter School on Algorithmic Foundations of Data Science.

Dr. Surya Snata Rout

- Astronomical Society of India Meeting held at on 02.2024: Invited Plenary talk.
- Brainstorming meeting for future Space Science Roadmap Formulation (SSRF) (SG5: Solar System Exploration (Includes Moon, Mars, Venus, Outer Solar System, Small bodies)). At URSC Bangalore. 22-23 April, 2024.

Dr. Amarendra Das

- IMPACT-NRE Programme during October 18-19, 2023 at NISER.
- Academic Writing Workshop at Utkal University as an Organiser and Resource Person on behalf of Odisha Economic Association on December 14, 2024.
- Making of Academic Poster workshop on December 23, 2024 at Department of Economics, Sambalpur University, Burla, Odisha as an organiser and resource person on behalf of the Odisha Economic Association.
- 56th Annual Conference of Odisha Economic Association, Held at Sambalpur University during February 11-12, 2024.
- Policy Dialogue on Energy Transition and Tribal Education in Eastern India during January 21-23, 2024 at NISER.

Dr. Ritwik Mukherjee

- Organized workshop in Geometry and Analysis (jointly with Chitrabhanu and Ramesh Manna) in July 2023.

Dr. Kaushik Majumder

- Co-organiser (with Nabin Kumar Jana) for the "Basic Instructional School on Stochastic Processes" program at NISER Bhubaneswar from June 26 to July 21, 2023.

Dr. Nabin Kumar Jana

- Basis Instructional School on Stochastic Processes, NISER, Bhubaneswar, 26th June -- 21st July, 2023.
- Advanced Instructional School on Stochastic Processes, NISER, Bhubaneswar, 26th June -- 15th July, 2023.
- Instructional School for Teachers on Probability and Statistics, NISER, Bhubaneswar, 10th -- 21st July, 2023.

Dr. Ramesh Manna

- Workshop on Analysis, geometry and mathematical physics, NISER, 24th July-02nd August, 2023.

Dr. Sudhir Kumar Pujahari

- Pi Day 2024.
- IISER-NISER Mathematics Meet (IINMM) 2023.
- Teachers Training Program in Mathematics 2023.

Dr. Tushar Kanta Naik

- Inter IISER-NISER Mathematics Meet, NISER Bhubaneswar, 29th September - 01st October 2023 (co-organized with A.P. Choudhury, B.K. Sahoo, B.Sahu, C. Chaudhuri, D.K. Keshari, S.K. Pujahari).

Prof. Bedangadas Mohanty

Member of:

- Local Organizing Committee member for 8th International Conference on Women in Physics (ICWIP 2023), TIFR, Mumbai, 10-14, July 2023.
- Second P. K. Parija Lecture in Life Sciences, Professor Raghavendra Gadagkar's "Can We Understand an Insect Society?" 20th March 2024, at NISER.
- Organizing committee of 67th DAE Symposium on

Nuclear Physics (DAE NPSYMP 2023) 9-23 December 2023. IIT Indore, Indore, Madhya Pradesh, India

- Organized the International School and Workshop on Probing Hadron Structure at the Electron-Ion Collider, ICTS, Bangalore, 29 January to 4th February 2024.

Prof. Subhankar Bedanta
- QMAT conference held at NISER-Bhubaneswar.
- QMH-3 conference held at IIT Hyderabad.

Dr. Ajay Kumar Nayak
- Organised QMAT-2023 conference as the Convenor.

Dr. Amaresh Kumar Jaiswal
- Organized "2nd Workshop on Dynamics of QCD Matter, NISER, October 07-09, 2023.

Dr. Anamitra Mukherjee
- Q-MAT 2023, NISER November 2023.

Dr. Nishikanta Khandai
- Advanced 21cm School and Workshop, NISER 11-21 December 2023 (Main Organiser Dr.TUHIN GHOSH at NISER).

Dr. Prasanjit Samal
- Annual Conference on QUANTUM CONDENSED MATTER National Institute of Science Education & Research, Bhubaneswar 27th - 30th November 2023.

Dr. Proloy Kumar Mal
- HSF-India HEP Software Workshop, NISER, Dec 18-22, 2023.

Dr. Yogesh Kumar Srivastava
- Current Trends in String Theory and Cosmology April 24-26, 2023.

Dr. Ashis K. Nandy
- Convenor of Annual National Conference, Quantum Condensed Matter 2023 (QMAT-223), NISER.

Dr. Luke Robert Chamandy
- 21 cm cosmology school and workshop, NISER, 11-21 Dec, 2023.

Dr. Najmul Haque
- Organised the 2nd workshop on Dynamics of QCD matter during 07-09 October 2023 in NISER.

Dr. Satyaprasad P. Senanayak
- Member organizing committee of QMAT, 2023.

Dr. Tapan Mishra
- Physics of quantum matter school, 23rd May to 3rd June 2023.
- Annual conference on quantum condensed matter (QMAT), NISER, Bhubaneswar 27-30 November 2023.

Dr. Tuhin Ghosh
- Advanced 21-cm Cosmology school plus workshop during 11-17th Dec 2023 and 18-21st Dec 2023 at NISER Bhubaneswar.

Dr. V. Ravi Chandra
- Co-organiser of QMAT-2023, at NISER, in November, 2023.

Dr. Narayan Rana
- Advanced School & Workshop on Multiloop Scattering Amplitude NISER Bhubaneswar, India (15th January - 19th January, 2024).
- Workshop in High Energy Physics Phenomenology (WHEPP XVII), Convenor of Heavy Ion and QCD Working group, IIT Gandhinagar, India (2nd January - 11th January, 2024).
- 2nd Workshop on Dynamics of QCD matter, NISER Bhubaneswar, India (7th October - 9th October, 2023).

Program Committee

Dr. Manjusha Dixit
- SBS MEET. 3 February 2024, NISER Bhubaneswar.
- Understanding Institutional Ethics Committee Functions and Regulations. 15 April 2024, NISER Bhubaneswar.

Dr. Pankaj Vidyadhar Alone
- Organized a one-day mini-symposium on Quarterly Union for Academic Discourse (QUAD) Bhubaneswar, Structure-Function and Homeostasis, 27th Jan 2024.

Dr. Praful Singru
- Indian Society for Comparative Endocrinology (ISCE)
- International Congress on Neuroendocrinology, Japan.

Dr. Subhasis Chattopadhyay
- 25th INDO-US Flow Cytometry Workshop on Flow Cytometry and its Applications in Biology, 3rd-4th February, 2024, Babasaheb Bhimrao Ambedkar University, Lucknow-226025, India.

Dr. Aniruddha Datta Roy
- Organised the Molecular Phylogenetics workshop at NISER from November 1-5, 2023. This workshop was open for participants from SAARC countries.
- As a part of the ATBC conference (July 2-6, 2023), I organised a symposium titled "Systematics, biogeography and phylogeography of South Asian biota". The symposium had 6 speakers from various parts of India.

Dr. Aritra Banik
- CALDAM 2024, WALCOM 2024.

Dr. Liton Majumdar
- Chair of the Strange New Worlds: The Exploration of Exoplanets conference, IISER Pune, 17 to 19 August, 2023.
- Member of the Scientific Organising Committee of Meteoroids, Meteors and Meteorites: Messengers from Space Symposium, Physical Research Laboratory, Ahmedabad, 1 to 3 November, 2023.
- Member of the Scientific Organising Committee of Astronomical Society of India (ASI) for the triennium 2022-2025.

Dr. Jayesh Mahendra Goyal
- Conference Name: Scientific Organizing Committee (SOC) member, "Strange New Worlds: The Exploration of Exoplanets" International Conference. Venue: IISER Pune, Dated, August 2023.

Dr. Amarendra Das
- Scientific Committee Member, Indian Health Economic and Policy Association, FLAME University, Pune.

Dr. Kaushik Majumder
- Basic Instructional School on Stochastic Processes at NISER Bhubaneswar from June 26 to July 21, 2023.

Dr. Ramesh Manna
- Committee Member, Pi day at SMS, Niser, March 14-15, 2024.

Prof. Sanjay Kumar Swain
- National organizing Committee, HQL 2023, TIFR, 10-23 July 2023.

Prof. Subhankar Bedanta
- Core organizing committee for DAE-SSPS Conference held in December 2023 at Gitam university, Vizag.
- Core organizing committee for ICMAGMA-2023 Conference held in December 2023 at Hyderabad.

Dr. Amaresh Kumar Jaiswal
- Member of National Advisory Committee and session chair of "4th Heavy Flavour Meet 2023, IIT Goa, November 02-04, 2023.
- Member of Program Committee of "India-JINR Workshop on Elementary Particle and Nuclear Physics, and Condensed Matter Research, JINR Dubna, Russia, October 16-19, 2023.

Dr. Colin Benjamin
- International Conference on Quantum Computing and Communications (QCC-2023) at Bhatinda, Punjab.

Dr. Nishikanta Khandai
- LOC Advanced 21cm School and Workshop, NISER 11-21 December 2023.

Dr. Prasanjit Samal
- Annual Conference on QUANTUM CONDENSED MATTER National Institute of Science Education & Research, Bhubaneswar.

Dr. Pratap Kumar Sahoo
- QMAT NISER- 27 - 30 November 2023.

Dr. Luke Robert Chamandy
- LOC member, 21 cm cosmology school and workshop, NISER, 11-21 Dec, 2023.

Dr. Najmul Haque
- National advisory committee member of the conference 4th Heavy Flavour Meet 2023 held in IIT Goa during 2-4 November 2023.

Dr. Satyaprasad P. Senanayak
- Speaker in the Conferences and Member Organizing Committee of QMAT conference.

Dr. Tuhin Ghosh
- SOC and LOC member, Advanced 21-cm Cosmology School plus workshop, NISER Bhubaneswar, 11 – 21st Dec 2023.

Dr. V.Ravi Chandra
- SOC and LOC member, Advanced 21-cm Cosmology School plus workshop, NISER Bhubaneswar, 11 – 21st Dec 2023.

Dr. Shuddha Shankar Dasgupta
- Member of International Advisory Committees for EIC-Asia Workshop held in National Cheng Kung University, Taiwan from January 29 – 31, 2024

EXTENSION AND OUTREACH ACTIVITIES

Dr. Debasmita Pankaj Alone
- Coordinator of NISER Open Day, Science camp, Student Internship, Educational visits and Popular talk for school students.
- Coordinated Teacher's Training, School visits and resource generation camp, as a part of Vigyan Pratibha and Outreach Cell initiative at NISER.

Dr. Pankaj Vidyadhar Alone
- Organised internship program for school children and mentored two class IX students.
- Organised Vigyan-Pratibha teacher training event.

Dr. Ramanujam Srinivasan

- The Concept of a Bacterium : Stanier to Shapiro. Resonance Science Outreach Program, Indian Academy of Sciences, Bangalore & University of Kashmir, Srinagar, October 10 - 14, 2023.

Dr. Aniruddha Datta Roy

- Delivered a talk on skinks for the Nature club of NISER (Oorna) on February 9, 2024.

Dr. K. Himabindu Vasuki

- Poster presentation and interaction with the students (class IX-XII) came for NISER SCIENCE CAMP outreach program.

Dr. Rittik Deb

- Resource person at Faculty Development Program, North Orissa University. 2023.

Dr. Swagata Ghatak

- Participated and held live scientific interactions with school students in Science Camp at NISER held on 6th to 8th April 2023.
- Gave a talk on "Excitatory/Inhibitory (E/I) Imbalance in Neurological Disorders" at Brain Matters club, 3rd February 2023.

Dr. Shyamasree Ghosh

- All schools visiting NISER at part of Outreach NISER.
- Teacher Training Workshop on National Science Day, as part of Outreach NISER.

Dr. Saurabh Chawla

- At NCARE, we welcomed visits from researchers, students, and academicians from national-level government and private universities. These visits provided an opportunity to discuss how they can use our facility and explore potential future collaborations. We provide research facilities and training to nearby institutes, regional institutes, and selected national-level institutions.
- Additionally, we are committed to supplying high-quality research animal models to support scientific advancements in various fields. This initiative aims to promote excellence in scientific endeavours across different levels of academia and research institutions.

Dr. Chandra Shekhar Purohit

- Science movement, interaction with school children on 12th June 2023.

Dr. S. Peruncheralathan

- Delivered a Career Guidance Webinar for XII standard students from Tamil Nadu Government Model Schools across Tamil Nadu on April 3, 2024, from 4:30 to 5:30 PM via Zoom.

Dr. Sharanappa Nembenna

- This year, I mentored high school students in association with Outreach NISER.

Dr. Bishnu Prasad Biswal

- Resource Person for FDP, MSCB University, Baripada, Odisha, May 2023
- Student internship program, NISER Bhubaneswar, June 2023.

Dr. Aritra Banik

- Nominated to be the ACM India summer/winter schools steering committee chair.

Dr. Anup Kumar Bhattacharya

- Zero-knowledge proofs at an outreach event at NISER.

Dr. Jayesh Mahendra Goyal

- NISER Open Day Popular Lecture on Exoplanets, April 2023.
- Leading the development of NISER Astronomical Observatory that will be utilized for teaching, research and outreach.

Dr. Pathikrit Bhattacharya

- Mentored summer interns from schools in Bhubaneswar and IIT Bhubaneswar.

Dr. Priyadarshi Chowdhury

- Mentored high-school students (two) as a part of the NISER Outreach Program 2023.

Dr. Amarendra Das

- Participated as a Panellist in TV programmes of Argus TV, OTV and DD Odia on several occasions and Published popular articles in newspapers. Regular Counselling of economically weak and meritorious students through Gyanalok initiatives.
- "Career Opportunities in Economics" at Berhampur University on January 13, 2024.

Prof. Brundaban Sahu

- Rural Mathematics Talent Search (RMTS) Programme, Dunguripali UP School, Dunguripali (December 26-30, 2023)
- Ramanujan and Mathematics, (December 28, 2023), Department of Mathematics, APS College, Roth
- Ramanujan and Mathematics, (December 22, 2023), P.G. Department of Mathematics, Berhampur University
- Ramanujan and Mathematics, (December 22, 2023), Department of Mathematics, NIST, Berhampur
- Teachers' Training Programme in Mathematics

(November 2-5, 2023), NISER Bhubaneswar.

Dr. Deepak Kumar Dalai

- Delivered few lectures in Rural Mathematics Talent Search (RMTS) programme at Dunguripali UP School, Dunguripali, Odisha during the period December 26 – 30, 2023.

Dr. Jaban Meher

- Delivered a series of lectures at Rural Mathematics Talent Search (RMTS) programme at Dunguripali UP School, Dunguripali, Sonepur, Odisha (26–30 December, 2023).
- Deliver a talk on Euler's phi function and some applications at NISER outreach teachers' training workshop, NISER, Bhubaneswar (25–28 September, 2023).

Dr. Kaushik Majumder

- A lecture was delivered on September 27 2023, at the teacher's training outreach program organized by NISER Bhubaneswar.

Dr. Nabin Kumar Jana

- Act as resource person in a Two days Teachers' Orientation Programme for Secondary School Teachers on 'Innovative Pedagogy in the context of NEP-2020' which was held on 27 and 28 March, 2024 in Ananda Marga High School (Affiliated to CBSE), Durlavpur, Raniganj, Bankura, West Bengal.

Dr. Chitrabhanu Chaudhuri

- Trigonometry on Complete simply connected surfaces of constant curvature – Outreach talk for college teachers at NISER, 27 September 2023.

Dr. Krishanu Dan

- Talk given at NISER Science Camp (Open Day), April 2023.
- Talk given at 2nd Vigyan Pratibha Teachers' Training Workshop held at NISER, September 2023.
- Talks given at NISER Outreach Program, November 2023.
- Talks given at NISER Educational Visit, February 2024.

Dr. Sudhir Kumar Pujahari

- Visiting schools/organisations - Khamsiri Pali government high school (gave a series of lectures).
- Organized and gave lecture at Teachers Training Program in Mathematics 2023.

Dr. Tushar Kanta Naik

- 6 lectures +6 tutorials on Elementary Number Theory, SOPM, NISER, May-June 2023.
- High-School Algebra, Rural Mathematics Talent Search Program, Dungripali High School, Sonepur, Odisha, December 2023.
- Extra-Mural Lecture on Exploring the beauty of Group theory, Sundargarh Govt. College, Sundargarh, Odisha, 19th February, 2024.

Prof. Bedangadas Mohanty

- Delivered the an outreach talk titled - Recreating microsecond old universe conditions in the laboratory - science and societal benefits at Manohar Parrikar Vidnyan Mahotsav on 13th December 2023, at Don Bosco College of Engineering, Fatorda, Goa.

Dr. Ajaya Kumar Nayak

- Visiting schools/organisations & participation in events such as science and technology camps, career fairs, interaction/giving talks at academic assemblies etc. or any relevant activities.

Dr. Sudakshina Prusty

- Coordinator, Summer Project Program, 22nd May – 21st July 2023.
- Summer Camp for 120 school children, 6th -8th April 2023.
- Coordinated physics lab visit by 20 school/college students & teachers in 2023-24

Dr. G. Santosh Babu

- Acted as one of the resource person for one module of Vigyan Pratibha outreach events to central government funded school teachers: During 20-23 November 2023 "precise and accurate measurements" and the second one during 20th Aug to 23rd Sept-2023, conducted "pin hole camera" module physics for this event to participants.
- Acted as one of the resource person for 1st Outreach Teachers' Training Workshop held in November-23 for science teachers of Odisha Adarsh Vidyalaya school teachers
- Acted as physics resource person for outreach activity for teachers on Science day and demonstrated experiments and helped to improve their understanding of concepts.

Research and Development

SPONSORED PROJECT

Projects Sanctioned During 2023-24

- Interaction-induced symmetry-protected topological phase transition, (**SERB**). Principal Investigator: **Dr. Tapan Mishra**, Physical Sciences.
- Hard probes of QGP at heavy ion collision experiments, (**DST**). Principal Investigator: **Dr. Lusaka Bhattacharya**, Physical Sciences.
- Quantum walk of multi-component bosons and its application to study many-body localization, (**SERB**). Principal Investigator: **Dr. Tapan Mishra**, Physical Sciences.
- Neural Networks at a Fraction, (**Microsoft India R&D Pvt. Ltd.**). Principal Investigator: **Dr. Subhankar Mishra**, Computer Sciences.
- SWAYANSAASITA: Autonomous Driving for Motorcycles (Phase-1), (**DSF**). Principal Investigator: **Dr. Subhankar Mishra**, Computer Sciences.
- Interface driven magnetic properties in ferromagnet (FM)/ Metal phthalocyanine (MPc) hybrid bilayers, (**DST**). Principal Investigator: **Dr. Mitali Swain**, Physical Sciences.
- Magnon Spintronics in Heterostructures with Ferrimagnets and Quantum Materials (Chanakya Post- Doctoral Fellowship), (**I-HUB Quantum Technology Foundation**). Principal Investigator: **Prof. Subhankar Bedanta,** Physical Sciences.
- Representaiotn of a natural number by Quadratic form, Convolution sums and modular forms, (**SERB**). Principal Investigator: **Prof. Brundaban Sahu**, Mathematical Sciences.
- Understanding the intricacies of eIF2 ternary complex formation that controls eukaryotic translation initiation, (**DBT**). Principal Investigator: **Dr. Pankaj Vidyadhar Alone,** Biological Sciences.
- Reconstructing Extraterrestrial Materials falling on Earth on Earth in the Past: Link to Extinction Events and Climate Change, (**SERB**). Principal Investigator: **Dr. Surya Snata Rout**, Earth and Planetary Sciences.
- Holographic Symmetry Algebra and Aspects of Cosmology, (**INSA**). Principal Investigator: **Prof. Sudhakar Panda**, Physical Sciences.
- Constraining the tectonic processes driving the subaerial emergence of continental crust on early Earth, (**SERB**). Principal Investigator: **Dr. Priyadarshi Chowdhury**, Earth and Planetary Sciences.
- Rational Projective representations of groups and Twisted group ring isomorphism problem, (**SERB**). Principal Investigator: **Dr. Suman Hatui**, Mathematical Sciences.
- Sato-Tate conjecture in arithmetic progressions, (**SERB**). Principal Investigator: **Dr. Sudhir K. Pujahari,** Mathematical Sciences.
- Therapeutic Potential of Carnosic Acid in decreasing Astrocytic TREK1-mediated Excitotoxicity in Alzheimer's Disease, (**ICMR**), Principal Investigator: **Dr. Swagata Ghatak,** Biological Sciences.
- Stimuli-responsive cellulose ionic liquid-based hydrogels for drug delivery applications, (**CSIR**). Principal Investigator: **Dr. Molay Sarkar**, Chemical Sciences.
- Development of Base Metal (Manganese, Iron, Cobalt, Nickel and Copper) Catalysts for sustainable Oxidation and Reduction Reactions and Their Application in Biomass Valorization, (**SERB**). Principal Investigator: **Dr. Bidraha Bagh**, Chemical Sciences.
- Designing Sublinear Algorithms and Making Them Robust, (**SERB**). Principal Investigator: **Dr. Anup K. Bhattacharya**, Computer Sciences.
- Low-dimensional topology and Coxeter groups, (**SERB**). Principal Investigator: **Dr. Tushar Kanta Naik,** Mathematical Sciences.
- Precision Studies for the Top-quark Decay, (**SERB**), Principal Investigator: **Dr. Narayan Rana**, Physical Sciences.
- Identification of novel biomarkers for pseudoexfoliation glaucoma through epigenome-wide association study, (**SERB**). Principal Investigator: **Dr. Debasmita Pankaj Alone,** Biological Sciences.
- A Protemic approach towards understanding anthocyanin accumulation in tomato fruits, (**SERB**). Principal Investigator: **Dr. Himabindu V. Kilambi,** Biological Sciences.
- Unconventional topoligical aspects of hopf insulators, (**SERB**). Principal Investigator: **Dr. Kush Saha**, Physical Sciences.
- Novel explorations on earthquake nucleation within complex fault-networks: An integrated theoretical and experimental approach, (**MoE**). Principal Investigator: **Dr. Pathikrit Bhattacharya,** Earth and Planetary Sciences.

