National Institute of Science Education and Research (NISER) Bhubaneswar

ANNUAL REPORT

and

Audited Statement of Accounts

2022 - 2023

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National Institute of Science Education
and Research (NISER) Bhubaneswar

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FROM THE DIRECTOR'S DESK

"The day science begins to study non-physical phenomena, it will make more progress in one decade than in all the previous centuries of its existence." –Nikola Tesla

With the collected wisdom of the year that whistled by and the promises of one in the reckoning, I am delighted to present the annual report of National Institute of Science Education and Research (NISER) for the financial year 2022-23.

Like the previous years, the year 2022-23 was also challenging, as we were left to stitch together the scattered pieces that the pandemic had forced us to live with. Bringing back the scheduled activities that were awfully thrown off track was our topmost priority. I must thank the entire NISER community that did not leave any stone unturned to restore normalcy, albeit with loads of functional difficulties. While doing so, we have managed to bring our academic activities on track to a great extent. Leaving behind the struggle through the uncertain times, I am glad to place on record that the quality and quantity of research publications by NISER faculty members in the past one year have been immensely satisfying.

We have been extremely proud of the success stories scripted by our students that graduated in 2022. Our alumni have been continuously keeping the NISER flag flying at some of the most sought after places all over the globe. Taking the legacy forward and keeping the mandate of NISER intact, most of the graduated students of class of 2022 have gone on to pursue higher scientific research and doctoral studies with fellowships from esteemed Universities and Institutes in India such as TIFR, IISc, and various IITs. From abroad, students have received offers from various Universities including many Universities under top 50 global rankings in respective subjects. Some of them Universities of Illinois-Urbana Champaign, Iowa, Kansas State, Virginia, California-Davis, Emory, London, Max Planck Institute, Edinburgh, Illinois-Chicago, Rutgers, Chicago, Connecticut, Ohio State, Purdue, Colordo State, to name a few. Similarly the graduated PhD students secured post-doctoral fellowships from esteemed places like TU Wien- Vienna, UT Southwestern, Busan National University, University of Toronto, Georgia Tech, Novosibirsk State University, IPC-Warsaw, TIFR-Mumbai, JNCASR-Bangalore, ISI-Calcutta, ISI-Bangalore, etc.

In addition to the three academic programmes that NISER offers; 5 year Integrated MSc programme, PhD programme and Integrated MSc-PhD programme, we have started a Master's Programme in Medical and Radiation Physics from the academic session 2022-23. The program has

been envisaged to create trained manpower in the field of medical physics and radiology. NISER has entered into an MOU with All India Institute for Medical Sciences (AIIMS) Bhubaneswar and Acharya Harihar Post Graduate Institute of Cancer (AHPGIC), Cuttack to help in the internship part and teaching of medical physics courses. I place on record our sincere gratitude to DAE and HBNI for starting this programme.

We are immensely thankful to the Department of Atomic Energy for its generous and continuous financial support to establish NISER in the forefront of research and development. We do place on record our gratitude to the DAE for that. To add further to our research and development activities, extramural funding is also coming thick and fast from various sources underpinning NISER's uninterrupted quest for excellence in scientific research. We have always been pushing the envelopes for the research being done here in our laboratories to get translated into tangible benefits to the society around us, justifying the public funding that we receive and also reinforcing our commitment to pay back to the society. During the financial year ending in March 2023, our faculty members have added twenty new research projects with funding to the tune of around Rs 6 crores from non-DAE sources. Some of the major non-DAE sources include Dept. of Science and Technology (DST), Science and Engineering Research Board (SERB), Dept. of Space, etc.

Although NISER is still very young in comparison with most of its peers, it has already made a mark in the scientific community with credible research and scientific publications by its Faculty members and students. I am pleased to share that the Honourable Prime Minister Sh. Narendra Modi on 11th May 2023 laid the foundation stone of Homi Bhabha Cancer Hospital and Research Centre, Jatni at NISER, Bhubaneswar, campus through video conferencing. It is likely to be ready in two to three years under the auspices of the Department of Atomic Energy, Tata Memorial Centre (TMC) and Tata Trusts. The hospital will not only provide affordable cancer care to the people but also help the institute conduct clinical and scientific research on cancer.

We, at NISER, recognize that innovative approaches and contribution to furthering the intellectual environment are the only keys to creating a niche in the global knowledge community. Keeping those in vision, we must uncompromisingly raise the bar and rise up to that. Transcending academic and intellectual boundaries, the students and research scholars are being nurtured in the ambiance of this scientific culture with a single minded focus to contribute meaningfully to the growth and development of the country.

Last but not the least, I am extremely thankful to the editorial team in bringing out this comprehensive Annual Report. Their efforts are sincerely appreciated.

Prof. Sudhakar Panda
DIRECTOR

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 inter-disciplinary 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 hypothesis 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 4 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 Ph.D 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 other one being Earth and Planetary Sciences.

The Institute has been dedicated to the nation by Honorable Prime Minister of India Shri Narendra Modi on February 07, 2016. NISER also carries out Doctoral Programme in all Basic Sciences and Humanities and Social Sciences.

New Course Introduced

The Centre for Medical and Radiation Physics at NISER has begun offering courses on Masters in Medical and Radiological Physics. Around 250 applications were received around 100 students were shortlisted for interview. After the interviews held in the month of July 2022, 10 students were admitted. They will be completing their first year in June 2023. The skill set acquired by the students after completing the course will be (i) Safe use of diagnostic and treatment radiation equipment, (ii) Quality assurance of radiation machines, radiation treatment planning, and radiation treatment delivery, (iii) In-depth knowledge on the radiation machine structure and function, (iv) Understanding of the principles and physical laws governing the biological effects of radiation, (v) Solving radiation therapy technology related problems, (vi) Appropriate domain knowledge on areas that are clinically applicable, (vii) Teach junior technicians in radiation therapy, (viii) Teach trainee oncologists on the relevant aspects of medical physics, (ix) Show a keen interest in research in the related field, (x) pursue innovation in radiation therapy technology to enhance safety, improve efficacy and allow cost effective assurance of service.

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 Ph. D program and Ph. D 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
- Green house
- 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 the relevant practical courses along with the theory courses that give the 'hands-on' activities to develop the research aptitude and to help the students to understand the 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 enable 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 the 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 focus on 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 include introductory courses covering the three disciplines in the first semester, followed by specialized courses in the second semester.

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; racture 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 Ph.D. 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

Scientific temper can sustain and advance in a holistic environment. Creative thinking along with skill based expertise is essential for new age scientists. The School of Humanities and Social Sciences plays a crucial role in the NISER undergraduate programme. The purpose of Humanities and Social Sciences is to help students to identify a set of values which will help them exercise integrity, vision, community involvement, and knowledge of self. It also helps students equip themselves with strong communication skills, interpersonal and team building skills and apply the same in their respective profession. Students must understand the application of their discipline to contemporary issues, they must acquire strong communication and team-building skills, and they must understand the definitions of leadership, personal responsibility, and professionalism. The Humanities and Social Sciences curriculum provides students the opportunity to explore and master communication skills, critical thinking skills, innovative problem-solving skills, and other learning opportunities offered by the department. The school focuses on bridging the gap between society-science interfaces. The School of Humanities and Social Sciences (SHSS) is encompassing five specific areas of study. The school aims to become an innovative centre for research in the fields of English, Economics, Sociology, Philosophy and Psychology. With faculty drawn from diverse background and experience, it targets to be a thriving academic community, ensuring a fertile ground for true multi-disciplinary research, where academic programs are nationally recognized for high levels of quality and clear multi-disciplinary research.

The curricula of the school for the 5-year Integrated Program emphasize interdisciplinary and holistic approach to impart training and skills in humanities and social sciences. To achieve this objective, a set of core has been identified which constitutes the courses of the first two semesters, and one in each in third and fourth semester. The curriculum generally begins with a two-course in communication skills, the purpose of which is to develop the required proficiency necessary to communicate, both orally and in writing, in their classes, in the workplace, and in community. Subsequent courses consist of introductory courses humanities and social science courses in sociology, psychology and economics that introduce students to the concepts of community, society, and self. In the third and fourth semester students are offered a variety of humanities and social science with an opportunity to select any two courses. Students are required to complete a minimum 16 credits. The electives are designed to provide advanced and applied knowledge in the areas of science communication, science, technology and society, organizational behaviour, urban planning, applied behavioural sciences, Indian society and social problems. This installs holistic vision and importance of responsible and sensitive global citizenship, through cultural self-reflection, ethical reasoning and historical understanding among the students.

The Ph. D programme aims to cultivate high quality research in various fields of English, Economics, Philosophy, Psychology and

Sociology. Graduates of the programme are expected to design and execute original, high quality, interdisciplinary research that can be published in major scholarly journals and books of the profession. The Ph. D. degree is generally a four-year program culminating in an original piece of humanities and social science research for a thesis and eventual publications in good and scholarly journals. The programme consists of both course Work and research work independently carried out by the student. While the thesis is in a specific area, the coursework leading up to this is designed to provide breadth to prepare the students for successful careers in the academics and industry. Students are expected to participate in the research seminars in the school, and to attend national/international conferences as well as regional meetings amply supported by NISER. Tata Institute of Social Sciences, Mumbai has conveyed approval to host NISER students for the Ph. D programme in Humanities and Social Sciences. The institute has started the Ph. D program in Humanities and Social Sciences from the even semester of academic year 2015-16.

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 strives to become a citadel for mathematics and allied subjects in terms of teaching and research. The faculty of Mathematics has a strong penchant for acquiring and updating their knowledge and imparting it to the students. The undergraduate program in the school is carefully designed to train the students to acquire creative mind and analytical skills that are needed to pursue their career. SMS aspires to become the foremost centre in the Ph. D. program in the forefront areas of Mathematics. In addition to formal courses and research, seminars are conducted regularly. In the seminars, outstanding mathematicians from throughout the world present their latest research findings in various fields of mathematics. SMS envisages to introduce strong curriculum in the fields of applied mathematics, financial mathematics and computer science so that students can take up prominent careers in financial/industrial establishments.

The Curriculum of the School

The curricula of SMS stresses interdependence and unified structure of science and at the same time emphasizes intensity of study in order to achieve a good understanding and skills in Mathematics. To fulfil this objective, a basic common core has been identified which constitutes the courses of the first two semesters. The courses on Mathematics in the 3rd semester onwards will focus on reading and understanding of mathematical proofs, emphasizing precise thinking and presentation of mathematical results both orally and in written form. The courses for the second and third year have been designed to provide an understanding of foundational level mathematics in the areas of logic, number theory, algebra, analysis, geometry, discrete mathematics and informatics. The students are encouraged to develop minor areas of interest in other streams of study by a system of open electives running up to the end of the sixth semester. The last four semesters have been reserved for advanced level courses and specialized courses. Provision has also been made for pursuing studies in special areas and writing an innovative project leading to a dissertation.

The aim and mission of the doctoral program in the School of Mathematical Sciences is to produce good and efficient scholars who will excel in acquiring and imparting good and deep knowledge in Mathematics. The program is carefully designed to understand mathematics both vertically and horizontally, that is, to obtain a fundamental understanding of basic fields of mathematics and a thorough state-of-the-art understanding of one major field of interest in which the student writes his thesis. Though the emphasis is placed on the abilities of the student recognizing significant research problems on their own and solving them, we create a sense of rapport between the students and the experts in the field, that is to say that an ambience is created for the students to have the excitement and stimulation on their own but at the same time with support and mentoring provided by the teachers.

The Ph. D. degree is generally a four-year program culminating in an original piece of mathematical research for a thesis and eventual publications in good and scholarly journals. While the thesis is in a specific area, the coursework leading up to this is designed to provide breadth to prepare the students for successful careers in the academics. Besides, there are many opportunities for our students to enrich their background in mathematics. Students are strongly encouraged to talk in the research seminars in the school, and to attend national/international conferences as well as regional meetings amply supported by NISER.

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 Ph.D. 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.

Central Library

"Libraries always remind me that there are good things in this world"

- Lauren Ward

The central library stands as an exceptional knowledge center, providing access to a wide range of vital and specialized information resources, along with various services, to cater to the ever-expanding information requirements. With a mission to enhance and facilitate discovery, the library optimally utilizes its resources. The students, faculty members, and institute employees all have the privilege of utilizing the library's facilities to support their academic and professional endeavors.

The library building spans an impressive carpet area of 60,000 square meters and boasts a prime location at the heart of the campus. It houses an extensive collection encompassing Biology, Chemistry, Mathematics, Physics, Earth & Planetary Sciences, Humanities, and Computer Sciences. The central library occupies the first and second floors of the building, providing a fully operational space for users. With a substantial seating capacity, it can accommodate up to 400 individuals simultaneously, facilitating a conducive environment for studying and research.

Library Operational Hours:

Monday to Sunday	9.00 AM to 9.00 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 2023 stands as follows:

Type of Resources	Volume
Purchased Books	24601
Gratis Books	1817
Bound Volume Journals	573
E-Books	10141
Electronic Databases (Bibliographic)	6
Electronic Databases (Full-Text)	25
Electronic Journals	8593
CD/DVD	224
Thesis and Disseratations	361
Newspapers	06
Magazines	20
Hindi Collection	253
Odia Collection	216
Children's Collection	297

Magazines & Newspaper:

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:

Newspapers: The Samaj (Odia), The Sambad (Odia), The Hindu, The New Indian Express, The Times of India and Dainik Jagaran (Hindi).

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

Books (print) were added during FY 2022-23: 779 books in the print format during FY 2022 - 23.

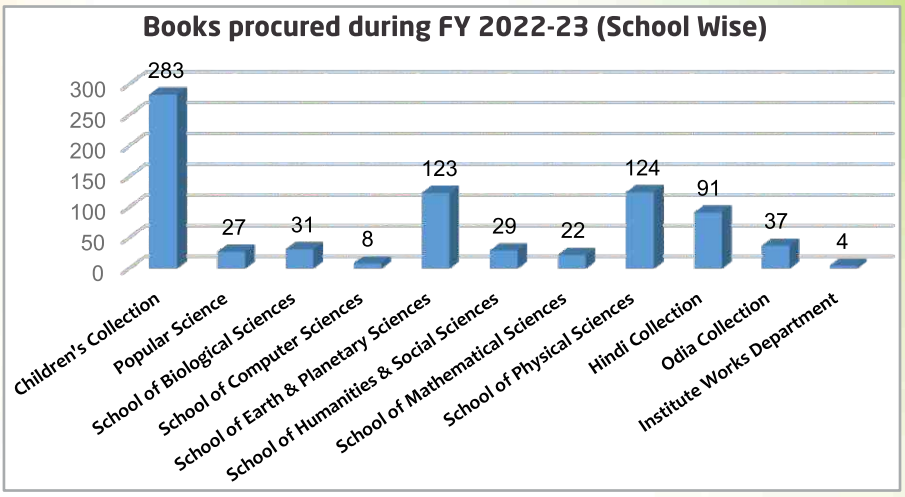
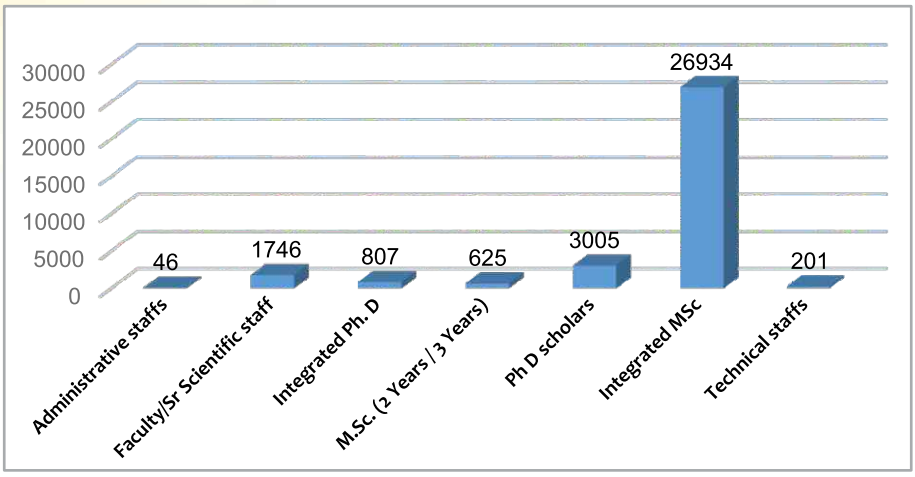


Fig. 1: Number of books (print) added in FY 2022-23



Usage Statistics: The diagram illustrates the utilization statistics of different resources within the central library, accessed by varying individuals from the institute.

Fig. 2: Issued books statistics patron category wise during 2022-23

Newly added patrons' statistics: Central library has welcomed a significant number of new members who have recently joined the institutes. The accompanying diagram provides insights into the various categories of membership that have been added.

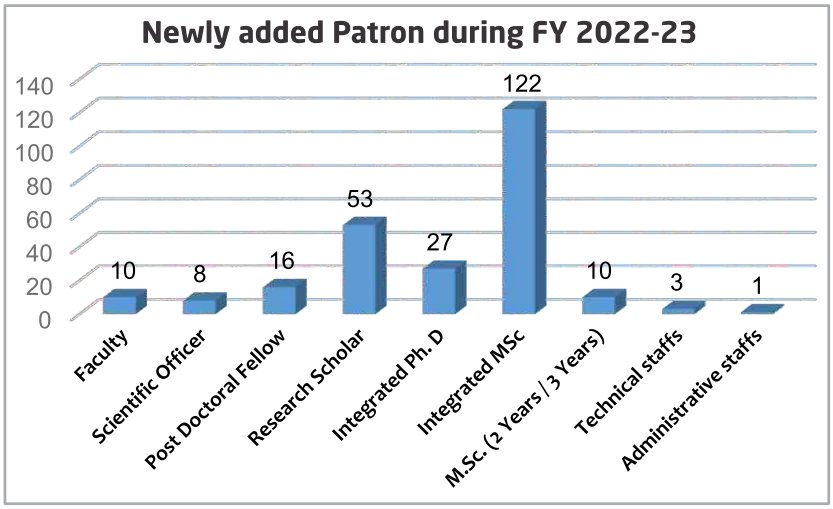
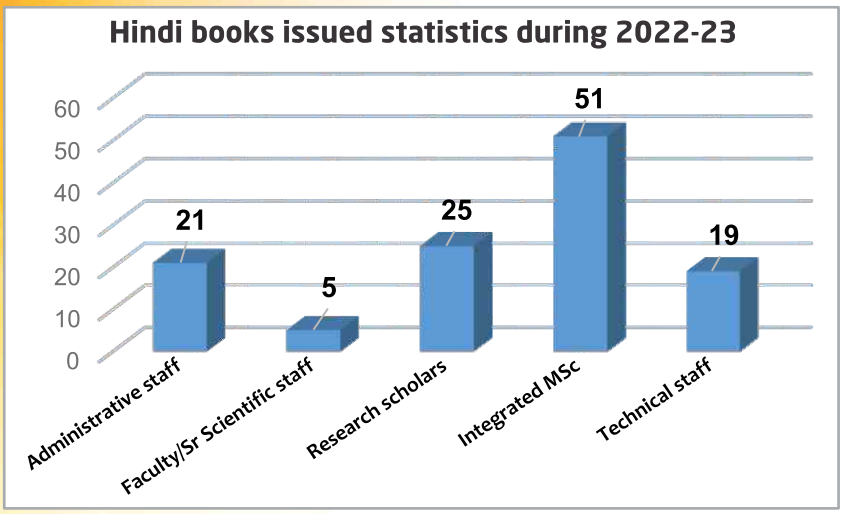


Fig. 3: Newly added patrons' statistics during 2022-23



Hindi Books Issued: The central library possesses a substantial compilation of literary works written in the Hindi language. The diagram illustrates the utilization statistics of Hindi resources within the central library, accessed by varying individuals from the institute.

Fig. 4: Hindi books usage statistics during 2022-23

Electronic Resources:

Databases (Bibliographic Databases):

- CCDC – CSD Enterprise License (CCDC)
- MathSciNet (AMS)
- Science of Synthesis (Thieme)
- Scientific American (Springer)
- SciFinder-n (CAS- ACS)
- Synthetic Reaction Updates (RSC)

e-Journals:

- American Association for Cancer Research
- American Association for the Advancement of Science
- American Chemical Society
- Association for Computing Machinery
- American Economic Association
- American Institute of Mathematical Sciences
- American Institute of Physics
- American Mathematical Society
- American Metrological Society
- American Physical Society
- American Society for Microbiology
- Annual Reviews
- Bentham
- Bioscientifica
- BMJ
- Cambridge University Press
- Canadian Mathematical Society
- Cold Spring Harbor Laboratory Press
- De Gruyter
- Duke University Press
- EDP Sciences
- Elsevier (Through DAE Consortium)
- Emerald
- European Mathematical Society
- IEEE
- IMPAN
- IOP Publishing
- IOS Press
- John Hopkins University Press
- Journal of Visualized Experiments
- JSTOR
- Lippincott Williams & Wilkins
- Mary Ann Liebert
- Mathematical Science Publishers
- Optical Society of America
- Oxford University Press

- PNAS
- Rockefeller University Press
- Royal Society of Chemistry
- SAGE Publishing
- Society for Industrial and Applied Mathematics
- Springer Nature
- Taylor and Francis
- The Company of Biologists
- The Geological Society of America
- The University of Chicago Press
- Thieme Medical Publication
- Wiley
- World Scientific

e-Books(Perpetual Access):

- Cambridge University Press (8 titles)
- Elsevier (561 titles)
- Oxford University Press (1 title)
- Pearson (8 titles)
- Springer Link (9567 titles)
- Taylor & Francis (4 titles)

Research Support Tools:

- Ithenticate (Turnitin) - Originality/ Plagiarism check software
- Grammarly - Writing support tool
- Web VPN – Off campus access of e-resources through NISER
- Mendeley, Zotero, and RefWorks quick start guides

Library Services:

The Central Library offers the following services:

1. Circulation (Issue, Return, Renewal & Reservation)
2. RFID integrated Kiosk and Book dropper for Self-Check-out and Check-in
3. Web-OPAC (: https://opac.niser.ac.in/)
4. Reference and Information Services
5. User Awareness Program
6. Technical Processing of books Purchased through contingency grants
7. Plagiarism Check – iThenticate
8. Overnight Book Lending
9. Current Awareness Service
10. Document Delivery Services
11. Hindi & Odia Collection
12. User Guides
13. Ask Librarian
14. Screen Reader: The Library has purchased the JAWS software. A computer screen reader program allows blind and visually impaired users to read the screen with a text-to-speech output or a refreshable Braille display.
15. Trial Access

- De Gruyter (Complete Journal Package 200+ Journals Collection): 1st June 2022 to 30th June 2022
- Springer Nature (1700+ Journals Collection of Multidisciplinary Subjects): 2nd June 2022 to 2nd July 2022

16. Publications & Citations data from Scopus
17. Institute Newsletter: Vibes (Bi-Annual)
18. Information & News Casting
19. Library Website: The Library homepage serves as an integrated interface of all services available from the Library.(https://www.niser.ac.in/library/)
20. Institutional Digital Repository: It is a digital service that collects, preserves, and distributes digital material. IDR plays an essential role in preserving an organization's legacy; they facilitate digital preservation and scholarly communication.
21. Indian Research Information Network System (IRINS): The portal showcases comprehensive profiles of faculty members and scientists, along with their publications and corresponding citations, among other pertinent information.

22. Popular Science Section: The newly setup Popular Science Section presents an optimal environment and an array of resources tailored for casual readers. Within this collection, the reading materials elucidate scientific concepts and unveil discoveries in a captivating and easily comprehensible manner. This initiative aims to offer a well-deserved respite to library users, who predominantly engage with scientific, technical, and scholarly literature throughout their reading endeavors.
23. Children's Library: The Children's Library, designed to ignite the spirit of discovery and exploration in young minds. This vibrant space offers a refreshing escape from the digital realm, enabling children to actively engage with a diverse range of subjects and topics. Through this initiative, the library seeks to foster a love for learning and provide an enriching experience for children.
24. Subject Guides (All Schools)
25. Library Brochure: The library brochure is designed to discover a world of knowledge, immerse yourself in a captivating journey as you explore the diverse resources, services, and facilities NISER library offers. With a wealth of information at your fingertips, this brochure acts as a guide to unlocking endless possibilities.

Infrastructure Facilities:

- AC reading area with a seating of 400 users at a time
- CCTV Surveillance
- Central Board Room
- Conference Room
- Cashless Payment through UPI (Late fee collection)
- Computers for e-resource access
- Wi-Fi Connectivity
- Silent Zone
- E-Reading Section
- Children's Library
- Popular Science Section
- Scholar's Zone

Inter Library Loan and DDS facility:

Libraries may not always have the resources to meet all of their users' needs. To address this issue, Inter Library Loan services can be utilized. Our primary objective is to facilitate a seamless and expedient process for obtaining the necessary materials in order to support our user community's educational and research endeavors.

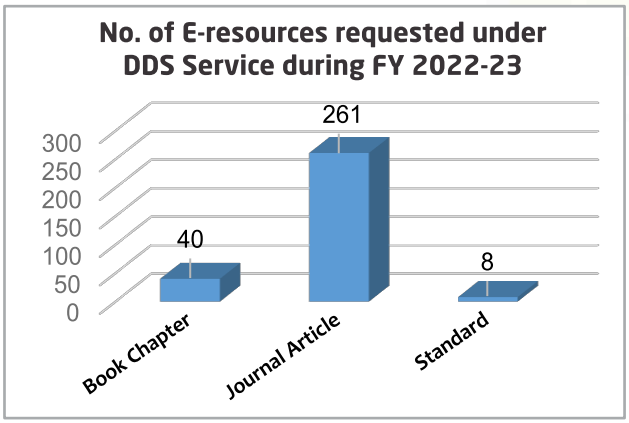


Fig. 5: ILL &DDS service statistics during 2022-23

Thesis and Dissertations Submission Statistics:

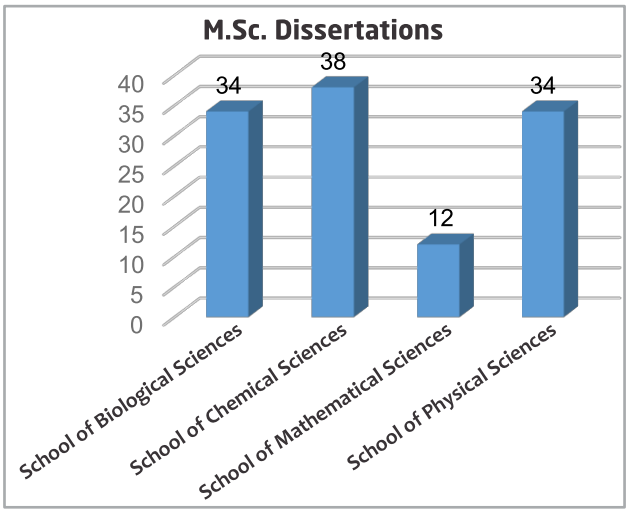


Fig. 6: MSc. dissertations submitted during 2022-23

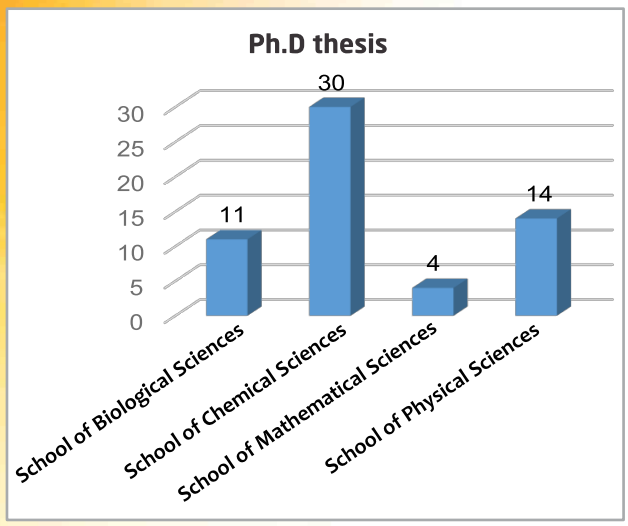


Fig.7: Ph.D. thesis submitted during 2022-23

Library Events:

During Utkal Divas (1st April 2022) celebration, the Central Library organized an exhibition of Odia literature books to celebrate the rich culture and heritage of Odisha, which was presented to all Library patrons.

The Central Library, NISER, and Wiley are jointly organized **Author Workshop** on **"Winning the Game of Publishing"** on August 31, 2022. Mr. Yateendra Joshi, delivered the workshop's keynote address.

During **Rajbhasha Hindi Pakhwada** (14 September 2022 to 29 September 2022), the Central Library organized an exhibition of Hindi literature books that were displayed for all Library patrons. This exhibition was well received by all library users.

On October 12, 2022, the Central Library, NISER hosted the **SciFinder-n Training Session** for research scholars and faculty from the Schools of Chemical Sciences and Biological Sciences.

The Central Library, and Bridge People Technology Solutions jointly conducted the **Grammarly Webinar** Session on November 16, 2022. Manisha Bisht, from Bridge People Technology Solutions, was the webinar's keynote speaker.

The Central Library, NISER, endeavored to establish a space, i.e., the Children's Library, which was officially inaugurated on December 11, 2022, by the Director, NISER.

On January 30, 2023, the Central Library, and Thieme Publisher collaborated to host an **Editorial talk on "Common Pitfalls for Scientific Writing & Science of Synthesis."** The

resource person was Dr. Rohit Bhatia, Acquisitions Editor at Thieme Chemistry.

The Central Library officially inaugurated the **Popular Science Section** on February 28, 2023. This newly established area caters specifically to the needs of library users who predominantly explore scientific, technical, and scholarly literature during their reading endeavors.

Outreach Visits

On June 30, 2022, Master of library and information science (MLISc) students from Utkal University, Vani Vihar visited the Central Library, NISER for a fruitful discussion on common study subjects. The session commenced with an orientation talk delivered by SO-C (Library).

On 8th Febryury 2023, Bachelor of library and information science (BLISc) students from Shailabala Women's College, Cuttack visited the Central Library. The purpose of their visit was to

engage in a discussion on shared study subjects. SO-C (Library) provided an orientation talk to the students, which was followed by a tour of the library.

Internship Programs

Ms. Shubalaxmi Mohanty, a student of Master of Library and Information Science (MLISc) at Central University Gujarat, Gandhinagar successfully completed a one-month internship in the Central Library, NISER, Bhubaneswar from 05th September 2022 to 04thOctober 2022. During the internship, Ms. Mohanty actively participated in various hands-on training sessions offered by different library section.

Academic Achievements and Research Overview

School of Biological Sciences

Professor Chandan Goswami

Field of Specialization: Cell biology of thermosensitive ion channels

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.

Professor Palok Aich

Field of Specialization: Systems Biology

My research focuses on establishing a core gut microbiome that could maintain our health and can protect against diseases. To establish such proposition we try to understand the role of microbiome on gut-adipose-brain axis. So the study requires in depth analysis and association of neurobiology and microbiology with host physiology. The study deals with host-microbe interactions, metabolism and energy utilization. We produce big data using various omics methodologies like metabolomics, metagenomics, transcriptomics etc. We also employ biochemical, biophysical, immunological and imaging methodologies and advanced statistical and data science protocols to collate data to understand the kinetics and dynamics to model the host-microbe interactions. Our research led to very in depth excavation of host physiology with microbial genetics. The work attracted industry sponsorship to help developing deep learning methodologies to improve health for chronic disorders.

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: Cancer Biology, Gastroenterology, Hypoxia, Oxidative Stress, Host-Pathogen Interaction. Broad area of research: Understanding the mechanism of gastric cancer progression and metastasis

Gastric cancer is an aggressive cancer and is a major cause of mortality in the developing nations. Gastric cancer patients exhibit poor prognosis due to the lack of early detection markers which hugely contribute to the high mortality associated with the disease. Helicobacter pylori, a microaerophilic, Gram-negative bacterium is one of the causes behind gastric cancer. Like many epithelial-origin solid tumors, dissemination of gastric cancer (metastasis) is mediated by epithelial to mesenchymal transition (EMT), a mechanism that converts immotile epithelial cells into motile and invasive mesenchymal cells. Regions of hypoxia develop inside the tumor mass which is a major driving force that contributes to the tumor proliferation, angiogenesis, metastasis and therapy resistance. The molecular events in H. pylori and hypoxia-driven gastric cancer progression and metastasis are complex and multi-factorial. The focus of our group is to identify the molecular events and pathways that contribute in gastric cancer progression 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. Whether its cancer, Alzheimer's or even glaucoma, extracellular matrix (ECM) might play a pivotal role behind the development of the diseased state. Our goal is to find the genetic and environmental players that change the micro-environmental niche during the developmental process of aging and hence are responsible for these age related-disorders. We are currently focusing on understanding the functional role of an extracellular chaperone, Clusterin, Vimentin, another ECM scaffold protein, Fibulin-5 along its binding partner, LoxL1 for their role in aged disrupted extracellular matrices using pseudoexfoliation glaucoma (PEXG) human samples as well as in vitro cell lines. Similarly, and the role of various Candidate genes, LAMC1 and ATP1B1 in patho-mechanism of Fuchs Endothelial Corneal Dystrophy (FECD) has been studied.

Dr. Harapriya Mohapatra

Field of Specialization: Molecular Microbiology

An unprecedented increase in the proportion of resistance bacteria has threatened modern advances in medical science. The development of resistance in bacteria is not only due to acquisition of genes. Structures (proteins) intrinsic to cellular functions and survival play a significant role in the organism tiding over the unfavourable situation. Our research focuses on developing understanding of two such aspects involving the bacterial membrane protein and persistence mechanism. We are trying to address how membrane proteins help the organism deal with the external milieu including interaction

with the host cells? In the second part of our research, we are trying to understand how isogenic population of cells respond differentially to a stress condition? We investigate these aspects in Enterobacter and Klebsiella that are opportunistic pathogens. Various microbial, molecular biology, biochemical and cell culture techniques are utilized for addressing these questions.

Dr. Kishore CS Panigrahi

Field of Specialization: Plant Biology

One of the Major focus of the lab is to understand the mechanism behind light and hormone cross-talk during the land plant evolution. We optimize Arabidopsis thaliana as a model to understand this and also the Pre-mRNA splicing regulating flowering time control. We have discovered a non-transgenic way of stimulating productivity and obtain earlier flowering by optimizing the use of carbon nano-particles (CNPs) for the first time. This phenomenon was found to be conserved from the model dicot to a monocot plants such as Rice. The CNP mediated early flowering is photoperiod independent and attributed to the alteration in thermal sensing of plant where it presumably interacts with Phy-B-Pif module and circadian clock. One of the circadian clock associated, plant specific nuclear protein GIGANTEA was discovered to be involved in pathogen defence modulating the Salicylic acid and Jasmonate signalling.

Another major objective of the lab is to shift the fundamental understanding of flowering time control and to use the knowledge in an application oriented project using a crop species Vigna Radiata(mung bean). This project specifically aims at to meet the local demand and sustainable production of protein rich pulses such as Vigna in relatively colder and prolonged winter in districts like Koraput, Kalahandi of Odisha, where few million people are affected routinely by malnutrition. Towards this, we have screened 214 natural accessions for cold tolerance and enhanced productivity and identified 20 of them further work. The result would pin-down to the components regulating the trait at molecular level.

Dr. Manjusha Dixit

Field of Specialization: Angiogenesis and Tumorigenesis Regulation

The Discovery of new angiogenic regulators and establishing the mechanism can help understand the angiogenesis process entirely, which can help reduce resistance and side effects observed with the currently available therapies. Our results support the dual role of IQGAP2 in inhibiting EMT and angiogenesis, which can be explored as a next-generation therapeutic target. IQGAP2 expression is reduced in breast cancer, which promotes EMT and inhibits apoptosis by modulating the MEK-ERK and p38 signaling irrespective of ER status. We identified that IQGAP2 could suppress angiogenesis in breast cancer by sequestering the IQGAP1 mediated activation of ERK.

After identifying FRG1 as a tumor suppressor, we analyzed the effect on survival. FRG1 expression shows a variable effect on survival across cancer types. We developed a multigene expression-based model to predict the effect of FRG1 expression by neutralizing the effect of other correlated genes.

Gallbladder cancer is comparatively frequent in North and Eastern states, including Odisha. In this project, our goal is to determine genetic predisposition in the population. We found a significant association of specific variants in SERPINB5 with gallbladder cancer.

Dr. Pankaj Vidyadhar Alone

Field of Specialization: Molecular biology of protein biosynthesis

Protein biosynthesis is an important step in the

life cycle of cell where genetic information is converted into functional protein information. 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) 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 supra molecular assembly of translation initiation complex by using range of genetic, biochemical and biophysical techniques in the yeast model system.

Dr. Praful Singru

Field of Specialization: Neural circuits, neuropeptides and behavior

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. Recently, we have demonstrated that the VTA DA neurons are of three types and these neurons express specific calcium binding protein. We are determining the role of the midbrain DA neurons in energy balance in these birds and study the significance of the calcium binding proteins in understanding the neuronal groups.

Dr. Ramanujam Srinivasan

Field of Specialization: Prokaryotic Cytoskeleton

Cytoskeletal Dynamics, their role in DNA segregation and cytokinesis & Bacterial Origins of Cancer.

Dr. Rudresh Acharya

Field of Specialization: Protien Crystallography, Protien 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 (Mahish et al. Front. Immunol. 2023, Chatterjee et al. Journal of Virology, 2022, Kumar et al. Virus Research 2023, Kumar et al. Journal of Biosciences 2022)

Dr. Tirumala Kumar Chowdary

Field of Specialization: Structural Virology

The complex biological process in a viral infection are carried out by viral protein complexes. Viral

surface proteins and their interactions with cell surface proteins are the first step in a virus infection. My research interest is in understanding the structure of viral protein complexes involved in viral entry, genome replication and genome packaging in important human pathogens that have caused epidemics in recent past (such as chikungunya, Dengue and the current pandemic virus SARS CoV-2). We employ a structural biology (such as X-ray diffraction, single particle electron microscopy), molecular dynamics simulations, biochemistry and molecular biology tools to study interaction between viral surface 'spike' proteins and corresponding receptors, interactions amongst the viral replication proteins in Dengue virus replication complex non-structural proteins and genome packaging and packaging elements in viral genomes.

Dr. V Badireenath Konkimalla

Field of Specialization: Pharmaceutical Biology

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 a 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 physicochemical properties, bio-pharmacokinetics, or structural mimicry of the molecule. Here, we try to design suitable study models (in silico, in vitro and/or in vivo) that can progressively help in developing a reliable formulation.

Dr. Aniruddha Datta Roy

Field of Specialization: Phylogenetics, Biogeography, Phylogeography, Systematics

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. Mohammad Saleem

Field of Specialization: Membrane Biochemistry/Biophysics

We are interested in the quantifying membrane remodelling and deformation and subsequent deformation relevant in host-pathogen interactions and neurodegeneration.

Dr. K. Himabindu Vasuki

Field of Specialization: Plant Biology; Plant Biochemistry

Tomato is the second most consumed vegetable in the world after potato in the world. The usage of this vegetable is indispensible for many preparations in Indian cuisine and it is consumed in raw or processed form. Enhancing nutritional content of tomato will promote the health of the people at affordable costs. Fruits accumulate various pigments as a part of natural ripening process and I am interested in understanding the synthesis, accumulation and degradation of these pigments, especially in tomato fruits. Currently, we are attempting to increase the nutritional content of tomato by increasing the anthocyanin pigment levels in the fruits.

Anthocyanin is effective antioxidant and also known to reduce the risk of cardiovascular diseases and involved in slowing down the progression of few types of cancers. The spontaneous tomato mutant, Abg accumulates high levels of anthocyanins in the fruits, of which the mechanism behind this accumulation is not known. In my lab, we use combined proteomics, metabolomics and transcriptomics techniques to understand the basis for this high anthocyanin accumulation in the Abg tomato mutant. The novel candidate genes/proteins identified will be functionally validated (through CRISPR-CAS genome editing) and introduced into the local tomato cultivar, AV for enhancing nutritional levels of market tomatoes.

Dr. Rittik Deb

Field of Specialization: Evolutionary Ecology, Behaviour, Bioacoustics, Gut-microbiome

I want to understand how biotic interaction at different levels - communities to individuals and macro to microscopic organisms - can shape organismal evolution. I will examine these biotic interactions using wild and laboratory-bred insect communities and their associated gut microbes.

Objectives: Impact of anthropogenic noise on eco-evolutionary dynamics of Orthopteran community. Human-based activities are the major threats to the fascinating biodiversity of our planet. Anthropogenic noise has the potential to mask acoustic communication. So, we are interested in understanding the effect of anthropogenic noise on acoustic communication and its evolutionary consequences using both field sampling and laboratory based experimental evolution.

Drivers of alternative reproductive strategy in a tree cricket

Condition-dependent alternate reproductive strategies involve organisms 'choosing' between a dominant strategy and alternatives according to their condition to optimise reproductive success. We are interested to understand what drives the switching between these strategies (both genetic and environmental factors). We focus on a clever alternate mating strategy called 'baffling' in the cricket species Oecanthushenryiwhere they transform a leaf into a megaphone.

Herbivory - a model to test the intermediate disturbance hypothesis

Intermediate disturbances (such as herbivory) can positively impact individual plant fitness by optimising growth through overcompensation. However, overcompensation is evolutionarily unstable as it can sustain only in sub-optimally growing plants. Our study tests the impact of optimal and suboptimal growth conditions on the spinach plant's ability to show overcompensation and its evolutionary stability.

Dr. Swagata Ghatak

Field of Specialization: Biological Sciences

Understanding pathological mechanisms underlying neurological disorders.

School of Chemical Sciences

Professor A. Srinivasan

Field of Specialization: Bio-Inorganic Chemistry

Our research interests are: (1) synthesis of contracted, normal and expanded derivatives of Carba and Pyriporphyrinoids and explore its coordination chemistry as well as receptor properties and (2) synthesis of normal and expanded arene as well as pyridyl ring incorporated calixpyrrole, calixphyrins & their respective 3-D analogues and these macrocycles are further exploited for sensing experiments.

Professor Chidambaram Gunanathan

Field of Specialization: Organometallic Chemistry, Catalysis and Organic Synthesis

Our group work on fundamental organometallic chemistry with pincer complexes and apply them to solve important from in organic synthesis and sustainable chemistry.Using Pincer catalysts we have developed serious of catalytic transformations in which advanced synthetic targets are prepared directly from industrial feedstock such as alcohols. Remarkably water and/or molecular hydrogen are the only by products. Further, recently we have devised a catalytic method for the synthesis of d-hydroxynitriles from nitriles and allylic alcohols in which there is not byproduct at all. Using half-sandwich ruthenium complexes as catalysts, efficient chemoselective hydroelementation reactions such as hydroboration of carboxylic acids, olefins, nitriles and imines, pyridines, carbonyl compounds, and hydrosilylation of aldehydes were reported. The hitherto unknown intermediate involved in these hydroelementation reactions turned out to be an efficient catalyst for the selective - deuteration of amines and amino acids and in direct synthesis of borosilaxanes from boranes, silanes and water. 1,2-selective hydroboration of aldazines was established recently. Using abundant base metal such as Co and Mn we have prepared pincer catalysts, which catalyzed the direct olefination of various organic compounds in which alcohols are used as alkenylation reagents. Using Co-pincer catalyst oxidation of alcohols to carboxylic acid and selective reduction of esters to alcohols and aldehydes were reported. Overall we have made excellent contributions to the sustainable chemistry.

Professor Himansu Sekhar Biswal

Field of Specialization: Spectroscopy and Computational Chemistry

Currently the group is working on 3 major problems:

1. Unusual non-covalent interactions in biomolecules.
2. Implications of aminoacid based ionic liquids in catalytic activity, stability, dissolution, and storage of DNA, RNA and proteins.
3. Excited state proton transfer and photo-dynamic therapy mediated through sulfur and selenium centered hydrogen bonds.

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

Dr. Bhargava B. L.

Field of Specialization: Computational Modeling of Condensed Phase Systems

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, Bio-Organic Chemistry

My research work is focused on molecular capsule

and bioorganic chemistry. Molecular capsules when used as reaction vessels, can accelerate the reaction speed as compared to the bulk solvent environment, and can trap the unstable molecules or reactive intermediates at room temperature. Self-assembled molecular capsules can also be used for molecular recognition and as sensing materials. Molecular capsule formed by non- covalent interaction(s) such as hydrogen bonding, is highly desirable as these bonds can easily be broken by subtle change in environment. This will help in drug delivery at targeted sites. Another aspect of my research is to make challenging molecular architecture those are challenging to prepare in normal ways of synthesis. We are in a process of preparing catenane polymers and other molecular architecture which are useful as special material for different purposes. We have now successfully prepared few unnatural derivative of purine for construction of various molecular architecture. The studies are underway.

Dr. Jogendra Nath Behera

Field of Specialization: Inorganic and Material Chemistry

1. Porous Magnetic Materials
2. Supercapacitors for layered composite Materials
3. Organic-Inorganic hybrid materials:
4. Electrocatalyst for Water Splitting
5. Conducting MOFs for electrocatalytic applications

Dr. Krishnan Venkatasubbaiah

Field of Specialization: Hybrid Organic Inorganic Materials

The chemistry in my group will be interdisciplinary which includes inorganic, polymer and organic. My research focuses on the development of new functional materials which have potential applications in catalysis and making sensors, OLED's and NLO materials.

Dr. Moloy Sarkar

Field of Specialization: Fluorescence Spectroscopy

During this period, we have mainly concentrated on understanding the photophysical behaviour of various nano structured organic and inorganic materials through various spectroscopic and microscopic investigations. Specifically, in many cases photophysical response of fluorescent nanoparticles in absence and presence of analyte of interests have been discussed. The dynamical behaviour of deep eutectic solvents (DES) and ionic liquids (ILs) have also been investigated. Several new physical insights with regard to the interaction mechanism of inorganic nano particles with the target analytes and dynamical behaviours of DES and ILs have emerged from this study.

Dr. Nagendra Kumar Sharma

Field of Specialization: Organic Syntheses and Bioorganic Chemistry

Nucleic acid (DNA/RNA) and protein/peptides interactions play critical roles for theregulation 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.

We are also involved in the synthesis of unnatural amino acid and their peptides for development therapeutic drugs mainly Anticancer and RNAi based drugs.

Dr. Ponneri C. Ravikumar

Field of Specialization: Synthetic Organic Chemistry

Research in our group is focused on development of new methods for the synthesis of bioactive heterocyclic and carbocyclic frameworks. To achieve this goal, we break normally inert bonds such as Carbon-Carbon, Carbon-Nitrogen & Carbon-Hydrogen using transition metals and functionalize them with pi systems such as alkynes and alkenes.

Dr. Prasenjit Mal

Field of Specialization: Organic Chemistry

Sustainable strategies in Organic Synthesis

Dr. S. Peruncheralathan

Field of Specialization: Synthetic Organic Chemistry

Our group is currently focused on selective functionalisation of C X and C H bonds to synthesise heterocycles with potential applications in biological and photophysical properties.

Dr. 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. Sharanappa Nembenna

Field of Specialization: Main group Organometallics, Inorganic synthesis and Catalysis

Our research group is currently focusing on cheaper, Earth-abundant, less toxic, and biocompatible main group elements such as zinc, magnesium, calcium, and aluminum-based catalysts for various organic transformations. Moreover, we developed a new -diketiminate analogue, conjugated bis- guanidinate (CBG) ligand containing C, H, and N elements. In this context, recently synthesized structurally characterized zinc, magnesium, and aluminum hydride complexes bearing a CBG ligand. Further, we investigated the catalytic applications of those complexes in the hydroboration of various organic substrates, such as alkynes, alkenes carbonyl compounds, and nitriles.

Dr. Subhadip Ghosh

Field of Specialization: Single-molecule and ultrafast fluorescence spectroscopy

We study photophysical properties of perovskite nanocrystals (NCs), including charge transfer, hot carrier cooling, Auger recombination etc. Recently we have been exploring hot carrier cooling dynamics in $CsPbBr_3$ nanocrystals. We found that facet engineering is a potential way to decelerate the cooling dynamics. While 26 faceted rhombicuboctahedron NCs exhibit ~ 3 ps cooling timescale, ~ 6 faceted cube NCs display a much

faster-cooling timescale of ~0.7 ps. This is indeed an interesting observation from the perspective of perovskite's future applications in real devices.

Dr. Sudip Barman

Field of Specialization: Materials and Physical Chemistry

Development of new electrode materials for electrochemical energy conversion and energy storage are of great importance because of the growing energy demand. Supercapacitors are important energy storage devices because of their high power density and long cycle life. We developed a simple facile method to synthesize boron (B), nitrogen (N) co-doped two dimensional carbon sheets for superior supercapacitor and gas adsorption applications. Earth-abundant and noble-metal free are highly desirable for efficient alkaline overall water splitting and anodic reactions. We synthesized Nickel oxide supported on carbon sheets for superior oxygen evolution reaction, urea oxidation, ethanol oxidation in alkaline media. We also developed a facile synthesis method of Pt-free electrocatalyst for hydrogen evolution reactions. These works may provide an opportunity to design Pt-free oxide-based catalysts for renewable energy technologies.

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. Arindam Ghosh

Field of Specialization:NMR Spectroscopy, MRI

A. Design of novel MRI CEST contrast agents.
B. Understanding of the mechanism of CEST contrast and investigation of the role of hydrogen bonding.
C. Carbon quantum dots as a novel class of CEST MRI contrast agents.

Dr. Bidraha Bagh

Field of Specialization: Organometallic Chemistry and Catalysis

Catalysis plays an essential role in life, science and society; over 80% of all industrial processes involve one or more catalyzed reactions and it is the key to more sustainable chemistry. The development of new approaches in transition metal catalysis is essential for a plethora of applications. This includes the efficient conversion of base chemicals via selective processes into high-value products and innovative materials. Significant breakthroughs are required for the sustainable exploitation of renewable and earth-abundant resources. Nature incorporates earth-abundant first row transition metals in combination with reactive ligands for essential transformations, while current homogeneous catalysis aimed at the functionalization of substrates is based on scarce, expensive novel metal complexes. Many novel metals and their complexes are toxic in nature. However, most of the first-row transition metals are considered as environmentally friendly. The emerging field of 'cooperative catalysis', which revolves around the functional interplay between ligand sphere and metal center for the activation and conversion of

substrates, is a promising approach. The challenging question that we are trying to address is how to design systems that incorporate earth abundant first row transition metals and cooperative ligands and apply them for small molecule activation and catalysis.

Dr. Bishnu Prasad Biswal

Field of Specialization: Physical and materials chemistry

Development of organic frameworks and composite membranes for energy storage, conversion and water purification.