- Synthesis of B-N coordinated tetra-coordinated boron compounds and their applications towards sensing, catalysis and OLED, (**SERB**). Principal Investigator: **Dr. V. Krishnan,** Chemical Sciences.
- Theoretical investigation of the energy transfe and dynamics in gas-surface scattering, (**SERB**). Principal Investigator: **Dr. Upakarasamy Lourderaj**, Chemical Sciences.
- Centre for Policy research, (**DST**). Principal Investigator: **Dr. Amarendra Das,** Co-Principal Investigator: **Dr. Pranay Swain,** Humanities and Social Sciences.
- J. C. Bose Fellowship, (**SERB**). Principal Investigator: **Prof. Bedangdas Mohanty**, Physical Sciences.
- Stabilization of non-trivial magnetic skyrmions from trivial bubbles by helicity locking in centrosymmetric magnets, (**SERB**). Principal Investigator: **Dr. Ajay Kumar Nayak,** Physical Sciences.
- Attractors and QGP Evolution in Heavy-Ion Collisions: U(1) Gauge Field Effects, (**SERB**). Principal Investigator: **Dr. Victor Roy**, Physical Sciences.
- Ramanujan Fellowship, (**SERB**). Principal Investigator: **Dr Soumita Pramanick**, Physical Sciences.
- Ramanujan Fellowship, (**SERB**). Principal Investigator: **Dr Manoj Kumar**, Physical Sciences.
- Ramanujan Fellowship, (**SERB**). Principal Investigator: **Dr Taniya Mandal**, Physical Sciences.

Ongoing Sponsored Projects

- Role of Endothelial to mesenchymal transition (EndoMT) inducing factors in the pathophysiology of Fuchs Endothelial Corneal Dystrophy, (**ICMR**). Principal Investigator: **Dr. Debasmita Pankaj Alone,** Biological Sciences.
- Role of mycobacterial membrane vesicles in evasion of phagosome maturation, (**DBT-Wellcome Trust India Alliance**). Principal Investigator: **Dr. Mohammad Saleem,** Biological Sciences.
- Interaction between thyrotropin-releasing hormone- and neuropeptide Y-containing systems in the hypothalamus of the zebra finch, Taeniopygia guttata and its relevance in regulation of energy balance, (**SERB**). Principal Investigator: **Dr. Praful Singru,** Biological Sciences.
- Aberrant interactions of two pore domain leak potassium channels with Amyloid β in modulating neuronal hyperactivity in Alzheimer's Disease, (**SERB**). Principal Investigator: **Dr. Swagata Ghatak,** Biological Sciences.
- Vibrational Signatures of Chirality, Chiral Recognition and Chirality Transfer through Novel Noncovalent Interactions, (**SERB**). Principal Investigator: **Prof. Himansu Sekhar Biswal,** Chemical Sciences.
- Synthesis of Functional DNA Comprising Aminotropnyl 2'-deoxyuridine Analogues For Cross-linking with Peptides, (**SERB**). Principal Investigator: **Dr. Nagendra Kumar Sharma**, Chemical Sciences.
- Design and fabrication of composite hollow fiber membranes using organic cage linked coordination polymers and waste plastic for olefin-paraffin separation, (**SERB**). Principal Investigator: **Dr. Bishnu Prasad Biswal,** Chemical Sciences.
- Conversion of CO_2 to renewable fuels using photocatalytic membrane reactor composedof crystalline, porous polymers, (**DST**). Principal Investigator: **Dr. Bishnu Prasad Biswal,** Chemical Sciences.
- Measurement of Dust Growth in Protoplanetary Disks: Understanding the Origins of Planet Formation, (**SERB**). Principal Investigator: **Dr. Liton Majumdar**, Earth and Planetary Sciences.
- The formation and evolution of complex organic molecules in extraterrestrial environments: Exploring the role of molecular astrophysics in the origin of life, (**SERB**). Principal Investigator: **Dr. Liton Majumdar**, Earth and Planetary Sciences.
- Indian participation in the ALICE experiment at CERN, (**DAE**). Principal Investigator: **Prof. Bedangdas Mohanty**, Physical Sciences.
- Spin wave dispersion and nanoscale imaging of magnons using Brillouin light scattering micro-spectroscopy, (**SERB**). Co-Principal Investigator: **Prof. Subhankar Bedanta,** Physical Sciences.
- Novel Recursive Green's function technique in the Fock space & Applications, (**SERB**). Principal Investigator: **Dr. Anamitra Mukherjee,** Physical Sciences.
- Josephson junctions with strained Dirac materials and their application in quantum information processing, (**DST**). Principal Investigator: **Dr. Colin Benjamin**, Physical Sciences.
- Diagonosis of cancer in human blood through spectroscopy, Indo-Germany industrial project from Canostix GHBM, Germany, (**Canostix GHBM**). Principal Investigator: **Dr. Pratap Kumar Sahoo**, Physical Sciences.
- Microcavity enhanced terahertz nonlinearities of topological states: Towards ultrafast spintronics, (**SERB**). Principal Investigator: **Dr. Shovon Pal**, Physical Sciences.
- Absolute order unit spaces: a generalisation of C*-algebras, (**SERB**). Principal investigator: **Dr. Anil Kumar Karn,** Mathematical Sciences.
- Linear codes of the symplectic geometry over finite fields of even characteristic, (**SERB**). Principal Investigator: **Dr. Binod Kumar Sahoo,** Mathematical Sciences.

- Graphical Indices associated with different central parts of connected graphs, (**SERB**). Principal Investigator: **Dr. Kamal Lochan Patra,** Mathematical Sciences.
- Algebraic independence problems connected to elliptic integrals of third kinds, (**SERB**). Principal Investigator: **Dr. K. Senthil Kumar,** Mathematical Sciences.
- Inspire research grant, (**DST**), Principal Investigator: **Dr. Ramesh Manna,** Mathematical Sciences.
- National Post-Doctoral Fellowship (Dr. Debkumar Giri), Mentor: **Dr. Ramesh Manna**, Mathematical Sciences.
- Graph Clustering: A Theoretical Perspective, (**SERB**). Principal Investigator: **Dr. Aritra Banik**, Computer Sciences.
- Lunar Mantle exposed or missed in South Pole Aitken basin-Insights from Chandrayaan-2 IIRS, (**DOS**). Principal Investigator: **Dr. Guneshwar Thangjam,** Earth and Planetary Sciences.
- Spin to charge conversion in ferromagnet/non-magnet systems through spin pumping by inverse spin Hall effect method, (**SERB**). Principal Investigator: **Prof. Subhankar Bedanta,** Physical Sciences.
- Harnessing pure spin current by tailoring molecular spinterface, (**BRNS**). Principal Collaborator: **Prof. Subhankar Bedanta**, Physical Sciences.
- Intensification of Research in High Priority Area which involves demonstration of Semi-transparent Perovskite Photovoltaic Devices, (**SERB**). Principal Investigator: **Dr. Satyaprasad P. Senanayak**, Physical Sciences.

CONSULTANCY PROJECTS

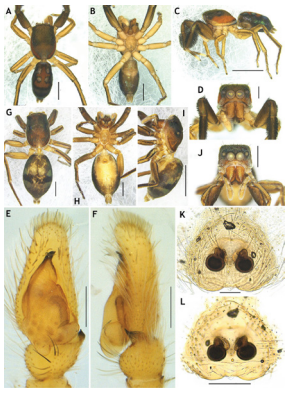
- Assessing Invasive species in protected forests of Kalahandi district, (**Forest Department of Odisha**). Principal Investigator: **Dr. Aniruddha Datta Roy,** Biological Sciences.

Intellectual Property

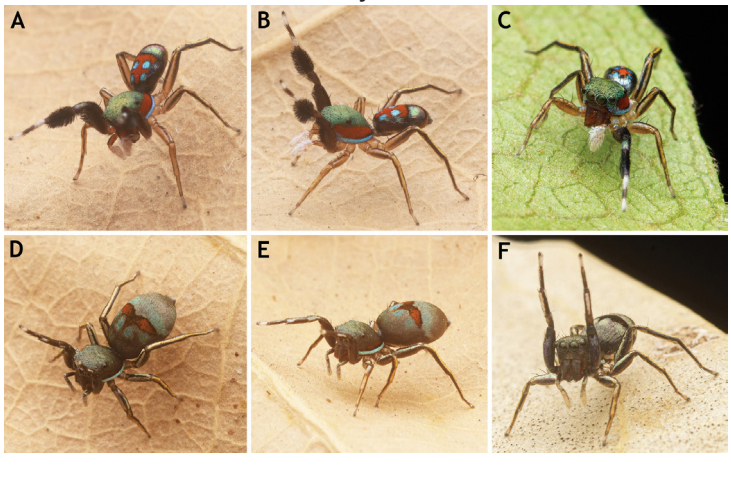
Patent filed during 2023-24

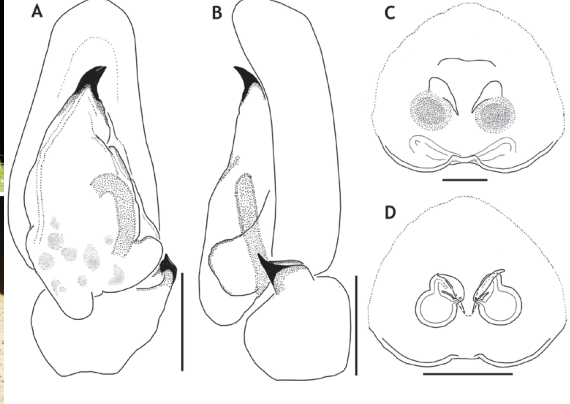
- System And Method For Determining Microbiome From Host Metabolome Using A Machine Learning Model: **Prof. Palok Aich** (INP Application No: 202341038067).
- Cyanobacteria embedded in polymer matrix can be used to chelate the toxic Hexavalent Chromium from contaminated soil and help improve productivity of rice: **Dr. Kishore CS Panigrahi.**
- Use of CNP for Enhanced Productivity of Rice: **Dr. Kishore CS Panigrahi**.

Exploring Nature's Riches: The Discovery of Siler niser



In a testament to NISER's scientific exploration, a novel spider species, Siler niser, has been discovered. Through coordinated efforts, **Mr. Ayush Parag**, an Integrated M.Sc. student, and his M.Sc. thesis mentor, **Dr. Aniruddha Datta Roy** from the School of Biological Sciences, paved the way for this remarkable discovery. Assisted by **Dr. John T.D. Caleb**, an eminent Indian jumping spider specialist, the team engaged in a campuswide spider biodiversity project, yielding unforeseen outcomes. Named "niser" after its discovery site, this species has been meticulously documented in the esteemed journal "Zoosystematics and Evolution." This finding promises to enhance the understanding of NISER's and Odisha's biodiversity.





NEW RESEARCH FACILITIES

Automatic Cage washing system

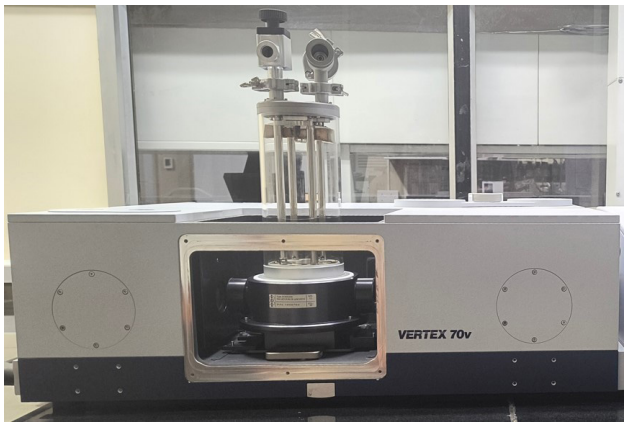
The new automatic cage washing facility has transformed lab operations with its advanced washing units, automated cycles, and efficient drying systems. This upgrade significantly improves hygiene, reduces manual labor, and enhances animal welfare by maintaining a pristine environment. **(Place: Animal House)**

Upgradation of Infectious Disease Biocontainment

The Infectious Disease Biocontainment Lab has recently undergone a major upgrade, enhancing safety and operational capabilities. The facility now boasts advanced negative containment units that effectively prevent pathogen escape. A new pass through autoclave ensures thorough sterilization of biomedical waste before it exits the containment area. Upgraded wet showers provide comprehensive decontamination for personnel. These enhancements significantly elevate biosafety measures, supporting cutting-edge infectious disease research and ensuring a safer working environment for researchers. **(Place: Animal House)**

Matrix Isolated Vibrational Circular Dichroism (MI-VCD) Spectroscopy

Vibrational circular dichroism (VCD) is a cutting-edge spectroscopic technique for examining the self-aggregation of chiral molecules and their interactions with guest molecules, with exceptional sensitivity to conformational details. However, at room temperature, VCD spectra can blur with flexible molecules having numerous conformations. The combination of matrix isolation (MI) and VCD spectroscopy (MI-CD) offers a game-changing solution by trapping these molecules in a cold noble gas matrix (~10 to 30K). This technique narrows spectra by reducing conformational diversity and eliminating solvent effects, providing razor-sharp details ideal for precise spectral analysis, chiral recognition, chirality transfer, and photoisomerization studies. By freezing the sample in an inert matrix, MI-CD reveals subtle spectral features that are otherwise obscured, enhancing the understanding of molecular behavior and interactions at a fundamental level.**(Place: School of Chemical Science)**



Other Lab Instruments

- 540 Tb Storage Server, named SAHA, for astrophysics group of **Dr. Nishikant Khandai.**
- New HPC facilty at lab of **Dr. Prasenjit Samal.**
- Nonlinear THz time-domain spectroscopy setup at lab of **Dr. Shovon Pal.**
- High temperature oven option for SQUID magnetometry, Development of in-house Spin-Orbit torque set-up at lab of **Prof. Subhankar Bedanta.**
- ISO-5 (Class 100) Clean Air table: An ISO-5 Clean Air table of working size 1800 mm × 1200 mm × 750 mm has been established. The existing cleanroom is ISO-6 (Class 1000), and this table will provide the facility to develop detectors with a much cleaner environment to develop, assemble, and test the gaseous and silicon detectors. **(CMRP)**

Twelfth Graduation Ceremony

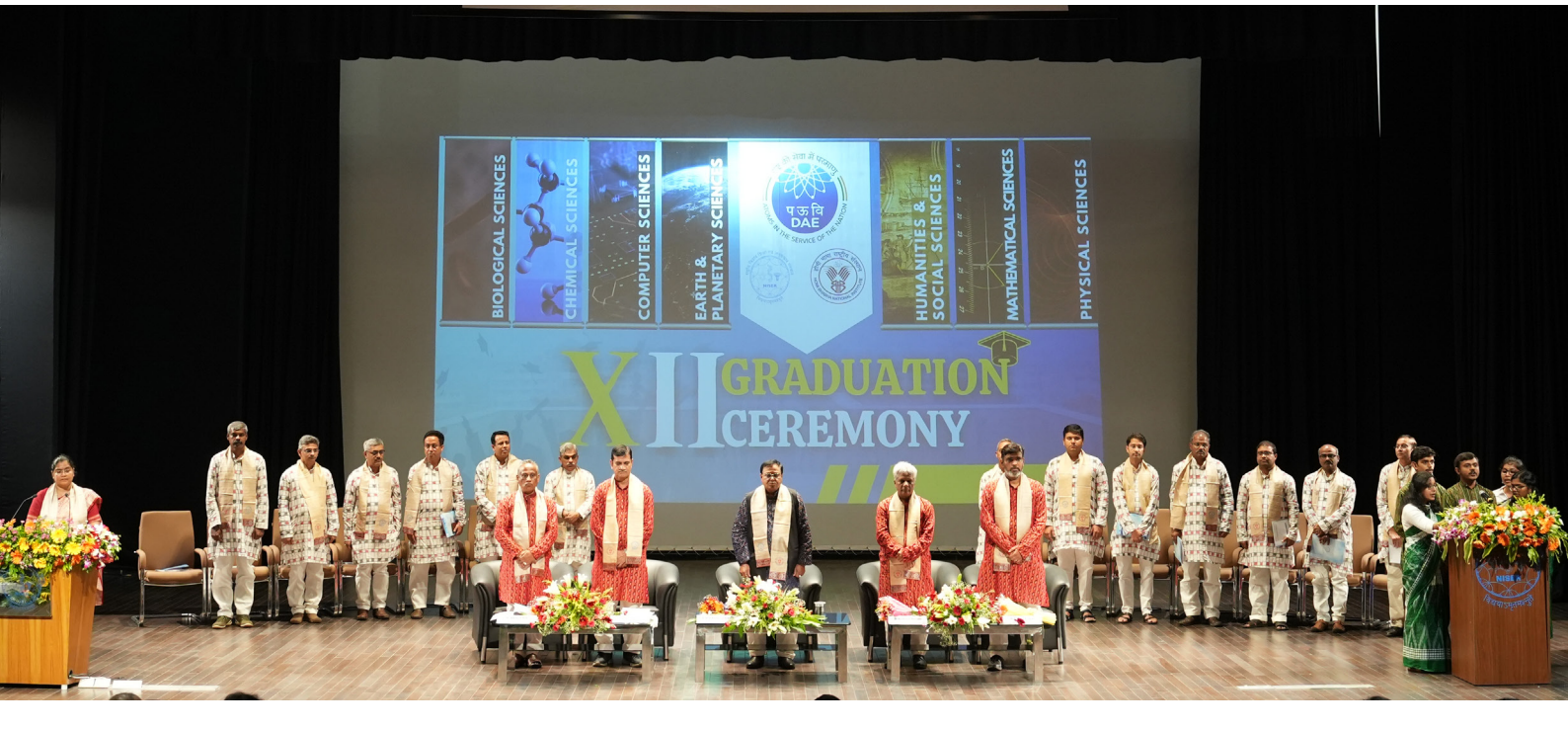
NISER celebrated a significant milestone with its 12th Graduation Ceremony on July 17, 2023. This memorable event served as a platform to recognize and honor the accomplishments of its graduates from various academic programs including 5-year Integrated M.Sc., Integrated PhD, and PhD Students were bestowed with degree certificates, mark sheets, and medals, symbolizing their dedication and hard work throughout their academic journey.

The ceremony witnessed the graduation of a total of 165 Integrated M.Sc., 1 Integrated PhD, and 53 PhD students, each embarking on their next chapter equipped with knowledge and skills acquired at NISER.

Dr. V. K. Saraswat, the esteemed Member of NITI Ayog and Chancellor of Jawaharlal Nehru University-New Delhi, graced the occasion as the Chief Guest, imparting valuable insights and inspiration to the graduates. **Prof. Ajit K. Mohanty**, the respected Chairman of the Board of Governors at NISER, presided over the ceremony, adding to the grandeur of the event.

The 12th Graduation Ceremony stands as a profound testament to the unwavering academic excellence and steadfast commitment to nurturing future leaders demonstrated by NISER. It not only signifies the culmination of years of hard work but also marks the auspicious beginning of a new journey, brimming with endless possibilities and promising opportunities for the graduates.

Name	Department
Overall Topper (Gold Medal)	
Mr. Aditya Pal	Chemical Sciences
Department Topper (Silver Medal)	
Mr. Priyobrata Biswas	Biological Sciences
Mr. Aditya Pal	Chemical Sciences
Mr. Apratim Choudhury	Mathematical Sciences
Mr. S Gauthameshwar	Physical Sciences
Best Thesis Award	
Mr. Shubham Kumar	Biological Sciences
Mr. Aniruddha Seal	Chemical Sciences
Mr. Sai Sriharsha Indukuri	Mathematical Sciences
Mr. S Gauthameshwar	Physical Sciences
Memorial Awards	
Recipient	**Name of the Awards**
Mr. S Gauthameshwar	Sarat Chandra-Annapurna Memorial Award
Mr. Aditya Pal	Smt. Jayalaxamma Memorial Award
Mr. Apratim Choudhury	Prof. Tribikram Pati Memorial Award
Mr. Priyobrata Biswas	Dr. Sumitra Maharana Memorial Award
Ms. Fida Salim	Mrs. Kanak Benjamin Memorial Award
Mr. Aditya Pal	Ishwar Parbati Memorial Award



Events and Activities

FIRE SERVICE WEEK

On April 14, NISER celebrated Fire Service Day, followed by a weeklong series of events from April 14 to 20. These activities included poster presentations, essay and slogan writing competitions, fire safety training, emergency evacuation drills, and informative seminars. The events raised awareness and honoured the courageous efforts of firefighters. The theme for this year's Fire Service Week was **"Awareness in Fire Safety for Growth of National Infrastructure" (AGNI)**.

HOMI BHABHA AND VIKRAM SARABHAI SEMINAR HALL

NISER recently expanded its infrastructure with the introduction of two state-of-the-art seminar halls named after renowned scientists Homi Jehangir Bhabha and Vikram Ambalal Sarabhai. These halls were inaugurated on April 27, 2023. They stand as a testament to our commitment to cultivating intellectual discourse and collaborations, showcasing modern design and advanced audio-visual systems that enrich presentations by enabling lively interactions. The Homi Bhabha and Vikram Sarabhai Halls are intended to facilitate the organization of both national and international conferences and workshops.

WORLD NO-TOBACCO DAY

In observance of World No-Tobacco Day on May 31, 2023, Tata Memorial Centre, Mumbai, and NISER jointly organised a virtual conference. This event encompassed a pair of engaging and insightful presentations. The first talk, "**Effects of Tobacco on Health**," was delivered by **Dr. Arjun Singh**, a head and neck surgeon at Tata Memorial Centre, Mumbai. The second lecture, **"Tobacco Quit Line Centre,"** was presented by **Dr. Suvarna Gore**, a Senior Project Manager cum Trainer at TMC, Mumbai.

WORLD ENVIRONMENT DAY

On June 14, 2023, the NISER community united to commemorate World Environment Day by embarking on a more sustainable and vibrant future. A tree-planting drive was carried out across the campus, underscoring the commitment to preserve and safeguard the natural surroundings.

INTERNATIONAL DAY OF YOGA

The grand celebration of the 9th International Day of Yoga was celebrated on June 21st, 2023 at our community center. The International Day of Yoga is an auspicious occasion that highlights the immense benefits of practicing yoga in our daily lives. It serves as a reminder of the holistic approach to well-being, both physically and mentally, that yoga brings forth. NISER conducted various yoga sessions, pranayama etc in which the faculty members, staff, family members, neigbours and students of the institute participated with all enthusiasm. NISER had followed the general practice guideline and other information provided by the Government of India.