Dr. Dipak Samanta

Field of Specialization: Inorganic Chemistry

In the past two decades, there has been a huge creative and elegant development of molecular switches and machines that can perform various useful unusual works. Hydrazone switchs has recently become an emerging building block for the rotary motion and its conformational changes have been used as a prototype for the development of an array of chemically activated molecular machines. The switch can isomerize into its two distinct forms (E/Z) through the regulation of pH of the environment. However, the main disadvantage of the switch relied on the fatigue resistance of the switch after a few cycles (5-6). To overcome this problem, we have used chemical fuel for the reversible isomerization of a number of hydrazine switches. With our design, the switching performance has significantly enhanced up to 50 cycles without any significant fatigue. In addition, we synthesized a series of ortho/para-substituted hydrazine switches and investigated their reversibility using UV-vis and NMR spectroscopy. Interestingly, we found with 1 eq. of chemical fuel a different equilibrium state can been generated for the different substituents such as electron withdrawing and donating, and the time of reverse switching was also changes with substituents. Finally, we found reversible switching of methoxyhydrazone using chemical fuel was associated with significant color change from reddish to pale yellow and was employed for rewritable information storage media on commercially available paper.

School of Computer Sciences

Dr. Aritra Banik

Field of Specialization: Algorithms

I have a broad research interest in the study of fixed-parameter tractability of graph theoretic problems. This area focuses on developing efficient algorithms for solving computational problems, particularly in relation to graphs, by incorporating the concept of parameterization. (By analyzing the complexity of these problems with respect to certain parameters, such as the size or structure of the input graph, we aim to identify efficient algorithms that exhibit improved runtime behavior for instances with specific parameter values. Through this research, I aim to contribute to the development of effective solutions for graph theoretic problems and further our understanding of their computational complexity).

Dr. Subhankar Mishra

Field of Specialization: Machine Learning

Machine Learning and Privacy. Focussing on new privacy in graph neural network, differential rendering and learning signed distance function representation of 3D Shapes, lottery ticket hypothesis and quaternion neural networks.

Dr. Anup Kumar Bhattacharya

Field of Specialization: Algorithms, Theoretical Computer Science

Worked on designing randomized algorithms for sample improvement and moment estimation problems.

Dr. Abhishek Sahu (Visiting Faculty)

Field of Specialization: Parameterized Algorithms

One of our primary objectives was to develop Fixed-Parameter Tractable Approximation Schemes (FPT-ASes) for a few important specifications of some very foundational problems such as Maximum Coverage, Max-SAT, and Max-CSP. We focused on achieving approximations in both solution size and the coverage of elements/clauses. After effectively attaining this objective, we were able to expand our findings to a generalized version of Maximum Coverage: one incorporating fairness criteria or, equivalently, the colored variation of the problem. Additionally, we conducted research on various problems, including Perfectly Matched Sets and k-Way Cut within the parameterized framework, and obtained several noteworthy results.

School of Earth and Planetary Sciences

Dr. Guneshwar Thangjam

Field of Specialization: Planetary Science, surface composition, reflectance spectroscopy and imaging

Understanding planetary formation and evolution, including the planet Earth, is one of the prime objectives of Planetary Science. Therefore, the study of planetary surface composition allows us to construct the overall composition and the geologic evolution. In our group, we use remotely acquired images, i.e., hyperspectral and multispectral data in the visible to infrared wavelengths to analyze the surface mineralogy and composition. We also focus on spectral image processing and calibration (e.g., modelling thermal emissivity and photometry considering geometric and roughness effects) to understand the data in terms of their signal-to-noise constraints and the uncertainty in the data. The objects that are of interest are the Moon, Mars, asteroids Ceres and Vesta in the inner solar system and a few others from outer solar system bodies (Europa, Titan, KBOs). Such studies require proper ground truth and cross-calibration, and therefore, laboratory-based works (e.g., geochemical analysis of planetary analogue samples and meteorites using XRD/SEM/Raman; reflectance spectroscopic measurements using FTIR/spectrophotometer) are also planned.

Dr. Liton Majumdar

Field of Specialization: Planetary Science: Planet Formation, Astrochemistry, Exoplanetary Atmospheres

My research interests lie at the interfaces of planet formation, astrochemistry, and exoplanetary science. I primarily focus on understanding the physical and chemical origins and evolutions of planetary systems, including our own Solar System and the thousands of exoplanetary systems discovered in the past two decades. My group takes an interdisciplinary/multidisciplinary approach to studying various aspects of the formation and evolution of planetary systems in order to address some fundamental questions listed below:

(a) How do planets and planetary systems form?

(b) What is the chemical evolution of interstellar material during its journey from clouds to forming stars, and ultimately to new born planets? How common are the ingredients for life, such as water, and do they naturally evolve as part of new planets?

(c) How do planets and their atmospheres evolve over time? What are exoplanets composed of?

(d) How many Earth-like planets exist, and do they possess atmospheres? In other words, is Earth unique?

Dr. Jaya Khanna

Field of Specialization: Atmospheric Science: Regional hydroclimatology, land-climate coupling

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: Planetary Science: Exoplanets, Planetary Atmospheres, Planetary Remote Sensing, Astrobiology

Our 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.

1. Being part of the James Webb Space Telescope (JWST) Early Release Science Program (ERS) program we had exclusive access to data. We observed a hot Jupiter planet WASP-39b and detected CO2 unambigiously for the first time in an exoplanet atmosphere. The grid of models that I developed here at NISER were applied to interpret these observations. This discovery was published in Nature. This was followed by 4 more papers for each instrument mode of JWST applied to WASP-39b to characterize its atmosphere across a range of wavelength and spectral resolution.
2. Priyanka Baghel PhD student in planetary atmospheres group is working on understanding the effect of host start elemental abundancs on the chemistry of exoplanet atmospheres. She also went to ARIES Devasthal 3.6 m Optical Telescope near Nainital to perform observations of exoplanet atmosheres. This is a pilot study to determine capability of India's largest optical-near infrared telescope for exoplanet atmosphere observations.
3. Swadhin Satapathy PhD student in planetary atmospheres group is developing a physical retrieval algorithm to determine Earth's atmospheric and surface porperites wil particular focus on the Indian sub-continent using ISRO's INSAT-3DR satellite. This development will have lot of applications and benefits for weather and climate prediction over the Indian sub-continent.

Dr. Pathikrit Bhattacharya

Field of Specialization: Earth Science: Geophysics

1. 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.

2. 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.

3. Slip sensitivity of frictional strength evolution at ultra-low slip rates (experiments, theory) – In collaboration with the experimental rock deformation group at Brown University, I worked on performing and analyzing experiments that probed frictional strength increase at ultra-low slip rates. We showed, in a surprising result, that the strengthening is dominantly controlled by nanometric amounts of slip.

Dr. Priyadarshi Chowdhury

Field of Specialization: Earth Science: Petrology, Lithosphere dynamics, Early Earth systems, Diffusion kinetics in geosciences

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: Planetary Science: Meteoritics & Cosmochemistry

Research is primarily focused on the study of meteorites and analogue planetary materials to understand the early evolution of the solar system and different solar system bodies:

1. Asteroid and Planetary Surface Processes: Under this research project the exposure ages of grains to solar wind and cosmic ray ions on the surface of different airless solar system bodies are directly studied using chemical etching methods, transmission electron microscopes and noble gas concetration measurements. In addition, an experimental set up is being installed in the ultrafast laser laboratory of Dr. Shovon Pal from SPS. The set up will be used to simulate the process of impact of dust particles on the surface airless bodies and later the samples will be studied using SEM, SEM-EDS, FTIR, and TEM.

2. Impact Shock Effects in Meteorites: Different meteorites show signatures of high shock effects and presence of high pressure phase polymorphs of different mienrals. These minerals provide direct evidence on the transformation process of minerals under high pressure and temperatures. Our research is focused on various outstanding questions related to the formation of diamond and lonsdaleite in ureilite meteorites, formation of high pressure phases in rare enstatite chondrites and new highly shocked meteorites from India.

3. Change in Flux of Extraterrestrial Materials and Cosmic Rays in the Past: The flux of extraterrestrial materials falling on Earth can be estimated by studying micrometeorites preserved in sedimentary rocks from different geologic time periods. In our group we are studying sedimentary rocks from India belonging to Permian and Triassic period which has never been explored before. After extraction of resistant chromite grains from these rocks the element, isotopic and noble gas concentration measurements are done to understand the flux of meteorites in different time windows. Similarly, these grains will also be used to look for cosmic ray tracks produced during travel of the micrometeoroids in space. This is the only method which can provide direct information about change in flux of cosmic rays in the past 500 Myrs.

School of Humanities and Social Sciences

Dr. Pranay Kumar Swain

Field of Specialization: Science-Society Interface, Public Policy and Governance, Social Entrepreneurship, Contemporary Social Issues

Urban Waste Management: Our focus is on household-level waste segregation and littering. The ongoing study intends to understand how people perceive waste and the existing practices related to household-level waste segregation and management. We also intend to dig further and study the policy efficacies and other associated socio-environmental aspects.

Education- Lifeworld of contract teachers: We are trying to capture the factors contributing to precarity of contract teachers in elementary schools in Odisha. Our endeavor continues to further understand the lived experiences to offer doable policy implications.

Gender dysphoria: We have been working on various social aspects of sex reassignment surgeries of transgender people, with a specific focus on their livelihood during the pandemic induced crisis. Issues such as access to health services and willingness to embrace SRS are our focus.

Traditional medicinal practices: We are trying to understand the changes in the embodied health experiences of the people as the system of Sowa Rigpa transitions from Amchi medicine to a more modernized and institutionalised system of medicine.

Dr. Amarendra Das

Field of Specialization: Natural Resource Management, Integrated Environmental and Economic Accounting of Natural Resources. Payments for Ecosystem Services, Damage, Loss, Need Assessment due to Natural Disaster, Energy Transition. Role of formal and informal institutions in Development Disparity, Public Finance, Environmental Economics.

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.

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.

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. Our ongoing research aims to answer these questions.

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.

Dr. Amarjeet Nayak

Field of Specialization: Postcolonial Studies, Speculative Fiction, Translation Studies, Cultural Studies

Under my guidance, PhD scholars are working on areas such as Coetzee Studies, Cultural studies, especially on Purulia Chhau dance, Northeast Indian literature. The Nobel committee considers J.M. Coetzee as a writer who in innumerable guises portrays the surprising involvement of the outsider. When the focus is on the outsider, the quest for a home is implicit. In this regard, the Jesus Trilogy dwells on two outsiders Simõn and David, who pine for a home in the landscape of Novilla and Estrella. The current research interrogates the idea of home from varied perspectives and examines issues such as exile, refugeeism, precarity, precariousness and new life, in relation to home and belonging. With my research group, I am also working on looking at the performing art tradition of Purulia Chhau as a cultural text, while also looking at the historical novels from the northeast region of India.

An article on Coetzee's Jesus trilogy has been published in this academic year titled "A Place to live": The Silence of [Non] Home in the Jesus Trilogy of J.M. Coetzee".

Dr. Joe Varghese Yeldho

Field of Specialization: African American Studies

Urban Spaces, Dwelling, Sound Studies

Dr. Debashis Pattanaik

Field of Specialization: Tourism System, Social aspects of ICT

eSports- There is growing concern about digital entertainment and digital sports today. The process of creativity, engagement, professionalization and social technical issues creates both challenges and opportunities for growth and participation. The research group focuses on professional aspects of eSports in the context of electronic gaming systems.

Tourism- Tourism is a multifaceted system. It is one of the largest growing service sectors in the world, spreading over rural tourism to star rated hotels. The research group focuses on understanding the dynamics of heritage tourism at a UNESCO heritage site of India.

Dr. Rooplekha Khuntia

Field of Specialization: Psychology: Organizational Behaviour, Positive Psychology, Mental health

Research group engages in research areas

resulting in immediate deliverables for some of the most vulnerable groups such as children with neuro developmental disorder and institutionalized children.

Recent research focus is on developing a psychometric instrument for the construct Unconditional Self-Acceptance. While the construct USA is considered as a psychological strength, and has been found to have positive impact on the psychological wellbeing of an individual, empirical studies on the same has been scarce. In addition to developing a psychological measure, this study also explores how USA is associated with quality of life, at the personal and professional levels.

Current research endeavour is towards developing a visual based method to assess the attachment pattern, emotional development among Children in Need of Care and Protection (CNCP). The care that children receive in their formative years is most crucial for their development. In the absence of primary caregivers, institutions play a major role in the emotional development of vulnerable children, who need care and protection. While the number of children in need for care and protection is on the rise in our country, the development of quality foster care systems in India is still in infancy and there is greater reliance on institutional care. Given the psychosocial significance of quality caregiving, the present research is an attempt to understand the interplay of sociodemographic and psychosocial factors associated with child, caregiver and the institution and how they affect these children's emotional development.

School of Mathematical Sciences

Professor Brundaban Sahu

Field of Specialization: Number Theory

1. We derive a simple extension of Ramanujan-Serre derivative map and use it to get a general method to derive certain convolution sums of the divisor functions. We also give explicit expressions for four types of convolution sums.
2. We study nonvanishing of kernel functions for the Jacobi groups, Poincare series and also nonvanishing of 2m Dirichlet series associated with Jacobi form of weight k and index m.

Dr. Binod Kumar Sahoo

Field of Specialization: Incidence Geometry

My research work is related to the characterization of minimum size blocking sets in PG (n,q) (the n-dimensional projective space over a finite field of order q) with respect to certain lines having nice geometric 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: Number Theory

During this period, I mainly worked on 3 problems. The first problem was on a converse theorem for quasimodular forms. In a joint work with M. Charan, K. D. Shankhadhar and R. K. Singh, we have proved an analogue of Weil's converse theorem for quasimodular forms. The second problem was on distinguishing Siegel eigenforms. In a joint work with A. Kumar and K. D. Shankhadhar, we have proved a result which distinguishes Siegel eigenforms from the signs of their eigenvalues. The third problem was on Gaussian hypergeometric series. In a joint work with M. Tripathi, we have obtained many special values of certain Gaussian hypergeometric series.

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 in 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 behaviour of solutions of the Cauchy problem by imposing additional conditions on initial data. we obtain the same asymptotic behaviour of solutions to the Cauchy problem without imposing additional condition on the initial data.

Dr. Sanjay Parui

Field of Specialization: Harmonic Analysis

I am interested to study weighted inequality for classical operators in Dunkl setting.

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.

Dr. Nabin Kumar Jana

Field of Specialization: Probability Theory

Working on application of probabilistis tools to different fields especially in Mathematical proofs.

Dr. K. Senthil Kumar

Field of Specialization: Number Theory

Study of the arithmetic nature of the values of Weierstrass zeta and sigma functions.

Dr. Ritwik Mukherjee

Field of Specialization: Enumerative geometry and Gromov-Witten Invariants

Counting singular curves, relative Gromov-Witten Invariants

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. Kaushik Majumder

Field of Specialization: Combinatorics

Pursuing research work on Ramsey numbers with a PhD student and on Random Matrix with an Int MSc student

Dr. Krishanu Dan

Field of Specialization: Algebraic Geometry

I'm interested in Linear series, more specifically, Seshadri constants on higher dimensional varieties.

Dr. Chitrabhanu Chaudhuri

Field of Specialization: Algebraic Geometry

Teichmuller Theory, Enumerative Geometry, Arakelov theory.

Dr. Sudhir Kumar Pujahari

Field of Specialization: Number Theory

I have been investigating the statistical and arithmetical properties of eigenvalues of Hecke operators. I also have been investigating Bombieri-Vinogradov type theorems for different modulie. During the mentioned I also have studied Turan inequality for plane partition.

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. Sumana Hatui

Field of Specialization: Group theory

My research area broadly lies in algebra, specifically in group theory. My primary research interests are studying two closely related topics, namely the projective representations and Schur multiplier of both finite and infinite groups. Note that every ordinary representation is a projective representation but converse is not true. Therefore the theory of projective representations is richer and more difficult in nature.

Earlier, we gave a construction of irreducible complex projective representations of Discrete Heisenberg groups, Special p-groups, and then continued further for finitely generated nilpotent groups.

For direct product of groups, the description of all the irreducible projective representations are not known. Even, this fact is not known for abelian groups. Recently, we gave a construction of irreducible projective representations for abelian groups, then this method help us to construct irreducible projective representations for direct product of any finite p-groups.

Dr. Tushar Kanta Naik

Field of Specialization: Algebra (Group theory and low-dimensional topology)

My research interests broadly lie in the area of group theory and related topics. I am studying groups that arise naturally in low-dimensional topology. Recently, we studied the structural aspects of twin and virtual twin groups. We also classified finite-dimensional Lie algebras of small breadths.

School of Physical Sciences

Professor Sudhakar Panda, Senior Professor

Field of Specialization: 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.

Professor Bedangadas Mohanty

Field of Specialization: Experimental High Energy Physics and Dark Matter

Experimental High Energy Physics and Dark Matter Group

Dr. Ranbir Singh	Dr. Varchaswi K. S. Kashyap
Mr. Debasish Mallick	Mr. Dukhishyam Mallick
Ms. Mouli Chaudhuri	Mr. Ashish Pandav
Mr. Prottay Das	Ms. Swati Saha
Mr. Sudipta Das	Mr. Bappaditya Mondal
Mr. Sawan	

ALICE

The primary goal of the ALICE experiment at the Large Hadron Collider (LHC) is to investigate

matter under extreme conditions of temperature and energy densities, particularly focusing on the quark-gluon plasma (QGP), a phase of deconfined QCD matter. Within this scope, the NISER group primarily concentrates on analyzing the production of short-lived hadronic resonances in various collision systems and energies. These resonances offer valuable insights into the initial and final stages of heavy-ion collisions, as their spin and lifetime provide information about the evolution of these collisions. Due to their short lifetime, resonances offer a unique probe to understand how the hadronic phase influences the particles produced in heavy-ion collisions. Even after the chemical freeze-out, the reconstructed yields of resonances deviate from the expected values based on thermal models, suggesting the occurrence of phenomena like re-scattering and regeneration during the hadronic phase. To comprehend the impact of the hadronic phase in experiment, the momentum distribution of resonances are measured and their yields are compared to those of stable hadrons. The ALICE detector has carried out measurements on various resonances with different masses, quark compositions, and lifetimes in collisions involving pp, p-Pb, Pb-Pb, and Xe-Xe at various LHC energies. Notably, a significant suppression of the K*/K yield ratio has been observed in central heavy-ion collisions across all centrality classes, indicating that rescattering effects prevail over regeneration in the hadronic phase of these collisions. Recent findings from high-multiplicity pp collisions also demonstrate a suppression of the K*/K yield ratio at low transverse momentum (pT). The charged particle multiplicity in high-multiplicity pp collisions at LHC energies resembles that observed in peripheral Pb-Pb collisions, suggesting the possible presence of a hadronic phase with a non-zero lifetime in smaller collision systems. The NISER group has made substantial contributions to measuring K^(*0) and K^(*±) resonances in pp, p-Pb, Pb-Pb, and Xe-Xe collisions at various center-of-mass energies. These studies have resulted in the four papers, two are accepted for publications in Physical Review C and EPJC, and two papers are under collaboration review.

In heavy-ion collisions, a strong magnetic field is expected to be generated (approximately 1015 T), along with a non-zero electric and axial charge density. These conditions give rise to vector and axial currents known as the Chiral Magnetic Effect (CME) and Chiral Separation Effect (CSE), respectively. The interplay between these effects leads to a collective excitation of the quark-gluon plasma known as the Chiral Magnetic Wave (CMW), which induces charge-dependent elliptic flow. Consequently, the normalized difference in the elliptic flow of positive and negative charges, denoted as Δv_2^norm, exhibits a positive slope as a function of the charge asymmetry A_ch. However, non-CMW mechanisms such as Local Charge Conservation (LCC) can also account for the dependence of ⟦Δv⟧ _2 on A_ch. To further investigate this, a similar measurement is performed with v_3, as it is expected to remain unaffected by the CMW. The paper related to this study is approved by ALICE Physics Board and currently undergoing review in the collaboration.

Furthermore, the NISER group is also involved in studying an exotic resonance particle called f1(1285) in pp collisions. This measurement represents the first exploration of the f1 resonance at the LHC and will provide a fundamental baseline for measurements in p-Pb and Pb-Pb systems at similar energies.

The study of event-by-event mean transverse momentum (pT) fluctuations is a useful tool to understand the dynamics of the system produced in ultrarelativistic heavy-ion collisions. The measurement of higher-order fluctuations of mean-pT can help in probing the hydrodynamic behavior of the system and is considered to be a

direct way of observing initial-state fluctuations. It can also be sensitive to the early-time evolution of the produced quark-gluon plasma. We have done the first measurement of three- and four-particle pT correlators and their intensive ratios, related to the skewness and kurtosis of event-by-event mean-pT distribution, as a function of average charged-particle density in Pb-Pb collisions at √(s"NN") = 5.02 TeV and Xe-Xe collisions at √(s_"NN") = 5.44 TeV using the data recorded by the ALICE detector. For the baseline study, the analysis is performed also in pp collisions at √s = 5.02 TeV. The measurements are compared to corresponding results from different theoretical model predictions. The results are approved by the collaboration and the paper draft is under review.

STAR

One of the primary goals of of STAR experiment is to study the phase diagram of strongly interacting matter - the QCD phase diagram. The QCD phase diagram consists of at least two distinct phases: a QGP phase where quarks and gluons are confined and hadronic phase where they are confined. The nature of phase transition between these two phases has been an active field of research. In this regard, fluctuations, especially higher-order fluctuation of event-by-event net-proton number, have been considered as sensitive observables in the study of QCD phase diagram. The fluctuations are measured in terms of cumulants. The STAR experiment at Brookhaven National Lab had carried out a program called Beam Energy Scan (BES) where Au+Au collisions were performed at a wide range of center-of-mass collision energies from √(s_"NN") = 7.7-200 GeV. This range constitute a total of nine collision energies. We performed measurement of net-proton cumulants up to sixth order. The Time Projection Chamber (TPC) and Time of Flight (TOF) detectors of the STAR were used to select protons and antiprotons for analysis. In the meantime, we extended the cumulants measurements to eighth order and also contributed to the analysis of data from the second phase of BES program (BES-II) which allow for precision measurement of cumulants. The key observations of these studies are i) the sixth order net-proton cumulant grows progressively negative with decreasing collision energy. The observed trend and negative sign are consistent with first-principle lattice QCD calculations with a crossover QGP-hadron phase transition. ii) the experimental measurement of net-proton cumulants up to sixth order in Au+Au collisions showed a particular ordering which is consistent with expectation from QCD thermodynamics. These results are published in Physical Review Letters.

We have also performed measurement of deuteron number cumulants up to fourth order and proton-deuteron correlations. Light nuclei (lighter than Lithium) in the Universe are believed to be created in primordial nucleosynthesis, which happened within a few minutes from the Big Bang when the Universe was cold enough for deuteron to survive. However, high energy heavy-ion collisions where the fireball created freezes out at a temperature of nearly 100 MeV, also copiously produce light nuclei. Study of the production mechanism of light nuclei in such collisions is of immense interest in the community. In this regard, fluctuations of event-by-event deuteron number and proton-deuteron correlations has been considered as sensitive observables to study the production mechanism of deuterons. The fluctuations are measured in terms of cumulants and mixed cumulants. The measurements are done in Au+Au collisions over all nine collision energies data available in Beam Energy Scan (BES) program. A paper draft based on these results is in final round of collaboration review.

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.

NISER is involved in the calculation of Si-32 background which is very crucial for dark matter experiments employing Si detectors. The dark matter-nucleon interaction cross-section is very low (in the order of 10-40 cm2) with the nuclear recoil energy in the order of a few keV for dark matter mass < 10 GeV. This makes the detection of dark matter very difficult and challenging. Si-32 is an isotope of Si that exists from the time of its fabrication. It emits beta particles which act as a source of backgrounds. Our goal is to estimate the decay rate of these isotop. In our study, signal modeling, data selection with basic and quality cuts have been done. We are working on modeling other backgrounds in our analysis and will perform a likelihood analysis to estimate the Si-32 rate.

We are currently working on extending the background models to set limits on the existence of ALPs (Axion Like Particles) and dark photons.

We are also in involved in the Compton step analysis

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.

2. ALICE-FoCal system

The ALICE heavy ion collisions experiment at LHC CERN plans to install a forward calorimeter (FoCal) detector in the far forward region (pseudorapidity interval 3.4 to 5.8) in 2028. The goal of the detector is to measure EM showers of direct photons of few GeV to 1 TeV transverse momentum. The FoCal consists of two parts, namely electromagnetic (EMCal) and hadronic (HCal) calorimeters, respectively. The EMCal will be built using silicon 8x9 pad array sensors (each pad of 1x1 cm2) arranged in layers together with tungsten as an absorber. There will be in total 2000 pad array sensors used in EMCal. The ALICE India collaboration is part of the EMCal project, where the NISER group is involved in the R&D work on qualification studies of pad array sensors fabricated at BEL, Bangalore. The readout electronics is being prepared for this purpose and by the end of 2023, NISER group plans to perform a beam test in an accelerator facility at CERN.

3. Cryogenic detectors for dark matter experiments

Using the NISER's cryogen free dilution refrigerator system currently undergoing upgrade at Texas A & M University, USA, two new detectors (a) Sapphire and (b) Active veto detector have been developed and tested. Sapphire is a scintillation crystal which generates scintillation photons and phonons upon particle interaction. The tested detector shows ~25 eV of baseline resolution and is an excellent candidate for low mass dark matter and CEvNS searches. The design of the active veto detector is such that it has a 25 mm annulus made up of germanium and an inner coin of like detector also made up of germanium of 25 mm diameter and 1 mm thickness. The detector has been shown to reduce ambient radiogenic backgrounds by an order of magnitude. The work on both these detectors have been published.