INDEPENDENCE DAY CELEBRATION

NISER commemorated the 77th Independence Day with a series of vibrant and meaningful activities. The day commenced with a dignified flag hoisting ceremony, symbolizing the institute's respect for the nation's heritage and freedom. Following this, a lively cultural program unfolded, showcasing the diverse talents of NISER students and fostering a sense of unity and celebration. In alignment with the institute's commitment to environmental responsibility, the NISER community actively participated in a collective tree-planting initiative. This endeavor not only contributed to the greenery of the campus but also emphasized the importance of sustainability and ecological consciousness. The festivities reflected the institute's commitment to sustainability, marking a holistic and memorable Independence Day observance.

OBSERVANCE OF SADBHAVANA DIWAS

In honour of the birth anniversary of late Prime Minister Shri Rajiv Gandhi, the NISER community solemnly observed Sadbhavana Diwas on August 18. The community took the Sadbhavana Diwas Pledge which, was administered by the director at the Pathani Samanta Auditorium.

SCIENTIFIC WRITING & PUBLISHING WORKSHOP

In a collaborative effort, the Central Library, NISER, and Springer Nature convened an Author Workshop titled "Scientific Writing & Publishing" on August 25, 2023. Attendees included faculty members, scientific officers, research scholars, and students from Integrated MSc (4th Year & 5th Year). **Ms. Swati Meherishi**, the Editorial Director at Springer Nature, delivered the keynote address.

FOUNDATION DAY

The 14th Foundation Day was celebrated on 6th September, 2023. **Prof. P. Sreekumar**, Director, Manipal Center for Natural Sciences, Manipal Academy of Higher Education was invited as the Chief Guest on this occasion and delivered a talk on **"Technology as an Enabler in Scientific Pursuits of Space"** on 6th September 2023.

RAJBHASA HINDI DIWAS CELEBRATION

To highlight the significance of Hindi, various programmes and competitions were conducted at the institute during the Official Language Hindi Fortnight from September 14 to September 29, 2023. The institute witnessed active participation from students, staff, and faculty members in all the events. Additionally, a Hindi Book Exhibition was curated by the Central Library on the occasion of Hindi Diwas, providing an opportunity for all Hindi readers to explore and benefit from the collection.

SCIFINDER-N TRAINING SESSION

The Central Library, NISER, orchestrated an exhilarating Training Session on SciFinder-n for scholars and faculty from the School of Chemical Sciences and School of Biological Sciences on October 6, 2023. **Dr. Nabin Sarkar**, Customer Success Specialist from ACSI India Pvt. Ltd., delivered the keynote address.

GRAMMARLY TRAINING SESSION

The Central Library, NISER, and Total Library Solutions (India) Pvt. Ltd. united to host a dynamic Training Session on Grammarly on October 13, 2023. This engaging event catered to faculty members, staff, research scholars (PhD & Integrated MSc-PhD), and Integrated MSc students (4th and 5th year) from NISER.

VIGILANCE AWARENESS WEEK

The Vigilance Awareness Week was observed from October 30 to November 5, 2023. The observance was initiated with a pledge-taking ceremony on October 31. Our director led the administration of the pledge during this event, which was attended by the staff and faculty members, highlighting our dedication to maintaining integrity and combating corruption.

OBSERVANCE OF RASHTRIYA EKTA DIWAS

In honour of the birth anniversary of Shri Sardar Vallabhbhai Patel, widely recognised as the 'Iron Man of India,' the NISER community passionately observed National Unity Day on October 31, participating in the Rashtriya Ekta Diwas Pledge.

CYBER SECURITY AND RESPONSIBLE USE OF SOCIAL MEDIA

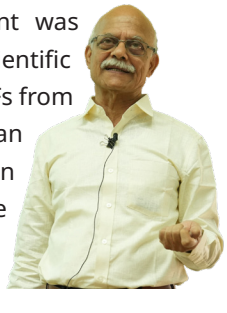
On January 3, 2024, NISER's Computer Centre hosted a talk on "Cyber Security and Responsible Use of Social Media," featuring **Shri S. K. Priyadarshi**, IPS Commissioner of Police (Bhubaneswar Cuttack), and **ACP Ms. Anjana Tudu**. They offered crucial insights into digital security and responsible social media use, equipping attendees with key knowledge for safe digital navigation.

CONDUCT RULES AND THE RIGHT TO INFORMATION (RTI)

On January 18, 2024, NISER hosted a training session on “Conduct Rules and the Right to Information (RTI)” led by **Mr. G. Venkatesan**, Director of ATI, Mumbai. The session aimed to enhance staff and faculty understanding of conduct regulations and RTI procedures, providing essential knowledge for effective navigation and adherence to best practices.

SECRETS OF GETTING PUBLISHED IN HIGH-IMPACT-FACTOR JOURNALS AUTHOR WORKSHOP

The Central Library, NISER, and Wiley joined forces to present an Author Workshop titled "*Secrets of Getting Published in High-Impact-Factor Journals*" on January 19, 2024. This captivating event was tailored for Faculty Members, Scientific Staff, Research Scholars, and PDFs from NISER. **Dr. Yateendra Joshi**, an esteemed Academic Publication Trainer, took center stage as the keynote speaker.



REPUBLIC DAY CELEBRATION

NISER embraced the zest of India’s 75th Republic Day by hoisting the national flag on its campus with exuberance and joy. The festivities commenced with a spirited parade led by NISER’s security staff, accompanied by the resonant singing of the national anthem. Prof. Hirendra Nath Ghosh, the Director of NISER, shared his insights in an inspiring address.

Recognizing and applauding excellence, the Institute bestowed outstanding performers’ awards upon our dedicated administrative and technical staff, acknowledging their unwavering commitment to the NISER community throughout the years. The awardees include Dr. Chandramohan Bathrachalam, Scientific Officer - D; Shri Dolananda Pradhan, Administrative Officer - I; Shri Jyotiranjan Sahoo, SA-B (Physiotherapist); Shri Prakash Chandra Behera, Tech - D (Chem.); Smt Lipsa Das, Assistant - A; and Shri M Siba Prasad Rao, Assistant - A.

WORLD CANCER DAY

Shearing glimpses of the enlightening World Cancer Day event that took place on February 4, 2024, hosted by Tata Memorial Centre and CMRP NISER. In observance of World Cancer Day and aligning with this year’s international slogan - **"Close the care gap,"** our program aimed to raise awareness and contribute to the collective efforts in cancer prevention and control. A heartfelt thank you to all our esteemed guests, experts, and community leaders who graced the occasion with their presence and valuable insights. Special gratitude to **Dr. Susanta Swain**, Additional Director of Health Services (NCD), Odisha and **Prof. Atul Budukh**, TMC, Mumbai, for their impactful deliberations. We took a moment to felicitate community leaders, tobacco quitters, and the winners of our drawing competition, acknowledging their significant contributions and efforts in the fight against cancer.

BOOK EXHIBITION 2024

The NISER Central Library hosted a three-day book exhibition from March 5th to 7th, 2024, featuring a wide range of textbooks, reference materials, popular science works, and literary classics from reputed publishers and vendors. The exhibition aimed

to enrich academic resources and inspire reading across disciplines, showcasing achievements from Nobel Laureates to celebrated Indian scientists and technologists.

OFFICIAL LANGUAGE HINDI IN NISER

The institute is making all possible efforts to promote & implement the Official Language Policy of the Union. The Official Language Implementation Committee (OLIC) consisting of all the Deans, Chairpersons, FICs, Registrar & other Section Heads under the Chairmanship of Director, NISER plays an important role to ensure the effective compliance and implementation of the policy in the Institute. The mandatory requirements like signage, stamps, letterheads, advertisements, and various administrative reports are already being done in bilingual manner. Staff members particularly those who have been trained through various official language Hindi courses and many others also execute their official work in Hindi to the best possible extent. To encourage and motivate more employees of the institute to execute their official work in Hindi, DAE's Incentive Scheme (ATOLIS – Atomic Energy Official Language Implementation Scheme) has been implemented and the staff members are being awarded the prizes under the scheme. The institute time to time also conducts Hindi Seminars / Webinars, Conferences, Workshops and Training Sessions. Competitive events in official language Hindi like essay writing, film quiz, noting & drafting, open speech competitions etc. are also being conducted during the Hindi Pakhwada / Hindi Diwas celebrations. Some of the Hindi events conducted during the year are mentioned below:

- In the year 2023-24 **Hindi Pakhwada** was observed in the Institute during September 14 – 29, 2023. A competitive event on "Hindi Grammer" was conducted amongst the staff & students of the Institute. Winners of this program were awarded with the cash prizes.
- **Training Programme:** A Faculty Development Programme for Hindi Officers & Officer In-Charges of Hindi was conducted in NISER by DAE during October 30th to November 1st, 2023. This training programme was sponsored / funded by the Administrative Training Institute (ATI) of DAE.
- A **"Public Awareness Programme on DAE's Activities"**, was conducted in collaboration with NISER & IOP at Kalinga Institute of Social Sciences, Bhubaneswar on November 2nd & 3rd, 2023. This programme was fully sponsored by the DAE & Conducted by the officials of Hindi Section of DAE Mumbai.
- NISER participated in a Hindi Workshop & Technical Training Programme at Institute of Physics (IOP) jointly organized by IOP & IIT Bhubaneswar on December 19th, 2023.

SWACHHATA PAKHWADA 2024

The Swachhata Pakhwada at NISER was observed during March 07 to March 20, 2024. The pakhwada was inaugurated on March 07, 2024. In order to raise the awareness of the NISER community on the burden of plastic waste, two documentaries were screened followed by a discussion on March 08. On March 09, a swachhata march was conducted on the NISER campus. Faculty members, staff, students, and the housekeeping staff joined the march to raise awareness on the importance of cleanliness. NISER members also spent two hours for cleaning the campus. On March 09 afternoon, NISER community members including the family members participated in the best out of plastic waste competition and displayed various crafts made of waste plastic materials.

On March 10, a cycle rally was undertaken to raise awareness on the importance of cleanliness. **Shri Sidharth Routray**, the First Odia Ultraman and Ironman, flagged off and joined the cycle rally along with 30 cycling enthusiasts of NISER. The rally started from NISER and went to Barunei Haill via Jatni market and IIT campus and returned to campus.

To promote the habit of cleanliness among the hostel inmates, a cleanest hostel competition was conducted among the nine hostels of NISER on March 11. Mahanadi Hostel emerged as the cleanest hostel of the campus. Similarly, the cleanest office space competition was conducted on March 12. Health centre of NISER and Library were adjudged as the cleanest office space of NISER campus.

On March 13, Meme Making and Slogan competitions were conducted on the theme burden of fossil fuel and transition towards clean energy.

On March 15, quiz on the environment theme was conducted.

On March 16 and 17, students painted beautiful graffiti on the NISER boundary wall on the theme ‘burden of plastic waste on the planet earth’.

On March 18, a poster competition was conducted on the theme “cleanliness”.

On March 20, the closing event of the Swachhata Pakhwada was organised. Director NISER, Professor Hirendra Nath Ghosh addressed the gathering and distributed the prizes to the winners of different competition.

PARTICLE THERAPY MASTER CLASS

The "Particle Therapy Master Class," organized by CMRP NISER in collaboration with the International Particle Physics Outreach Group on March 15, 2024, offered a deep dive into the future of healthcare through particle therapy. Attendees explored the fundamentals of particle therapy, and advanced radiotherapy treatment planning with MatRad software, and participated in hands-on sessions to enrich their knowledge and skills.

P. K. PARIJA LECTURE IN LIFE SCIENCES

NISER had the distinct honor of hosting the Second P. K. Parija Lecture in Life Sciences, made possible by the generous endowment from the Prof. Prana Krushna Parija Charitable Trust (Odisha). This year's captivating lecture, **"Can We Understand an Insect Society?"** was delivered by the esteemed **Professor Raghavendra Gadagkar**, DST Year of Science Chair Professor at the Centre for Ecological Sciences, Indian Institute of Science, Bengaluru. Prof. Gadagkar's presentation provided a fascinating exploration into the complexities of insect societies, enriching our understanding of these remarkable creatures and highlighting the crucial role of interdisciplinary research in unraveling nature's mysteries.

Student Activities

AWARDS AND RECOGNITIONS

HBNI Outstanding Doctoral Student Award

Dr. Sudip Sau, affiliated with the School of Chemical Sciences, has attained the prestigious HBNI Outstanding Doctoral Student Award 2023. This accolade highlights the notable contributions of Dr. Sau, who was guided by the expertise of **Dr. Prasenjit Mal**, to his field of study.

Best Poster Award

- **Ms. Sasmita Behera,** a Research Scholar, was conferred with the coveted Best Poster Award at the 6th International Eco Summit held at Gold Coast, Australia. Her innovative insights showcased on this global platform underline the calibre of research excellence nurtured at NISER.
- **Mr. Abhisek Mishra,** a Research Scholar from School of Physical Sciences, NISER achieved acclaim by securing the Best Poster Award at the International Conference on Materials for Advanced Technologies 2023, held in Singapore.
- **Mr. Saptarshi Datta,** Integrated MSc, School of Physical Sciences, was conferred the "Best Poster Award" in the experimental category at the 4th Heavy Flavour Meet hosted by IIT, Goa.
- **Varun Manilal** and **Dibya Bharati Pradhan**, both pursuing their Integrated MSc and engaged in their MSc thesis projects at the School of Earth and Planetary Sciences (SEPS), received recognition at the International Exoplanet Conference in Pune, held in August 2023. Their outstanding contributions were acknowledged with the 1st and 3rd Best Poster Prizes, respectively, highlighting the excellence of their research in the field of exoplanets.

NIRMAN

RoboTech Club obtained the 2nd prize in the Line Follower competition at NIRMAN, an event hosted by the Silicon Institute of Technology, Bhubaneswar, by demonstrating their technical prowess and synergy.

DAE Essay Competition

Ms. N Sneha, Integrated MSc at the School of Physical Sciences, won the Second Prize in the 35th DAE All India Essay Competition with her essay on "Application of Laser and Plasma Technology to Nuclear Fusion Energy."

Prof. Dayanidhi Patnaik Memorial Award

Dr. Subhrakant Jena, Senior Project Associate from the School of Chemical Sciences, received the "Prof. Dayanidhi Patnaik Memorial Award" by the Odisha Chemical Society (OCS) in the best research paper category.

VARIOUS CLUB EVENTS

Zaariya

Zaariya is a group of dedicated individuals passionate about making a positive impact on society and giving back to their community. The club is committed to organizing and participating in various volunteer and service opportunities throughout the year, with the goal of making a meaningful difference in the lives of those around us. Among their notable events during 2023-24 is the Diwali Food Fest, where volunteers set up food stalls to sell food items, donating a portion of the profits to Zaariya. Another initiative, "your's कृतज्ञतापूर्वक," encouraged students of NISER to write letters or give small gifts to express gratitude to other students, with Zaariya delivering these letters anonymously. Additionally, the club hosts Prerana, an event where the children of NISER's housekeeping staff and security guards are invited to enjoy science demonstrations conducted by various science clubs, aiming to introduce and inspire a love for science among the children.

Vaktavya

Vaktavya is a structured organization of extracurricular activity where individuals engage in formalized discussions or arguments on various topics. The primary objective of the debate club is to enhance critical thinking, communication skills, and the ability to formulate coherent arguments backed by evidence. Club events include a debate on "Should India's constitution be amended to remove the word: Socialist?" held during the event of Umang' 23, debate competitions during IICM' 23 elections, a Preamble reading on Netaji Jayanti, and cultural performances of different languages on International Mother Language Day.

The Free Radicals (TFR)

The Free Radicals (TFR) is the chemistry club of NISER, established on 19th April 2022, making it the newest addition to the institute's science clubs. The club enhances academic experiences through alumni and student talks, and chemistry-themed activities, fostering a passion for chemical sciences beyond the classroom. TFR also engages in outreach activities to popularize science among school students and the public. Notable recent events include a chemistry-themed treasure hunt during Tvisha, an inter-college fest, and a reaction tier-list competition during Umang, the intra-NISER fest. Club events also feature the TFR Induction Quiz for first-year students, exhibitional chemistry sessions demonstrating experiments to young audiences, and TFR Student/Alumni Talks for discussing scientific topics.

Sapsara (Photography club)

The Photography Club at NISER is revitalizing students' interest and skills in photography, providing a creative outlet to relieve academic stress. It offers a platform for sharing and discussing photos, learning, and improving through various activities. Recent events include:

- Insect Race: A collaboration with the Nature Club where participants photographed and identified insects on campus, with prizes for best photograph and most species.
- Into the Cam-verse: A workshop series starting on September 9, 2022, covering basic to advanced photography topics, paired with hands-on event coverage for skill enhancement.
- Sci-pic Photography: Part of NISER's outreach week, this competition encouraged school and college students to depict scientific phenomena through photography.

Mathematix Club

The Mathematix Club at NISER celebrates numerical phenomena and ignites mathematical fervor through events like Pi Day, scavenger hunts, and the prestigious Integration Bee. Beyond competitions, it fosters a community of erudite thinkers with seminars and talks, enriching the academic landscape with a symphony of numerical intellect.

Film Club

The NISER Film Club is a vibrant community of cinephiles dedicated to fostering a film-watching culture on campus. By screening a diverse selection of acclaimed and lesser-known films, the club provides a platform for appreciation and discussion. It encourages healthy discourse on the art of filmmaking and hosts student talks focusing on both technical and cultural aspects. In addition, the club organizes various events, including a Film Quiz and an Oscar Marathon, and actively promotes independent filmmaking among students. Through these activities, the club enriches the film knowledge of its members and cultivates a passion for cinema within the NISER community.

Drama and Music Club

The Drama and Music Club at NISER, Bhubaneswar, was established to unite individuals who share a passion for art, fostering collaboration and the development of co-curricular skills. The club has organized various exciting events, including the Solo/Duet Singing and Battle of Bands competitions during the UMANG 4.0 festival. The production of "Madagascar" also showcased the members' talents. Additionally, the club hosted **Dr. Kiran Seth**, the founder of SPICMACAY, for a special session, and conducted a Street (Nukkad Natak) Workshop led by **Nimi Mathew**. The club's induction program and Republic Day celebration further enriched the community, culminating in a vibrant Band Show by StereoHearts during the prize distribution ceremony.

Coding Club

The NISER Coding Club aims to promote a code-first approach to problem-solving, bringing together those who share this philosophy and inspiring others. Its activities include programming tutorials, competitive contests, talks on computer science, and competitions in web development and creative coding. The club's software development group creates useful applications for NISER students, such as the canteen menu and the NISER archive. It also collaborates with the RoboTech club on projects requiring hardware-software integration. During NISER's festivals, the club organizes competitive programming contests and hackathons, which have motivated many students to take up coding. The club's events include Switcheroo, Against Time (a timed problem-solving competition), and coding club blogs.

Dance club

The Dance Club is an inviting community for anyone eager to explore the joy of expression through movement. This vibrant group consists of enthusiastic students passionate about diverse dance forms, ranging from Bharatanatyam to Breakdance. They actively practice, promote, and perform the art of dance, creating an engaging environment. Notable events include Garba Night, featuring a dance workshop led by NISER alumni, and a Bollywood workshop conducted by choreographers from Odisha. Additionally, the club participates in Nrityotsav, the Umang intra-college fest dance event, and showcases talent at the IICM-2023 dance event at IISER Mohali, fostering creativity and collaboration.

Brain Matters Club

The 'Brain Matters' Neuroscience Club at NISER fosters a vibrant community of neuroscience enthusiasts, making the complex field more accessible to students across disciplines. The club organizes a variety of events, including lectures, discussions, and interactive activities that explore diverse aspects of neuroscience. Notable activities include the Internship Talk Series, where students share their summer internship experiences, and a PhD Panel Discussion in collaboration with other clubs, offering insights into PhD applications. The club has also hosted engaging events like the Neural Nexus escape room and experimental demonstrations such as the Dancing Cockroach leg experiment and brain slide displays, providing hands-on learning opportunities. Looking ahead, the club plans to introduce more hands-on projects, including electrophysiological recordings and behavioral experiments.

Astronomy club

The NISER Astronomy Club (NAC) is dedicated to fostering exploration, education, and community engagement in astronomy. The club actively organizes a wide range of activities, including night-sky observation sessions, astrophotography challenges, and hands-on astrophysics experiments. NAC's outreach extends beyond campus, with programs designed to engage

local schools and colleges.

The club conducts regular weekly talks on various astronomy topics, offering students a platform to share their knowledge. Notable events include the Astrophotography Challenge and the Make Your Own Nebula competition, where participants showcase their creativity and scientific understanding. NAC also hosts live streaming events for significant astronomical milestones, such as the Chandrayaan-3 Launch and Landing, along with telescope demonstrations and observation sessions that engage both the NISER community and the general public.

Through its magazine, 'KSHITIJ,' NAC spreads knowledge and inspiration, featuring contributions from various science enthusiasts. The club's activities are designed to nurture a deeper understanding of astronomy while building a vibrant community of like-minded individuals passionate about exploring the cosmos. Stay connected with NAC through its website and social media platforms for the latest updates and opportunities to engage with the wonders of the universe.

Arts Club

The Art Club is a vibrant community where students explore and express their creativity through various art forms, including painting, drawing, sculpture, and photography. Open to all skill levels, the club fosters artistic growth and meaningful discussions about art's societal impact. The club has organized several events, such as a painting contest titled "NISER through your eyes" and a pot painting contest during UMANG 4.0. Additionally, an art exhibition and competition were held on the occasion of Agomoni. During Swachhata Pakwada 2024, the club hosted a "Best Out of Waste" competition, a poster-making competition, and a graffiti competition. A live spot painting event was also conducted in front of the SBS and SCS departments.

Science Activities Club

The Science Activities Club at the NISER is one of the institute's oldest and most dynamic organizations, dedicated to promoting scientific awareness among students and the wider community. The club regularly hosts open days as part of its outreach initiatives, where school children are invited to experience fascinating experiments and scientific models. Events also include engaging talks by students and faculty members. The club's structure features four representatives from each school, covering mathematics, physics, biology, and chemistry. Additionally, the club organizes enjoyable events like "High-Pot-Thesis" and "Three Minute Thesis," which blend fun with scientific inquiry.

Quizone

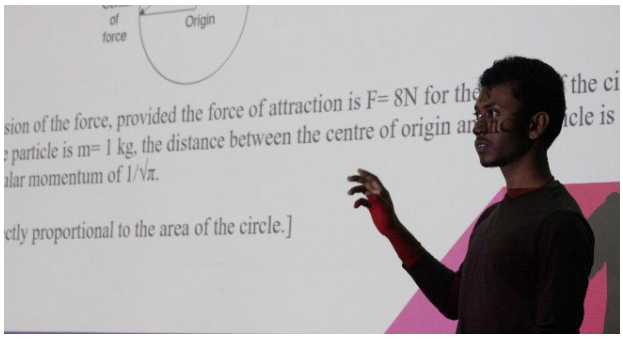
The Quiz Club at NISER is a vibrant and intellectually stimulating community for students who thrive on challenging their knowledge and curiosity. With a diverse range of topics, from history and science to pop culture and current events, the club offers an exciting platform for members to participate in quizzes, competitions, and trivia nights. Through regular meetings, practice sessions, and friendly competitions, members sharpen their critical thinking, enhance teamwork, and forge lasting friendships. The club's events, such as the Sports Quiz on National Sports Day, Umang Fest quizzes, The Incredible India Quiz on Republic Day, the Swachhata Pakhwada Quiz, and Scibiztech quiz, provide ample opportunities for engagement and learning. Whether an experienced quizzer or a newcomer, the Quiz Club welcomes everyone to explore, discover, and grow in a fun and supportive environment.

OORNA

Oorna, the nature club of NISER, was established with the aim of viewing nature through the lens of science while bringing the nature-lovers of our campus together. We conduct nature walks and talks and organize nature-themed events to inculcate appreciation and attention towards our natural surroundings. We also strive to conserve and rejuvenate the natural environment in and around NISER with joint efforts from the members of Oorna and NISER. The club's events include “Bungle in the Jungle: Treasure Hunt on the event of Tvisha”.

VIKIRAN

Vikiran, a student-run club at NISER aims to engage students interested in physics. The club hosts events like Scientia, a physics quiz competition, and Prerna, where demonstrations on non-Newtonian fluids and electron beams were conducted for the children of NISER staff in collaboration with Zaariya. Vikiran also organizes weekly student talks on diverse physics topics, offering a platform for knowledge exchange and discussion. Additionally, the club's online Memes Competition encourages creativity by blending humor with physics concepts.



Literary Club

The NISER Literary Club is a vibrant space for literature enthusiasts, offering book discussions, creative writing sessions, and literary analysis. It fosters a rich literary culture through events like author talks and fun monthly challenges. During Tvisha and Umang 2023, the club made a significant impact by organizing captivating events such as "Dastak," an open mic for Hindi-Urdu poetry, "Khat," a letter writing event, "Muse," a literary-artistic convergence, and "Echoes," an open mic themed around Nostalgia. These activities highlighted the club's dedication to blending literary passion with cultural celebration, enriching the NISER community.

Yoga Club

The Yoga Club at NISER promotes wellness through regular practice, offering free daily yoga sessions to foster a stress-free and healthy campus environment. Recently, the club resumed special morning yoga and meditation classes to help students relax and rejuvenate. These sessions include warm-ups, various asanas, pranayama, and guided meditations. During Umang 2023, the club organized a Yoga session featuring the Deep Relaxation Technique (DRT) and a Yogasana competition, where students showcased their skills. The club also celebrates International Yoga Day each year, encouraging participation to reap the benefits of yoga.

Outreach Activities

OUR OBJECTIVE:

The NISER Outreach Program is committed to fostering a deeper understanding of the importance and principles of science within the broader community. These multifaceted initiatives play a crucial role in advancing scientific literacy, nurturing the aspirations of future scientists, and establishing stronger connections between the scientific community and the public. These programs ensure that the advantages of scientific knowledge are accessible to diverse audiences, thereby contributing to a society that is more informed, innovative, interconnected, and actively engaged with the scientific enterprise.

The initiatives taken by the NISER Outreach Cell aim to inspire students by exposing them to real-world scientific research and discoveries, encouraging them to pursue further studies and careers in STEM (Science, Technology, Engineering, and Mathematics) related fields. Hands-on experiments, workshops, demonstrations, and interaction with scientists and researchers are some of the key tools utilized in these outreach initiatives, as this exposure can broaden the students' perspectives on the advancement of science beyond classroom lessons. Lastly, these activities strengthen ties between the institute and the schools and colleges of Odisha, fostering collaboration and mutual support in educational endeavors.

Distinguished faculty members from various schools at NISER have been pivotal contributors to the success of these Outreach programs. Notable individuals in this dedicated cohort include Dr. Debasmita P. Alone, Associate Professor, SBS; Dr. U. Lourderaj, Associate Professor, SCS; Dr. Pankaj V. Alone, Associate Professor, SBS; Dr. Subhankar Mishra, Reader-F, SCPS; Dr. Anupam Pal Choudhury, Assistant Professor, SMS; Dr. Jayesh Goyal, Assistant Professor, SEPS; and Dr. Satyaprasad P. Senanayak, Assistant Professor, SPS.

As a part of NISER's Outreach program, we conduct various science outreach activities throughout the year, which are mentioned below:

Science Outreach Activities	No. of Events
Educational Visits to NISER	**21**
Popular Talks	**5**
Student Internship	**1**
Teachers' Training Workshop	**1**
Other events	**3**
Total Number of Outreach Events in the year 2023-24	**31**

EDUCATIONAL VISITS 2023-24

Embarking on an educational journey outside the confines of a classroom can profoundly impact students' learning experiences. Organizing an educational visit to a research institute provides transformative educational experiences and a unique opportunity for school students to immerse themselves in the world of a cutting-edge scientific environment. Considering these thoughts, NISER Outreach Cell periodically organizes educational visits for Odisha's school and college students to deepen their understanding of scientific principles and cultivate a sense of curiosity and wonder in them. These visits are a year-round affair at NISER, allowing participants to engage with a state-of-the-art scientific institution. Interactions with NISER faculty, scientific officers, and NISER students inspire and enlighten, fostering a profound understanding of science as a career path and contributing to the scientific, social, and emotional development of all involved. Scheduled on Fridays with prior appointments, these visits expose school and college students to live experiments and provide insights into the work-life balance at NISER.

Upon arrival, students undergo an initial orientation session headed by Dr. Debasmita P. Alone, acquainting them with NISER's offerings, diverse courses, cutting-edge facilities, and extracurricular activities. Subsequently, they are guided to laboratories within their respective academic schools, including the School of Biological Sciences, School of Chemical Sciences, School of Physical Sciences, School of Mathematical Sciences, School of Computer Science, and the Centre for Interdisciplinary Sciences. Coordination of these visits is managed by Scientific Officers, including Dr. Arun Kumar, Dr. Chandramohan Bathrachalam, Dr. Priyanka Pandey, Dr. Santosh Babu Gunda, Dr. Saralasrita Mohanty, Dr. Shyamashree Ghosh, and Dr. Sudakshina Prusty.

In the academic year 2023-24, the Outreach cell successfully organized 21 educational visits, welcoming more than 1000 students and 180 teachers from various schools and colleges in Odisha. Institutions such as Baba Bhairabananda Autonomous Mahavidyalaya, Saraswati Sishu Vidyamandir, Aryan Institute of Engineering & Technology, Sai International School, KV Bhubaneswar No. 1, Shailabala Women's College, DPS Paradip Refinery, JNV Mundali, Shrimad Bhagwat Gita Vidyamandir, OAV Kamakhyanagar Jantaribol, JNV Hadagarh Keonjhar, Bhadrak Govt. Autonomous College, JNV Konark, High schools Mandasahi, Jagatsinghpur, Ghanshyam Hemalata Vidya Mandir, Puri, Brundaban Chandra Govt High School, Jagatsinghpur, Tulsi Women's College, Kendrapara, Rajdhani College and KV Puri participated in these educational initiatives.

Notably, visits were extended to various Odia medium schools representing all 14 blocks in Cuttack District and schools affiliated with the Odisha Block Education Office. Faculty members such as Prof. A. Srinivasan, Dr. Debasmita P. Alone, Dr. Pranay Kumar Swain, Dr. Chandra Sekhar Purohit, Dr. Kamal Lochan Patra, Dr. Subhankar Mishra, Dr. Satyaprasad Senanayak, Dr. Surya Snata Rout, and Dr. Guneshwar Thangjam provided enriching insights and imparted educational knowledge to the students in these visits.

OUTREACH POPULAR TALKS 2023-24

NISER hosts a series of popular talks featuring renowned scientists from across the country, delivering enlightening plenary discussions to students from classes 9th to 12th and undergraduates alike. These talks delve into modern scientific research topics carefully chosen to resonate with students, offering insights into cutting-edge developments in various fields. A lively Q&A session follows each presentation, allowing students to engage directly with the speakers and delve deeper into the subject matter. These talks serve as invaluable platforms for students to broaden their understanding of contemporary science and technology, inspiring curiosity and igniting a passion for exploration. By exposing students to the latest advancements and facilitating direct interaction with experts, these sessions enrich their academic experience, foster critical thinking skills, and encourage future involvement in scientific endeavors.

During the academic year 2023-24, the Outreach cell orchestrated five highly attended popular talks, drawing an audience of approximately 2300 participants. The diverse participant pool encompassed students from institutions like Carmel English Medium School in Khordha, St. Xavier's High School in Jatni, St. Vincent's School in Khordha, PN College in Khordha, Jawahar Navodaya Vidyalaya in Khordha, High schools Mandasahi in Jagatsinghpur, Cohen International School in Khordha, DPS Paradeep Refinery as well as NISER students, faculty, and staff, along with attendees from various other educational institutions.

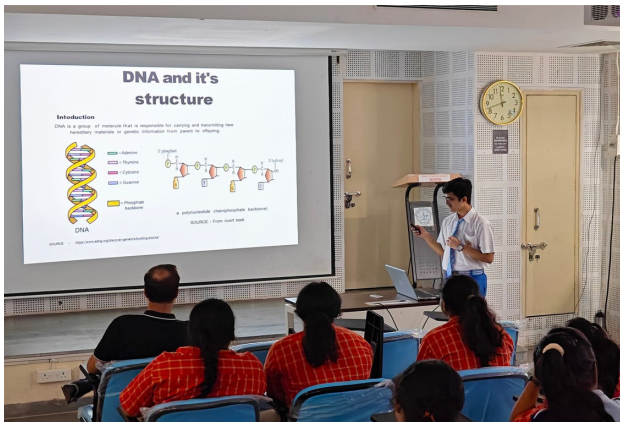
Renowned scientists graced these talks, contributing their expertise to the engaging sessions. The distinguished speakers included Prof. Padmanabhan Balaram, Professor & Former Director, IISc, Padma Bhushan Awardee; Prof. V. Chandrasekhar, a Fellow of the National Academy of Sciences and a Distinguished Professor and Centre Director at the Tata Institute of Fundamental Research, Hyderabad; Prof. Jagat K. Roy

from the Department of Zoology at Banaras Hindu University; Prof. Naba K Mondal, INSA Senior Scientist, Saha Institute of Nuclear Physics, Kolkata; and Prof. Alok Goswami, NBHM Visiting Professor at the Indian Association for the Cultivation of Sciences, Jadavpur. Their presentations captivated the audience and enriched the intellectual atmosphere, making these talks valuable contributions to the academic discourse within the community.

STUDENTS' INTERNSHIP 2023-24

The NISER Outreach program has pioneered a transformative 15-day internship tailored for students in grades 11th to 12th. This immersive experience is designed to provide participants with a comprehensive understanding of the intricacies of research laboratories. During the internship, students are strategically assigned to various laboratories, where they actively engage in diverse activities and experiments, gaining valuable insights into the dynamic world of scientific research. On the last day of the program, the students are also given a chance to present what they have learned from the internship, which enables them to have a firsthand idea about science communication.

This year, the program accommodated 35 students from prominent educational institutions such as Apeejay School Bhubaneswar, BJB Higher Secondary School, Carmel School in Khordha, DAV Public School in Unit-8, Bhubaneswar, Kendriya Vidyalaya in Khurda Road, Prananath Higher Secondary School, and Sai International School. The feedback from the participating students highlighted their appreciation for the opportunity to witness the research environment firsthand, providing them with a tangible understanding of the research process.



The program's success is attributed to the dedicated efforts of NISER's esteemed faculty members, who played pivotal roles in guiding and mentoring the interns. The faculty members involved in this impactful initiative include Prof. A Srinivasan, Dr. Ajaya Kumar Nayak, Dr. Bishnu P. Biswal, Prof. Brundaban Sahu, Prof. Chandan Goswami, Dr. Chandra Shekhar Purohit, Dr. Debasmita P. Alone, Dr. Krishnan Venkatasubbaiah, Dr. Mohammed Saleem, Dr. Pankaj V. Alone, Dr. Pathikrit Bhattacharya, Dr. Pratap K. Sahoo, Dr. Priyadarshi Chowdhury, Dr. S. Peruncheralathan, Dr. Shamik Banerjee, Dr. Sharanappa Nembenna, Dr. Shovon Pal, Dr. Subhankar Mishra, Dr. Tirumala Kumar Chowdary, and Dr. Upakarasamy Lourderaj. Their collective commitment has made the internship program successful and provided a platform for nurturing the next generation of scientific minds.

TEACHERS' - TRAINING WORKSHOP 2023-24

In 2023, the Outreach Cell inaugurated a Teachers' Training Workshop at NISER, expanding its initiatives. The inaugural NISER Outreach Teachers' Training Workshop took place from 25th to 28th September 2023, hosting 53 teachers from Odisha Adarsha Vidyalaya Sangathan from 25 districts in Odisha. Over four days, they actively engaged in training, enriching their skills and contributing to a more dynamic educational environment for students.

The first workshop empowered educators with innovative techniques to effectively communicate science concepts to students. Participants gained insights into making science an inclusive learning experience through interactive sessions and hands-on activities. Led by seasoned professionals, the workshop enhanced teachers' pedagogical skills and fostered a deeper appreciation for science.

SCIENCE CAMP 2023:

In 2023, India celebrated the G20 Jan Bhagidari Summit to generate interest among the people regarding the G20 education meet. The National Institute of Science Education and Research Bhubaneswar was chosen as one of the anchoring institutes in Odisha to conduct such outreach events in Khordha and to coordinate month-long educational activities.

To commemorate the spirit of hosting the premier presidency of G20, NISER Bhubaneswar kick-started the launch of G20 Jan-Bhagidari from April 6th-8th, 2023, by organizing a Science Camp at the Institute. 128 students and 23 teachers from 12 districts in Odisha participated in the event. The Science Camp was a three-day, fun-filled educational event designed for higher secondary students with interactive experimental demonstrations with hands-on experience, lectures from faculty members and eminent scientists, and recreational activities related to robotics, astronomy, and nature.

OPEN DAY 2023:

As part of the G20 Outreach activities, the Outreach Cell conducted Open Day 2023 on April 8th. This event welcomed around 300 students and teachers from 14 districts across Odisha to the NISER campus, which was open to the public. The day featured various engaging activities, including experimental demonstrations conducted by NISER students and insightful talks delivered by faculty members. Participants had the opportunity to explore state-of-the-art laboratories, interact with researchers, and gain hands-on experience with scientific experiments.

NATIONAL SCIENCE DAY CELEBRATION 2024:

To honor National Science Day, the NISER Outreach Cell organized a two-day exposure visit on 29th February and 1st March 2024. On the first day, 38 teachers from Jatni block, Khurda district, and DAV Public School, Unit VIII, Bhubaneswar, participated. They experienced demonstrations, discussions, and observations by involved faculty members and scientific officers in the School of Biological Sciences, Physical Sciences, Chemical Sciences, Earth and Planetary Sciences, and Computer Sciences. The second day welcomed undergraduate and postgraduate Physics students from Rajdhani College, Bhubaneswar, who toured research labs in the School of Physical Sciences, led by Dr. Kartikeswar Senapati, Dr. Pratik Sahoo, and Dr. Satyaprasad Senanayak. They observed various instruments and learned about the research process and its importance.

VIGYAN PRATIBHA BRIEF REPORT 2023-24

About the Vigyan Pratibha Project at NISER:

Vigyan Pratibha, an innovative initiative by the central government, aims to create a unique learning environment by integrating constructivist and collaborative pedagogical tools. The National Institute of Science Education and Research (NISER) and the Institute of Physics (IOP) are spearheading this effort, working with 8th, 9th, and 10th-grade students and educators from Kendriya Vidyalaya (KV), Jawahar Navodaya Vidyalaya (JNV), and Atomic Energy Central Schools in Odisha and Chhattisgarh. This collaboration involves scientists, teachers, and educators developing 'learning units'—activity modules designed by the Homi Bhabha Centre for Science Education (HBCSE). These units align with the NCERT curriculum and are designed to give students a deep and critical understanding of scientific concepts.

The Vigyan Pratibha project aims to revolutionize science education for students by incorporating hands-on experiences and interactive learning methods. This initiative seeks to move beyond traditional textbook learning, offering students practical engagement with scientific concepts. By fostering a more immersive and participatory learning environment, the project helps students develop a deeper understanding and appreciation of science. Through experiments, real-world applications, and collaborative projects, Vigyan Pratibha enhances students' knowledge and stimulates their curiosity and critical thinking skills, preparing them for future scientific endeavors.

The dedicated Vigyan Pratibha team at NISER, which includes distinguished faculty and staff such as Dr. Debasmita P. Alone, Associate Professor, SBS; Dr. Pankaj V. Alone, Associate Professor, SBS; Dr. Upakarasamy Lourderaj, Associate Professor, SCS; Dr. Subhankar Mishra, Reader-F, SCPS, and associated project staff, actively participates in numerous events throughout the year. Other faculty members and scientific staff also contribute to the Vigyan Pratibha project as resource persons, including Dr. Anupam Pal Choudhury, Reader-F, SMS, and Dr. G. Santosh Babu, Scientific Officer-F, SPS.

The following activities have been conducted in the year 2023-24 under the VP project:

Sl. No.	Date of the Event	Title of the Activities	Participating Educational Institutes	Number of participants
1	19.06.2023 - 23.06.2023	Vigyan Pratibha Resource Generation Camp 2023	VP Regional Centers	43 Resource Persons
2	18.09.2023 - 22.09.2023	First Vigyan Pratibha Teachers' Training Workshop 2023-24	KVs, JNVs, and AECSs Odisha, Chhattisgarh and Karnataka	53 teachers
3	20.11.2023 - 23.11.2023	Second Vigyan Pratibha Teachers' Training Workshop 2023-24	KVs, JNVs, and AECSs Odisha, Chhattisgarh and Karnataka	48 teachers
4	25.08.2023	VP School Visit (Components of Wood Ash)	KV Bhubaneswar No. 1	31 students (Class 9)
5	11.12.2023	VP School Visit (Measuring Volumes)	JNV Baleswar	24 students (Class 8)
6	11.12.2023	VP School Visit (Exploring Dot Grids using Rectangles)	JNV Baleswar	31 students (Class 8)
7	03.02.2024	VP School Visit (Components of Wood Ash)	KV Khurda Road	20 students (Class 9)
8	2023-24	Learning Units conducted in schools	KVs, JNVs and AECs	1058 students

RESOURCE GENERATION CAMP

The VP team at NISER held a Vigyan Pratibha Resource Generation Camp from June 19th to 23rd, 2023, where 43 resource persons from different science studies participated from all around the country. The camp aimed to share school visit experiences, highlighting creativity, resourcefulness, and student engagement. Discussions covered resource management, teaching in native languages, peer-led learning, and innovative approaches for learning units. Participants brainstormed new ideas, drafted learning units, and planned upcoming workshops, cluster meets, teacher submissions, and fellowships. The camp fostered collaboration and strategic planning to enhance the effectiveness of the Vigyan Pratibha project.

VIGYAN PRATIBHA TEACHERS'-TRAINING WORKSHOPS

The purpose of the Vigyan Pratibha project was to revolutionize science education by conducting biannual teachers' training workshops in several Regional Centers across the country, in addition to two additional sessions held at the NISER campus. With a focus on Trained Graduate Teachers (TGTs) from Kendriya Vidyalayas (KVs), Jawahar Navodaya Vidyalayas (JNVs), and Atomic Energy Central Schools (AECs), these carefully planned workshops seek to empower educators from a variety of schools.

Participants at these workshops receive extensive training utilizing a variety of learning modules intended to improve their teaching abilities. After the first training, educators return to their classrooms with pre-designed lesson plans for their students, giving them a dynamic and participatory learning environment.

An evident feature of the Vigyan Pratibha initiative is observed in the subsequent workshops, where teachers delve into a fresh set of educational modules. During this phase, the teachers exchange their experiences, discussing the achievements and difficulties faced

during implementing these modules. This continuous method expands teachers' viewpoints and enhances their teaching practices with inventive ideas and approaches.

This program's influence spreads nationwide as these dedicated teachers nurture their students' scientific excellence and curiosity. They greatly contribute to advancing scientific literacy and education in society by consistently enhancing their abilities and implementing innovative tactics, motivating the following generation of scientists and knowledgeable citizens.

Vigyan Pratibha 1st Teachers'-training Workshop

Vigyan Pratibha 2nd Teachers'-training Workshop

VIGYAN PRATIBHA SCHOOL VISITS

The Vigyan Pratibha team at NISER works with teachers to execute the previously mentioned learning units in their individual schools. During these visits, the teacher and the VP team bring a variety of interactive and hands-on scientific activities right into the classroom. They begin by introducing students to the learning modules and then proceed to facilitate the tasks listed in each unit. Students actively participate in these activities, asking questions and working together to solve difficulties, which improves their grasp of the material at a deeper and more intuitive level. These sessions offer vital insights into students' viewpoints and teacher interactions.