Simulations

We are doing FoCal simulation and performance studies for direct photons and neutral pions using proton-proton and proton-lead collisions. The azimuthal correlations between direct photons and neutral pions are expected to be sensitive to gluon saturation and can probe saturation scale in nuclei. Our study includes the signal and

background studies in terms of efficiency and purity of direct photons. The correlations in generator and reconstructed levels studied and the process involves unfolding techniques to correct the bin-to-bin migration and efficiency corrections. The simulation results would be a part of FoCal Technical Design Report (TDR) as physics performance studies.

Phenomenology

Along with the experimental data analysis, our group is also involved in the various analysis using QCD based models, thermal model, and Hadron Resonance Gas (HRG) model.The model studies are mainly performed to understand the experimental results. A multiplicity dependent freezeout study is performed in pp collisions at $\sqrt{s}$ = 7 TeV using a thermal model (THERMUS) and the freezeout parameters are extracted. The results are now published in Phys. Rev. C 104, 064905 (2021).

We have studied higher order moments of net-particle fluctuations using the HRG model. In this study, a test of thermal nature of the bulk of medium formed in most central heavy ion collisions is performed using comparison of higher order moments of net-particle fluctuation measurements and the calculations in the HRG model. A paper based on this study is published in Phys. Lett. B 829 (2022) 137021.

Professor Sanjay Kumar Swain

Field of Specialization: Experimental High Energy Physics

My research has few parts:

$B_s^0 \to \mu^+\mu^-$ Data analysis: The physics study of B-mesons were very crucial (among the collider experiments) during 1995-2010. Specifically measurement of CP violation in B-meson decays (through measurement of CKM angles and sides). This eventually earned Nobel Prize to Kobayashi and Maskawa (along with Y Nambu) in 2008. The two experiments: Belle at KEK, Japan and BaBar at SLAC performed different measurements during this period. Although earlier CLEO experiment made several B-physics measurement. One of the most important measurements in the area of B-physics (considered as golden channel) is finding the decay of $B_s^0 \to \mu^+\mu^-$. The search for this decay mode using collider data started during CLEO (Experiment at Cornel University) in 1985. It went on for 30 years without much success on this decay mode. This is significant in a sense, theoretically it is clean (no hadronic uncertainty) and experimentally the final state involves two oppositely charged muons to be detected (although the branching fraction is ~ 10-9). This decay is sensitive to physics beyond the standard model. This analysis is one of the top priority (probably amongst top 5) analyses in the CMS. My student and I have been actively participating and contributing to this analysis. This analysis resulted many papers published in CMS such as in PRL, JHEP, Nature Journal.

Other B-physics analysis and building B-physics analysis group in India: Apart from the $B_s^0 \to \mu^+\mu^-$ the other promising analysis are the angular analysis of B-mesons through their FCNC rare decay channels, such as B-> K*0 etc. Currently the group has 3- 4 faculties from India who have prior expertise in B-analysis and several students taking up multiple analysis projects. Also the group is participating effective lifetime analysis for different B-meson decays.

SUSY analysis: We know that standard model is not the ultimate theory of elementary particle physics at all energy scales. It's only tested up to electroweak scale (~200 GeV). Standard model has many drawbacks such as it cannot explain the known non-zero neutrino masses, presence of dark matter, stability of Higgs mass, hierarchy problem and many more. One theory that is generally preferred and accepted among scientists is SUSY (super symmetric theory), which fills the gap of standard model. As per

SUSY, there is another set of particles (than standard model particles) that must exist in nature. But those particles are never seen in any past collider experiments. It was/is expected that LHC would be able to see those particle as LHC can go to higher energy scale. My group participates in search for SUSY using the data collected with the CMS experiment at LHC.

CMS Phase-II tracker upgrade: One of the most ambitious projects I have undertaken is to build 2000 modules of silicon tracking detector that is going to be installed for CMS phase-II upgrade (2024-2025). During Phase-II of the run, the LHC luminosity is planned to go up to 2-5 x 1034 /cm2sec. With this configuration, the pile up is expected to be around 150-200 compared to current average value of 20-30. The L1 trigger rate will be around 750 kHz compared to current 100 kHz. The increase in channel number will be significant (10 million channels now, to 200 million channels). This new tracker will have close to 8000 modules for the barrel region out of which 25% will be build by NISER. The component will be machined in different parts of the world and will be sent to NISER for fabrication and test of the complete SI-detector module. Since last two years the R&D work has already started and the simple version of module with glass plates (instead of silicon sensors) has been built with the required precision. This project is planned to be finished in collaboration with IIT Madras, IIT BBS, IOP, SINP, and Delhi University with NISER as the main production and testing center. Below shows the pictorial view of one module after and before assembly (on the upper part) and the side view (lower part of the picture).

Participation in Neutrino project (NOvA): My previous short experience in MINOS data analysis motivated me to go for similar neutrino experiment and participate in physics data analysis, as there are still large interesting undiscovered questions in neutrino physics. This is complementary to the searches we do in CMS experiment. I found the two most important unresolved questions in neutrino physics are: (a) mass hierarchy and (b) search for sterile neutrino species. Decades of neutrino experimental programs have not been able to resolve these due to low statistics. I started the NOvA experiment year ago with ~113 lakhs support from DST and is participating precisely these two sectors, which are not resolved (there are many other unresolved questions in neutrino sector as well). I have two PhD students funded by DST projects: one working in mass hierarchy and other one in sterile neutrino search.

Dr. Anamitra Mukherjee

Field of Specialization: Condensed Matter Theory

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. Ashok Kumar Mohapatra

Field of Specialization: Experimental Condensed Matter Physics

Currently, the group is working on 2 major projects.

1. Study of coherent Rydberg excitation in a thermal and ultra-cold atomic vapor.

The long term objective of the project is to realize strong photon-photon interactions using the non-linearity mediated by Rydberg blockade interaction. Rydberg blockade is the phenomenon

where more than one atom within the blockade volume cannot be excited to the Rydberg state using a monochromatic laser beam due to strong Rydberg-Rydberg interaction. Recently the group has demonstrated the blockade interaction in thermal atomic vapour which has a potential application in quantum information processing and quantum computation. The group has developed the set up for ultra-cold atoms to study blockade interaction as well as interaction facilitated enhanced Rydberg excitation.

Recently, the group investigated the four-photon excitation to the Rydberg state theoretically where the residual Doppler shift in thermal vapour can be overcome using Suitable beam geometry. The theoretical results promises the observation of Rydberg blockade mediated optical nonlinearity for single photon which can be used for quantum computation and quantum technology. Also, the four-photon excitation in cold atoms will reduce the decoherence and hence increase the fidelity of the quantum gates based on Rydberg blockade.

2. Study of Mirrorless optical parametric oscillator (MOPO) using four wave mixing (FWM) enhanced by ground state coherence in thermal atomic vapour

Ground state coherence in atomic vapour can enhance the optical non-linearity and one of the striking examples are EIT induced enhancement of cross-phase modulation (XPM) and four wave mixing (FWM) etc. The group has recently demonstrated MOPO, where the new fields are generated spontaneously through FWM process in the presence of strong pump and control fields. In this case the driving fields are counter-propagating to each other leading to the feedback due to efficient FWM in the system. The generated fields have a lasing threshold which has been studied in the same system in the last decade. However, the system has also possess large XPM of the generated fields due to the presence of strong driving fields resulting in all-optical wave-guiding of the generated fields. The correlated wave-guided modes like Gaussian, Laguerre-Gaussian and Hermite-Gaussian modes are observed depending on the experimental parameters. Also the system display a bistability in the MOPO threshold which is demonstrated by the group the associated non-equillibrium phase transition is investigated in detail.

In the recent experiments, the group is involved in developing preciasion magnetometry based on Zeeman state coherence and four wave mixing process. The observed experimental results has applications in accurate measurement of radio frequency magnetic field with state of the art precision and which would ultimately helps in detection of dark matter.

Dr. Colin Benjamin

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

I work on 3 independent topics, following is the list of submitted manuscripts under each-

a. Theoretical nanoscale science:

I have concentrated mainly on 3 aspects: 1. quantum noise and 2. detecting ajorana bound states and 3. Odd-frequency superconductivity.

b. Quantum information theory:

In quantum information theory I have mainly confined myself to quantum cyclic heat engines, discrete time quantum walks and quantum stochastic walks.

c. Game Theory

Finally, in Game theory we have shown that Nash equilibrium mapping can better model social dilemmas in the thermodynamic limit analytically than either Hamiltonian dynamics model or Darwinian evolution.

Dr. Chethan N. Gowdigere

Field of Specialization: String theory

Contemporary Topics in String and Field Theory

- Study of Monopole Operators in Three Dimensional Chern-Simons-Matter Theories
- Applying Conformal Bootstrap Techniques to Study Universality Classes in Statistical Mechanics
- Study of Fermion Zero Modes above Black Hole Solutions in Supergravity Theories

Dr. Kartikeswar Senapati

Field of Specialization: Superconductivity

Ongoing research on (i) Detection of Rashba-Edelstein effect using Josephson junctions and SQUIDs (ii) NiBi3 nanorod Josephson Junctions (iii) Combining spin-orbit and ferromagnetic interactions for generation of triplet supercurrent in vertical nanoscale junctions.

Dr. Nishikanta Khandai

Field of Specialization: Astrophysics and Cosmology

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

a. Understanding the distribution of Neutral Hydrogen in the Post-Reionization Universe.

b. Modeling the distribution of HI in the local Universe.

c. Understanding the clustering of the IGM in the local Universe.

d. Using the pair-velocities of galaxies as a probe of cosmology.

e. The dependance of dark matter halo shapes on the index of the power spectrum.

f. Understanding the Properties of Metal Absorbers in the IGM and CGM

g. The detection of Gravitational Waves from Supermassive Blackholes Mergers in next generation detectors.

Dr. Prasanjit Samal

Field of Specialization: Density Functional Theory

Density-Functional Theory (DFT) and its application in Atomic and Molecular Physics, Computational Materials Science, Condensed Matter Physics, Quantum Theory of Solid-State, Theoretical quantum chemistry.

Our main 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. 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.

The scientific research we performed having a great impact on the scientific community based on the outcomes. The overall goal and far-reaching consequences of our research are to understand the potential material functionalities including the bulk to two-dimensional nanoscale solids, ab-initio structure prediction, the study of structural phase transition, novel properties of solids, engineer and understand the fundamental as well as functional material properties of wide classes of quantum systems by developing accurate density functional methods. The methods we develope can be used for next-generation electronic, optoelectronics, renewable energy-efficient systems generation, and quantum information applications development. We are also enthusiastic to explore several new fields of many-body physics within and beyond density functional approaches. Our developed methodologies of research can be further used by many-body physicists and experimentalists to understand the new physical properties of emerging systems.

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.

Our brief research activities are as follows:

- Theoretical Development of Density Functional Theory (DFT) and beyond DFT methods
- All areas of modern ab-initio and many-body methods applied to realistic materials or molecular systems
- Corespectroscopy (XPS and XAS) for molecules and solids
- Theoretical and Computational Quantum Chemistry
- Dispersion corrected density functional theory, New non-local correlation methods for van der Waals molecules and solids.
- Density functional theory for strongly interacting systems
- Molecular dynamics simulation
- Time-dependent density functional theory (TD-DFT)
- Two-dimensional materials and Hetero-structures.
- Study of interfaces between the metal surface and organic compounds.
- Dimensional Crossover problems. DFT in two dimensions.
- Ab-initio study of structural phase transition of solids, Optical properties of solids and clusters. Ab-initio study of water and water-solid interactions.
- Development of the semilocal and hybrid exchange-correlation functionals within density functional theory and Screened meta-GGA hybrids for solids.
- Exchange-correlation functionals for low dimensional systems based on the density matrix expansion based techniques and the development of Colle-Salvetti type correlation energy functional.
- Development of the Pseudo-potential approach for meta-GGA functionals in plane wave basis set codes.
- Development of the accurate semi-local exchange potential for band gap calculations.
- TDDFT applied to molecules and solids with meta-GGA kernels. Applying meta-GGA range-separated functionals in the time-dependent DFT.
- Development of dielectric dependent meta-GGA level range-separated hybrid functionals. Dielectric-dependent hybrid functionals.
- Use of non-local van der Waals density functionals with semi-local exchange-correlation functionals.
- Study of non-local electron correlation in biological molecules and their interaction with metal surfaces.
- Study of the meta-GGA level hybrid functionals in the prediction of excited state properties: A comprehensive comparison with many body GW approximations.

Dr. Pratap Kumar Sahoo

Field of Specialization: Experimental Condensed Matter Physics

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 sensing applications, (b) multifunctional properties of nanomaterials such as ZnO nanorods, TiO2 nanorods for device applications. The highlight 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 materials modifications. In case of high energy > 5 MeV the energy deposition can raise the temperatyure up to 100 of kelvin in the materials along an ion track off radius 1-10 nm, which can alter the properties of the material drastically. One can tune continuously of 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.

- Intermetallic compounds NiBi3and NiBi are known to form sponta-neously at the interface of Ni and Bi thin films, which become superconducting below ~ 4.2 K. Synthesis of these compounds is a slow diffusion-reaction, which means the local environment around Ni and Bi atoms may vary with time and temperature.
- Another thrust area is ion Beam induced dewetting for composite nanodot for super-hydrophobic application. We have demonstrated the self-organized evolution of Au-Si and Au-Ge composite nanodots under medium keV energy ion irradiation on a thin Au-Si and Au-Ge bi-layer structure on SiO2 surface. A new mechanism was developed to explain the phenomena, i.e a synergetic effect of dewetting, sputtering, and mixing results in the evolution of a nanodot array through different stages.

b. Multifunctional properties of nanomaterials:

Presently, research on nano particles and nanowires 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 system i.e. ZnO for fundamental studies and for novel device fabrication.

- A proposed phonon tunnel device and non-contact Nano-thermometry based on zinc oxide twin nanorod junctions: We have demonstrated the phonon tunnel device between two crystalline ZnO nanorods with an amorphous junction. Typical electron tunneling devices consist of thick metal layers separated by ultrathin insulating layers which allows for a finite tunneling probability for electrons.
- We also demonstrate that the individual ZnO NRs can be used as highly sensitive cryogenic temperature sensors below ~175 K.
- We address another problem of tunable field emission properties by making a unique corrugated decoration of Au on densely packed vertical ZnO nanotapers. We have been able to combine the two most important features of any desirable field emission material (viz. low turn-on potential and uniform spatial emission profile) in one system with Kelvin probe force microscopy (KPFM) and Tunnelling Atomic Force Microscopy (TUNA) techniques.
- We have demonstrated the single nanorod based p-n, p-n-p and p-n-p-n type tendom junction after successive ion implantation using suitable ion energies. These Nanorods are also highly luminescence, which can be used as photodiodes and phototransistors.

Dr. Ritwick Das

Field of Specialization: Nonlinear Optics and Lasers

We, at the School of Physical Sciences at NISER,

are focusing on Nonlinear Photonics which userly include generation of high-power radiations at wavelengths different from the conventional Laser sources and are tunable across a band of wavelengths or frequencies. The underlying physical processes include Second-Harmonic-Generation (SHG), Third-Harmonic-Generation (THG), Optical-Parametric-Generation/Oscillation (OPG/OPO), Four-Wave-Mixing (FWM) etc. in the bulk as well as waveguiding geometries. The field of Nano-Photonics and Plasmonics is another area where we are laying significant emphasis. We are theoretically and experimentally investigating the surface optical properties/surface states of periodic and aperiodic photonic lattices in order to ascertain topological phases in such systems. By carrying out such investigations, we aim to reduce the design as well as fabrication tolerances in modern-generation photonic/optical systems for applications in spectroscopy/sensing / communications. Our laboartory possess variety of fiber lasers which includes single-frequency, continuous-wave 40.0 W Yb-fiber laser and 20.0 W green fiber laser. Also, we have added high-pulse energy Yb-fiber laser (>30 microjoule) with ultrashort (< 300 femtosecond) pulse-width to be used for various nonlinear optical studies.

Dr. Shamik Banerjee

Field of Specialization: String Theory

My research is focusedon understanding asymptotic symmetries in asymptotically flat space-time and its relation to scattering amplitudes. In four dimensional space time the asymptotic symmetries form an infinite dimensional symmetry algebra. Our goal is to use this infinite dimensional algebra to simplify calculation of complicated scattering amplitudes. We have succeeded in doing so in case of tree level graviton and gluon scattering amplitudes. Recently, based on this symmetry algebra (technically known as w-infinity) we have identified an infinite number of gravitational theories in which graviton scattering amplitudes can be calculated exactly.

Dr. Subhankar Bedanta

Field of Specialization: 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 spin pumping, organic spintronics, magnon-magnon coupling, spin Seebeck effect (SSE), ferromagnet (FM)/fullerene system on flexible substrate, domain dynamics, synthetic antiferromagnets (SAF), spin-orbit torque (SOT) 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/ -W systems. Magnon-magnon coupling has also been explored in FiM/FiM systems. Additionally, our group has developed the SSE measurement set-up and thoroughly investigated the LSMO/Pt.

Further, our group focuses on domain and skyrmion dynamics. Recently, we have stabilized skyrmions in Pt/Co and Pt/CoFeB thin films at room temperature (RT). For Pt/CoFeB system we could drive the skyrmions at a low critical current density than the previous reports. In addition, we have successfully optimized synthetic antiferromagnetic (SAF) thin film using Ir or Ru as a spacer layer. 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. Subhasis Basak

Field of Specialization: Theoretical High Energy Physics

Presently the group is working on the following.

a) Bottom baryon spectroscopy with staggered lighter quarks (u/d, s, c) and NRQCD bottom quarks has been attempted for the first time. The difficulty in constructing local heavy baryon operator using staggered quarks have been overcome by redefining di-quark part of the operator. The associated spectrum and hyperfine mass splittings obtained matches with PDG values (where available) within 1 .

b) Heavy tetraquarks Zb (10610) and Zb* (10650) with minimal quark content of bbud have been reproduced with the same formalism built for the heavy baryon spectroscopy. GEVP analysis and potential model calculations are carried out to establish the nature of the tetraquark viz. 4-quark deeply bound tetraquark state or BB* bound state.

c) Random Matrix spectrum of minimally doubled fermions is carried out to establish its Eigen spectra and understand the nonperturbative parity restoration, which is violated at the action level in minimally doubled fermions.

Dr. Yogesh Srivastava

Field of Specialization: High energy theory, String theory

I currently work on topics related to black holes in String theory and extension of gauge-gravity duality to time-dependent backgrounds.

Dr. A. V. Anil Kumar

Field of Specialization: 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 Specialization: Condensed Matter Experiment

In the last one year, the group has focused its research on two important topics, magnetic

skyrmions/antiskyrmions and tuning of anomalous Hall effect. In the following a summary of the research works based on the above two works are discussed.

Skyrmions/Antiskyrmions:

Magnetic skyrmions/antiskyrmions are topologically protected nontrivial chiral spin configurations that can move by in low current density avoiding defectd, hence are considered as excellent candidates for the future high density memory devices. Although Skyrmions are mostly found in the non-centrosymmetric chiral magnets due to competition between the Dzyaloshinskii-Moriya interaction (DMI) and the exchange

Interaction, recently, skyrmion-like whirling spin textures are found in certain centrosymmetric magnets. The stabilization of skyrmions comes as a result of competing dipolar energy and the uniaxial magnetic anisotropy. In one of our recent work, we utilize Lorentz transmission electron microscopy (LTEM) study to report the finding of skyrmion lattice up to room temperature in the centrosymmetric kagome ferromagnet Mn4Ga2Sn. A controlled switching between the topological skyrmions and non-topological type-II magnetic bubbles can be realized in the system. We also show that the topological skyrmions are the energetically most stable magnetic objects in the centrosymmetric hexagonal magnets. Application of in-plane magnetic field stabilizes type-II magnetic bubbles as an excited state.

In another work related to magnetic antiskyrmions, the evidence of a tunable antiskyrmion phase is shown in the D2d-symmetry-based tetragonal Heusler system $Mn_{2+x}Ni_{1-x}Ga$. With the help of dc magnetization, ac susceptibility, and topological Hall effect measurements, it is demonstrated that the potential antiskyrmion phase can be tuned over a wide compositional range with magnetic ordering temperature of above 600 K. Micromagnetic simulations is carried out to show that the transition from antiskyrmionium and antiskyrmion pockets to the conventional antiskyrmion phase at the optimal value of magnetic anisotropy might be responsible for the observed multiple topological transitions in the present materials.

Anomalous Hall effect in Mn-Pt(Ir)-Sn System:

The observation of large anomalous Hall effect in certain non-ferromagnetic and non-ferrimagnetic materials suggest that the magnetization of the system is not a critical component for the realization of the anomalous Hall Effect (AHE). With the help of a combined theoretical and experimental study, we demonstrate the evolution of different mechanisms of AHE in a cubic Heusler system $MnPt_{1-x}Ir_xSn$. We perform magnetization and neutron diffraction studies to show that the substitution of nonmagnetic Ir in place of Pt significantly reduces the net magnetic moment from 4.17 μB/f.u. in MnPtSn to 2.78 μB/f.u. for $MnPt_{0.5}Ir_{0.5}Sn$. However, the anomalous Hall resistivity is enhanced by nearly three times for the Ir doped sample. Our analysis of the Hall resistivity data suggests that the extrinsic contribution of AHE that dominates in the case of the parent MnPtSn almost vanishes for $MnPt_{0.5}Ir_{0.5}Sn$, where the intrinsic mechanism plays the major role. Finally, the experimental results are well supported by our theoretical study which shows a considerable enhancement of the spin-orbit coupling when Ir is introduced into the system.

Dr. Amaresh Kumar Jaiswal

Field of Specialization: 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. Ashis Kumar Nandy

Field of Specialization: Condensed Matter Theory

Our primary focus has been to understand topological magnetism, unveil the mechanism of topological superconductivity in the presence of noncollinear magnetism, unconventional transport phenomena due to chiral magnetism, strongly correlation physics in oxides etc. These studies are performed using numerical methods within ab initio electronic structure calculations and model Hamiltonian approaches using in-house codes.

Dr. Joydeep Bhattacharjee

Field of Specialization: Condensed Matter Theory

Computational Materials Science from first principles and model Hamiltonian

Direction of research: magnetism, catalysis, transport, topological protection of states etc. in the lightest low-dimensional systems - graphene, hexgonal boron nitride, germanene etc. and their hybrids and functional forms

Introduction: With the aim of proposing new materials and methodologies towards solving some of the contemporary problems faced by humanity, such as, securing clean green energy resources and environment, our group focuses on computationally understanding electronic, optical and magnetic properties, and their interplay in primarily low-dimensional systems from first principles as well as model Hamiltonian. We compute and analyse electronic structure of the ground and excited states in layered structures made of the lightest of the elements known to self-assemble into extended structures in normal temperature and pressure, namely, boron, carbon, nitrogen and oxygen, within the frameworks of density functional theory with refinements to include self-energy corrections and correlations through mean-field approximation of Hubbard model.

Dr. Kush Saha

Field of Specialization: Condensed Matter Theory

Our group has a broad range of interests in condensed matter physics with specific focus on physics of ultracold atomic gas loaded in optical lattices, topological phases of matter and Dirac semimetals. Over the course of last several months, we have been involved in studying non-Hermitian physics in Rice-Mele models. In particular, we have examined the effect of non-Hermiticity on the topological boundary modes and topological pumping.

We have also focused on undertsanding Floquet Phenomena in higher order topological materials. We have analyzed the stroboscopic dynamics of hinge modes of a second-order topological materials and showed existence of several interesting dynamics of hinge mode at special frequencies.

Recently, we have started working on non-linear response of quantum systems. In particular, we have studied the interplay between disorder and interaction in the presence of a strong light pulse field. We have shown that the particle current can contain only odd harmonics in the delocalized phase in contrast to the localised phase where both even and odd harmonics are identified. The relative magnitudes of these even and odd harmonics and sharpness of the peaks can be tuned by varying frequency and the number of cycles of the applied pulse.

Dr. Najmul Haque

Field of Specialization: Theoretical High Energy Physics

High energy heavy ion physics (Theory)

1. Properties of meson in a warm magnetised medium
2. Curvature of QCD phase transition line from NNLO HTLpt thermodynamics
3. Heavy Quark Diffusion in Perturbative QCD at Next-next-to-Leading Order
4. Quark and Gluon propagator in a hot magnetised medium
5. Thermodynamics of deconfined hot and dense magnetised nuclear medium

Dr. Prolay Kumar Mal

Field of Specialization: Experimental High Energy Physics

Brief of Research Activity

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 into the rare signatures of top pair production in association with photons and Z boson with LHC Run II dataset at $\sqrt{s}$=13 TeV. In particular his student immensely contributed to the very first CMS analysis on the photon associated top quark pair production using the Run II dataset. In the context of SM Higgs and beyond, his group members are quite involved in the Run II analysis with diphoton signature. Here, his group has led the tHq analysis (leptonic decay of top quark) and the Run II legacy paper has been published including the tHq analysis for the very first time. Presently, his students and group members are also pursuing precision measurements on some of the top quark properties.