LEARNING UNITS CONDUCTED IN SCHOOLS

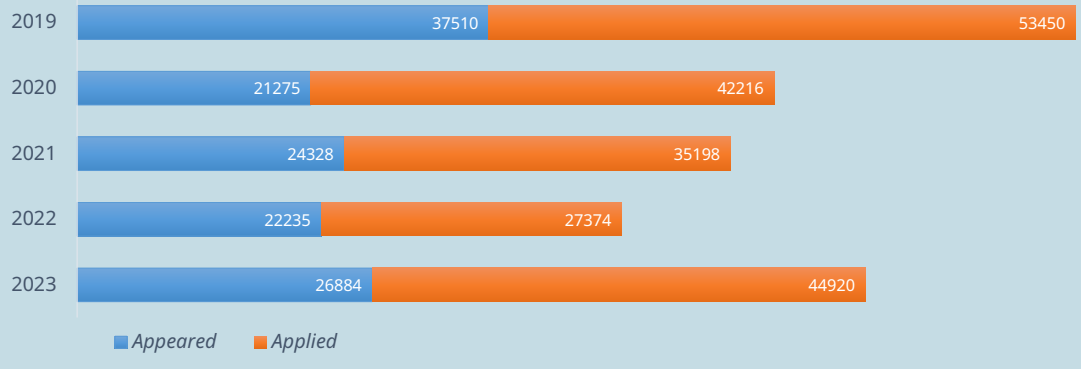
Teachers who attended training workshops implemented the specified learning units with their pupils, provided detailed reports to the Vigyan Pratibha teams at NISER, and posted their entries to the official website. These seminars comprised interactive experiments and demonstrations designed to help students develop a practical understanding of scientific principles. Instead of simply memorizing, these activities exposed students to real-world applications of their study. In the academic year 2023-24, these efforts through the Vigyan Pratibha project impacted 1,058 students.

The teacher training workshops conducted as part of Vigyan Pratibha have equipped educators with cutting-edge tools and tactics to enhance science education. This method has not only enhanced the engagement and accessibility of science for students but has also empowered teachers to create dynamic and efficient learning environments. As a result, students and teachers have acquired a more profound understanding of scientific topics, leading to a more fulfilling educational experience.

National Entrance Screening Test

National Entrance Screening Test (NEST) is an annual entrance exam conducted by the National Institute of Science Education and Research (NISER), Bhubaneswar and the University of Mumbai - Department of Atomic Energy Centre for Excellence in Basic Sciences (UM-DAE CEBS), Mumbai. Successful candidates are offered admission to the Integrated-MSc programmes of these institutes based on the merit list. The NEST-2023 examination was conducted nationally on **24th of June, 2023**. **26884** candidates appeared for the exam, of which **7354 (>27%)** were from Odisha. The exam was conducted in two sessions in **117** cities (**139** venues) all over the country. Following the examination, the answer scripts were released to the students along with the answer keys and sufficient time was provided for raising objections. After dealing with all queries and objections, the merit list was prepared based on the final answer key and the results were declared on the **10th of July, 2023**. A total of **200+2** candidates were admitted (1st round) to the Integrated MSc program of NISER for the Academic Session **2023-28**.

Number of applicants over last five years is depicted below



Brief Summary of the gender and category wise applicants who appeared in the test is as follows:

Gender	General	Gen-EWS	OBC-NCL	SC	ST	Supernumerary	Divyangjan	Total
Female	6190	663	3637	1183	401	89	41	12074
Male	6640	1113	4703	1804	550	103	64	14810

State of Domicile	Number	Percentage
Odisha	7354	27.355
Uttar Pradesh	2615	9.727
West Bengal	2198	8.176
Maharashtra	1931	7.183
Delhi	1790	6.658
Kerala	1708	6.353
Bihar	1272	4.731
Rajasthan	1179	4.386
Jharkhand	778	2.894
Madhya Pradesh	753	2.801
Telangana	627	2.332
Andhra Pradesh	554	2.061
Uttarakhand	539	2.005
Tamil Nadu	502	1.867
Chhattisgarh	485	1.804
Karnataka	458	1.704
Haryana	411	1.529
Himachal Pradesh	368	1.369
Punjab	366	1.361
Assam	305	1.135
Gujarat	251	0.934
Jammu & Kashmir	167	0.621
Tripura	110	0.409
Puducherry	33	0.123
Andaman & Nicobar Islands	32	0.119
Goa	26	0.097
Meghalaya	21	0.078
Arunachal Pradesh	17	0.063
Manipur	13	0.048
Nagaland	7	0.026
Sikkim	7	0.026
Ladakh	7	0.026
Total (%)		100.000

Employment and RTI Data

NEW APPOINTMENTS

Director	
Professor Hirendra Nath Ghosh	
Scientific and Technical Staff	
Shri Rakesh Kumar Bhatta	Scientific Officer–C, Centre for Medical and Radiation Physics
Smt Nijun Mishra	Scientific Officer–C, Centre for Medical and Radiation Physics
Shri Avneesh Kumar Tripathi	Scientific Assistant-B, Centre for Medical and Radiation Physics
Shri Goutam Shikdar	Technician-B, Centre for Medical and Radiation Physics

EMPLOYEE DATA (AS ON 31.03.2024)

Faculty	Scientific and Technical Staff	Administrative Staff	Total
114	91	43	248

EMPLOYEE DATA ON SC, ST, OBC AND PWD (AS ON 31.03.2024)

Category	SC	ST	OBC	PWD
Academic	01	NIL	14	NIL
Non-Academic	15	09	20	01

RIGHT TO INFORMATION ACT DATA

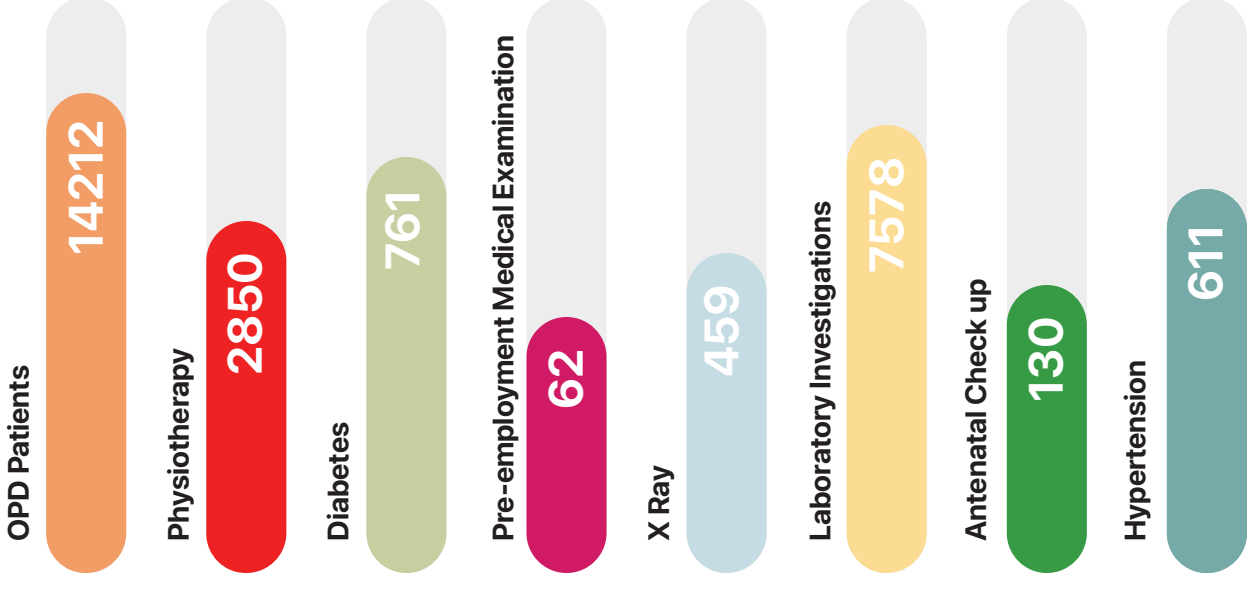
Under the Right to Information Act 2005, 66 RTI applications and 7 Appeals were received during the period of April 1st 2023 to March 31st 2024 and were responded to.

Information provided for RTI Request		
RTI Request (s) disposed of	Within 30 days	After 30 days
66	66	NIL
Information provided for RTI Appeals		
RTI Appeal (s) disposed of	Within 30 days	After 30 days
7	7	NIL

Health Centre

Health Centre in NISER, Bhubaneswar has been established to provide health care facility to the Institute faculties and staff members and their dependent entitled family members, students, research fellows and retired employees of DAE enrolled under the CHSS of Heavy Water Facility Talcher. The Health Centre aims at providing comprehensive primary health care. Apart from basic health care it also provides health promotional activities like health education, periodical and pre-employment health check-up, vaccination and dietary advices.

STATISTICS (01-04-2023 TO 31-03-2024)



FACILITIES:

- OPD consultation
- Laboratory Investigations
- X-ray
- Minor OT and Dressing room
- Emergency ward
- Ultrasound (Obstetrics and Gynaecology)
- Pulmonary Function Test
- ECG
- Physiotherapy

The Health Centre at present is staffed by four doctors, five staff nurses, one physiotherapist, one radiographer, one medical laboratory technician and one pharmacist. One-part time visiting paediatrician is also available once in a week for providing consultation to paediatric patients. It has one well equipped emergency ward to provide emergency medical facilities. Two basic life support ambulances are also available to shift patient to higher centre for further medical facility. Health Centre also conduct pre-employment health examination of employees prior to joining at NISER and periodical examination of employees.

From 1st January 2019 DAE Contributory Health Service Scheme was implemented at NISER. Under the scheme different private hospitals are empanelled for providing treatment to referred patients on cashless basis. At present Kalinga Hospital, Kalinga Institute of Medical Sciences, Sparsh Hospital, SUM Ultimate Medicare and AMRI hospital at Bhubaneswar are empanelled under CHSS Scheme for providing treatment under different speciality. Further Dr Agarwal's Eye Hospital is also empanelled to provide specialised service for eye diseases.

Pulse Polio Immunisation was also conducted at the Health Centre on 3rd March 2024 and a total of 50 children under the age of five years were vaccinated.

Computer Centre

OVERVIEW

The Computer Centre at NISER provides vital IT services including network management, Email, Web Services, HPC support, Desktop support software, and hardware maintenance. It caters to academic, research, and administrative needs, ensuring seamless operations across the campus.

KEY SERVICES

- **Computer Lab Setup & Maintenance**: Managing labs for academic and research use.
- **Networking**: Offering wired and wireless connectivity across the institute.
- **Email & Web Services**: Managing official email accounts & Institute website has been developed and hosted with inhouse CMS portal using Laravel web application framework.
- **Hardware & Software Support**: Installing, configuring, and troubleshooting IT systems.
- **High-Performance Computing (HPC) & Data Centre**: Providing advanced computing resources for research.
- **Office Automation:** IMS is being managed and supported by computer center it contains automation of each and every department including online applications for students, staff and faculty recruitment.
- **Home Folder & Personal Website**: Offering personal data storage and hosting for researchers.
- **IT Support**: Providing ongoing technical assistance.
- **Service Ticketing System**: Implementing a system for tracking IT issues and requests.
- **HPC Training**: Trained 5 summer students on HPC usage from sri sri university, Cuttack.

CAMPUS NETWORK UPGRADES

Computer Centre have initiated a Detailed Project Report (DPR) for upgrade of the network infrastructure. The existing network infrastructure is configured for IPv6 as per the mandate of Govt of India using Dual Stack Mechanism. IPv6 adoption is completed in the major part of the campus network and few remaining segments are in the pipeline.

The major portion of the network is already migrated to open standards to ensure compatibility of the existing network devices with any OEM and to facilitate the rollout of DPR, which is expected to be approved soon.

FACILITIES

- **CC Lab**: A well-equipped computer lab for students and researchers.
- **Datacentre**: Hosts servers and HPC resources, with 3 high-density (55KW) RDHx server racks, chiller units, and UPS systems for optimal performance.

STATISTICS (01-04-2023 TO 31-03-2024)

Help Topic	Tickets Closed
Desktop Support	78
Network Support	72

HIGH-END COMPUTING SERVERS (HPC) INSIDE DATACENTER

- **Kalinga Cluster** – 97 nodes
- **Astro Cluster** – 16 nodes
- **Noether** – 5 nodes
- **Virgo Cluster** – 5 nodes
- **Kanaad HPC** – 4 nodes
- **Bihan Cluster** – 10 nodes

SINGLE-NODE SERVERS INSIDE DATACENTER (TOTAL : 21)

Includes **Xanadu**, **Chandra**, **Aquila**, **Hercules**, **Amazon**, **Himalaya** and others, each with 1 node, supporting various academic departments.

People

FACULTY

Discipline	Designation	PHD	Field of Specialization
Biological Science			
Chandan Goswami	Professor	Freie University of Berlin, Germany	Cell Biology
Palok Aich	Professor	Saha Institute of Nuclear Physics	Systems Biology
Abdur Rahaman	Associate Professor	Indian Institute of Science, Bangalore	Biochemistry
Asima Bhattacharyya	Associate Professor	Jadavpur University (Bose Institute), West Bengal	Physiology / Host-Pathogen Interaction, Cancer Biology
Debasmita Pankaj Alone	Associate Professor	Banaras Hindu University, Varanasi	Human Genetics
Harapriya Mohapatra	Associate Professor	University of Delhi South Campus, New Delhi	Microbiology
Kishore CS Panigrahi	Associate Professor	Tata Institute of Fundamental Research, Mumbai	Plant Biology
Manjusha Dixit	Associate Professor	Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow	Human Genetics
Mohammed Saleem	Associate Professor	University of Münster, Germany	Biophysics / Biochemistry of membranes
Pankaj Vidyadhar Alone	Associate Professor	National Institute of Immunology, New Delhi	Molecular Biology
Praful Singru	Associate Professor	Nagpur University, India	Neural circuits and regulation of energy balance
Ramanujam Srinivasan	Associate Professor	Indian Institute of Science, Bangalore	Bacterial Pathogenesis, Cytoskeletal Dynamics and Functions
Rudresh Acharya	Associate Professor	Indian Institute of Science, Bangalore	Macromolecular X-ray Crystallography, Structural Biology, De Novo Protein Design
Subhasis Chattopadhyay	Associate Professor	Indian Institute of Chemical Biology, West Bengal	Immunology
Tirumala Kumar Chowdary	Associate Professor	Centre for Cellular and Molecular Biology, Hyderabad	Structural Virology
V Badireenath Konkimalla	Associate Professor	University of Heidelberg, Germany	Bioinformatics
Aniruddha Datta Roy	Reader-F	University of Mysore	Phylogenetics, Biogeography
Himabindu Vasuki Kilambi	Assistant Professor	University of Hyderabad	Plant functional genomics, proteomics & metabolomics
Rittik Deb	Assistant Professor	Indian Institute of Science, Bangalore	Ecology, Evolution, Animal Behavior, Bioacoustics, and Gut-microbial ecology.

Swagata Ghatak	Assistant Professor	Indian Institute of Science, Bangalore	Neuroscience, stem cell Biology
Chemical Science			
Hirendra Nath Ghosh	Senior Professor (Director)	University of Bombay, Mumbai	Nanomaterials, photonics, and ultrafast spectroscopy
A. Srinivasan	Professor	Indian Institute of Technology, Kanpur	Inorganic Chemistry, Bio-Inorganic Chemistry-Pyrrole Based Receptors
Chidambaram Gunanathan	Professor	Central Salt and Marine Chemicals Research Institute, Bhavnagar	Organic Chemistry, Organometallic Chemistry and Catalysis
Himansu Sekhar Biswal	Professor	Tata Institute of Fundamental Research, Mumbai	Laser Spectroscopy and Instrumentation
Jogendra Nath Behera	Professor	Indian Institute of Science, Bangalore	Inorganic Chemistry, Law temperature multiferroics from single source precursors and Porous Magnetic Materials
Moloy Sarkar	Professor	University of Hyderabad, Hyderabad	Physical Chemistry, Fluorescence Spectroscopy
Prasenjit Mal	Professor	Indian Institute of Technology, Kanpur	Inorganic Chemistry, Supramolecular chemistry and Photochemistry
Sanjib Kar	Professor	Indian Institute of Technology, Bombay	Inorganic Chemistry, Bio-inorganic chemistry: Metals in Medicine
Sudip Barman	Professor	Indian Institute of Science, Bangalore	Physical Chemistry, Synthesis and Functionalization of Graphene
Arindam Ghosh	Associate Professor	Indian Institute of Science, Bangalore	Physical Chemistry, Methodology development in NMR
B.L. Bhargava	Associate Professor	Jawaharlal Nehru Center for Advanced Scientific Research, Bangalore	Physical Chemistry, Computational studies of Materials
Bidraha Bagh	Associate Professor	University of Saskatchewan, Canada	Inorganic and organometallic Chemistry
Chandrasekhar Purohit	Associate Professor	Indian Institute of Technology, Kanpur	Organic Chemistry, Bio-organic and Organic Synthesis
Krishnan Venkatasubbaiah	Associate Professor	Indian Institute of Technology, Kanpur	Inorganic Chemistry, Catalysis and Materials Synthesis
Nagendra Kumar Sharma	Associate Professor	National Chemical Laboratory (NCL), Pune	Inorganic Chemistry, Bio-Organic and Organic Synthesis
Ponneri C. Ravikumar	Associate Professor	Indian Institute of Science, Bangalore	Inorganic Chemistry
S. Peruncheralathan	Associate Professor	Indian Institute of Technology, Kanpur	Organic Chemistry, Synthetic Organic chemistry and Asymmetric Catalysis

Sharanappa Nembenna	Associate Professor	Goettingen University, Germany	Inorganic Chemistry, Main Group Organometallic chemistry and Low oxidation state metal chemistry
Subhadeep Ghosh	Associate Professor	Indian Association for the Cultivation of Science, West Bengal	Physical Chemistry, Single Molecule Spectroscopy, Molecular Dynamics
Upakarasamy Lourderaj	Associate Professor	Indian Institute of Technology, Kanpur	Physical Chemistry, Theoretical and Computational Chemistry
Bishnu Prasad Biswal	Reader - F	CSIR-National Chemical Laboratory, Pune	Physical and Materials Chemistry
Dipak Samanta	Assistant Professor	Indian Institute of Science, Bangalore	Inorganic and Materials Chemistry
Computer Science			
Aritra Banik	Associate Professor	Indian Statistical Institute, Kolkata	Computational Geometry
Subhankar Mishra	Reader - F	University of Florida	Graph Theory, Cyber Security, Smart Grid
Manoj Mishra	Reader - F	Indian Institute of Technology, Bombay	Information Theory, Cryptography
Anup Kumar Bhattacharya	Reader - F	Indian Institute of Technology, Delhi	Algorithm design
Earth and Planetary Science			
Guneshwar Singh Thangjam	Reader - F	Max Planck Institute for Solar System Research/ Clausthal University of Technology, Germany	Planetary Geology
Liton Majumdar	Reader - F	University of Calcutta, Kolkata	Astrochemistry, Radio/ sub-mm/infrared astronomy, Astrobiology, Star and Planet formation Exoplanetary Atmospheres
Pathikrit Bhattacharya	Reader - F	Princeton University, USA	Geophysics, Earth Sciences
Jaya Khanna	Assistant Professor	Princeton University, USA	Land-atmosphere interaction, Regional climatology, Boundary layer processes
Jayesh M. Goyal	Assistant Professor	University of Exeter, England	Planetary Science, Atmospheric Science, Astrophysics
Priyadarshi Chowdhury	Assistant Professor	Ruhr University Bochum, Germany	Geology
Surya Snata Rout	Assistant Professor	University of Muenster, Germany	Planetary Science
Humanities and Social Science			
Pranay K. Swain	Associate Professor	Indian Institute of Technology, Kanpur	Public Policy and Governance, Science-Society Interface, Contemporary Social Issues
Amarendra Das	Associate Professor	Centre for Development Studies, Thiruvananthapuram, Jawaharlal Nehru University, New Delhi	Natural Resource Management, Public Economics

Amarjeet Nayak	Associate Professor	Indian Institute of Technology, Kanpur	Postcolonial Theory and Literature, Translation Studies, Speculative Fiction, Indian English Literature, Diaspora Studies
Joe Varghese Yeldho	Reader - F	Indian Institute of Technology, Kanpur	Critical History and Narratives of Race
Debashis Pattanaik	Reader - F	Indian Institute of Technology, Kanpur	Social Innovation, Social Network Analysis, Social Study of Sciences and Technology
Rooplekha Khuntia	Assistant Professor	Indian Institute of Technology, Kharagpur	Business Ethics, Ethical Cynicism, Organizational Behavior and Leadership
Mathematical Sciences			
Gadadhar Mishra	Adjunct Professor	Suny, Stony Brook	Operator theory
Brundaban Sahu	Professor	Harish-Chandra Research Institute, Prayagraj	Number Theory
Anil Kumar Karn	Associate Professor	University of Delhi, Delhi	Theory of operator spaces
Binod Kumar Sahoo	Associate Professor	Indian Statistical Institute, Bangalore	Representations of Geometries
Deepak Kumar Dalai	Associate Professor	Indian Statistical Institute, Kolkata	Cryptography
Jaban Meher	Associate Professor	Harish-Chandra Research Institute, Allahabad	Number Theory
Kamal Lochan Patra	Associate Professor	Indian Institute of Technology, Kanpur	Algebraic Graph Theory
Manas Ranjan Sahoo	Associate Professor	TIFR CAM, Bangalore	Differential Equations
Panchugopal Bikram	Associate Professor	Institute of Mathematical Sciences, Chennai	Functional Analysis
Ritwik Mukherjee	Associate Professor	Stony Brook University	Differential Geometry
Sanjay Parui	Associate Professor	Indian Statistical Institute, Bangalore	Harmonic Analysis
Sutanu Roy	Associate Professor	Georg-August-Universität Göttingen, Germany	Functional Analysis
Anupam Pal Choudhury	Reader-F	TIFR CAM, Bangalore	Differential Equations
Dinesh Kumar Keshari	Reader-F	Indian Institute of Science, Bangalore	Functional Analysis
Nabin Kumar Jana	Reader-F	Indian Statistical Institute, Kolkata	Probability Theory
K. Senthil Kumar	Reader-F	Harish-Chandra Research Institute, Allahabad	Number Theory
Ramesh Manna	Reader-F	Harish-Chandra Research Institute, Allahabad	Harmonic Analysis
Chitrabhanu Chaudhuri	Assistant Professor	Northwestern University, Evanston IL, USA	Algebraic Geometry
Kaushik Majumder	Assistant Professor	Indian Statistical Institute, Kolkata	Discrete Mathematics
Krishanu Dan	Assistant Professor	Institute of Mathematical Sciences, Chennai	Algebraic Geometry
Rekha Biswal	Assistant Professor	Institute of Mathematical Sciences, Chennai	Representation Theory