In addition, he is leading the NISER-CMS group in terms of CMS detector upgrade program scheduled in next few years. During this period the LHC is scheduled to undergo several luminosity upgrade programs where the number of interactions per proton-proton branch crossing would heavily be increased. In such an environment, any physics analyses would require event filtering based on the tracking detector. Dr. Mal is actively involved in the CMS upgrade program for developing suitable track triggering mechanism, as well as in building the tracking detector for High-Luminosity LHC (HL-LHC). During HL-LHC, the CMS Outer Tracker (OT) would completely be replaced with a brand new Silicon pixel/strip detectors. Detailed designing and feasibility studies for the same have been documented in the CMS OT Technical Design Report. NISER-CMS has group has taken the responsibility to build 2000 modules consisting of Silicon strip detectors. The responsibility involves assembly of such detector modules, electrical testing and temperature cycling, and integration of the modules into ladder structure. Presently, the NISER-CMS facility is setup with most of the major equipments required for this assembly works. The ladder integrated strip detectors are expected to delivered/shipped to CERN by 2023, while successful prototyping of modules are to be completed by 2020. Dr. Mal is the contact person from NISER-CMS group for the

successful execution and timely delivery of these detectors to CERN. Furthermore, he and his group members are working on the performance studies for the present CMS tracker, studies with different HEP event generators, development of monitoring tools for CMS L1 trigger system, etc. He has regularly been participating in CMS detector operations and data-taking.

Dr. Sayantani Bhattacharyya

Field of Specialization: String theory

In past one year, She is working with two Ph.D. students Parthajit Biswas, Anirban Dinda and two Integrated Ph.D she is am working on new perturbative techniques ('large dimension' expansion) to generate dynamical black hole solutions and they are comparing it with other existing techniques. Last year we had two publications in Journal of High Energy Physics and one arXiv preprint, which got published this year. In these projects we also collaborate with Yogesh Dandekar, post doctoral fellow in ICTS. The another parallel project that she was working on along with Anirban, Shuvayu, Nilay Kundu (faculty in IITK) and Jyotirmoy Bhattacharya (faculty in IITKgp) is about generalizing the concept of entropy current to higher derivative theories of gravity. However, this project has not lead to any publication so far. Dr. Pratim Roy, post-doctoral fellow in our group, is independently working on the holographic aspects of complexity. Last year he has one publication.

Dr. Sumedha

Field of Specialization: Statistical Mechanics

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. Tuhin Ghosh

Field of Specialization: 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:

1. Testing statistical isotropy (SI) of CMB E-mode polarization and Galactic foregrounds, especially synchrotron emission and polarization. For SI test of random fields, we use the statistical methods like Minkowski Functionals, Minkowski Tensors and Directionality test.
2. Development of PSF photometry pipeline for the PASIPHAE survey. It is an international

collaboration with members from University of Crete, Caltech, South African Astronomical Observatory, IUCAA, and University of Oslo.

3. Forecasting of tensor-to-scalar ratio r for the proposed ISRO CMB mission ECHO (Exploring Cosmic History and Origins) and optimizing the frequency coverage to achieve the target sensitivity of r ~ 10-3 in presence of complex foreground models.

Dr. V Ravi Chandra

Field of Specialization: Condensed Matter Theory

We have initiated in collaboration with Dr. Kallol Mondal (Postdoctoral fellow, NISER) and Mr. V. V. Jyothis (PhD student, NISER) the analysis of magnon-magnon interactions on the linear spin wave band structure for Heisenberg magnets with anisotropic interactions on the pyrochlore lattice. In prior work with Mr. V. V. Jyothis and Mr. Bibabasu Patra, which is being finalised for submission, we have mapped out four different phases in the spin wave phase diagram depending on the Dzyaloshinskii-Moriya interaction and spin-ice anisotropy. These are the ferromagnetic and antiferromagnetic splay phases, the all-in-all-out phase and a coplanar phase. Some of these phases have bulk band structures associated with point or line degeneracies whose spectrum with open boundary conditions have signatures of some edge-dominated eigenstates. We are investigating how much of this analysis will survive the introduction of magnon interactions by considering effects beyond linear spin wave theory.

In collaboration, we completed the analysis of spin wave band structures of finite slabs of the pyrochlore lattice with Heisenberg exchange, Dzyaloshinskii-Moriya interactions and spin-ice anisotropy. We analysed for 40, 60 and 80 layers of the Hamiltonian detailed edge spectra for both ferromagnetic and antiferromagnetic phases of the model for three different terminations of the lattice.

We found the presence of several kinds of band degeneracies and associated edge state structures, spectral non-reciprocities and analysed instances of bulk boundary correspondence. These results have been presented at conferences and a manuscript has been submitted and is currently under review. Building on this work we have now analysed in detail the dependence of the magnon spectrum of this model in the presence of a magnetic field. In particular, we analysed the bulk and slab spectra for fields along the [111], [100] and [110] directions. We find that the location of the Weyl points in the ferromagnetic Hamiltonian shifts to different directions and nodal lines evolve to point degeneracies in the antiferromagnetic case. We have also completed preliminary calculations of the thermal Hall conductivity in this class of models. In parallel, the effect of magnon interactions on the physics of this class of models is also ongoing. All the above work is in collaboration with Mr. V. V. Jyothis (PhD student, NISER), Mr. Mavani Himanshu and Mr. Haraprasad Dhal (Master's students, NISER) and Dr. Kallol Mondal (Postdoctoral fellow, NISER).

In a different research direction we have extended our previous work on many body localisation (MBL) in one dimensional disordered fermionic chains and have studied the finite size scaling behaviour of disorder averaged local density of states and scattering rates. We found, both for systems with short range interactions as well as algebraically decaying long range interactions, that the critical exponent associated with the correlation length of the transition satisfies the Chayes-Chayes-Fisher-Spencer (CCFS) inequality. This has been a often debated and contentious issue in the field of MBL because several of the commonly studied quantities to characterise the transition do not

satisfy this general inequality expected for broadly defined disorder driven transitions. Our analysis identifies experimentally relevant physical quantities which do satisfy the CCFS criterion for a whole class of disordered models with several different ranges of interactions. These results have been presented at conferences and have been communicated to a journal and the review process is currently ongoing. This work is in collaboration with Mr. Atanu Jana (PhD student, NISER) and Dr. Arti Garg (SINP).

Dr. Victor Roy

Field of Specialization: High energy heavy-ion collisions

The main focus of the group is to study and develop relativistic hydro/magnetohydrodynamics for application in high-energy heavy-ion collisions. In one of our recent work we derive a first-order, stable and causal, relativistic hydrodynamic theory from the microscopic kinetic equation using the gradient expansion technique in a general frame. The general frame is introduced from the arbitrary matching conditions for hydrodynamic fields. The interaction is introduced in the relativistic Boltzmann equation through the momentum-dependent relaxation time approximation (MDRTA) with the proposed collision operator that preserves the conservation laws. We demonstrate here for the first time that not only the general frame choice but also the momentum dependence of microscopic interaction rate, captured through MDRTA, is imperative for producing the essential field corrections that give rise to a causal and stable first-order relativistic theory.

In another work we derive the first and second-order expressions for the shear, the bulk viscosity, and the thermal conductivity of a relativistic hot boson gas in a magnetic field using the relativistic kinetic theory within the Chapman-Enskog method. The order-by-order off-equilibrium distribution function is obtained in terms of the associated Laguerre polynomial with magnetic field-dependent coefficients using the relativistic Boltzmann-Uehling-Uhlenbeck transport equation. The order-by-order anisotropic transport coefficients are evaluated in powers of the dimensionless ratio of kinetic energy to the fluid temperature for finite magnetic fields. In a magnetic field, the shear viscosity (in all order) splits into five different coefficients. Four of them show a magnetic field dependence as seen in a previous study [1] using the relaxation time approximation for the collision kernel. On the other hand, bulk viscosity, which splits into three components (in all order), is independent of the magnetic field. The thermal conductivity shows a similar splitting but is field-dependent. The difference in the first and second-order results are more prominent for the thermal conductivities than the shear viscosity; moreover, the difference in the two results is most evident at low temperatures. The first and second-order results seem to converge rapidly for high temperatures.

Dr. Luke Chamandy

Field of Specialization: Astrophysics

Interacting binary stars, magnetic fields of galaxies

Dr. Tapan Mishra

Field of Specialization: Theoretical Condensed Matter Physics

Condensed matter theory, quantum simulations and computation

Our primary focus has been to understand localization transitions in quasiperiodic systems, ground state properties of interacting many-body systems, interaction induced topological phase transitions in low dimensional lattices, quantum walk of interacting particles. These studies are performed using numerical methods.

Dr. Atul Varshney

Field of Specialization: Soft Condensed Matter Physics

Flows in nature and those employed in industry usually occur at speeds at which the flow looses its stability and exhibits complex flow patterns involving eddies, cross-stream motions, and complete randomness in its velocity distribution. Such patterns are hallmarks of turbulent flow, which causes higher frictional drag compared to the steady (laminar) flow. Turbulent drag in cardiovascular flows is believed to give rise to a variety of vascular diseases--a leading cause of mortality globally.

Controlling frictional drag in fluid flows continues to be a challenging problem. The observation that has received the most attention in this area is the reduction of frictional drag up to 80% when long-chain, flexible, polymers are added at low concentrations into turbulent flow of ordinary fluids, such as water. In addition, polymers are shown to be effective in impeding the formation of atherosclerotic lesions.

The focus of Soft Matter and Complex Fluids group will be to investigate a hydrodynamic instabilities and turbulence in the context of cardiovascular flows and their effects on blood vessels, and b drag reducing properties of polymers, which inhibit the formation of atherosclerotic lesions.

Dr. Satyaprasad P. Senanayak

Field of Specialization: Semiconductor, Nanoelectronics and Device Physics

The research of my group is focused on fundamental understanding of the charge transport and photo-physics of organic semiconductors, perovskites, self-assembled nanostructures 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, spectroscopic, microscopic, 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.

Major results:

Development of p-type perovskite nanocrystal FETs:

High performance p-type perovskite FETs are demonstrated using perovskite nanocrystals which is not only fundamentally interesting to understand the charge transport mechanism in perovskite-based semiconductors but also can have the possibility to overcome the Moore's law of scaling. Furthermore, the effect of semiconductor dimensionality is explored.

Relating Mechanical Property of Semiconductor with Charge Transport

Measurement of the mechanical properties of conjugated polymers can be a useful tool to reveal information linking optoelectronic properties to underlying microstructures and also allows deciding appropriate processing condition for designing high performance optoelectronic devices. We use dynamical mechanical analysis to determine the Tg of a range of state-of-the-art conjugated polymers with different degrees of crystallinity that are widely studied for applications in organic field-effect transistors and compare with the charge transport behaviour.

Role of grain boundaries in charge transport of double perovskite

Halide double perovskites have gained significant attention, owing to their composition

of low-toxicity elements, stability in air, and recent demonstrations of long charge-carrier lifetimes that can exceed 1 μs. However, the efficiencies of solar cells based on this double perovskite are still far from the theoretical efficiency limit of the material. Here, the role of grain size on the optoelectronic properties of Cs2AgBiBr6 thin films is investigated through a combination of microscopic, spectroscopic and charge transport measurement.

Dr. Shovon Pal

Field of Specialization: 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. Narayan Rana

Field of Specialization: Theoretical High Energy Physics

Precision computations for collider observables, presently working on mixed QCD-EW corrections to Drell-Yan process which is significant for precision measurement of the electroweak parameters.

Dr. G. Santosh Babu

Field of specialization: Teaching and developing physics experiments

My work overview is improving and teaching experiments for first semester lab, modern physics lab, solid state lab and open ended lab.

Setup the open ended lab experiments namely proof of existence of single photons and single photon interference, Capacitance Voltage profiling using LABVIEW, setup Double pendulum experiment. Setup experiment Ultra Voilet-A ray exposure setup for 'UVA-induced Fuch's endothelial corneal dystrophy (FECD) in mice' for Dr.Debasmita Alone lab, SBS in animal house.

Centre for Interdisciplinary Sciences

Nanoscience and nanotechnology involves the study, developments and understanding of materials at nanometer scale. This multidisplinarysubject area is the interface between Physics, Chemistry, Materials Science,Electronics and Biology. It imparts the ability in researcher to observe and design

materials at nanometer scale leading to development of materialswith enhanced properties, new nanoelectronics components that can mimic a biological system, smart medicine and nanosensors. To carry forward this interdisciplinary research and characterization lead to the concept of the "Center for Interdisciplinary Sciences (CIS)".

CIS is being developed into a new state-of-the-art interdisciplinary research center at National Institute of Science Education and Research (NISER) Bhubaneswar. This center is bringing scientists together from different disciplines e.g. biology, chemistry, material science, and physics. This center widens the strength of NISER infrastructure which will open up newer research activities.

Center for Interdisciplinary Sciences (CIS) is an interdisciplinary centre where research from different areas is performed under one umbrella. Faculties, staffs, Phd students, Post docs from various schools of NISER viz. Biology, Physics, Chemistry, Earth & Planetary Sciences, perform their research activities in CIS. The CIS has been inaugurated officially since 2019 though the inception of CIS has been started from 2014. Currently, about 35 faculties, 20 postdocs, 100 PhD students from different schools and several external users are using CIS facility.

CIS houses a couple state of art of electron spectroscopy, microscopy techniques, advance imaging and advance analytical techniques such as

i. High resolution transimission electron microscope (HR- TEM)
ii. Field emission scanning electron microscope (FE-SEM with cryo option)
iii. Raman spectrometer (with cryo option)
iv. MALDI-TOF mass spectrometry
v. TRIPLE-TOF NANO LC & UPLC
vi. non Biological sample preparation unit for transimission electron microscope
vii. Biological sample preparation unit for transimission electron microscope
viii. Fourier transform infrared (FTIR) spectroscopy
ix. Time resolved fluorescence microscope
x. Super resolution microscope
xi. Optical microscopes

CIS is also organising the Outreach programme under which students and teachers from different schools and universities come and visit CIS labs and learn and gain knowledge about them.

Centre for Medical and Radiation Physics

Dr. Ganesh Jagannath Tambave

My expertise is on the development of silicon based detector technology for high energy physics experiments. ALICE is a detector dedicated to heavy-ion physics at the Large Hadron Collider (LHC). The main physics goal of ALICE is to study the physics of strongly interacting matter at extreme energy densities, where a phase of matter called quark-gluon plasma forms. Currently, at NISER I am coordinating the hardware activities for the ALICE FoCal (forward electromagnetic and hadronic calorimeter) experiment, which is an upgrade to the ALICE experiment that is to be installed during Long Shutdown 3 (LS3) for data-taking in 2027-2029 at the LHC. The FoCal provides unique capabilities to measure small-x gluon distributions via prompt photon production and will significantly enhance the scope of ALICE for inclusive and correlation measurements with mesons, photons, and jets to explore the dynamics of hadronic matter at small x down to about 10^{-6}. At NISER, using my expertise on the silicon detector technology, we are developing

pad based silicon technology for the electromagnetic calorimeter of FoCal. We will also develop silicon detectors for medical imaging purposes.

Dr. Shuddha Shankar Dasgupta

We are participating in the R & D of photon detector technologies needed for future Electron Ion Collider (EIC) Particle identification (PID) studies. My expertise is in MPGD based particle detectors. As detectors of single photons act as the photo sensors for Ring Imaging Cherenkov Counters (RICHs) in Collider Experiments (e.g. COMPASS RICH at CERN SPS), I am also interested in participating and benchmarking the different PD technologies with respect to SiPMs. We will be contributing to the Electorn-Proton/Ion Collider (EPIC) detector at EIC on design, prototyping and fabrication related to photon detector technologies in the next few years. MPGD Based Hybrid Detectors of single photons can be studied as the detectors for social security devices and Medical Imaging devices. A dedicated R & D for developing a prototype of a Computed Tomography (CT) machine with MPGD based detector is being considered.

Dr. Raveendrababu Karnam

My expertise is R & D on the resistive plate chambers (RPC). Muon radiography is an imaging technique that produces a projectional image of a target volume by exploiting the abundant natural flux of cosmic-ray muons (μ) in the Earth's atmosphere. At NISER, we are developing a portable muon radiography telescope based on RPCs. Their compact size, low cost, excellent space and time resolutions, and the stability of their response make RPCs an attractive choice for muon radiography. The telescope can be used to image small targets in situations at underground and/or confined environments (e.g. tunnels) with complex logistics, such as in archaeology, geological surveys, etc.

Mr. Lalatendu Mishra

I am working for the establishment of a NABL accredited calibration laboratory at CMRP. A laboratory equipped with a Telecobalt unit will be used to calibrate the Cylindrical Ionization Chambers and Parallel plate ionization chambers. These cylindrical and parallel plate ionization chambers are used for the dosimetry of photon and electron beams respectively in a Radiation Oncology department. This proposal also includes setting up another facility equipped with two brachytherapy units to calibrate the Well type Ionization chambers used for the validation of the source strength of Ir-192 and Co-60 radioactive source used in a Radiation Oncology Department. Various humanoid phantoms will be developed and validated for patient dosimetry. A Primary Standard will be developed for measuring the Absorbed Dose to water.

Mr. Kirti Prakash Sharma

My expertise is in Electronics Circuit design, simulation and PCB design. I am currently working on the development of electronics for the ALICE FOCAL detector. In future I will be involved in the development of electronics detectors developed for medical applications at NISER.

Awards, Honours & Recognitions

School of Biological Sciences

Professor Chandan Goswami

- Served as the "DAAD Research Ambassador for 2018-2022"
- Obtained "Letter of appreciation" for teaching performance from NISER

Professor Palok Aich

- Director (March 2023-present), MicrobioTx Health Pvt. Ltd.

Dr. Asima Bhattacharyya

- Biochemical Society, UK, Member of Policy Network
- Editorial board member: Current Research in Physiology, Elsevier.
- Associate guest editor of a special edition: Frontiers in Microbiology. Topic- Microbial sensing to control host immune responses.
- Handling editor: Frontiers in Oncology

Dr. Debasmita Pankaj Alone

- Appointed as Co-opted Member of the expert committee in Life Sciences on SRG, NPDF & ECRA schemes in SERB (2021-2024).
- Chair, Best Platform Presentations, All India Cell Biology Conference, Banaras Hindu University, 22nd January 2023.

Dr. Harapriya Mohapatra

- Reviewer for several international journals such as Current Microbiology, PLoS One, Frontiers in Microbiology, BMC Microbiology

Dr. Kishore CS Panigrahi

- Mercator Fellow
- Visiting Professor to Heinrich Heine University, Dusseldorf, Germany
- Key-note speaker at Agrivision 2023, Knowledge Partner
- Recognised as a Research Alumni Ambassador to Heinrich Heine University 2022.

Dr. Manjusha Dixit

- Article selected for Cover page in AACR journal Molecular Cancer Research (https://doi.org/10.1158/1541-7786.MCR-20-1044)
- Article selected as HIGHLIGHTS in AACR journal Molecular Cancer Research (https://aacrjournals.org/mcr/article/20/1/1/674925/Selected-Articles-from-This-Issue)
- Reviewed research grant SERB-DST

Dr. Aniruddha Datta Roy

- New species of spider named after NISER (Siler niser)

Dr. Mohammad Saleem

- DBT/Wellcome Trust Intermediate Fellowship Award Activated (01/10/2021 - 21/09/2026)
- Invited as a chair for the annual talks of NCBS themed "Patterns in Biology"

Dr. K. Himabindu Vasuki

- Tel Aviv International post-doctoral fellowship award, 2018-2022, International fellowship.

Dr. Shyamasree Ghosh

- AZRA-Young Scientist Award, conferred on XVIII AZRA International Conference" on 10-12 November, 2022, Odisha, India.
- Won the best essay in Vigilance Awareness week, NISER 2022
- Received Certificate the Second Prize from Director, NISER in Cybersecurity Quiz Held on the occasion of Cybersecurity Awareness Programme on 05-06 January 2023.
- ISEA Certified Cyber Hygiene Practitioner conferred by Ministry of Electronics &

Information Technology (MeitY), Government of India, 6th Jan 2023

- Godhulir Arghya: Sahityo Sammanna Award 2022
- Kabita kutir Award: May 2022

School of Chemical Sciences

Professor Chidambaram Gunanathan

- Received CRSI Bronze medal and Appointed as Co-opted member of SERB-Expert Committee.
- Accepted the invitation to serve as Editorial Board Member of Journal of Chemical Sciences (Jan-2023 to Dec-2025).
- Top 3% highly cited author of 2019-2020 from India in American Chemical Society.

Professor Himansu Sekhar Biswal

- Affiliate member of the Royal Society of Chemistry, UK
- Member, Board of Studies, Chemistry, HBNI
- Member Project Assessment Committee , DST, Govt. of Odisha
- Member, Board of Studies, Chemistry, CET, Odisha
- Member, Board of Studies, Chemistry, Berhampur University, Odisha

Dr. Ponneri C. Ravikumar

- Awarded CRSI Bronze Medal for significant contribution to Research in Chemical Sciences. (Date: 2nd February 2023.
- Recognized by American Chemical Society (ACS) as Top 3% highly cited ACS Author from India. (Date: 19th August 2022).

Dr. Upakarasamy Lourderaj

- sCRSI-Bronze Medal of 2022

Dr. Jogendra Nath Behera

- "Highly cited author 2021" in the Royal Society of Chemistry journals for publishing research in the top 5% of highly cited works from Indian institutions"

Dr. Nagendra Kumar Sharma

- Reviewers of various journal: OBC, JOC, ACS Omega, NJC, OL,

Dr. Bishnu Prasad Biswal

- Vishnu Ji Ram Memorial Award (2022), BIT Mesra, India
- Top 2% Most Influential Scientists (Single Year) in 2023 by Stanford University.

School of Computer Sciences

Dr. Subhankar Mishra

- Fulbright-Nehru Academic & Professional Excellence Award (2021-22)
- Best Paper Award (CODS COMAD-YRS Track)
- MIMA Project selected for DST Fellowship for Incubation

School of Humanities and Social Sciences

Dr. Amarendra Das

- Springer Nature Best Paper Award 2023 for the paper titled "A Comprehensive Methodology for the Post Disaster Damages, Losses and Need Assessment" at the Resilience and Sustainability Summit: Vision 2047 (RESSUMMIT2047) Organized by: Department of Science & Technology (DST), Government of India, New Delhi & National Institute of Disaster Management (NIDM), Ministry of Home Affairs, Delhi during January 17-19, 2023. Co-authors were Sasmita Behera and Bishnupada Sethi.
- Executive Committee Member, The Indian Econometric Society (TIES)
- Serving as the Secretary, Odisha Economic Association
- Resource Person for Odisha State Higher Education Council for the Odisha Higher

Education Program for Excellence and Equity Project" (OHEPEE)

Dr. Joe Varghese Yeldho

- Letter of Appreciation for Teaching, H210, 20th March, 2023.

School of Mathematical Sciences

Dr. Jaban Meher

- Received Chebyshev grant to attend ICM 2022 in Russia.

Dr. Sutanu Roy

- CNRS visiting researcher at the Laboratoire de mathematiques de Besancon in 2023.

School of Physical Sciences

Professor Bedangadas Mohanty

- Elected as the Deputy spokesperson of the ALICE collaboration
- Elected as India-ALICE-STAR Spokesperson (2021-2022)
- Mr. Sudipta Das working under Prof. Bedangadas Mohanty got selected for the best group attending the laboratory sessions at the XV ICFA School on Instrumentation in elementary particle physics at TIFR, Mumbai.
- Dr. Samir Banik working under Prof. Bedangadas Mohanty, PhD thesis received the honourable mention by the IPA award committee for Rahul Basu memorial best thesis in high energy physics 2020-2022.
- Dr. Dukhishyam Mallick working under Prof. Bedangadas Mohanty received best poster recognition in the Quark Matter Conference, Krakow, Poland, April 4-10, 2022

Dr. Anamitra Mukherjee

- "Novel Recursive Green's function technique in the Fock space & Applications", MATRICS grant (Grant No. MTR/2022/000636) from the Science and Engineering Research Board (SERB), 2022-2025.

Dr. Colin Benjamin

- Resource person for ATAL FDP program of AICTE under MHRD, Govt. of India
- Referee for SERB projects of SERB, DST, Govt. of India.
- Referee for journals from Elsevier, APS, AIP, Wiley, IOP, Springer, Nature Publishing group

Dr. Shamik Banerjee

- INSA Medal for Young Scientists 2022, 27.1.2023

Dr. Amaresh Kumar Jaiswal

- Young Achiever Award, DAE Symposium on Nuclear Physics 2022

Publications

Articles in Professional Journals

School of Biological Sciences

Professor Chandan Goswami

1. Chakraborty, R., Acharya, T. K., Tiwari, N., Majhi, R. K., Kumar, S., Goswami, L., & Goswami, C. (2022). Hydrogel-mediated release of TRPV1 modulators to fine tune osteoclastogenesis. ACS omega, 7(11), 9537-9550. doi: 10.1021/acsomega.1c06915
2. Chakraborty, R., & Goswami, C. (2022). Both heat-sensitive TRPV4 and cold-sensitive TRPM8 ion channels regulate microglial activity. Biochemical and Biophysical Research Communications, 611, 132-139. doi: 10.1016/j.bbrc.2022.04.032
3. Das, R., Kumar, A., Dalai, R., & Goswami, C. (2022). Cytochrome C interacts with the pathogenic mutational hotspot region of TRPV4 and forms complexes that differ in mutation and metal ion-sensitive manner. Biochemical and Biophysical Research Communications, 611, 172-178. doi: 10.1016/j.bbrc.2022.04.066
4. Saha, S., Mohanta, S., Das, R., Dalai, R., Divyanshi, Tiwari, N.,.. & Goswami, C. (2022). Ratio of Hydrophobic-Hydrophilic and Positive-Negative Residues at Lipid-Water-Interface Influences Surface Expression and Channel Gating of TRPV1. The Journal of Membrane Biology, 255(2-3), 319-339. doi: 10.1007/s00232-022-00243-z
5. Singh, A., Kumar, S., Acharya, T. K., Goswami, C., & Goswami, L. (2022). Application of nanohydroxyapatite - polysaccharide based biomaterial for bone cell mineralization in tissue engineering. Materials Today Communications, 31, 103783. doi: 10.1016/j.mtcomm.2022.103783
6. Acharya, T. K., Sahu, R. P., Kumar, S., Rokade, T. P., Chakraborty, R., Dubey, N. K., ... & Goswami, C. (2022). Function and regulation of thermosensitive ion channel TRPV4 in the immune system. Current Topics in Membranes, 89, 155-188. doi: 10.1016/ bs.ctm. 2022.07.002
7. Das, R., & Goswami, C. (2022). Role of TRPV4 in skeletal function and its mutant-mediated skeletal disorders. Current Topics in Membranes, 89, 221-246. doi: 10.1016/bs. ctm. 2022.07.004
8. Jain, A., Sahu, R. P., & Goswami, C. (2022). Olmsted syndrome causing point mutants of TRPV3 (G568C and G568D) show defects in intracellular Ca2+-mobilization and induce lysosomal defects. Biochemical and Biophysical Research Communications, 628, 32-39. doi: 10.1016/j.bbrc.2022.08.026
9. Swain, N., Samanta, L., Goswami, C., Kar, S., Majhi, R. K., Kumar, S., & Dixit, A. (2022). TRPV1 channel in spermatozoa is a molecular target for ROS-mediated sperm dysfunction and differentially expressed in both natural and ART pregnancy failure. Frontiers in Cell and Developmental Biology, 10, 867057. doi: 10.3389/fcell.2022.867057
10. Acharya, T. K., Kumar, A., Majhi, R. K., Kumar, S., Chakraborty, R., Tiwari, A., ... & Goswami, C. (2022). TRPV4 acts as a mitochondrial Ca2+-importer and regulates mitochondrial temperature and metabolism. Mitochondrion, 67, 38-58. doi: 10.1016/j.mito.2022.10.001
11. Acharya, T. K., Kumar, A., Kumar, S., & Goswami, C. (2022). TRPV4 interacts with MFN2 and facilitates endoplasmic reticulum-mitochondrial contact points for Ca^{2+}-buffering. Life Sciences, 310, 121112. doi: 10.1016/j.lfs.2022.121112
12. Sahu, R. P., & Goswami, C. (2023). Presence of TRPV3 in macrophage lysosomes helps in skin wound healing against bacterial infection. Experimental Dermatology, 32(1), 60-74. doi: 10.1111/exd.14683
13. Das, R., Mohanta, S., Dubey, N. K., Das, N. K., & Goswami, C. (2023). Human skeletal dysplasia causing L596P-mutant alters the conserved amino acid pattern at the lipid-water-Interface of TRPV4. Biochimica et Biophysica Acta (BBA)-Biomembranes, 1865(2), 184085. doi: 10.1016/j.bbamem.2022.184085
14. Acharya, T. K., Kumar, S., Rokade, T. P., Chang, Y.

T., & Goswami, C. (2023). TRPV4 regulates mitochondrial Ca2+-status and physiology in primary murine T cells based on their immunological state. Life Sciences, 318, 121493. doi: 10.1016/j.lfs.2023.121493

15. Kar, M. R., Kumar, S., Acharya, T. K., Goswami, C., & Bhaumik, S. (2023). Highly water-stable, luminescent, and monodisperse polymer-coated CsPbBr 3 nanocrystals for imaging in living cells with better sensitivity. RSC advances, 13(9), 5946-5956. doi: 10.1039/D2RA07019G

16. Mohapatra, A., Kumar, S., Acharya, T. K., Goswami, C., & Bhaumik, S. (2023). Highly stable multi-encapsulated red-emitting cesium lead halide nanocrystals for efficient copper ion detection and imaging in live cells. Journal of Alloys and Compounds, 947, 169453. doi: 10.1016/j.jallcom.2023.169453

Professor Palok Aich

17. Pandey, U., Tambat, S., & Aich, P. (2023). Postnatal 14D is the Key Window for Mice Intestinal Development An Insight from Age Dependent Antibiotic Mediated Gut Microbial Dysbiosis Study. Advanced Biology, 2300089. doi: 10.1002/adbi.202300089

18. Panda, S. S., Nayak, A., Shah, S., & Aich, P. (2023). A Systematic Review on the Association between Obesity and Mood Disorders and the Role of Gut Microbiota. Metabolites, 13(4), 488. doi: 10.3390/metabo13040488

19. Singh, D., Pandey, S., Ghosh, A., & Aich, P. (2023). Effects of constant darkness on behaviour and physiology of male and female mice. European Journal of Neuroscience, 57(9), 1498-1515. doi: 10.1111/ejn.15972

20. Singh, D., Ambati, A. P., & Aich, P. (2023). Sex and Time: Important Variables for Understanding the Impact of Constant Darkness on Behavior, Brain, and Physiology. Neuroscience, 519, 73-89. doi: 10.1016/j.neuroscience.2023.03.016

21. Mukhopadhyay, S., Pattnaik, T., & Aich, P. (2022). A deeper understanding of the gut microbiota of different human races in search of disease specific microbial and metabolic biomarkers. Microenviron Microecol Res, 4(4), 18. doi: 10.53388/MMR2022018

22. Mukhopadhyay, S., Ray, P., & Aich, P. (2023). A comparative analysis of gut microbial dysbiosis by select antibiotics and DSS to understand the effects of perturbation on the host immunity and metabolism. Life Sciences, 312, 121212. doi: 10.1016/j.lfs.2022.121212

23. Chu, L. M., Karunanayake, C., Aich, P., Hecker, M., & Pahwa, P. (2022). Association between liver enzymes and metabolic syndrome in Canadian adults: results from the Canadian health measures survey-cycles 3 &4. Journal of Diabetes & Metabolic Disorders, 21(2), 1699-1708. doi: 10.1007/s40200-022-01124-x

24. Mukhopadhyay, S. and Aich, P. (2022). Cost-Effective Method for gDNA Isolation from the Cecal Content and High Yield Procedure for RNA Isolation from the Colonic Tissue of Mice. Bio-protocol 12(15): e4484. doi: 10.21769/BioProtoc.4484.

25. Bellanti, F., Buglio, A. L., Dobrakowski, M., Kasperczyk, A., Kasperczyk, S., Aich, P., ... & Vendemiale, G. (2022). Impact of sodium glucose cotransporter-2 inhibitors on liver steatosis/fibrosis/inflammation and redox balance in non-alcoholic fatty liver disease. World Journal of Gastroenterology, 28(26), 3243. doi: 10.3748/wjg.v28.i26.3243

26. Mukherjee, R., Pandey, S., Ghosh, A., & Aich, P. (2022). Effects of starch-rich or fat-rich diets on metabolism, adiposity, and glycemia in immune-biased, C57BL/6 and BALB/c mice. The Journal of Nutritional Biochemistry, 108, 109086. doi: 10.1016/j.jnutbio.2022.109086.

27. Pandey, U., & Aich, P. (2023). Postnatal intestinal mucosa and gut microbial composition develop hand in hand: a mouse study. biomedical journal, 46(2), 100519. doi: 10.1016/j.bj.2022.03.004

28. Mukhopadhyay, S., Saha, S., Chakraborty, S., Prasad, P., Ghosh, A., & Aich, P. (2022). Differential colitis susceptibility of Th1-and Th2-biased mice: A multi-omics approach. Plos one, 17(3), e0264400. doi: 10.1371/journal.pone.0264400

Dr. Asima Bhattacharyya

29. Dixit, P., Suratkal, S. S., Kokate, S. B., Chakraborty, D., Poirah, I., Samal, S., ... & Bhattacharyya, A.

(2022). Siah2-GRP78 interaction regulates ROS and provides a proliferative advantage to Helicobacter pylori-infected gastric epithelial cancer cells. Cellular and Molecular Life Sciences, 79(8), 414. doi: 10.1007/s00018-022-04437-5

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31. Sayed, I. M., Bhattacharyya, A., & Das, S. (2022). Microbial sensing to control host immune responses. Frontiers in Microbiology, 13, 4100. doi: 10.3389/fmicb.2022.1054640

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Dr. Debasmita Pankaj Alone

33. Chakraborty, M., Das, R. K., Samal, S., Das, S., & Alone, D. P. (2022). Fuchs endothelial corneal dystrophy associated risk variant, rs3768617 in LAMC1 shows allele specific binding of GFI1B. Gene, 817, 146179. doi: 10.1016/j.gene.2021.146179

34. Kapuganti, R. S., Mohanty, P. P., & Alone, D. P. (2022). Quantitative analysis of circulating levels of vimentin, clusterin and fibulin-5 in patients with pseudoexfoliation syndrome and glaucoma. Experimental Eye Research, 224, 109236. doi: 10.1016/j.exer.2022.109236

35. Padhy, B., Kapuganti, R. S., Hayat, B., Mohanty, P. P., & Alone, D. P. (2023). Wide-spread enhancer effect of SNP rs2279590 on regulating epoxide hydrolase-2 and protein tyrosine kinase 2-beta gene expression. Gene, 854, 147096. doi: 10.1016/j.gene.2022.147096

36. Chakraborty, M., Jandhyam, H., Basak, S. K., Das, S., & Alone, D. P. (2023). Intergenic variants, rs1200114 and rs1200108 are genetically associated along with a decreased ATP1B1 expression in Fuchs Endothelial Corneal Dystrophy. Experimental Eye Research, 228, 109403. doi: 10.1016/j.exer.2023.109403

37. Kapuganti, R. S., Bharati, B., Mohanty, P. P., & Alone, D. P. (2023). Genetic variants and haplotypes in fibulin-5 (FBLN5) are associated with pseudoexfoliation glaucoma but not with pseudoexfoliation syndrome. Bioscience Reports, 43(3), BSR20221622. doi: 10.1042 / BSR20221622

Dr. Kishore CS Panigrahi

38. Patnaik, A., Kumar, A., Behera, A., Mishra, G., Dehery, S. K., Panigrahy, M., ... & Panigrahi, K. C. (2023). GIGANTEA supresses wilt disease resistance by down-regulating the jasmonate signaling in Arabidopsis thaliana. Frontiers in Plant Science, 14, 1091644. doi: 10.3389/fpls.2023.1091644

39. Manasa, L. S., Panigrahy, M., Panigrahi, K. C., Mishra, G., Panda, S. K., & Rout, G. R. (2023). Cold Tolerance Mechanisms in Mungbean (Vigna radiata L.) Genotypes during Germination. Agriculture, 13(2), 315. doi: 10.3390/agriculture13020315

40. Panigrahy, M., Panigrahi, K. C. S., Poli, Y., Ranga, A., & Majeed, N. (2022). Integrated expression analysis of small RNA, degradome and microarray reveals complex regulatory action of miRNA during prolonged shade in swarnaprabha rice. Biology, 11(5), 798. doi: 10.3390/biology11050798

41. Manasa, S., Panigrahy, M., Panigrahi, K. C., & Rout, G. R. (2022). Morphological Characterization and Germination-Based Screening for Cold Stress Response of Vigna radiata L. International Journal of Plant & Soil Science, 34(24), 14-27. doi: 10.9734/ijpss/2022/v34i242609

42. Patnaik, A., Alavilli, H., Rath, J., Panigrahi, K. C., & Panigrahy, M. (2022). Variations in circadian clock organization & function: A journey from ancient to recent. Planta, 256(5), 91. doi: 10.1007/s00425-022-04002-1

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dark induced senescence in Arabidopsis. Journal of Plant Biochemistry and Biotechnology, 31(3), 489-510. doi: 10.1007/s13562-021-00682-0

44. Biswal, D. P., & Panigrahi, K. C. S. (2022). Red Light and Glucose Enhance Cytokinin-Mediated Bud Initial Formation in Physcomitrium patens. Plants, 11(5), 707. doi: 10.3390/plants11050707

45. Manasa S, L., Panigrahy, M., Panigrahi, K. C., & Rout, G. R. (2022). Overview of cold stress regulation in plants. The Botanical Review, 88, 359-387p. doi: 10.1007/s12229-021-09267-x

Dr. Manjusha Dixit

46. Palo, A., Besra, K., & Dixit, M. (2023). Gallbladder cancer-associated genetic variants rs1003349 and rs1004030 regulate MMP14 expression by altering SOX10-and MYB-binding sites. Human Molecular Genetics, ddad077. doi: 10.1093/hmg/ddad077

47. Mukherjee, B., Brahma, P., Mohapatra, T., Chawla, S., & Dixit, M. (2023). Reduced FRG1 expression promotes angiogenesis via activation of the FGF2□mediated ERK/AKT pathway. FEBS Open bio, 13(5), 804-817. doi: 10.1002/2211-5463.13582

48. Palo, A., Patel, S. A., Sahoo, B., Chowdary, T. K., & Dixit, M. (2023). FRG1 is a direct transcriptional regulator of nonsense-mediated mRNA decay genes. Genomics, 115(1), 110539. doi: 10.1016/j.ygeno.2022.110539

49. Palai, B. B., Patel, S. A., Sharma, N. K., & Dixit, M. (2022). One-pot synthesis of cyclic-aminotropiminium carboxylate derivatives with DNA binding and anticancer properties. Communications Chemistry, 5(1), 179. doi: 10.1038/s42004-022-00798-x

50. Mohapatra, T., & Dixit, M. (2022). IQ Motif Containing GTPase Activating Proteins (IQGAPs), A-Kinase Anchoring Proteins (AKAPs) and Kinase Suppressor of Ras Proteins (KSRs) in Scaffolding Oncogenic Pathways and Their Therapeutic Potential. ACS omega, 7(50), 45837-45848.doi: 10.1021/acsomega.2c05505

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Dr. Praful Singru

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E., ... & Lechan, R. M. (2022). Origin of thyrotropin-releasing hormone neurons that innervate the tuberomammillary nuclei. Brain Structure and Function, 227(7), 2329-2347. doi: 10.1007/s00429-022-02527-5

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Dr. Ramanujam Srinivasan

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Dr. Rudresh Acharya

65. Dash, P., & Acharya, R. (2022). Distinct Modes of Hidden Structural Dynamics in the Functioning of an Allosteric Polysaccharide Lyase. ACS Central Science, 8(7), 933-947. doi: 10.1021/acscentsci.2c00277

Dr. Subhasis Chattopadhyay

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Journal Editorships

Professor Chandan Goswami

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- Editorial Board Member: Medicine in Microecology. Elsevier
- Associate Editor: Frontiers in Cellular and Infection Microbiology (section: Microbiome in Health and Disease). Frontiers

Dr. Asima Bhattacharyya

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- Associate guest editor: Frontiers in Microbiology (special edition). Topic- Microbial sensing to control host immune responses. Frontiers
- Handling editor: Frontiers in Oncology. Frontiers
- Ad-hoc reviewer: for the Journals during 2022-23: Biochimica et Biophysica Acta (BBA)-Molecular Basis of Disease (1), Toxicology and Applied Pharmacology (1), Cytokine (3), Cancer Communications (1)

Dr. Harapriya Mohapatra

- Guest Associate Editor: Frontiers in Cellular and Infection Microbiology section Molecular Bacterial Pathogenesis. Frontiers

Dr. Manjusha Dixit

- Editorial board member: Scientific Reports. Nature Publishers
- Editorial board member: BMC Cancer.BioMed Central, Springer Nature.

Dr. Subhasis Chattopadhyay

- Review Editor: Frontiers in Immunology, Cellular and Infection Microbiology.Frontiers

Dr. V Badireenath Konkimalla

- Reviewer: Current Bioactive Compounds, Chemical Biology & Drug Design, Current Topics in Medicinal Chemistry, European Journal of Pharmaceutics and Biopharmaceutics, Biomed International, Frontiers in Pharmacology, Journal of Biomaterial Science-Polymer, Life sciences
- Editorial Board member: Current Topics in Medicinal Chemistry, Current Bioactive Compounds

Dr. Aniruddha Datta Roy

- Subject editor: Zootaxa, Magnolia Press. (worldwide skink related submissions)

Dr. Mohammad Saleem

- Expert Reviewer: CEFIPRA (Indo-French Centre for the Promotion of Advanced Research) in the area of membrane biology/ reconstitution biology.

Dr. Swagata Ghatak

- Guest editor: Frontiers in Neuroscience, Frontiers Media S.A.

Dr. Shyamasree Ghosh

- Associate Editor: Frontiers in Immunology, Cancer Immunity and Immunotherapy. Frontiers.

- IANCAS-ERC as Board of Editors and as Officials of IANCAS-ERC as Executive Committee member.

Dr. Chandra Sekhar Purohit

- Guest Editor: Frontiers in Chemistry, Frontiers Media S.A., Switzerland.Frontiers.

Dr. Prasenjit Mal

- Associate Editor: Special Issue (Visible Light Photocatalysis); Journal Molecules. MDPI

Dr. Bishnu Prasad Biswal

- Associate Editor: Frontiers in Chemistry. Frontiers.

Dr. Pathikrit Bhattacharya

- Handling Editor: Seismica (a peer-reviewed, community-driven diamond open-access journal). Seismica

Dr. Priyadarshi Chowdhury

- Editorial Board Member: Geology (a high-impact, peer-reviewed journal in the field of Earth Sciences). Geological Society of America

Dr. Pranay Kumar Swain

- Article Editor: Sage Open, Sage

Dr. Amarendra Das

- Associate Editor:Odisha Economic Journal Published by Odisha Economic Association

Dr. Binod Kumar Sahoo

- Editorial Board Member: Innovations in Incidence Geometry. Mathematical Sciences Publishers

Professor Bedangadas Mohanty

- Editor: International Journal of Modern Physics E. World Scientific
- Subject Editor: Proceedings of the Indian National Science Academy. Springer
- Editorial Board Member: Nuclear Science and Techniques. Springer

Dr. Subhankar Bedanta

- Journal of Superconductivity and Novel Magnetism. Springer
- Journal of Magnetism and Magnetic Materials. Elsevier Sciencedirect
- Frontiers in Nanotechnology. Frontiers
- Frontiers in Condensed Matter Physics. Frontiers

- **Dr. Tapan Mishra**
- Review Editor, Frontiers in Physics, Frontiers

Talks Delivered (Invited/Contributory)

Professor Chandan Goswami

- TalkTitle: Ion channels in health and disease: Noble prize 2021 and future research. April 2nd, 2022. National Seminar of Department of Botany, Shailabala Women's college, Cuttack.
- Talk Title: TRP ion channels in health and disease: Microbiology and Immunology. 11th May 11th, 2022.Seminar on "Microbes for Better Tomorrow" at Department of Life Sciences, Rama Devi Women's University. Bhubaneswar.
- Talk Title: TRP ion channels and its importance in reproductive biology. July 27th, 2022. National Symposium on Biotechnology for sustainable development-2022 RGCB, Thiruvananthapuram.
- Talk Title: Cholesterol, amino acids at lipid-water-interface and molecular evolution of TRPV ion channels.July 28th, 2022. Departmental seminar, IISER-Thiruvananthapuram.
- Talk Title: Analysing mitochondrial structure and functions: Use of different molecular probes and novel microscopic techniques - relevant for diseases and health (ICT). One Week Workshop on Hands-on Experiences on High-end Instruments" during 3rd-7th Jan 2023 at SDI Bhubaneswar as a part of Teachers' Training Program.
- Symposium on Interdisciplinary Sciences (SIS-1) conference. 27-28th Jan 2023
- Talk Title: Analysing subcellular structure and functions: Use of different molecular probes and novel microscopic techniques - relevant for diseases and health
- Talk Title: TRPV4 acts as a mitochondrial Ca^{2+}-importer and regulates mitochondrial temperature, ER-Mito contact points and metabolism. Feb10th, 2023. EMSI 2023. Delhi University.
- Talk Title: 400 years of microscopy and milestones in cell imaging. Refresher Course in Bio Technology, Utkal University. Feb 13th 2023(On-line talk).
- Talk Title: Molecular evolution of TRPV1 at the lipid-water interface and Cholesterol. February 23rd, 2023. Departmental Seminar.P.G. Department of Biotechnology, Utkal University, Bhubaneswar.
- Talk Title: TRP channels in sub-cellular organelle structure and functions: Importance in mitochondrial and lysosomal biology. Mar 31st, 2023. SBS Talk, NISER.

Professor Palok Aich

- 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. HomiBhabha National Institute Theme Meeting on Life Sciences. Feb 16-17, 2023. Saha Institute of Nuclear Physics, Kolkata, India.
- Title of the talk: Gut-Adipose-Brain Axis: An important regulator of Metabolism and Immunity. 6th Biennial Conference of Pai & International Symposium on Psychobiotics and Gut: Potential in Neurological Disorders, December 5-6, 2022. Organized by: Probiotic Association of India, in association with ICAR-National Dairy Research Institute, Karnal & DUVASU, Mathura, India.

Dr. Abdur Rahaman

- 91st Annual Meeting of Society of Biological Chemists (India) Life at the Confluence of Biology and Chemistry, Kolkata 8 -11 December, 2022.
- Invited to give a lecture in Ciliate Molecular Biology Conference, Institute of Human Genetics, Montpellier.

Dr. Asima Bhattacharyya

- Invited webinar: A minimally-invasive physiological tool for biomedical research. University of Calcutta, Dept. of Physiology, 2 Nov, 2022.
- Talk Title: Involvement of a bacterial infection in human gastric carcinogenesis. Nov 14th, 2022. Faculty talk, NISER.
- Talk Title: The rise of extracellular vesicles (EVs) from cellular trashes to useful biotechnology tools.Feb 17th, 2023. Biotechnology Department, Utkal University, Odisha.

Dr. Debasmita Pankaj Alone

- Cancer: A multifactorial Disease. 22nd September, 2022. Zoology Department, PN College, Khordha.
- Talk Title: Molecular insights into the pathogenesis of pseudoexfoliation syndrome and glaucoma.February 16-17th, 2023.2nd HBNI Theme Meeting on Life Sciences, SINP, Kolkata,

Dr. Kishore CS Panigrahi

- Talk Title: Carbon Nano particles influences flowering time and productivity in Arabidopsis and Rice. May20th, 2022. Heinrich Heine University, Dusseldorf, Germany.
- Talk Title: Light Signalling, Flowering time Control and Productivity. July 29th, 2022. Institute of Plant Molecular Biology, CAS, Branišovská 31, 370 05 ČeskéBudějovice, Czechepublic.
- Talk Title: Light signalling and flowering time control in plants (03 lectures). June 2022. Department of Ecology, Agronomy and Aquaculture, University of Zadar, TrgKneza Viseslava 9, HR- 23000 Zadar, Croatia.
- Talk Title: CNPs Enhances productivity in rice by modulating thermal signalling. 28th Jan 28th, 2023. Centurion University, Bhubaneswar. Key note lecture in the International Conference on Agriculture and Rural Development, organized by Society for Agricultural Research & Management (SARM).

Dr. Manjusha Dixit

- Talk Title: Reduced expression of FRG1 stimulates cancer angiogenesis via ERK/AKT signaling. February 07-08th, 2022.1st International CAM-Conference, Organized by Prof. Dr. Regine Schneider-Stock, University Hospital Erlangen, Germany.
- Talk Title: EEF1A2 triggers more pronounced Erk mediated metastatic program in ER negative breast cancer cells. Feb 16-17th, 2022. 10th Edition Webinar on Breast Cancer.

Dr. Pankaj Vidyadhar Alone

- Talk Title: "Translation initiation fidelity defect influences cellular physiology". Sept 7-10th, 2022. HBNI Life science theme meeting, RRCAT-Indore.
- Talk Title: "Cellular cost of translation fidelity defect".Dec 1-3rd, 2022.11th RNA group meeting, NCCS-Pune.

Dr. Praful Singru

- 8th ASSOPICON 2022, Department of Physiology, All India Institute of Medical Sciences (AIIMS), Nagpur, October 14-16, 2022.
- Department of Zoology, Sindhu Mahavidyalaya, Nagpur, October 17, 2022.
- 72nd Indian Pharmaceutical Society (IPC) Congress, RTM Nagpur University, Nagpur, Jan. 19-22, 2023.

- Department of Biotechnology, Utkal University, Bhubaneswar, Feb. 4, 2023.
- Trends in Biotechnology and its Contemporary Relevance. Refresher Course in Biotechnology UGC-Human Resource Development Centre (HRDC), Utkal University, Bhubaneswar, February 10-23, 2023.

Dr. Subhasis Chattopadhyay

- Talk Title: "Analysis of Cell Mediated Immunity (CMI) in Health and Disease".September 7-10th, 2022. 1stHBNI Theme meeting on Life Sciences, RRCAT, Indore.
- Talk Title: "Analysis of Immuno-Regulatory T-cells in experimental Cancer Microenvironment". November 11-13th, 2022. 4th INDO ONCOLOGY Summit. Organized by International Association of Oncology (IAO) in association with BioLEAGUES on the Theme: Cancer Care : Era Of Precisionheld at Pipul Padmaja Premium Hotel and Convention, Bhubaneswar, Odisha 751016

Dr. Aniruddha Datta Roy

- Talk Title: Unravelling the Biogeography of the Indian subcontinent (Keynote lecture) Date: December 15th, 2022. Venue: Shillong, Meghalaya.
- Talk Title: Distentangling the origins of Indian and Sri Lankan Scincine Lizards: A molecular phylogenetic study (Keynote lecture) February 27th, 2022.Venue: Assam Don Bosco University.