Sudhir Kumar Pujahari	Assistant Professor	Indian Institute of Science Education and Research, Pune	Number Theory
Sumana Hatui	Assistant Professor	Harish Chandra Research Institute, Allahabad	Algebra
Tushar Kanta Naik	Assistant Professor	Harish-Chandra Research Institute, Prayagraj	Algebra
Physical Science			
Ashoke Sen	Honorary Fellow	Stony Brook University	String Theory
Hiranmaya Mishra	Visiting Professor	Institute of Physics, Bhubaneswar	Theoretical Physics
Bedangadas Mohanty	Professor	Institute of Physics, Bhubaneswar	Experimental High Energy Physics
Sanjay Kumar Swain	Professor	University of Hawaii, USA	Experimental HEP: LHP Physics
Subhankar Bedanta	Professor	University of Duisburg-Essen, Duisburg, Germany	Experimental condensed matter physics (Nanomagnetism and multiferroics)
A.V. Anil Kumar	Associate Professor	Indian Institute of Science, Bangalore	Statistical Mechanics and Modeling of Soft Matter
Ajaya Kumar Nayak	Associate Professor	Indian Institute of Technology, Bombay	Condensed Matter Experiment: Magnetism
Amaresh Kumar Jaiswal	Associate Professor	Tata Institute of Fundamental Research, Mumbai	Theoretical high energy nuclear physics
Anamitra Mukherjee	Associate Professor	Harish-Chandra Research Institute, Prayagraj	Condensed Matter Physics
Ashok Mohapatra	Associate Professor	Tata Institute of Fundamental Research, Mumbai	Ultra-cold Atoms and Bose-Einstein Condensation
Chethan N. Gowdigere	Associate Professor	University of Southern California, Los Angeles, USA	String Theory
Colin Benjamin	Associate Professor	Institute of Physics, Bhubaneswar	Theoretical CMP and Quantum Information
Joydeep Bhattacharjee	Associate Professor	Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore	Computational Condensed Matter Physics
Kartikeswar Senapati	Associate Professor	Indian Institute of Technology, Kanpur	Experimental CMP
Nishikant Khandai	Associate Professor	Harish-Chandra Research Institute, Prayagraj	Astrophysics and Cosmology
Prasanjit Samal	Associate Professor	Indian Institute of Technology, Kanpur	Theoretical CMP, Atomic and Molecular Physics
Pratap Kumar Sahoo	Associate Professor	Indian Institute of Technology, Kanpur	Nano fabrication and Ion/ Photon matter interaction
Prolay Kumar Mal	Associate Professor	Tata Institute of Fundamental Research, Mumbai	Experimental High Energy Physics (Collider experiments)
Sayantani Bhattacharyya	Associate Professor	Tata Institute of Fundamental Research	String Theory
Shamik Banerjee	Associate Professor	Harish-Chandra Research Institute, Prayagraj	Counting Microscopic Degeneracyof N=4 Black Holes
Subhasis Basak	Associate Professor	University of Calcutta	HEP Theory: Lattice QCD
Sumedha	Associate Professor	Tata Institute of Fundamental Research, Mumbai	Special Mechanics and Interdisciplinary Applications

Victor Roy	Associate Professor	Variable Energy Cyclotron Centre (VECC), Kolkata	Theoretical & phenomenological study of high-energy nuclear collisions, specifically the study of Quark Gluon Plasma (QGP).
Yogesh Kumar Srivastava	Associate Professor	Ohio State University, USA	String Theory
Ashis Kumar Nandy	Reader - F	Indian Association for the Cultivation of Science, Kolkata	Condensed Matter Physics (Theory)
Kush Saha	Reader - F	Indian Association for the Cultivation of Science, Kolkata	Theoretical Condensed Matter Physics
Luke Robert Chamandy	Reader - F	Inter-University Centre for Astronomy and Astrophysics, Pune	The origin of large scale Magnetic field sin Galaxies
Najmul Haque	Reader - F	Saha Institute of Nuclear Physics, Kolkata	High Energy Physics (Theory)
Satyaprasad P Senanayak	Reader - F	Jawaharlal Nehru Centre For Advanced Scientific Research, Bangalore	Device Physics, Semiconductors, Charge Transport, Field Effect Transistors, Photovoltaics, Light emitting Diodes, Medical Diagnostic Devices
Shovon Pal	Reader - F	Ruhr-Universität Bochum, Bochum, Germany	Ultrafast dynamics, Nonlinear 2D terahertz spectroscopy, Time-resolved terahertz spectroscopy, Strongly correlated electronic systems, Correlation physics
Tapan Mishra	Reader - F	Indian Institute of Astrophysics, Bangalore	Condensed Matter Theory
Tuhin Ghosh	Reader - F	Inter-University Centre for Astronomy and Astrophysics, Pune	Cosmic Microwave Background Radiation, Dust Polarization, Primordial gravitational waves from cosmic inflation
V. Ravi Chandra	Reader - F	Indian Institute of Science, Bangalore	Theoretical Condensed Matter Physics
Narayan Rana	Assistant Professor	Institute of Mathematical Sciences, Chennai	Particle Physics (Perturbative QCD)

SCIENTIFIC, TECHNICAL AND ADMINISTRATIVE STAFF

Arun Kumar Scientific Officer - F, School of Chemical Sciences	Biswajit Mishra Scientific Officer - E, Health Centre
Ranbir Singh Scientific Officer - F, School of Physical Sciences	Dilip Jha Scientific Officer - E, Institute Works Department
Saikat Hira Scientific Officer - F, Computer Centre	Haraprasanna Lenka Scientific Officer - E, School of Physical Sciences
Santosh Babu Gunda Scientific Officer - F, School of Physical Sciences	Saurabh Chawla Scientific Officer - E, School of Biological Sciences
Shyamasree Basu Scientific Officer - F, School of Biological Sciences	Souvagya Mahapatra Scientific Officer - E, Institute Works Department
Sudakshina Prusty Scientific Officer - F, School of Physical Sciences	Varchaswi KS Kashyap Scientific Officer - E, School of Physical Sciences
Ananda Raman A Scientific Officer - E, Computer Centre	Ashank Vishwakarma Scientific Officer - D, Institute Works Department
Bandita Dash Scientific Officer - E, Health Centre	Chandramohan Bathrachalam Scientific Officer - D, School of Biological Sciences

Ganesh Jagannath Tambave
Scientific Officer - D, Centre for Medical and Radiation Physics

Priyanka Pandey
Scientific Officer - D, School of Chemical Sciences

Raveendrababu Karnam
Scientific Officer - D, Centre for Medical and Radiation Physics

Saralasrita Mohanty
Scientific Officer - D, School of Physical Sciences

Shuddha Shankar Dasgupta
Scientific Officer - D, Centre for Medical and Radiation Physics

Sibananda Jena
Scientific Officer - D (Medical Practitioner), Health Centre

Ajay Kumar Dash
Scientific Officer - C, School of Earth and Planetary Sciences

Kapil Kumar Gupta
Scientific Officer - C, Central Library

Kirti Prakash Sharma
Scientific Officer - C, Centre for Medical and Radiation Physics

Lalatendu Mishra
Scientific Officer - C (Electronics), Centre for Medical and Radiation Physics

Nijun Mishra
Scientific Officer - C (Medical Physics), Centre for Medical and Radiation Physics

Prasanna Kumar Muduli
Scientific Officer - C, Central Library

Rakesh Kumar Bhatta
Scientific Officer - C, Centre for Medical and Radiation Physics

Sitaram
Scientific Officer - C, Health Centre

Amit Kumar Panigrahi
Scientific Assistant-E, Institute Works Department

Bhagaban Dhal
Scientific Assistant-E, Institute Works Department

Binod Bhagat
Scientific Assistant-E, Institute Works Department

Dipak Kumar Rout
Scientific Assistant-E, Computer Centre

Jitendra Narayan Dash
Scientific Assistant-E, Central Library

Pramod Kumar Nath
Scientific Assistant-E, Institute Works Department

Ranjan Kumar Rana
Scientific Assistant-E, Institute Works Department

Sambid Ranjan Pradhan
Scientific Assistant-E, Institute Works Department

Ajit Kumar Mohanty
Scientific Assistant-D, Institute Works Department

Alok Sahoo
Scientific Assistant-D, Computer Centre

Bidyut Siba Sankar Mohanty
Scientific Assistant-D, Central Library

Deepankar Dash
Scientific Assistant-D, Computer Centre

N Bharati Reddy
Scientific Assistant-D, Health Centre

Sibani Bhuyan
Scientific Assistant-D, Health Centre

Sujit Kumar Raut
Scientific Assistant-D, Institute Works Department

Adhikari Suryakanta Dash
Scientific Assistant-C, Health Centre

Binodini Behera
Scientific Assistant-C, Health Centre

M Suryanarayan
Scientific Assistant-C, Student Affairs

Smrutirekha Behera
Scientific Assistant-C, Health Centre

Susama Pachalasingh
Scientific Assistant-C, Health Centre

Avneesh Kumar Tripathi
Scientific Assistant-B, Centre for Medical and Radiation Physics (CMRP)

Bhola Nath Karmali
Scientific Assistant-B,Health Centre

Debasis Barik
Scientific Assistant-B, Centre for Medical and Radiation Physics (CMRP)

Deepak Kumar
Scientific Assistant-B, Centre for Medical and Radiation Physics (CMRP)

Jyotiranjan Sahoo
Scientific Assistant-B, Health Centre

Ram Jeet
Scientific Assistant-B, Health Centre

Subhas Das
Scientific Assistant-B, Central Library

Umakanta Sasmal
Scientific Assistant-B, Central Workshop

Alok Kumar Jena
Technician-F, School of Biological Sciences

Anuradha Das
Technician-F, School of Chemical Sciences

Bikash Chandra Behera
Technician-F, School of Biological Sciences

Mriganka Sadhukhan
Technician-F, School of Chemical Sciences

Prafulla Kumar Sethi
Technician-F, School of Physical Sciences

Pravakar Mallick
Technician-F, School of Physical Sciences

Rabindra Kumar Maharana
Technician-F, Central Library

Ram Prasad Panigrahi
Technician-F, School of Physical Sciences

Rudranarayan Mohanty
Technician-F, School of Physical Sciences

Suchismita Dash Technician-F, Central Library
Tapan Kumar Panigrahi Technician-F, Computer Centre
V.A. Sakthivel Technician-F, School of Physical Sciences
Amit Sankar Sahu Technician-D, School of Chemical Sciences
Kuna Mahara Technician-D, School of Biological Sciences
Prakash Chandra Behera Technician-D, School of Chemical Sciences
Rakesh Kumar Behera Technician-D, Institute Works Department
Sandeep Kumar Behera Technician-D, Institute Works Department
Sanjaya Kumar Mishra Technician-D, School of Chemical Sciences
SK. Safatulla Technician-D, Central Library
V Shiny Jerusha Joseph Technician-D, School of Biological Sciences
Ashwini Babrubahan Sethi Technician-C, School of Biological Sciences
Debasis Das Technician-C, School of Physical Sciences
Deepak Kumar Behera Technician-C, School of Chemical Sciences
Deepak Kumar Pattanaik Technician-C, Central Workshop
Mukesh Kumar Meena Technician-C, School of Biological Sciences
Srikrushna Sahu Technician-C, School of Physical Sciences
Subhransu Sekhar Panda Technician-C, Computer Centre
Susanta Kumar Parida Technician-C, School of Physical Sciences
Banoth Sridhar Technician-B, Central Workshop
Basudev Mallick Technician-B, Central Workshop
Ganesh Mandi Technician-B, Institute Works Department
Goutam Shikdar Technician-B, Centre for Medical and Radiation Physics (CMRP)
Satyajit Pani Technician-B, Centre for Medical and Radiation Physics (CMRP)

Administrative Staff

Name	Designation
Abhaya Kumar Naik	Registrar
Deepak Srivastava	Stores & Purchase Officer
Ramakant Kar	Administrative Officer-III
Satya Narayan Mohanty	Deputy Controller of Accounts
Dinesh Bahadur Singh	Administrative Officer-II
Gopal Krishna Rath	Administrative Officer-II
Pradeep Kumar Mishra	Administrative Officer-II
Purna Chandra Sahu	Administrative Officer-II
Rajeev Kumar Singh	Administrative Officer-II
Abhaya Kumar Mohanty	Administrative Officer-I
Chandra Sekhar Mahapatra	Administrative Officer-I
Dhaneswar Nayak	Administrative Officer-I
Dolananda Pradhan	Administrative Officer-I
Hiralal Das	Administrative Officer-I
Sanjaya Kumar Patro	Administrative Officer-I
Shabnam Khanum	Administrative Officer-I
Amarendra Kumar Behera	Assistant "A"
Apolina Lakra	Assistant "A"
Bijay Kumar Behera	Assistant "A"
Biplab Kanungo	Assistant "A"
Bishnupriya Das	Assistant "A"
Chittaranjan Nayak	Assistant "A"
D.Lingaraj	Assistant "A"
Lipsa Das	Assistant "A"
Lopamudra Sahoo	Assistant "A"
M. Siba Prasad Rao	Assistant "A"
Sandeepa Sahoo	Assistant "A"
Smruti Kanungo	Assistant "A"
Susanta Kumar Sethi	Assistant "A"
Vijay Singh	Assistant "A"
A B Rosy	Upper Division Clerk
Babita Pradhan	Upper Division Clerk
Banita Pradhan	Upper Division Clerk
Elina Das	Upper Division Clerk
Monalisa Baliarsingh	Upper Division Clerk
Nabin Kumar Sahoo	Upper Division Clerk
Ranjan Kumar Das	Upper Division Clerk
Sujit Kumar Bastia	Upper Division Clerk
Madhusudan Padhy	Office Assistant (MS)
Jogendra Jena	Operator
Smt Sasmita Sahoo	Operator
Subrat Ranjan Hota	Operator
Tusar Kanta Sahoo	Operator

Audited Statements of Accounts

Audited Statement of Accounts
&
Statutory Auditor's Report
Financial Year-2023-24

Auditor
NAYAK RATH & ASSOCIATES
CHARTERED ACCOUNTANTS
367, Jagamara, Khandagiri
Bhubaneswar-751030

NAYAK RATH & ASSOCIATES
Chartered Accountants

INDEPENDENT AUDITOR'S REPORT

TO
THE MEMBERS
National Institute of Science Education and Research,
P.O:Jatni, Dist:Khurda, Odisha
PIN-752050

We have audited the accompanying financial statements of National Institute of Science Education and Research, Bhubaneswar ('The Institute'), which comprise the Balance Sheet as at 31 March 2024, the Income and Expenditure account and the Receipt & Payment account for the year ended, and a summary of significant accounting policies and other explanatory notes.

Management's Responsibility for the Standalone Financial Statements

The management is responsible for the preparation of these financial statements that give a true and fair view of the financial position, financial performance of the Institute in accordance with the accounting principles generally accepted in India. This responsibility also includes maintenance of adequate accounting records for safeguarding the assets of the Institute and for preventing and detecting frauds and other irregularities; selection and application of appropriate accounting policies; making judgments and estimates that are reasonable and prudent; and design, implementation and maintenance of adequate internal financial controls, that were operating effectively for ensuring the accuracy and completeness of the accounting records, relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We have taken into account the accounting and auditing standards generally accepted in India.

NAYAK RATH & ASSOCIATES ★ BHUBANESWAR ★ CHARTERED ACCOUNTANTS

We conducted our audit in accordance with the Standards on Auditing issued by the Institute of Chartered Accountants of India. Those Standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and the disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal financial control relevant to the Institute's preparation of the financial statements that give a true and fair view in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on whether the Institute has in place an adequate internal financial controls system over financial reporting and the operating effectiveness of such controls. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of the accounting estimates made by the Institute as well as evaluating the overall presentation of the financial statements.
We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion on the standalone financial statements.

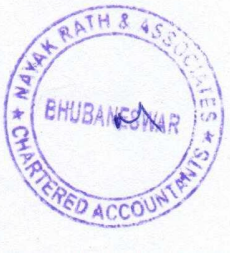
Opinion

In our opinion and to the best of our information and according to the explanations given to us, the aforesaid financial statements give the information required by the Act in the manner so required and give a true and fair view in conformity with the accounting principles generally accepted in India,

Further to our observations annexed hereto, we report as follows:

1. We have obtained all the information and explanations, which to the best of our knowledge and belief were necessary for the purpose of our audit.

2. In our opinion proper books of accounts have been kept by the Institute so far as appears from our examination of those books.



3. The Balance Sheet and the Income and Expenditure Account dealt with by this report are in agreement with the books of accounts maintained by the Institute.

4. In our opinion and to the best of our information and according to explanations given to us the said accounts give a true and fair view:

(i) In the case of the Balance Sheet, of the state of affairs of the Institute as at 31st March, 2024.

AND

(ii) In the case of Income and Expenditure Account of the excess of Expenditure over income for the year ended on that date.

For **Nayak Rath & Associates**
Chartered Accountants
FRN- 021051N

CA Manas Ranjan Pradhan
Partner
M. No. 307292
UDIN - 24307292BKEBKN6258

Place: Bhubaneswar
Date: 24.07.2024

NAYAK RATH & ASSOCIATES * BHUBANESWAR * CHARTERED ACCOUNTANTS

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)

ANNUAL ACCOUNTS

2023-24

BALANCE SHEET AS AT 31ST MARCH, 2024

Amount in (₹)

Particulars	*Schedule*	*As at 31st March, 2024*	*As at 31st March, 2023*
A. CAPITAL FUND & LIABILITIES :			
1. Capital Fund	1	6,75,31,42,111	6,91,91,72,383
2. Reserves & Surplus	2	-	-
3. Earmarked/Endownment Fund	3	-	-
4. Secured Loans & Borrowings	4	-	-
5. Unsecured Loans & Borrowings	5	-	-
6. Deferred Credit Liabilities	6	-	-
7. Current Liabilities & Provision	7	79,30,66,234	5,11,28,080
TOTAL		*7,54,62,08,345*	*6,97,03,00,463*
B. ASSETS :			
1. Fixed Assets	8	6,33,30,09,616	6,66,26,37,070
2. Investments of Earmarked/Endownment Funds	9	-	-
3. Investments *(Others)*	10	96,43,32,150	22,63,10,252
4. Current Assets, Loans & Advances etc.	11	24,88,66,579	8,13,53,141
TOTAL		*7,54,62,08,345*	*6,97,03,00,463*
Significant Accounting Policies	24		
Contingent liabilities & Notes on Accounts	25		

*As per our report of even date attached

For Nayak Rath & Associates
Chartered Accountants
FRN - 021051N

CA Manas Ranjan Pradhan
(Partner)
M. No. 307292
UDIN : 24307292BKEBKN6258
Place: Bhubaneswar
Date: 24-07-2024

NAYAK RATH & ASSOCIATES BHUBANESWAR CHARTERED ACCOUNTANTS

Deputy Controller of Accounts

Director

PO.: Bhimpur - Padanpur, jatani ,Khurda - 752050, Odisha, India, Phone: 0674-2494008, Fax.: 0674-2494009, Emai: director@niser.ac.in,Web . : www.niser.ac.in

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)

ANNUAL ACCOUNTS 2023-24

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2024

Amount in (₹)

Particulars	*Schedule*	*For the Year Ended 31st March, 2024*	*For the Year Ended 31st March, 2023*
A. INCOME :			
1. Income from Sales/ Services	12	-	-
2. Grant/ Subsidies	13	1,29,27,00,000	1,26,49,98,499
3. Fees/ Subscriptions	14	2,72,91,734	4,60,68,262
4. Income from Investment	15	-	-
5. Income from Royalty, Publication etc.	16	-	-
6. Interest Earned	17	57,10,270	1,00,93,429
7. Other Income	18	-	-
8. Increase/ (Decrease) in stock of *Finished Goods & Work-in-Progress*	19	-	-
TOTAL (A)		*1,32,57,02,004*	*1,32,11,60,190*
B. EXPENDITURE :			
1. Establishment Expenses	20	91,96,55,523	83,95,49,935
2. Other Administrative Expenses etc.	21	42,06,51,787	53,87,44,754
3. Expenditure on Grants, Subsidies etc.	22	-	-
4. Prior Period Income (Adjustment)		1,00,93,429	1,94,43,590
5. Interest	23	-	-
6. Depreciation *(Net total at the year-end-corresponding to Schedule-8)*		78,29,31,537	79,30,71,623
TOTAL (B)		*2,13,33,32,276*	*2,19,08,09,902*
Balance being Excess of Expenditure over Income *(A-B)*		**(80,76,30,272)**	**(86,96,49,712)**
BALANCE BEING SURPLUS/(DEFICIT) CARRIED TO CORPUS/ CAPITAL FUND		*(80,76,30,272)*	*(86,96,49,712)*
Significant Accounting Policies	24		
Contingent liabilities & Notes on Accounts	25		

*As per our report of even date attached

For Nayak Rath & Associates
Chartered Accountants
FRN - 021051N

CA Manas Ranjan Pradhan
(Partner)
M. No. 307292
UDIN : 24307292BKEBKN6258
Place: Bhubaneswar
Date: 24-07-2024

Deputy Controller of Accounts

Director

PO.: Bhimpur - Padanpur, jatani ,Khurda - 752050, Odisha, India, Phone: 0674-2494008, Fax.: 0674-2494009, Emai: director@niser.ac.in,Web . : www.niser.ac.in

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)

ANNUAL ACCOUNTS

2023-24

RECEIPTS AND PAYMENTS ACCOUNT FOR THE PERIOD FROM 1ST APRIL, 2023 TO 31ST MARCH, 2024

Amount in (₹)