Dr. V Badireenath Konkimalla

- (Invited lecture) Virtual Screening and Structure-based drug design methods. Nov 10-14, 2022. National Workshop on Drug Design and Discovery, Institute of Life Science, Bhubaneswar, India.

Dr. Ramanujam Srinivasan

- Yeast India 2023: Fundamentals to Applications of Yeast and Fungi. 10th - 14thMarch, 2023, IISER Mohali, India. A salt bridge mediated resistance mechanism to FtsZ inhibitor PC190723 revealed by a single step cell-based screen.
- CEM3DISI 3rd Annual Symposium. 17th Dec 2022. IISER Pune, India. Partitioning DNA in bacteria.
- EMBO Practical Course CEM3DIP 2022: Single Particle Cryo-EM of Macromolecular Assemblies and Cellular Tomography 4th-16th December, 2022, Pune, India.

Dr. Rittik Deb

- Talk title: Tree crickets use megaphones - how and why. Oral presentation on Wildlife week meeting organized by Oorna, Wildlife club NISER, HBNI, DAE, 2022.

Dr. Shyamasree Ghosh

- "Biology and ecology of earthworms" IANCAS-ERC, Outreach Seminar "Wonder Materials, Energy and Radiation", organized by IANCAS-Eastern Regional Chapter, Institute of Physics, Bhubaneswar and Rama Devi Women's University, Bhubaneswar on 27th July 2022.Published in Samaj E paper, Thu 28th July 2022, Bhubaneswar Edition, Page 9. https://samajaepaper.in/imageview_23_2872022235294 30_4_73_28-07-2022_9_i_1_sf.html
- Invited Speaker: "Jeevan vigyaan ke aakarshak duniya: kenchuon ke pratiraksha pranaalee"National Hindi Scientific Web Seminar organized by Institute for Plasma Research, Gandhinagar on 23, 24 June, 2022.

Professor A. Srinivasan

- Talk Title: Porphyrinoids with polycyclic aromatic units in the core.February 7th, 2023. Sacred Hearts College, Ernakulum, Kerala.

Professor Chidambaram Gunanathan

- Green Catalysis Enabled by Metal-Ligand

Cooperation. Delivered the Lecture on 31st July in FORCE-IICS Meeting at Jaypee Palace, Agra during 28th - 31st July, 2022.

- Catalytic C- and N-Alkylation Reactions using Alcohols. Trends in Organometallic Chemistry. ACS Webinar Series. 15th December 2022.

Professor Himansu Sekhar Biswal

- Talk Title:"Hydrogen Bonding with Sulfur: Conceptual Advancement from Gas Phase Laser Spectroscopy to Applications in Solution".September 06, 2022.Symposium 40 years of gas phase laser spectroscopy: an ongoing story. CEA-Saclay, Paris, FRANCE.
- Talk Title:"Secondary Effects of Hydrogen Bonding with Sulfur and Selenium: Energy Transfer, Chemical Shielding, Aromaticity and Piezoelectricity".September 12-15th, 2022.24th International Conference on Horizons in Hydrogen Bond Research (HBOND-2022), Bilbao, SPAIN.
- Talk Title: "Hydrogen Bonding that Turns the DNA and Folds the Protein: A Spectroscopist's Delight".December 30, 2022."ASET Colloquium", Tata Institute of Fundamental Research (TIFR), Mumbai, INDIA.
- Talk Title:"Noncovalent Interactions with Carbon: Experimental Challenges".January 18-20th, 2023."First HBNI Interaction Meeting in Chemical Sciences" National Institute of Science Education and Research (NISER), Bhubaneswar, INDIA.
- Talk Title:"Noncovalent Interactions with Carbon: A Step Forward to Understand Hydrophobic Interaction".March 2-4th, 2023, "EMERGING TRENDS IN CHEMICAL SCIENCES (ETCS-2023)" North-Eastern Hill University (NEHU), Shilong, INDIA.

Dr. Bhargava B.L.

- Molecular dynamics studies of Intrafibril and fibril - membrane interactions, HBNI ChemMeet NISER - Bhubaneswar, 20.01.2023.

Dr. Chandra Sekhar Purohit

- Peptides as Drug delivery vehicle
- High yielding synthesis of favipiravir and its tautomerism in solid state

Dr. Jogendra Nath Behera

- Metal-Organic Frameworks (MOFs) derived nanaostrucured materialsas electrocatalyst for energy conversion and storage, ITER, Dept. of Chemistry, Bhubaneswar, dated 12.01.2023.
- Talk Title: Hybris Materials towards Energy Conversion and Storage Applications, C. V. Raman Global University (CGU), Bhubaneswar, dated March 04, 2023.

Dr. Krishnan Venkatasubbaiah

- Krishnan Venkatasubbaiah, B-N Coordinated Fluorescent Materials: Synthesis, Characterization and Photophysical Studies, (MTIC-XIX), BHU, Varanasi, December, 14-17th 2022.

Dr. Moloy Sarkar

- In "Chemical Dynamics in Complex Systems (CDCS-2022)" conducted by IISER Bhopal, IIT Bombay and JNU in May 2022.
- Gave Invited Talk in International Conference in BITS Goa (IC-AIE-FA 2022) in DEC 2022

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. Ponneri C. Ravikumar

- Functionalization of Inert Bonds for the Synthesis of Functionalized Heterocycles and Useful Organic Scaffolds. Organic Synthesis Conference (OSC-2022), Dept. of Chemistry, IIT Kanpur, dated 2nd April 2022.
- Breaking Inert Bonds for making Heterocyclic Derivatives Using Co-catalyst through Weak Chelation. Frontiers in Chemical Sciences, IIT Guwahati, Assam, dated 4th December 2022.
- Weak Chelation Assisted Cobalt Catalysed nthesis of Acyloins. ASK Memorial Lecture Series, University of Hyderabad, Telangana, dated 20th Jan 2023.
- Palladium Catalysed C-C bond Cleavage of Strained Carbocyclic Systems: A Useful Strategy in Organic Synthesis. 30th Chemical Research Society of India (CRSI) Conference, held at Jawaharlal Nehru University, dated 2nd February 2023.
- Palladium Catalysed C-C bond Activation of Strained Carbocyclic Ring Systems: A Promising Strategy in Organic Synthesis. XXII NOST Organic Chemistry Conference, dated 17th-20th February 2023.
- Palladium Catalysed C-C bond Activation of Strained Carbocyclic Ring Systems: A Promising Strategy in Organic Synthesis. 3rd Anatolian Conference on Organic Chemistry. Antalya, Turkey, dated 13th-16th March 2023.

Dr. Prasenjit Mal

- "Supramolecular Catalysis in Organic Synthesis" 1st HBNI interaction meeting in Chemical Sciences from 18th -20th January 2023 at NISER.
- Invited Lecture at SERB sponsored workshop (OECSS-2022) @ IITBBS on 22nd December 2022.

Dr. S. Peruncheralathan

- Deilvered talk on -Arylacetonitriles as versatile synthons for the synthesis of indolo fused heterocycles in 1st HBNI meet, NISER Bhubaneswar, January 2023.

Dr. Sharanappa Nembenna

- Talk delivered at International Main Group Chemistry conference held at IISER Tiruvananthapuram
- Talk delivered at first HBNI Interaction meeting in Chemical Sciences held at NISER Bhubaneswar

Dr. Subhadip Ghosh

- Perovskite Nanocrystals- Novel Materials for Real Applications, European Congress on Chemistry and Applied Sciences, March 20-21, 2023 at Rome, Italy.
- Exploring Molecules, Materials and Bio-materials for Sustainable Society (EMMBSS) on 11-13th April 2022, Midnapore collage, West Bengal, India.

Dr. Upakarasamy Lourderaj

- 28th CRSI National Symposium, March 2022
- NISER Outreach talk
- Culinary Reactions, Outreach talk, April 2022
- Influence of Second-order Saddle on Reaction Mechanisms, Oxford, June 2022
- Energy Transfer and Rainbow Scattering of H2CO from Surfaces, Hungary, September 2022
- Machine Learning in Chemistry, SCS meet - NISER, October 2022
- Energy Transfer and Rainbow Scattering of H2CO from Surfaces, SDMC, November 2022
- Mechanisms and Dynamics of Chemical Reactions, SCS NISER, January 2023
- Machine Learning in Chemical Dynamcis,

ML4Science, Kodaikanal, March 2023

Dr. Arindam Ghosh

- International Symposium on NMR: 28th meeting of national magnetic resonance society (NMRS 2023), IISER Berhampur. (Invited)

Dr. Bidraha Bagh

- Manganese Catalyzed Chemoselective Hydrosilylation of Nitroarenes: Sustainable Route to Aromatic Amines (invited talk), 'Trends in Organometallic Chemistry' organised by Organometallic, ACS, 28.11.2022.
- Iron Catalyzed Oxidation of Primary Alcohols: Reaction Media Induced Chemodivergent Aldehyde/Acid Selectivity (invited talk), Modern Trends in Inorganic Chemistry (MTIC-XIX 2022), BHU, Varanasi, 17.12.2022.
- Sustainable and Selective Oxidation of Primary Alcohols: Aerobic and Peroxidative Oxidations Catalyzed by Base Metals (Cu and Fe) (invited talk), HBNI Interaction Meeting, NISER, Bhubaneswar, 19.01.2023.

Dr. Bishnu Prasad Biswal

- Plenary talk in NCCE-2023 (March 17-18) at Sardar Patel University, V. V. Nagar, Gujarat.
- Invited talk at EMEE-2023, (March 04-05) IIT Roorkee, Uttarakhand.
- Invited talk at ISCBC-2022, (Nov. 16-19) BIT Mesra, Ranchi.
- Chief Guest lecture (April 27, 2022) in the Annual Function of Dhenkanal (Auto.) College, Dhenkanal, Odisha.

Dr. Subhankar Mishra

- 3D Digitization of Historical temples and develop Heritage Building Information Modelling (H-BIM), Expression of Excellence, Dassault Systemes La Fondation
- ACM Annual Event 2023, Bhopal
- DD Odia, Gyana Bigyana on Artificial Intelligence

Dr. Liton Majumdar

- Protoplanetary disk model for Emissions from GAS and Ice absorption Simulations (PEGASIS): Astrochemistry in the era of ALMA and JWST, March 20, 2023, Interstellar Medium, Matter Cycle and Astrochemistry (MICMAC) Colloquium, Institut de Recherche en Astrophysique et Planetologie (IRAP), Toulouse, France.
- The Search for Habitable Worlds in the era of JWST, December 7, 2022, Eminent Guest Lecture Series: An Odyssey of Physics, SRM University, Andhra Pradesh, India.

Dr. Jayesh Mahendra Goyal

- Invited Talk - IISc Bangalore Astrophysics Seminar, September 2022, "Exoplanet Atmospheres and the Dawn of the JWST Era."
- Invited Course Talk - Pune Knowledge Cluster Exoplanets Course, February 2023, "Exoplanet Atmospheric Characterisation & Observables, Interiors"
- Invited Talk - Astronomical Society of India (ASI March 2023) IIT Indore, Plenary Session, "Exoplanet Atmospheres and the Dawn of the JWST Era"
- Contributed Talk - ESLAB 2023, ESA ESTEC Netherlands, March 2023, "Planetary Atmosphere Model Constraints and Lessons from JWST Transiting Exoplanet ERS observations"

Dr. Pathikrit Bhattacharya

- P Bhattacharya, TE Tullis, AM Rubin, NM Beeler, N Badt (2022) A physics-based constitutive equation for frictional response to normal stress changes, Fall Meeting of the

American Geophysical Union.

Dr Priyadarshi Chowdhury

- Invited Talk on 'Deciphering early Earth systems through petrology-geochemistry-geodynamic modelling' at the 'IISc-NTU Meet 2023', IISc Bengaluru, 03 March 2023.
- Invited Talk on 'The transition from pre-plate to modern plate tectonics', Zhejiang University Hangzhou, 27 July 2022.

Dr. Pranay Kumar Swain

- Science-Technology-Society Interface, KIIT University Bhubaneswar, 27 November 2022
- User engagement in new normal, organised by Odisha Library Academy, 7th August 2022 at ITER (SOA University), Bhubaneswar

Dr. Amarendra Das

- "Environment and Development" Special lecture (invited) at the UGC Human Resource Development Centre, Utkal University on February 24, 2023.
- "Budget 2023-24" (invited) at PrajatantraPathachakra, Cuttack on February 25, 2023
- An Economic Analysis of Union Budget 2023 in the Department of Economics, (invited) Maharshi College of Natural Law, Bhubaneswar on February 21, 2023.
- Panel Discussion on Union Budget 2023 in Business Standard Budget 360 on February 13, 2023 at IBCS Convention Hall, Bhubaneswar SoA University.
- Fiscal Policy for Sustainable Development in Odisha Vision 2036 Conclave during January 12-14, 2023 at Utkal University and NISER Bhubaneswar.
- "Digitally aligned or divided: Determinants of computer literacy among Indian Households" With Bibhunandini Das in the 57th TIES Conference at University of Hyderabad, Telangana during January 04-06, 2023.
- "India's Transition towards Cleaner Energy Sources" with KhulanaMallick in the 57th TIES Conference at University of Hyderabad, Telangana during January 04-06, 2023.
- Capacity Building Workshop for Undergraduate ResearchProjects Department of Economics, Shailabala Women's (Auto) College, Cuttack on December 26, 2022.
- "Odisha @ 2036 and @ 2047" (invited) in the Golden Jubilee Function, PG Department of Economics, Berhampur University, Bhanja Bihar, Odisha on December 10-11, 2022.
- Capacity Building Workshop for Undergraduate Research Projects organised by IQAC, Nimapara Autonomous College, Nimapada Odisha on November 26, 2022
- Odisha's Growth Transition amidst Social and Regional Disparity (invited talk) at Department of Economics and IQAC, SarankulColege, Sarankul, Nayagarh, September 16, 2022
- Odisha's Lopsided Growth Transition (invited) in the International Seminar on The Economy of Odisha organsied by PG department of Economics, SCS College, Puri on September 10, 2022.
- Odisha's Lopsided Growth Transition (invited) in the International Seminar on The Economy of Odisha organsied by Department of Economics, Nipara Autonomous College on June 18, 2022.
- Odisha's Lopsided Growth Transition, ecial lecture (invited) in the Department of Economics, Berhampur University, Bhanja Bihar on June 21, 2022.

Dr. Rooplekha Khuntia

- "New age Parenting: Towards the emotional

wellbeing of children', at Mother's Public School, Bhubaneswar, 6th August, 2022, 9.30 am.- Invited talk.'

- Psychology in the New Era', invited speaker in the orientation program for the fresh batch of PG students, Department of Psychology, Utkal University, 17th October, 2022, 11.00am.'
- Managing Anger in Children', Mother's Public School, Bhubaneswar, 26th Nov, 2022, 10.30 am.

Professor Brundaban Sahu

- Mathematics at NISER, Discussion Meeting on Basic Sciences (DiMBS) April 6-8, 2022, HBNI, Mumbai.
- Modular forms and the number of representations of a natural number by certain quadratic forms, National Conference on Mathematical Analysis and its applications, GIET, Gunupur (June 11-12, 2022).
- A simple extension of Ramanujan-Serre derivative map and some applications, 5th EU/US Workshop on Automorphic Forms and Related Topics (August 1-13, 2022), University of Sarajevo, Bosnia and Herzegovina
- Ring of Jacobi forms (4 lectures) NCMW- Jacobi forms (December 12--24, 2022), IIT Guwahati.

Dr. Kamal Lochan Patra

- On the super graphs and reduced super graphs of some finite groups, Conference in memory of Prof. PravirDutt, Prof. Arbind Kumar Lal and Prof. Sudipta Dutta, 5 - 7 November 2022, Department of Mathematics and Statistics, IITKanpur, India.
- Minimum cut-sets of the power graph of a finite cyclic group, Graph Spectra, Combinatorial Graph Theory, Group Theory and Nano-Molecular Electronic Devices (Online), 28 - 30 March 2023, University of Malta, Malta.

Dr. Binod Kumar Sahoo

- Delivered four lectures (six hours) on Group Theory during the Madhava Nurture Camp (June 20-25, 2022), at IIT Bhubaneswar.

Dr. Jaban Meher

- Zeros of L-function attached to half-integral weight modular forms, ICTS, Bengaluru, 28 July, 2022
- An introduction to modular forms, IIT Jammu, 9 and 11 November, 2022.
- On the theory of Jacobi forms, IIT Guwahati, 12–24 December, 2022.
- On solving polynomial equations, Sri Sri University, Cuttack, 20 January, 2023.
- Ramanujan tau function, Kendrapada Autonomous College, 18–19 March, 2023.

Dr. Manas Ranjan Sahoo

- Conservation laws with convex flux}, A FIVE Day ONLINE National Workshop (Self-finance) on Computational Number Theory and Mathematical Analysis (CNTMA-2022), NIT Warangal, on December 26, 2022.
- A brief introduction to Brachistochrone problem and its solution}, National Mathematics Day, Department of Mathematics, P. G. College Ghazipur on December 22, 2022.
- Explicit formula for a scalar conservation law with convex flux}, Webinar on "Recent trends in differential equations," Department of Mathematics, C V Raman global university on March 4, 2023.

Dr. K. Senthil Kumar

- Elliptic functions and algebraic independence, NCM Workshop, HRI, Prayagraj, 24 Nov- 3 December 2022.

Dr. Sutanu Roy

- Braided quantum symmetries of (classical and quantum) spaces, Conference on Functional

Analysis and Related Topics, Indian Institute of Technology Bombay on 22 February, 2023.

- Braided free unitary quantum groups, Rencontre 2022 de l'ANR ANCG, Cabourg on 8 Nov., 2022.
- Braided quantum symmetries of classical and quantum spaces, Stat-Math Unit (online seminar), Indian Statistical Institute Delhi on 26 October, 2022.
- Braided quantum symmetries of finite sets, Functional Analysis Seminar, Laboratoire de mathématiques de Besançon on 13 September, 2022.
- Braided quantum symmetries of classical and quantum spaces, A conference on ergodic theory and von Neumann algebra (online), National Institute of Science Education and Research Bhubaneswar, India on 6 Aug., 2022.
- Braided quantum symmetries of graph C*-algebras, APRG Seminar, Indian Institute of Science Bangalore on 8 June, 2022.
- Braided quantum symmetries of finite spaces, Mathematics Colloquium, TIFR Centre For Applicable Mathematics Bangalore on 7 June, 2022.
- Quantum symmetries of finite spaces, Department of Mathematics and Statistics seminar, Indian Institute of Science Education and Research Kolkata on 27 February, 2023.
- Quantum symmetries of finite spaces, Mathematics and Statistics colloquium, Indian Institute of Technology Kanpur on 2 February, 2023.

Dr. Nabin Kumar Jana

- Probabilistic Arguments: Unlimited possibilities, IISER Kolkata, June 02, 2022
- Probability: a tool for Mathematicians, Cooch Behar Panchanan Barma University, May 17, 2022

Dr. Kaushik Majumder

- Talk Title: ``An application of probabilistic technique to ensure the existence of derangement permutations".December 20, 2022. Department of Mathematics, Acharya B N Seal College, Cooch Behar-736101, West Bengal.
- Talk Title: "The lower bound of Ramsey numbers." December 20, 2022.Department of Mathematics, Cooch Behar Panchanan Barma University, Cooch Behar-736101, West Bengal.

Dr. Anupam Pal Choudhury

- Talk Title: "A class of triangular systems in fractional BV spaces".31st May, 2022. Inter IISER-NISER Mathematics Meet (IINMM) 2022 at IISER Kolkata.
- Series of lectures on the theme "An introduction to the mathematical theory of obstacle scattering'' at Advanced Instructional School on Inverse Problems held in TIFR- Centre for Applicable Mathematics in July 2022.

Dr. Krishanu Dan

- AFS-II held in NISER (6 lectures) during June 6 - July 2, 2023.

Dr. Chitrabhanu Chaudhuri

- Talk Title: Counting Genus 1 curves on Del Pezzo Surfaces, 7 October 2023. IIT Tirupati.

Dr. Sudhir Kumar Pujahari

- 2023 (March 29th) Sambalpur University, The mysterious primes.
- 2023 (February 15th) Radhakrishna Institute of Technology and Engineering (RITE), Mathematics in daily life.
- 2023 (January 14th) TIE talk, The mysterious primes.
- 2022 (December 29th) Number Theory

Seminar, IMSc, Sato-Tate conjecture in arithmetic progressions for certain families of elliptic curves.

- 2022 (December 22th) National Mathematics Day, Institute of Mathematics and its Applications, Legacy of Ramanujan.
- 2022 (November 26th) National seminar on "Awarness on Madhava Mathematics competations", B.J.B College.
- 2022 (November 11th) National seminar on "Awarness on Madhava Mathematics competations", Revenshaw. University.
- 2022 (20th - 24th June) Equidistribution and Arithmetic Dynamics, Oklahoma State University, Sato-Tate Conjecture in Arithmetic Progressions for Certain Families of Elliptic Curves.
- 2022 (May 17th) International Seminar On Automorphic forms (ETH Zurich and TU Darmstadt), Sato-Tate conjecture in arithmetic progressions for certain families of elliptic curves.

Dr. Ramesh Manna

- Mini-course on Analysis II (Measure and Integration), 12 hours lectures at AFS-II - Annual Foundation School - II (2022), (6 Jun 2022 to 2 Jul 2022).
- Talks at National forums (invited): L^p-improving estimates for Fourier integral operators and maximal operators at Indian Institute of Science Education and Research, Pune, India, 2023.

Professor Bedangadas Mohanty

- Experimental results from RHIC Beam Energy Scan Program, 6th online seminar series on "RHIC Beam Energy Scan". 8th March 2023.
- Recent results from ALICE experiment at CERN (Invited Plenary), International Conference on Physics and AstroPhysics of Quark Gluon Plasma (ICPAQGP), Feb. 07-10, 2023, Puri, Odisha, India.
- New inventions in Science, Kalahandi University, Bhawanipatana, Odisha, 18th November 2022.
- Heavy-Ion Physics in India (invited), Horizons in Accelerators, Particle/Nuclear Physics and Laboratory based Quantum Sensors for HEP/NP, November 14-17, 2022, ICTS, Bangalore.
- Panel Discussion on Scientific Culture: Need of the hour, International Day of Scientific Culture, 28 September 2022, Regional Science Centre, Bhubaneswar.
- Studying QCD Phase Diagram with relativistic nuclear collisions (invited plenary talk), INPC 2022, Cape Town, South Africa, 16th September 2022.
- Recent discoveries in Physics, Foundation Day celebrations, Institute of Mathematics and Applications, May 2022.
- Science, Technology and Society, IIT, Delhi, March 27- April 7, 2022.
- Swati Saha (for the ALICE collaboration), Higher-order event-by-event mean-pT fluctuations in pp and A-A collisions with ALICE, XI International Conference on New Frontiers in Physics (ICNFP 2022), Aug. 30 - Sep. 11, 2022, Kolymbari, Crete, Greece.
- Swati Saha (for the ALICE collaboration), Higher-order event-by-event mean-pT fluctuations in pp and A-A collisions with ALICE, INPC2022 - 28th International Nuclear Physics Conference 2022, Sep. 11-16, 2022, Cape Town, South Africa.
- Swati Saha, Study of Ising model and three state Pott's model cumulants in 2D lattice, XXV DAE-BRNS High Energy Physics Symposium, , Dec. 12-16, 2022, IISER Mohali, India.