RECEIPTS	*For the Year Ended 31st March, 2024*	*For the Year Ended 31st March, 2023*	*PAYMENTS*	*For the Year Ended 31st March, 2024*	*For the Year Ended 31st March, 2023*
I. Opening Balances			**I. Expenses**		
			a) Establishment Expenses		
a) Cash in Hand	-	-	*(corresponding to Schedule 20)*		
b) Bank Balances:			*i) Pay & Allowances*	89,73,69,131	84,35,57,618
i) In Current Accounts	3,36,22,470	1,53,14,803			
			b) Administrative Expenses		
ii) In Savings Accounts	2,68,34,084	9,12,34,198	*(corresponding to Schedule 21)*		
			i) Other Administrative Expenditure	24,06,01,678	28,91,20,935
II. Grants Received			*ii) NISER Plan Expenses*	17,48,83,327	24,72,55,952
a) From DAE	1,93,43,00,000	1,77,56,68,889			
			II. Expenditure on Fixed Assets & Capital Work-in-Progress		
III. Interest Received			a) Purchase of Fixed Assets	45,05,57,958	53,10,56,991
a) On Bank Deposits *(SBI & IOB)*	47,93,847	1,02,16,561	b) Expenditure on Capital WIP	62,34,518	1,91,51,835
IV. Other Income			**III. Finance Charges *(Interest Refunded)***	1,00,93,429	1,94,43,590
a) Registration Fee *(MSc & PhD)*	1,90,47,528	1,82,52,481			
b) Job Application Fee	1,22,000	51,000	**IV. Other Payments**		
c) RTI Application Fees	80	90	a) Deposit *(Asset : LC)*	73,80,21,898	-
d) Sale of Tender Paper	2,40,206	3,24,383	b) Security Deposit	13,58,711	22,85,884
e) Guest House Rent	14,00,280	15,70,331	c) Duties & Taxes	8,82,914	13,47,292
f) License Fees *(Rent of Quarter/Bank Branch)*	35,01,016	25,25,010	d) Statutory Recoveries	2,17,30,802	-
g) Transcript Fees	33,600	27,300	e) Student Dues	24,177	4,97,419
h) Identity Card/Health Card *(Deplicate Fee)*	17,325	12,595	f) Loans & Advance	10,23,87,431	47,13,316
i) Lease Rent	7,82,006	1,98,000	g) Liabilities for Expenses (Sundry Creditors)	35,31,598	-
j) Water Charges	-	3,16,828			
k) Sale of Assets	-	4,31,550	**V. Closing Balances**		
l) Liquidated Damage	21,44,931	27,29,206	a) Cash-in-Hand	-	-
m) Sample Testing Charges	24,400	75,000	b) Bank Balances:		
n) Sale of Animals	1,59,000	-	*i) In Current Accounts*	4,35,83,020	3,36,22,470
o) Creche & Day Care Fees	21,805	-	*ii) In Savings Accounts*	8,72,51,618	2,68,34,084
V. Any other receipts *(Loans, Advances & Expenses Recovered)*					
a) E.M.D	11,42,921	2,07,500			
b) Statutory Recoveries	-	43,86,957			
c) Deposit *(Asset : LC)*	-	9,08,73,621			
d) NISER R&D Receivable	1,24,711	8,21,083			
e) CBM Theme Meeting	-	2,50,000			
f) CERN Alice VECC Project	-	34,00,000			
g) Medical Cyclotrone Unit Grant	75,00,00,000	-			
h) 7th DAE Yoga Conference	2,00,000	-			
	2,77,85,12,210	*2,01,88,87,386*		*2,77,85,12,210*	*2,01,88,87,386*

*As per our report of even date attached

For Nayak Rath & Associates
Chartered Accountants
FRN - 021051N

CA Manas Ranjan Pradhan
(Partner)
M. No. 307292
UDIN : 24307292BKEBKN6258
Place: Bhubaneswar
Date: 24-07-2024

NAYAK RATH & ASSOCIATES BHUBANESWAR CHARTERED ACCOUNTANTS

Deputy Controller of Accounts

Director

PO.: Bhimpur - Padanpur, jatani ,Khurda - 752050, Odisha, India, Phone: 0674-2494008, Fax.: 0674-2494009, Email: director@niser.ac.in,Web . : www.niser.ac.in

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

2023-24

Schedule -1 : Capital Fund
(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Particulars	*Current Year*		*Previous Year*	
Balance as at the beginning of the year	10,66,54,16,390		10,15,47,46,000	
Add : Contribution towards Capital Fund	64,16,00,000	11,30,70,16,390	51,06,70,390	10,66,54,16,390
		11,30,70,16,390		**10,66,54,16,390**
Add/*(Deduct)* : Balance of net Income/ *(Expenditure)* transferred from the Income & Expenditure Account	-	(4,55,38,74,279)	-	(3,74,62,44,007)
TOTAL		*6,75,31,42,111*		*6,91,91,72,383*

Schedule -2 : Reserves & Surplus
(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Particulars	*Current Year*		*Previous Year*	
1. Capital Reserve:				
- As per last Account	-		-	
- Addition during the year	-		-	
Less: Deduction during the year	-	-	-	-
2. Revaluation Reserve				
- As per last Account	-		-	
- Addition during the year	-		-	
Less: Deduction during the year	-	-	-	-
3. Special Reserve				
- As per last Account	-		-	
- Addition during the year	-		-	
Less: Deduction during the year	-	-	-	-
4. General Reserve				
- As per last Account	-		-	
- Addition during the year	-		-	
Less: Deduction during the year	-	-	-	-
TOTAL		-		-

For Nayak Rath & Associates
Chartered Accountants
FRN - 021051N

CA Manas Ranjan Pradhan
(Partner)
M. No. 307292

NAYAK RATH & ASSOCIATES * CHARTERED ACCOUNTANTS * BHUBANESWAR

Deputy Controller of Accounts

Director

PO.: Bhimpur - Padanpur, jatani ,Khurda - 752050, Odisha, India, Phone: 0674-2494008, Fax.: 0674-2494009, Emai: director@niser.ac.in,Web . : www.niser.ac.in

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)

ANNUAL ACCOUNTS

2023-24

Schedule -3 : Earmarked / Endowment Fund

(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Particulars	*Fund-wise Break up*								*Totals*			
	Fund WW		*Fund XX*		*Fund YY*		*Fund ZZ*		*Current Year*		*Previous Year*	
1) Opening balance of the funds :		-		-		-		-		-		-
2) Additions to the funds :												
a. Donations/Grants	-		-		-		-		-		-	
b. Income from Investments made on account of funds	-		-		-		-		-		-	
c. Other additions	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL (A + B)		-		-		-		-		-		-
3) Utilisation / Expenditure towards objectives of funds :												
a. Capital Expenditure :												
(i) Fixed Assets	-		-		-		-		-		-	
(ii) Others	-		-		-		-		-		-	
Total (i)		-		-		-		-		-		-
b. Revenue Expenditure :												
(i) Salaries, Wages and allowances	-		-		-		-		-		-	
(ii) Rent	-		-		-		-		-		-	
(iii) Other Administrative expenses	-		-		-		-		-		-	
Total (ii)		-		-		-		-		-		-
TOTAL (C)		-		-		-		-		-		-
Net Balance at the year end (A+B-C)		-		-		-		-		-		-

For Nayak Rath & Associates
Chartered Accountants
FRN - 021051N

CA Manas Ranjan Pradhan
(Partner)
M. No. 307292

NAYAK RATH & ASSOCIATES * BHUBANESWAR * CHARTERED ACCOUNTANTS

Deputy Controller of Accounts

Director

PO.: Bhimpur - Padanpur, jatani ,Khurda - 752050, Odisha, India, Phone: 0674-2494008, Fax.: 0674-2494009, Emai: director@niser.ac.in,Web . : www.niser.ac.in

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

2023-24

Schedule - 4 : Secured Loans and Borrowings
(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Particulars	*Current Year*		*Previous Year*	
1. Central Government		-		-
2. State Government ***(Specify)***		-		-
3. Financial Institutions				
a) Term Loans	-		-	
b) Interest accured and due	-	-	-	-
4. Banks:				
a) Term Loans	-		-	
b) Interest Accured & Due	-		-	
c) Other Loans *(Specify)*	-		-	
d) Interest Accured & Due	-	-	-	-
5. Other Institutions & Agencies		-		-
6. Debenture & Bonds		-		-
7. Others ***(Specify)***		-		-
TOTAL		-		-

For Nayak Rath & Associates
Chartered Accountants
FRN - 021051N

CA Manas Ranjan Pradhan
(Partner)
M. No. 307292

Deputy Controller of Accounts

Director

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NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)

ANNUAL ACCOUNTS

2023-24

Schedule -5 : Unsecured Loans & Borrowings

(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Particulars	*Current Year*		*Previous Year*	
1. Central Government		-		-
2. State Government *(Specify)*		-		-
3. Financial Institutions		-		-
4. Banks:				
a) Term Loans	-		-	
b) Other Loans *(Specify)*	-	-	-	-
5. Other Institutions & Agencies		-		-
6. Debenture & Bonds		-		-
7. Fixed Deposits				
8. Others *(Specify)*		-		-
TOTAL		-		-

Schedule -6 : Deferred Credit Liabilities

(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Particulars	*Current Year*	*Previous Year*
1) Acceptances secured by hypothecation of capital equipment & other assets	-	-
2) Others	-	-
TOTAL	-	-

For Nayak Rath & Associates
Chartered Accountants
FRN - 021051N

CA Manas Ranjan Pradhan
(Partner)
M. No. 307292

NAYAK RATH & ASSOCIATES ★ BHUBANESWAR ★ CHARTERED ACCOUNTANTS

Deputy Controller of Accounts

Director

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NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

Schedule -7 : Current Liabilities & Provisions **2023-24**

(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Sl. No.	Particulars	Current Year		Previous Year	
A.	CURRENT LIABILITIES				
1.	Acceptances	-	-	-	-
2.	Sundry Creditors:				
	a) For Goods /Services	27,67,230		35,31,598	
	b) Others - EMD	26,96,372	54,63,602	23,37,006	58,68,604
3.	Advances Received	-	-		-
4.	Interest accured but not due :				
	a) Secured Loans/Borrowings		-		-
	b) Unsecured Loans/Borrowings		-		-
5.	Statutory Liabilities				
	a) Overdue		-		-
	b) Others				
	i) TDS	5,24,478		9,12,900	
	ii) TDS *(CGST)*	1,25,382		1,58,178	
	iii) TDS *(SGST)*	1,25,382		1,58,177	
	iv) TDS *(IGST)*	2,51,654		4,46,727	
	v) Labour Cess	1,64,321	11,91,217	3,81,952	20,57,934
6.	Other Current Liabilities				
	a) Student Dues :				
	(i) Internal Amenitie S.D.	-		2,51,000	
	(ii) Excess Prog. Regd. Fees	-		32,668	
	(iii) Caution Money *(Labrotary)*	13,000		13,000	
	(iv) Caution Money *(Library)*	29,07,680		27,27,680	
	(v) Caution Money *(Institute)*	54,99,250		49,30,250	
	(vi) Caution Money *(Hostel)*	4,94,811		3,51,931	
	(vii) CSIR Contingency	90,713		94,513	
	(viii) Alumuni Association Subscription	2,81,220		2,17,420	
	(ix) Student Welfare Fund	5,30,660		4,66,860	
	(x) Kotak Mahindra Scholarship Payable	-		98,950	
	(xi) DBT Scholarship *(Ph.D)*	26,210		26,210	
	(xii) HDFC Scholarship	-		28,759	
	(xiii) Inspire Scholarship *(Ph.D)*	75,36,694	1,73,80,238	75,57,926	1,67,97,167
	(b) Smart City Fund		2,974		2,974
	(c) Odisha State Fund		-		43,805
	(d) CBM Theme Meeting (CMRP)		-		44,670
	(e) CERN Alice (VECC)		-		34,00,000
	(f) NISER R&D Payable		1,30,64,267		1,29,97,226
	(g) Medical Cyclotrone Unit Grant		75,00,00,000		
	(h) Security Deposit :				
	- Amarendra Ojha	3,961		3,961	
	- Anton Paar India Pvt. Ltd.	1,19,593		-	
	- Avantor	-		40,000	
	- Axenic Systems	2,68,435		6,68,914	
	- Bigyan Kumar Pradhan	1,21,908		2,35,757	
	- Bijay Kumar Behera	3,32,181		3,98,245	
	- Bi Biotech			10,000	
	- Firestep Sales and Services			12,359	
	- Uma Fire Services Pvt. Ltd.	88,475		84,255	
	- Giridhari Lal	89,450		4,73,520	
	- Green Innovative Power Ltd.	-		67,615	
	- HAK Electrical & Engineering Works	11,255		2,13,732	
	- Henxtix Biotech	-		20,000	
	- Hindustan Engineering Company	-		69,300	
	- Indian Plant Feeds	5,19,817		3,85,992	
	- Jagannath Electrical Works	24,700		24,700	
	- Prakash Chandra Dhal & Co.	19,704		8,168	
	- Rabindra Kumar Mallick	57,268		57,268	
	- Ramakanta Sahani	11,186		17,535	
	- Canara Lighting Industries Pvt. Ltd.	-		14,04,939	
	- Carbofill	34,000		34,000	
	- Daikin Airconditioning India Ltd.	-		18,690	
	- Deepana Electricals & Consultancy	10,139		97,246	
	- Nobel Enterprises	-		2,000	
	- Nirmal Chandra Sar	1,67,464		1,50,541	
	- New Odisha Enterprises	41,781		34,895	
	- Lab India	-		30,000	
	- Central Ware House Corporation	1,35,505		98,040	
	- Kalinga Combines Pvt. Ltd.	-		4,25,661	
	- Sahai Exclusive Contracts Pvt. Ltd.	8,42,164		8,42,164	

ANNUAL ACCOUNTS

Schedule -7 : Current Liabilities & Provisions

(Schedule forming part of the accounts for the period ended on 31.03.2024)

2023-24

Amount in (₹)

Sl. No.	Particulars	Current Year		Previous Year	
	- Tarsun	-		10,000	
	- Chemix Speciality Gases & Equipment	22,319		22,319	
	- Sritam Computers	18,653		72,380	
	- Supdex Services Pvt. Ltd.	6,083		6,083	
	- Invitrogen	-		22,000	
	- Martha Engineerings & Suppliers	16,500		-	
	- Rabindra Electricals	16,822		33,849	
	- Eco Pest Control & Engineering Services	5,952		5,952	
	- Sonatech Infosolutions Pvt. Ltd.	7,408		1,41,940	
	- Enva Water Technology (P) Ltd.	1,16,842		1,16,842	
	- Bansidhar Hati	1,71,919		1,48,064	
	- G D Anklesaria & Co.	2,42,725		2,42,725	
	- Bibekananda Patra	-		18,737	
	- GL Solutions	48,525		48,525	
	- Enhance Ecotech Solutions Pvt. Ltd.	-		1,15,500	
	- Vadilal Chemical Ltd.	-		1,70,000	
	- Vijaypower Generators Ltd.	1,51,253		2,65,555	
	- Golden Bell & Co.	4,289		4,289	
	- Laxminarayan Enterprises	86,091		1,98,052	
	- Mira Engineering Services	-		444	
	- Mohapatra Scientific Supply	-		10,000	
	- Odisha General Electronics			31,533	
	- Oriental Security Services	8,10,755		8,10,755	
	- Palit Equipment Sales Pvt. Ltd.	-		4,601	
	- Fabtech Technologies International Ltd.	-		94,335	
	- Schneider Electric Infrastructure Ltd.	-		1,08,560	
	- Sign World	65,884		32,651	
	- Mahima Enterprises	21,444		21,444	
	- Millenium Business associates	70,908		70,908	
	- SAINEZ	37,025		37,025	
	- Novel Telenet (P) Ltd	51,870		51,870	
	- Shri Samaresh Chottaray	5,887		11,393	
	- SPK & Co.	25,133		25,133	
	- Shinryo Engineering P Ltd	58,986		58,986	
	- Shree Enterprises	-		22,656	
	- SRS Enterprises	37,188		37,188	
	- Shuvendu Kumar Mohanty	2,37,702		2,37,702	
	- WIS Construction & Consultancy P Ltd.	1,368		1,368	
	- Zero Degree Cooling System P Ltd	18,600		18,600	
	- The Seal Coat Structural Works (P) Ltd.	11,516		11,516	
	- RGS Infotech	43,875		-	
	- Rath Architectonic	72,240		-	
	- Prachi Electrical	1,683		-	
	- Kislay Kumar	3,699		-	
	- Mascotek Engineers	3,81,612			
	- Tathagata Engineering	1,63,661	**59,35,403**	1,96,279	**94,67,256**
	(i) Statutory Recoveries :				
	i) Faculty Club NISER	26,500			
	ii) NPS Recovery	1,033		3,72,794	
	iii) Professional Tax	1,000	**28,533**	75,650	**4,48,444**
	Sub-Total (A)		*79,30,66,234*		*5,11,28,080*
B.	***PROVISIONS***				
1.	***For Expenses Payable :***				
	Sub-Total (B)		-		-
	Total (A+B)		*79,30,66,234*		*5,11,28,080*

For Nayak Rath & Associates
Chartered Accountants
FRN - 021051N

CA Manas Ranjan Pradhan
(Partner)
M. No. 307292

NAYAK RATH & ASSOCIATES ★ BHUBANESWAR ★ CHARTERED ACCOUNTANTS

Deputy Controller of Accounts

Director

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NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)

ANNUAL ACCOUNTS

Schedule -8 : Fixed Assets

(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Sl. No.	Particular of Assets	Rate	GROSS BLOCK					DEPRECIATION			NET BLOCK	
			WDV as on 01.04.2023	Addition during the year		Deductions [/ (Sale / Adjustt.] during the year	Cost/valuation at the year-end	Depreciation for the year	Deductio	Total upto the year-end	As at the current year-end on 31.03.2024	As at the Previous year-end on 31.03.2023
				> 180 days	< 180 days							
1	Land	0%	2,76,17,405	-	-	-	2,76,17,405	-	-	-	2,76,17,405	2,76,17,405
2	Buildings (Academic)	10%	1,81,36,89,776	1,49,99,065	6,20,615	-	1,82,93,09,456	18,28,99,915	-	18,28,99,915	1,64,64,09,541	1,81,36,89,776
3	Building (Residential)	5%	2,23,79,85,879	-	4,90,390	-	2,23,84,76,269	11,19,11,554	-	11,19,11,554	2,12,65,64,715	2,23,79,85,879
4	Electrical Installation	10%	18,68,12,837	1,47,942	5,54,304	-	18,75,15,083	1,87,23,793	-	1,87,23,793	16,87,91,290	18,68,12,837
5	Furniture & Fixtures	10%	22,91,26,824	12,96,689	89,100	-	23,05,12,613	2,30,46,806	-	2,30,46,806	20,74,65,807	22,91,26,824
6	Computers	40%	3,80,20,671	27,14,539	-	-	4,07,35,210	1,62,94,084	-	1,62,94,084	2,44,41,126	3,80,20,671
7	Software	40%	37,23,971	12,744	19,158	-	37,55,873	14,98,518	-	14,98,518	22,57,355	37,23,971
8	Lab Equipments	15%	86,15,38,881	75,00,701	1,22,64,960		88,13,04,542	13,12,75,809	-	13,12,75,809	75,00,28,733	86,15,38,881
9	Tools Equipments	15%	47,777	-	-	-	47,777	7,167	-	7,167	40,610	47,777
10	Books	40%	84,18,321	9,12,497	17,716	-	93,48,534	37,35,870	-	37,35,870	56,12,664	84,18,321
11	Journals	40%	12,70,75,986	9,28,46,859	9,91,650	-	22,09,14,495	8,81,67,468	-	8,81,67,468	13,27,47,027	12,70,75,986
12	Air Conditioners	15%	98,03,825	-	-	-	98,03,825	14,70,574	-	14,70,574	83,33,251	98,03,825
13	Vehicles	15%	7,14,483	-	-	-	7,14,483	1,07,173	-	1,07,173	6,07,310	7,14,483
14	Bicycle	15%	1,160	-	-	-	1,160	174	-	174	986	1,160
15	Machinery & Equipments	15%	1,10,95,17,440	17,01,25,506	15,45,05,649	-	1,43,41,48,595	20,35,34,366	-	20,35,34,366	1,23,06,14,229	1,10,95,17,440
16	EPABX	15%	3,633	-	-	-	3,633	545	-	545	3,088	3,633
17	Kitchen Equipments	15%	16,90,038	-	-	-	16,90,038	2,53,506	-	2,53,506	14,36,532	16,90,038
18	Telephones	10%	42,162	-	-	-	42,162	4,215	-	4,215	37,947	42,162
19	Capital Assets(WIP)	0%	68,06,001	57,09,103	5,25,415	1,30,40,519	-	-	-	-	-	68,06,001
	Total		*6,66,26,37,070*	*29,62,65,645*	*17,00,78,957*	*1,30,40,519*	*7,11,59,41,153*	*78,29,31,537*	*-*	*78,29,31,537*	*6,33,30,09,616*	*6,66,26,37,070*

For Nayak Rath & Associates
Chartered Accountants
FRN - 021051N

CA Manas Ranjan Pradhan
(Partner)
M. No. 307292

NAYAK RATH & ASSOCIATES * BHUBANESWAR * CHARTERED ACCOUNTANTS

Deputy Controller of Accounts

Director

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NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

2023-24

Schedule -9 : Investments - Earmarked/ Endowment Funds
(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Particulars	*Current Year*	*Previous Year*
1. In Government Securities	-	-
2. Other Approved Securities	-	-
3. Shares	-	-
4. Debentures & Bonds	-	-
5. Subsidiaries & Joint Ventures	-	-
6. Others (to be specified)	-	-
TOTAL	-	-

Schedule -10 : Investments - Others
(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Particulars	*Current Year*	*Previous Year*
1. In Government Securities	-	-
2. Other Approved Securities	-	-
3. Shares	-	-
4. Debentures & Bonds	-	-
5. Subsidiaries & Joint Ventures	-	-
6. FD at Bank	96,43,32,150	22,63,10,252
TOTAL	*96,43,32,150*	*22,63,10,252*

For Nayak Rath & Associates
Chartered Accountants
FRN - 021051N

CA Manas Ranjan Pradhan
(Partner)
M. No. 307292

NAYAK RATH & ASSOCIATES ★ BHUBANESWAR ★ CHARTERED ACCOUNTANTS

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NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

Schedule -11 : Current Assets, Loans, Advances etc.
(Schedule forming part of the accounts for the period ended on 31.03.2024)

2023-24

Amount in (₹)

Particulars	*Current Year*		*Previous Year*	
A. CURRENT ASSETS:				
1. Inventories:				
a) Stores and Spares	-		-	
b) Loose Tools	-		-	
c) Stock-In-trade				
i) Finished goods	-		-	
ii) Work-In-progress	-		-	
iii) Raw Materials	-	-	-	-
2. Sundry Debtors:				
a) Debts Outstanding for a period exceeding six months	-		-	
b) Others	-		-	
3. Cash balances in hand	-	-	-	-
4. Bank Balances				
a) SBI A/C - 30755200010	68,27,075		64,39,175	
b) SBI A/C - 37871572767	3,67,55,945		2,71,83,295	
c) IOB A/C - 373701000000001	6,03,46,323		1,16,83,339	
d) IOB A/C -147601000015510	28,58,868		16,14,682	
e) SBI A/C - 38629236942	2,38,63,449			
f) SBI A/C - 41803345744	1,61,173			
e) IOB A/C - 373701000002190	21,805	**13,08,34,638**	1,35,36,063	**6,04,56,554**
Total (A)		*13,08,34,638*		*6,04,56,554*
B. LOANS, ADVANCES AND OTHER ASSETS:				
1. Loans & Advances				
a) Security Deposit :		64,37,479		63,21,610
b) Staffs:				
i) Ashish Pandav	-		1,30,320	
ii) Kishore Chandra Panigrahi	-		2,73,600	
iii) Prottay Das (Phd Student)	-		4,99,500	
iv) Swati Saha (Phd Student)	-		4,50,000	
v) Ajay Kumar Nayak (SPS)	-		1,08,000	
vi) Anil Kumar Karna	-		62,590	
vii) Apolina Lakra	-		4,230	
viii) Bishnupriya Das	-		3,680	
ix) Brundaban Sahu	1,50,000		63,000	
x) Debasish Mallick	-		1,30,320	
xi) Debasmita P Alone	20,000		10,000	
xii) Deepak Kumar Rout	-		2,34,000	
xiii) Dukhishyam Mallick	-		1,66,320	
xiv) Jayesh Mahendra Goyel	-		90,000	
xv) Jyoti Ranjan Sahoo	-		92,244	
xvi) Krishnu Dan	-		7,943	
xvii) Kusha Saha	-		90,000	
xviii) Liton Majumdar	96,000		1,35,000	
xix) Molay Sarkar	-		1,48,401	
xx) Panchugopal Bikram	-		74,000	
xxi) Pratap Kumar Sahoo	1,40,000		1,85,600	
xxii) Pralay Kumar Mal	-		1,80,000	
xxiii) Rupalekha Khuntia	-		57,073	
xxiv) Sanjay Kumar Swain	-		2,38,500	
xxv) Smrutirekha Behera	-		70,420	
xxvi) Subhadip Ghosh	-		1,35,000	
xxvii) Subhankar Bedanta	1,53,900		1,40,000	
xxviii) Sudip Barman (SCS)	35,400		2,47,500	
xxix) Vijaya Singh	-		20,000	
xxx) Alok Sahoo	90,000		-	
xxxi) Amaresh Kumar Jaiswal	5,000		-	
xxxii) Anirudha Dutta Roy	61,103		-	
xxxiii) Binod Kumar Sahoo	1,80,000		-	
xxxiv) Chandra Shekar Purohit	40,000		-	
xxxv) Kamal Lochan Patra	2,00,000		-	
xxxvi) Kartikeswar Senapati	1,40,000		-	
xxxvii) P. C. Ravikumar	78,000		-	

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NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

Schedule -11 : Current Assets, Loans, Advances etc.
(Schedule forming part of the accounts for the period ended on 31.03.2024)

2023-24

Amount in (₹)

Particulars	*Current Year*		*Previous Year*	
xxxviii)Raveendrababu Karnam	49,700		-	
xxxix)Satya Narayan Moahanty	9,105		-	
xxxx)Saurabh Chawla	20,000		-	
xxxxi)Shabnam Khanum	2,52,000		-	
xxxxii)Surya Snata Rout	87,840		-	
xxxxiii)Victor Roy	80,000			
xxxxiv)Sawan Phd, SPS	2,55,278	**21,43,326**	-	**40,47,241**
c) Others				
i) DCS & EM,Mumbai	10,65,00,000		65,00,000	
ii) Director, NIPGR	1,30,980		76,700	
iii) Director, IMMT	-		2,160	
iv) Registrar, IISC	-		14,726	
v) Central Tool Room & Training Centre	-		9,12,683	
vi) Exim Logistic P Ltd.	-		20,92,140	
vii) Kayaku	-		54,063	
viii) Poly Tech	-		1,45,896	
ix) IISER, Pune	52,801		-	
x) Board of Radiation & Isotope Technology	6,08,070		-	
xi) National Informatics Centre	1,89,980		-	
xii) Ulta-Tech Laboratories P. Ltd.	8,968		-	
ix) Imprest Advance	61,700		25,385	
x) Advance Tax, TDS & TCS Receivable	18,98,637	**10,94,51,136**	7,03,983	**1,05,27,736**
2. Advances and other amounts recoverable in cash or in kind or for value to be received:				
a) R&D Receivable	-		-	
b) Lease Rent Receivable	-			
i) SBI (NISER Campus) - March 2021	-		-	
ii) IOB (NISER Campus) - March 2021	-		-	
iii) Subhamayee Devi - Feb, 21 & Mar, 21	-		-	
iv) Rudra Narayan Mishra - Mar, 21	-	-	-	-
3. Income Accrued:				
a) On Investments from Earmarked/Endowment Fund	-		-	
b) On Investment *(Others)*	-		-	
c) On Loans and Advances	-		-	
d) Others	-	-	-	-
4. Grant Receivables		-		-
Total (B)		*11,80,31,941*		*2,08,96,587*
TOTAL (A+B)		*24,88,66,579*		*8,13,53,141*

For Nayak Rath & Associates
Chartered Accountants
FRN - 021051N

CA Manas Ranjan Pradhan
(Partner)
M. No. 307292

NAYAK RATH & ASSOCIATES ★ BHUBANESWAR ★ CHARTERED ACCOUNTANTS

Deputy Controller of Accounts

Director

PO.: Bhimpur - Padanpur, jatani ,Khurda - 752050, Odisha, India, Phone: 0674-2494008, Fax.: 0674-2494009, Emai: director@niser.ac.in,Web . : www.niser.ac.in

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

2023-24

Schedule -12 : Income from Sales/Services
(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Particulars	*Current Year*	*Previous Year*
1) Income from sales		
a) Sale of Finished Goods	-	-
b) Sale of Raw Material	-	-
c) Sale of Scraps	-	-
2) Income from Services		
a) Labour and Processing Charges	-	-
b) Professional/Consultancy Service	-	-
c) Agency Commission and Brokerage	-	-
d) Maintenance Services *(Equipment/Property)*	-	-
e) Others *(Specify)*	-	-
TOTAL	-	-

Schedule -13 : Grants/Subsidies
(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Particulars	*Current Year*	*Previous Year*
(Irrevocable Grants & Subsidies Received)		
1) Central Government		
a) Revenue *(Salary & General)*	1,29,27,00,000	1,26,49,98,499
TOTAL	***1,29,27,00,000***	***1,26,49,98,499***

For Nayak Rath & Associates
Chartered Accountants
FRN - 021051N

CA Manas Ranjan Pradhan
(Partner)
M. No. 307292

NAYAK RATH & ASSOCIATES * BHUBANESWAR * CHARTERED ACCOUNTANTS

Deputy Controller of Accounts

Director

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

2023 -24

Schedule -14 : Fees/Subscriptions
(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Particulars	*Current Year*	*Previous Year*
1. Registration Fees *(MSc & PhD)*	1,60,20,111	1,82,35,461
2. License Fees	35,01,016	25,25,010
3. Sale of Tender Paper	2,40,206	3,24,383
4. RTI Application Fees	80	90
5. Transcript Fees	33,600	27,300
6. Identity Card/Health Card Fee	17,325	12,595
7. Guest House Rent	15,08,557	15,80,981
8. Job Application Fees	1,22,000	51,000
9. Sample Testing Charges	24,400	75,000
10. Lease Rent	5,42,006	1,98,000
11. Misc. Receipt *(EMD & SD Lapsed))*	29,56,697	1,95,54,224
12. Liquidated Damages	21,44,931	27,29,206
13. Water Charges *(Income)*	-	3,23,462
14. Creche & Day Care Fees	21,805	-
15. Sale of Animals	1,59,000	-
16.Sale of Assets	-	4,31,550
TOTAL	*2,72,91,734*	*4,60,68,262*

Schedule -15 : Income from Investments
(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Particulars	*Investment from Earmark Fund*		*Investment Others*	
	Current Year	*Previous Year*	*Current Year*	*Previous Year*
(Income on Invest. From Earmarked/Endowment Funds) Transferred to Funds				
1) Interest :				
a) On Govt. Securities	-	-	-	-
b) Other Bonds/Debentures	-	-	-	-
2) Dividends :	-	-	-	-
a) On Shares	-	-	-	-
b) On Mutual Fund Securities	-	-	-	-
3) Rents	-	-	-	-
4) Others *(Specify)*	-	-	-	-
TOTAL	-	-	-	-
Transferred to Earmarked/Endowment Funds	-	-	-	-

For Nayak Rath & Associates
Chartered Accountants
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CA Manas Ranjan Pradhan
(Partner)
M. No. 307292

NAYAK RATH & ASSOCIATES BHUBANESWAR CHARTERED ACCOUNTANTS

Deputy Controller of Accounts

Director

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

2023 -24

Schedule -16 : Income from Royalty, Publication etc.

(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Particulars	*Current Year*	*Previous Year*
1) Income from Royalty	-	-
2) Income from Publications	-	-
3) Others *(Specify)*	-	-
TOTAL	-	-

Schedule -17 : Interest Earned

(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Particulars	*Current Year*	*Previous Year*
1) On Term Deposits:		
a) With Scheduled Banks	-	-
b) With Non-Scheduled Banks	-	-
c) With Institutions	-	-
d) Others	-	-
2) On Savings Accounts:	-	-
a) With Scheduled Banks	57,10,270	1,00,93,429
b) With Non-Scheduled Banks	-	-
c) With Institutions	-	-
d) Others	-	-
3) On Loans:	-	
a) Employees/Staff	-	-
b) Others	-	-
4) Interest on Debtors & Other Receivables	-	-
TOTAL	*57,10,270*	*1,00,93,429*

For Nayak Rath & Associates
Chartered Accountants
FRN - 021051N

CA Manas Ranjan Pradhan
(Partner)
M. No. 307292

NAYAK RATH & ASSOCIATES BHUBANESWAR CHARTERED ACCOUNTANTS

Deputy Controller of Accounts

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NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

2023-24

Schedule -18 : Other Income
(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Particulars	*Current Year*	*Previous Year*
1. Profit on Sale/disposal of Assets:		
a) Owned Assets	-	-
b) Assets acquired out of grants, or received free of cost	-	-
2. Export Incentives Realised	-	-
3. Fees for Miscellaneous Services	-	-
4. Miscellaneous Income	-	-
TOTAL	-	-

Schedule -19 : Increase / (Decrease) in Stock of Finished Goods & Work-in-progress
(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Particulars	*Current Year*	*Previous Year*
a) Closing Stock	-	-
Add: Finished Goods	-	-
Add: Work-in-Progress	-	-
b) Less : Opening Stock	-	-
Add: Finished Goods	-	-
Add: Work-in-Progress	-	-
NET INCREASE / (DECREASE) (a-b)	-	-

Schedule -20 : Establishment Expenses
(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Particulars	*Current Year*	*Previous Year*
a) Pay and Allowances	44,01,83,801	40,86,88,409
b) Manpower *(Outsourced)*	11,66,02,603	11,07,57,147
c) Contribution to NPS	5,86,78,362	5,30,32,174
d) Leave Travel Concession	23,52,140	36,05,099
e)Fellowship	18,90,25,794	15,17,37,741
f) Honorarium & Scholarship	99,90,738	1,10,03,565
g) PRIS	5,92,24,368	7,25,02,865
h) Medical Expenses	3,00,78,585	1,54,28,295
i) Children Education Allowance	37,26,000	31,59,000
j) Leave Encashment	32,46,847	35,11,843
k) Professional Update Allowance	64,75,496	60,36,402
l) Gratuity	70,789	87,395
TOTAL	*91,96,55,523*	*83,95,49,935*

For Nayak Rath & Associates
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NAYAK RATH & ASSOCIATES BHUBANESWAR CHARTERED ACCOUNTANTS

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Director

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

Schedule -21 : Other Administrative Expenses

(Schedule forming part of the accounts for the period ended on 31.03.2024)

2023-24

Amount in (₹)

Particulars	*Current Year*	*Previous Year*
A. Other Administrative Expenses :		
Academic Expenditure	9,63,389	5,40,385
Freight & Forwarding Expenses	10,25,735	19,89,638
Purchases *(Consumables)/ Supplies & Materials*	2,45,53,309	5,94,76,643
Repair & Maintenance	3,95,21,383	6,21,13,866
Advertisement	9,28,426	17,74,879
Audit Fees	59,000	59,000
Bank Charges & Commission	8,531	69,982
CRA Service Charges	34,174	32,386
Electricity Charges	9,59,16,281	9,45,43,158
Fuel for DG Set	13,31,223	6,91,204
Hospitality Expenses	-	1,22,850
House Keeping Expenses	3,26,69,103	2,25,74,555
Legal Fees	12,14,900	32,68,000
Meeting Expenses	35,08,704	63,83,370
News Papers & Periodicals	1,51,947	1,53,200
Postage & Telegram	2,05,739	2,38,997
Printing & Stationery	20,63,803	4,74,312
Seminar/Workshop Expenses	37,80,389	19,36,014
Telephone & Internet Charges	79,68,780	93,01,767
Travelling & Conveyance - Domestic	56,31,053	66,27,031
T.A. on Transfer	-	9,28,836
Travelling & Conveyance - Foreign	25,17,270	46,25,072
Vehicle Maintenance Expenses	86,39,557	84,71,901
Professional Charges	6,12,388	1,07,130
Publication Charges	6,51,906	26,93,397
Horticulture & Plantation Expenses	-	45,280
Subscription Expenses	19,83,016	8,62,847
Thesis Evaluation Fee Expenses	8,47,625	-
Water Charges	17,90,994	1,30,200
Rent, Rate & Taxes	33,78,522	-
B. NISER PLAN EXPENSES :		
a) Domestic Travel	51,41,389	18,38,533
b) Fellowships	2,37,68,667	3,56,90,030
c) Foreign Travels	1,34,71,646	35,67,982
d) Salary Expenses	17,83,973	19,47,215
e) Other Expenses	6,22,425	3,67,72,088
f) Supplies & Materials	11,91,31,589	16,57,27,252
g) Meeting /Seminar/Workshop Expenses	1,01,26,817	20,03,181
h) Repaire & Maintanance	46,48,134	9,62,573
TOTAL====>	***42,06,51,787***	***53,87,44,754***

For Nayak Rath & Associates
Chartered Accountants
FRN - 021051N

CA Manas Ranjan Pradhan
(Partner)
M. No. 307292

Deputy Controller of Accounts

Director

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NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

2023-24

Schedule -22 : Expenditure on Grants, Subsidies etc.

(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Particulars	*Current Year*	*Previous Year*
a) Grant given to Institutions/Organisation	-	-
b) Subsidies given to Institutions/Organisation	-	-
TOTAL	-	-

Schedule -23 : Interest

(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amount in (₹)

Particulars	*Current Year*	*Previous Year*
a) On Fixed Loans	-	-
b) On Other Loans *(including Bank Charges)*	-	-
c) Others *(Specify)*	-	-
TOTAL	-	-

For Nayak Rath & Associates
Chartered Accountants
FRN - 021051N

CA Manas Ranjan Pradhan
(Partner)
M. No. 307292

NAYAK RATH & ASSOCIATES ★ BHUBANESWAR ★ CHARTERED ACCOUNTANTS

Deputy Controller of Accounts

Director

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ANNUAL ACCOUNTS 2023 - 24

SCHEDULE 24 – SIGNIFICANT ACCOUNTING POLICIES

(Schedule forming part of the accounts for the period ended on 31.03.2024)

About the Organization:

The National Institute of Science Education and Research (NISER) was set up at Bhubaneswar by the Department of Atomic Energy, registered as a Society with the Registrar of Societies, Cuttack, Orissa vide registration no: 22426/16 dt. 10.07.2007. NISER, a Grant-in-Aid institution of Department of Atomic Energy and affiliated to Homi Bhabha National Institute, Deemed University of DAE, Mumbai conducts the following academic programme for bright and meritorious students who are selected through National Entrance Screening Test (NEST) conducted on all India basis.

a) An integrated 5 year M.Sc programme in the core and emerging branches of basic sciences to students after 10+2 higher secondary schooling.
b) Integrated M.SC +PHD programmes after B.Sc from other universities.
c) Ph.D programme after M.Sc from other Universities.
d) Computer Science and Earth & Planetary Science
e) M.Sc in Centre for Medical and Radiation Physics (CMRP)

Presently NISER has 839 students admitted in 5 year M.SC programme in the various streams of Basic Sciences. Moreover NISER has 401 research Scholar (Ph.D) in its roll.

1. **Basis of Preparation of Financial Statements**

   The Financial Statements have been prepared on Cash (Receipt & Payment) basis following going concern concept, accounting standards and in accordance with the General Accepted Accounting Principles in India (Indian GAAP) except otherwise stated elsewhere.

   The accounting policies adopted in the preparation of financial statements are consistent with those of previous year.

2. **Fixed Assets**

   Fixed assets are stated at cost of acquisition inclusive of inward freight, duties & taxes and incidental & direct expenses related to acquisition.

3. **Depreciation**
   Depreciation has been provided on written down value method as per rate prescribed in the income Tax Act, 1961.

4. **Capital Assets (WIP)**
   The Institute has certain projects which are still in execution stage and hence these are taken as CWIP. But, as on 31st March, 2024, value of CWIP is Rs. Nil

5. **Recognition of Income & Expenditure**
   Income & expenditure are generally recognised on Cash (Receipt & Payment) basis.

6. **Consumable Stores**
   Lab consumables and stores consumables purchased during 2023-24 are treated as recurring expenditure and the consumables are transferred to respective Schools of study. Necessary records are maintained at the School concerned.

7. **Foreign Exchange Transactions**
   Transactions involving foreign currency are accounted at the exchange rate prevailing on the date of the transaction.

8. **Accounting for Registration Fees**
   Registration fee of students are being accounted for on receipt basis.

9. **Accounting of interest earned on FD**
   Interests earned on lien of FD against LC are being accounted for on actual basis.

10. **Government Grants/ Subsidies**
    a) Government Grants of the nature of contribution towards capital cost of setting up projects are treated as grant in aid for creation of assets.
    b) Grants in respect of specific fixed assets acquired are shown as a deduction from the cost of the related assets.
    c) Government Grants is accounted on realisation basis.

11. **Lease Rent:**
    Lease Rentals are with reference to Lease Terms.

12. Retirement Benefits

Liability towards gratuity payable on death/ retirement and provision for accumulated leave encashment benefit to employees is not applicable at present.

13. Taxation

Since the Institute is a research oriented organization wholly funded by Government of India, Department of Atomic Energy and there being no taxable income under section 10(23C)(iiiab) of Income Tax Act 1961, no provision for income tax has been made during the year.

For **Nayak Rath & associates**
Chartered Accountants
FRN – 021051N

CA Manas Ranjan Pradhan
Partner
M. No. 307292
UDIN - 24307292BKEBKN6258

Place: Bhubaneswar
Date: 24.07.2024

NAYAK RATH & ASSOCIATES * BHUBANESWAR * CHARTERED ACCOUNTANTS

Deputy Controller of Accounts

Director

ANNUAL ACCOUNTS 2023- 24

Schedule -25: Contingent liabilities & Notes on Accounts

(Schedule forming part of the accounts for the period ended on 31.03.2024)

Amounts in Rs. (In Crores)

A) CONTINTENT LIABILITIES

1.	Claims against the entity not acknowledge as debts	NIL
2.	Liability for partly –paid investments	NIL
3.	Liabilities on account of outstanding forward exchange contracts	NIL
4.	Guarantee & letters of credit outstanding	NIL
5.	Bills Discounted	NIL
6.	Other items for which the entity is contingently liable	NIL

B) Notes on accounts

1. **Deposit with DCSE&M, Mumbai**
   During the period of report, against the deposit placed with DCSE&M, Mumbai for construction of NISER Complex, the detailed account statement for Rs. 10,65,00,000/- is yet to be submitted by DCSE&M, Mumbai.

2. **Lien against FD**
   Lien against FD shown in Receipt &Payment s account relates to items under import & the same is in order.

3. **Fixed Asset Verification**
   Physical verification of Fixed Asset has been carried out by a firm of Chartered Accountants and the report shows the assets physically found along with the asset identification mark.

4. **Consumable Stores**
   All purchases are made against specific requirement and supposed to have been consumed in total during the year, hence there is no store lying unused.

5. Corresponding figures for the previous year have been regrouped/ arranged, where ever necessary.

6. Rounded off to the nearest rupee.

7. Schedules 1 to 25 are annexed to and form an integral part of the Balance Sheet as at 31st March, 2024 and the Income & Expenditure Account for the year ended on that date.

For **Nayak Rath & Associates**
Chartered Accountants
FRN – 021051N

CA Manas Ranjan Pradhan
Partner
M. No. 307292
UDIN - 24307292BKEBKN6258

Place: Bhubaneswar
Date: 24.07.2024

NAYAK RATH & ASSOCIATES BHUBANESWAR CHARTERED ACCOUNTANTS

Deputy Controller of Accounts

Director

ଜାତୀୟ ବିଜ୍ଞାନ ଶିକ୍ଷା ଏବଂ ଗବେଷଣା ପ୍ରତିଷ୍ଠାନ

ପରମାଣୁ ଶକ୍ତି ବିଭାଗ, ଭାରତ ସରକାରଙ୍କ ଏକ ସ୍ୱୟଂଶାସିତ ପ୍ରତିଷ୍ଠାନ

राष्ट्रीय विज्ञान शिक्षा एवंअनुसंधान संस्थान

परमाणु ऊर्जा विभाग, भारत सरकार का एक स्वयंशासित संस्थान

National Institute of Science Education and Research

AN AUTONOMOUS INSTITUTE UNDER DAE, GOVERNMENT OF INDIA