- Prottay Das (for the ALICE collaboration), Exploring the hadronic phase of relativistic heavy-ion collisions with resonances in ALICE, XLI International Conference on High Energy Physics (ICHEP 2022), July 06-13, 2022, Bologna, Italy.
- Prottay Das (for the ALICE collaboration), Search for the Chiral Magnetic Wave in Pb-Pb collisions with the ALICE detector, INPC2022 - 28th International Nuclear Physics Conference, Sep. 11-16, 2022, Cape Town, South Africa.
- Prottay Das (for the ALICE collaboration), Search for local parity violation in strong interaction using the ALICE detector in Pb–Pb collisions, XXV DAE-BRNS High Energy Physics Symposium, Dec. 12-16, 2022, IISER Mohali, India.
- Prottay Das (for the ALICE collaboration), Probing rescattering effect in heavy-ion collisions with ALICE at LHC, 66th DAE Symposium on Nuclear Physics, Dec. 01-05, 2022, Cotton University, Guwahati, Assam, India.
- Prottay Das (for the ALICE collaboration), Probing heavy-ion collision evolution with resonances in ALICE at the LHC, International Conference on Physics and AstroPhysics of Quark Gluon Plasma (ICPAQGP) , Feb. 07-10, 2023, Puri, Odisha, India.
- Dukhishyam Mallick (for the ALICE collaboration), Exploring the hadronic phase of relativistic heavy-ion collisions with resonances in ALICE, 20th International Conference on Strangeness in Quark Matter (SQM 2022), June 13 - 17, 2022, Busan, Republic of Korea.
- Dukhishyam Mallick (for the ALICE collaboration), Search for higher mass resonances via KK decay channel in pp collisions with ALICE at the LHC, Quark Matter 2022 - XXIXth International Conference on Ultra-relativistic Nucleus-Nucleus Collisions (Quark Matter 2022), April 04-10, 2022, Krakow, Poland.
- Ashish Pandav (for the STAR collaboration), Seventh and eighth order cumulants of net-proton number distributions in heavy-ion collisions at RHIC-STAR, 20th International Conference on Strangeness in Quark Matter (SQM 2022), June 13 - 17, 2022, Busan, Republic of Korea.
- Ashish Pandav (for the STAR collaboration), Probing the QCD Phase Diagram via Higher Order Net-particle Fluctuation Measurements from STAR-BES, 2022 RHIC/AGS Annual Users' Meeting, June 7 - 10, 2022.
- Ashish Pandav (for the STAR collaboration), Experimental overview of critical fluctuations, International conference on Critical Point and Onset of Deconfinement (CPOD 2022), Nov. 28 – Dec. 2, 2022.
- Debasish Mallick (for the STAR collaboration), Deuteron Number Fluctuations and Proton-deuteron Correlations in High Energy Heavy-ion Collisions in STAR Experiment at RHIC, XXIXth International Conference on Ultra-relativistic Nucleus-Nucleus Collisions (Quark Matter 2022), April 4 - 10, 2022, Krakow, Poland.
- Mouli Chaudhuri, Reduction in radioactivity-induced backgrounds using a novel active veto detector for rare event search experiments, International Conference on Identification of Dark Matter 2022, , July 18-22, 2022, Austria, Vienna.
- Mouli Chaudhuri, Simultaneous detection of phonon and light using cryogenic detectors for rare event searches, 66th DAE Symposium on Nuclear Physics, December 01-05, 2022,

Cotton University, Guwahati, Assam, India.

- Mouli Chaudhuri, Estimation of 32Si and 32P background rate in CDMS II experiment, XXV DAE-BRNS High Energy Physics Symposium, Dec. 12-16, 2022, IISER Mohali, India.

Dr. Anamitra Mukherjee

- Invited talks at: SINP Kolkata
- Invited talk at Q-MAT2022, IIT Kanpur
- Invited talk in conference in IISER Pune

Dr. Colin Benjamin

- Invited Talk in IISER, Kolkata on "DTQW v CTQW v QSW" on the occasion of the Summer School on Quantum Information and Quantum Technology in June 2022 at IISER Kolkata.
- Seminar on "Research in theoretical nanoscience, quantum information, and game theory" at SPS, NISER, for SPS DAY, March 2023.

Dr. Nishikanta Khandai

- November 29 2023: NCRA And Indian Academy of Science Meeting on Gas in Galaxies, Orange County, Coorg, Karnataka. Invited Speaker: The Clustering Properties of Gas-rich Galaxies.
- March 03 2023: GALFLOWS 2023 Workshop in IUCAA, Pune Invited Speaker: The Distribution of Cold Gas in the local Universe.
- March 24 2023: SPS Day, NISER, Bhubaneswar Contributed: The Distribution of Cold Gas in the local Universe.

Dr. Prasanjit Samal

- Talk Title: Sandwiched in between the museum and zoo of density functional approximations
- "Evolution of Electronic Structure Theory and Experimental Realization" (EESTER 2023), during 4-12, January 2023 (Jan 4-7 for workshop and Jan 9-12 for conference) in Chennai, India.
- Density Functional Theory: Status, Achievements, Challenges.
- APCTP-IACS-SNBNCBS Workshop on Computational Methods for Emergent Quantum Matter : From Theoretical Concepts to Experimental Realization' held at S N Bose National Centre for Basic Sciences (SNBNCBS) and Indian Association for the Cultivation of Science(IACS), Kolkata during Nov 17-25, 2022.

Dr. Shamik Banerjee

- An infinite family of W-invariant theories on the celestial sphere, 23/01/2023, Indian Institute of Science, Bengaluru.
- An infinite family of W-invariant theories on the celestial sphere, 23/02/2023, TIFR Mumbai.
- Revisiting the Shadow Virasoro Symmetry and Shadow stress tensor in celestial holography, 19/11/2022, IISER Bhopal.

Dr. Subhankar Bedanta

- Invited talk in physics Colloquium at University of Johannesburg, South Africa via online mode on 'Excitements in organic spintronics', March 2023.
- Invited talk in Frontiers Areas in physics at JNCASR on 'Excitements in organic spintronics', March 2023.
- Invited talk in ICMA at Goa University on 'Organic spintronics- a new playground for exciting physics', Feb 2023.
- Invited talk in Frontier Problems in Nanomagnetism and Spintronics at IIT Gandhinagar on 'Study of inverse spin Hall effect and domain/skyrmion dynamics for spin-orbit torque based applications', Feb 2023
- Invited talk in FMET at SIT, Bhubaneswar on

'Study of inverse spin Hall effect and domain/skyrmion dynamics for spin-orbit torque based applications', Feb 2023.

- Invited talk in IUMRS at IIT Jodhpur on 'Exploring Nanomagnetism via architecture and interface engineering', Dec 2022.
- Invited talk in Condensed matter days at NIT Nagaland on 'Magnetism at the interfaces and in nanostructures for future spintronic applications', Dec 2022.
- Invited talk in SiMS-II at IISc Bangalore on 'Organic spintronics- a new playground for exciting physics', Dec 2022.
- Invited talk in ICEMTA at VIIT, Andhra Pradesh on 'Organic spintronics', Nov 2022.
- Invited talk in E-qmat-2022at IIT Roorkee on 'Study of Domain wall dynamics and interfacial Dzyaloshinskii-Moriya interaction in HM/FM multilayer thin film', October 2022.
- Invited talk in QMAT at IIT Kanpur on 'Spin-to-charge conversion with heavy metals, topological insulators and antiferromagnets', September 2022.
- Invited talk in FIMTA at IMMT Bhubaneswar on 'Organic spintronics- a new playground for exciting physics', August 2022.
- Invited talk in HBNI meeting at SINP Kolkata on 'Spintronics with Fullerene', June 2022.
- Invited talk at SNBNCBS, Kolkata on 'Spin to charge conversion with heavy metals, topological insulators and antiferromagnets', June 2022.

Dr. Yogesh Srivastava

- "Milne Spacetime and Holography" in Regional String Meeting September 2022 at NISER.

Dr. Ajaya Kumar Nayak

- Delivered contributory talk in the SPS March Meeting in Las Vegas, US, 2023 Topic: Noncoplanar magnetic state and scalar spin chirality driven large anomalous Hall effects in electron doped Mn3Sn.
- Delivered Invited talk in International Conference on "Frontiers in Materials for Technological Applications (FIMTA-2022)", IMMT Bhubaneswar, 2022. Topic: Room temperature magnetic skyrmion bubbles in centrosymmetric magnet.
- Delivered Invited talk in Annual Conference on QUANTUM CONDENSED MATTER, IIT Kanpur, 2022 Topic: Room temperature magnetic skyrmion bubbles in centrosymmetric magnet.

Dr. Amaresh Kumar Jaiswal

- Relativistic spin-magnetohydrodynamics, Conference on Hot QCD Matter 2022, Goa, May 12-14, 2022.
- Bottomonium elliptic flow from anisotropic escape, ALICE-India collaboration meeting, VECC Kolkata, September 5-8, 2022.
- Relativistic spin-(magneto) hydrodynamics, Physics Seminar (online), Shandong University, China, September 21, 2022.
- Relativistic spin-(magneto) hydrodynamics, IPA Lecture, IIT Roorkee, September 29, 2022.
- Mini course on relativistic hydrodynamics (15 lectures + 5 tutorials) at IIT Roorkee, September 26-October 1, 2022· Relativistic spin-(magneto) hydrodynamics, Nuclear Theory Group Seminar Series (online), McGill University, Canada, October 4, 2022.
- Relativistic spin-magnetohydrodynamics, Excited QCD 2022, Sicily, Italy, October 24-28, 2022.
- Set of 2 lectures on relativistic kinetic theory, transport and hybrid models in ALICE-STAR India School, IOP Bhubaneswar, November 10 2022.
- Virtual photon polarization and dilepton

anisotropy in relativistic heavy-ion collisions, CETHENP 2022, VECC Kolkata, November 15-17, 2022.

- Relativistic spin-(magneto) hydrodynamics, 66th DAE Symposium on Nuclear Physics, Guwahati, December 1-5, 2022.
- Relativistic spin-(magneto) hydrodynamics, Free Meson Seminar, TIFR Mumbai, January 12, 2023.
- Student day lecture on relativistic hydrodynamics in heavy-ion collisions in ICPAQGP Puri, February 6, 2023
- Relativistic spin-magnetohydrodynamics, ICPAQGP Puri, February 7-10, 2023
- Relativistic spin-(magneto) hydrodynamics, HHHPS 2023, IIT Gandhinagar, March 24-25, 2023
- Relativistic spin-(magneto) hydrodynamics, MAGIC 2023, Kovalam Kerala, March 28-April 1, 2023.

Dr. Ashis Kumar Nandy

- Vector Chirality Switching: An Unconventional Route to Manipulate Topological Phases in Antiferromagnet, "DD Transition" Meeting in Goa August 5 – 7, 2022, India.
- Vector Chirality in Antiferromagnet: An Unconventional Way to Switch Intrinsic Anomalous Hall Conductivity, QMAT-2022, IIT Kanpur, September 18 - 22, 2022, Kanpur, India.
- Tailoring Band Topology and the Associated Anomalous Hall Conductivity via Staggered Rotation in a Noncollinear Antiferromagnet, National Conference on Electronic Structure 2022 (NCES2022) November 14 - 16, 2022, Goa University, Goa, India.
- Unconventional Route to Tailor Magnetic Octupoles in Noncollinear Antiferromagnets & the Associated Switching in the Anomalous Hall Conductivity, Evolution of Electronic Structure Theory and Experimental Realization (EESTER) 2023, 3rd Edition January 4 -12, 2023, IIT Chennai, India.
- Magnetic octupoles & the associated topological phases in noncollinear antiferromagnets, "Focused meet on Quantum Matter" January 24, 2023 S.N.Bose National Centre for Basic Sciences, Kolkata, India.

Dr. Kush Saha

- Invited talk in Annual Conference on "Quantum Condensed Matter 2022" on "Non-linear response of interacting bosons in a quasiperiodic potential", IIT Kanpur, India, 21st September, 2022.
- Contributory talk in "American Physical Society March Meeting 2023" on "Non-linear response of interacting bosons in a quasiperiodic potential", at Las Vegas, USA, 8th March, 2023.

Dr. Luke Chamandy

- SPS Day, NISER "Stellar Mergers and Galactic Dynamos", 25 March, 2023.

Dr. Tapan Mishra

- Understanding the quantum phases of interacting bosons with quantum walk, Quantum Information and Quantum Technology (QIQT) - 2022, IISER Kolkata, 20/06/2022.
- Re-entrant localization in quasiperiodic lattices, QMAT-2022, IIT Kanpur, 20th September 2022.
- Re-entrant localization in quasiperiodic lattices, Department of Physics, Kerala University

Dr. V Ravi Chandra

- "Edge states in magnon dispersions of the pyrochlore Heisenberg magnets with anisotropies", Invited talk, Annual conference

on quantum condensed matter (QMAT-2022), IIT Kanpur.

- "Edge magnons in the pyrochlore Heisenberg model with anisotropies", Invited talk, Novel Phases of Matter in frustrated magnets, Organised by CEFIPRA in University of Bordeaux, France.

Dr. Victor Roy

- Spooky connection of causality and stability in relativistic hydrodynamics, IIT Gandhinagar, March 25, 2023
- Taming instabilities in relativistic hydro and magneto hydro. ICPAQGP 2023, Puri
- Taming instabilities in relativistic hydrodynamics and magnetohydrodynamics Physics Seminar at IISER Pune, February 14, 2023

Dr. Narayan Rana

- Mixed QCD-EW corrections to the Drell-Yan process (Invited) International Meeting on High Energy Physics (IMHEP II) 21.02.2023.

Dr. Shovon Pal

- Ultrafast dynamics of electrons in strongly-correlated systems, UFS 2022, IISER Trivandrum.

Dr. G. Santosh Babu

- Friday seminar talk in CMRP, NISER on gamma-gamma coincidence experiment. Date: 28-10-22.

Dr. Ganesh J Tambave

- "Silicon pad array detector development for electromagnetic calorimeter application", XXV DAE-BRNS High Energy Physics symposium at Mohali, 12 to 16 December 2022.
- Status of silicon pad sensor development in India', ALICE upgrade week, 21 September 2022, time.
- Special lecture on "Future detector FOCAL and contribution of India" in the ALICE India collaboration organized "V ALICE STAR India school on Quark Gluon Plasma", 1st November to 12th November 2022 at the Institute of Physics, Bhubaneswar.

Dr. Shuddha Shankar Dasgupta

- "Possible Indian Participation at EPIC collaboration in EIC", APCTP workshop for the Electron Ion Collider (EIC) in Seol South Korea – November 2, 2022 to November 4, 2022.

Dr. A. Ananda Raman

- Using HPC in a shared environment with Batch

Extension Activities

School of Biological Sciences

Dr. Abdur Rahaman

- Trained more than five summer trainees from various institutes.

Dr. Asima Bhattacharyya

- UGC-Human Resource Development Centre Refresher Course for Faculty Members, The rise of extracellular vesicles (EVs) from cellular trashes to useful biotechnology tools, Biotechnology Department, Utkal University, Odisha, 17 Feb 2023.
- Contributed in the "Minimum Information for the Study of Extracellular Vesicles" (MISEV) 2023 guidelines of the International Society for Extracellular Vesicles (ISEV).

Dr. Chandan Goswami

- One school student visited my lab for 15 days in 2022 through NISER Outreach programme.

Dr. Debasmita Pankaj Alone

- In the capacity of Chairperson, Outreach Committee NISER and Coordinator, Vigyan Pratibha Odisha and Chattisgarh Region, have organized various Outreach Talks, workshops, and Student related events.

Dr. Harapriya Mohapatra

- Conducted internship programs for students.

Dr. Kishore CS Panigrahi

- Long-night of Science, 09th sept 2022, public demonstration of importance of Mung bean as alternative to meat, organized by HHU Dusseldorf, Germany in the City center.

Dr. Pankaj Vidyadhar Alone

- Member NISER Outreach Committee; Organised school internship event, NISER-open day, Vigyan-Pratibha teacher training event.

Dr. Ramanujam Srinivasan

- Meridian School. Madhapur. Hyderabad. 16th Dec. 2022. Bacteriology and Cell Biology - Laboratory Techniques.

Dr. Subhasis Chattopadhyay

- Invited talk titled Study of altered Cell Mediated Immunity (CMI) in health and diseases as a Resource Person in the Refresher Course in Biotechnology 10th - 23rd February2023, Trends in Biotechnology and its Contemporary Relevance, organized by UGC-Human Resource Development Centre (HRDC), Utkal University, on 17th February, 2023.

Dr. V Badireenath Konkimalla

- Invited lecture - World of Honeybees and us. Dec 16, 2022. 3rd Edition of Children Science Conclave. DAV Public School, Chandrasekharpur, Bhubaneswar, India.
- Invited lecture - Secrets of life. Sept 12, 2022. Govt. Elementary Teacher Education Institute, Bhubaneswar, India.

Dr. Rittik Deb

- Faculty advisor of NISER nature club Oorna, Wildlife club NISER. Associated with all Oorna outreach activities.
- Faculty advisor of NISER Photography club Sapsara. Associated with all Sapsara outreach activities.
- Was associated along with laboratory students with NISER Science Camp (6-8th April 2023) to give class XI students a glimpse of behavioural and bioacoustics ecology.

Dr. Swagata Ghatak

- Gave talk on "Excitatory/Inhibitory (E/I) Imbalance in Neurological Disorders" at Brain Matters club (organized by students of NISER), 3rd February 2023.
- Participated and held live scientific interactions with school students inScience Camp at NISER held on6th to 8th April 2023.

Dr. Shyamasree Ghosh

- Invited in Make in Odisha Conclave, Govt of Odisha, 2022
- Participated in the outreach programme at NISER

School of Chemical Sciences

Professor A. Srinivasan

- Interaction at academic assemblies held at NISER

Professor Himansu Sekhar Biswal

- We made a software called "**ViLEG**" (**Vi**rtual **L**aboratory **E**xperiments for **G**raduates). The purpose of this software to demonstrate the rural students the experiments that use sophisticated instruments like fluorimeter, TCSPC, ES-MS and NMR spectrometer. Most of the colleges in Odisha don't have access these instruments. In the weekends and holidays we visited almost 15 remotely located colleges to demonstrate the use of the software.

Dr. Chandra Sekhar Purohit

- Participated in the outreach programme at NISER

Dr. Jogendra Nath Behera

- Chief speaker in block level science exhibition, January 2023.

Dr. Arindam Ghosh

- Steering committee member, Advance course on NMR spectroscopy, HBNI
- Course instructor, Advance course on NMR spectroscopy, HBNI

Dr. Bishnu Prasad Biswal

- Visited and delivered a talk at Dhenkanal (Auto.) College, Dhenkanal, Odisha.

School of Computer Sciences

Dr. Anup Kumar Bhattacharya

- Participated in outreach activities of niser and delivered a talk on zero-knowledge proofs

Dr. Abhishek Sahu (Visiting Faculty)

- Participated in outreach activities of niser and delivered a talk on zero-knowledge proofs

School of Earth and Planetary Sciences

Dr. Jaya Khanna

- In 2022, two forest meteorological stations have been successfully set up to study forest-atmosphere interactions in the middle Himalayas near Nathuwakhan, Uttarakhand. The observatories are providing data for surface-atmosphere moisture and energy fluxes, regional hydrology and plant level transpiration fluxes. The instrumentation includes a Bowen ratio set up for evapotranspiration measurements, net radiometers, soil moisture and heat flux sensors, sap flux sensors, rain gauges and flumes to study stream flow. Preliminary data is being evaluated.

Dr. Jayesh Mahendra Goyal

- Delivered NISER Outreach Poupular Lecture to more than 300 school students, November 2022, "Exoplanets and the Search for Habitable Worlds"
- NISER Open Day Popular Lecture, April 2023

Dr. Priyadarshi Chowdhury

- Delivered popular lecture on continental land

formation and its relevance for local people of Jharkhand-Odisha people on invitation from CSR Team, Tata Steel.

- Communicated my work on continental evolution with AGU's EoS magazine and put out a popular blog in their 'Editor's Vox' section under the title: The seven-ages of earth as seen through the continental lens (https://doi.org/10.1029/2023EO235003).

School of Humanities and Social Sciences

Dr. Amarendra Das

- Participated as a Panelist in TV programmes of Argus TV, OTV and DD Odia on several occasions and published popular articles in newspapers.
- Preparing Odisha Vision 2036 document which has 26 chapters and 45 authors to commemorate the 100 years of Odisha in 2036. The document is being prepared by the Odisha Economics Association.

Dr. Joe Varghese Yeldho

- Thesis Adjudicator-
  1) Mahatma Gandhi University, Kottayam
  2) University of Madras, Chennai
- Doctoral Board - SHSSM, IIT Bhubaneswar

School of Mathematical Sciences

Professor Brundaban Sahu

- Gave an outreach talk on "Sum of Squares" organized by Curry Leaf (Math Club of MTTS Alumni) on October 30, 2022.

Dr. Jaban Meher

- Gave a talk at Kendrapada Autonomous College and interacted with students on 27 February, 2023.

Dr. Anupam Pal Choudhury

- Teaching 4 students of Krypton Science College, Bhubaneswar for two weeks (in June 2022) as part of outreach activities.
- Organising outreach activities as part of the Institute Outreach committee.

Dr. K. Senthil Kumar

- Harish-Chandra Research Institute, 27 February -- 3 March, 2023.

Dr. Sutanu Roy

- An excursion to quantum permutations, Seminar series organized for summer students, School of Physical Sciences, NISER Bhubaneswar on 6 July, 2022.
- A tale of a rotating needle of length one, Outreach talk NISER Bhubaneswar on 8 April, 2022.

Dr. Nabin Kumar Jana

- Visited Dept. of Mathematics, Cooch Behar Panchanan Barma University, May 17 - 20, 2022

Dr. Kaushik Majumder

- One outreach talk at Pathani Samanta Auditorium (NISER) on February 3, 2023

Dr. Krishanu Dan

- Talk delivered at NISER as part of the Outreach Program for School Teachers dated February 03, 2023.

Dr. Chitrabhanu Chaudhuri

- "Platonic Solids" --- Talk for exposure visit on 3 February, 2023 for Mathematics Teachers

Dr. Sudhir Kumar Pujahari

- 2023 (March 29th) Sambalpur University, The mysterious primes.
- 2023 (February 15th) Radhakrishna Institute of Technology and Engineering (RITE), Mathematics in daily life.

- 2022 (November 26th) National seminar on "Awarness on Madhava Mathematics competations", B.J.B College.
- 2022 (November 11th) National seminar on "Awarness on Madhava Mathematics competations", Revenshaw. University.

Dr. Sumana Hatui

- One of the panelists in the panel discussion entitled with "The world of Mathematics, exploring the opportunities" on March 26, 2023 as a part of pi day celebration at NISER.

School of Physical Sciences

Professor Bedangadas Mohanty

- Particle Therapy Master Class for School students, March 31, 2023
- World Cancer Day Awareness program at NISER, 4th February 2023

Dr. Colin Benjamin

- Three Summer project students from IISER, Berhampur worked with him from May-July 2022

Dr. Subhankar Bedanta

- Coordinated visit of about 50 students from Carmel English Medium School, Jatni. Gave a lecture "Excitements in magnetic nanotechnology" and gave the students a tour to different laboratory equipment in SPS, NISER.
- Coordinated visit of about 45 students from Freedom International School, Bahugram, Cuttack. Gave a lecture "Excitements in magnetic nanotechnology" and gave the students a tour to different laboratory equipment in SPS, NISER.

Dr. Tapan Mishra

- Visited the Department of Physics, S. V. M. autonomous college, Jagatsinghpur, Odisha, delivered a talk and interacted with the students.

Dr. Shovon Pal

- Talk at SPS day 2022 (Title: Dynamics at ultrashort and ultrafast timescales).

Dr. G. Santosh Babu

- Acted as resource person for Vigyan Pratibha event (4th Teachers Training Workshop from 30th August 2022 to 3rd September 2022). Helped in outreach activity of NISER for school students visiting NISER.

Dr. Sudakshina Prusty

- Coordinated physics laboratory activities for Science Camp during 6-8th April 2023.
- Coordinated exposure visit of Physics teachers of Odisha Adarsha Vidyalaya Sangathan.
- Coordinated numerous physics laboratory visits for school and college students of Odisha.

Centre for Interdisciplinary Sciences

- Coordinated visit of about 50 students from Carmel English Medium School, Jatni.
- Coordinated visit of about 45 students from Freedom International School, Bahugram, Cuttack.
- Coordinated visit of about 45 students from Rajdhani College, Bhubaneswar.
- Coordinated visit of teachers from different schools under Vigyan Pratibha Workshop - Kendriya Vidyalaya, Jawahar Navodaya Vidyalaya.

Consultancy / Sponsored Projects

Consultancy Projects

School of Computer Sciences

Dr. Aritra Banik

- Graph Clustering: A Theoretical Perspective, Science and Engineering Research Board, 2022-2025.

Dr. Subhankar Mishra

- TIRTHA: Crowdsourcing 3D hertitage models, Dassault Systèmes Foundation, India (2022-24).
- Predictive Irrigation Recommendations TIH-IoT Chanakya Fellowship program (2023 -24).

Sponsored Projects

School of Biological Sciences

Professor Palok Aich

- Longitudinal Study of Impact of Probiotics on Gut Profile. Funder: Axilor Venture, Bengaluru.

Dr. Debasmita Pankaj Alone

- Role of Endothelial to mesenchymal transition (EndoMT) inducing factors in the pathophysiology of Fuchs Endothelial Corneal Dystrophy (PI), ICMR, 2021-2024.
- Proteostasis impairment in the progression of pseudoexfoliation syndrome and glaucoma, SERB, 2019-2022.
- Molecular pathogenesis of Ageing disorders: Intramural grant from DAE.

Dr. Harapriya Mohapatra

- Co-PI DST SERB: SARS-CoV-2 spike protein (S)pseudotyped AcNPV baculovirus as a viral entry inhibitor therapeutic, through blocking Sprotein – ACE2 interaction, and as a possible vaccine candidate.

Dr. Manjusha Dixit

- CRISPR-RNA-Cas9 System: Syntheses and Biochemical Evaluations of Nucleobase Modified tropolonyl-Ribose Nucleoside in CRISPR-RNA". DBT, 03/01/2019 to 02/01/2022.

Dr. Praful Singru

- 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 (3 years, 2022-25) Funding agency: SERB.

Dr. Rittik Deb

- DST SERB SRG (SRG/2021/001604): Can gut microbes influence host sexual selection and speciation: a study using agricultural pest Triboliumcastaneum. Funding 2022-2024.

Dr. Swagata Ghatak

- "Aberrant interactions of two pore domain leak potassium channels with Amyloid β in modulating neuronal hyperactivity in Alzheimer's Disease", Funding agency: SERB, Duration: 2 years.
- Award title: Ben Barres Spotlight Awards, Funding agency: eLife Sciences Publications Ltd.

School of Chemical Sciences

Professor A. Srinivasan

- 2D and 3D Calixbenzopyrroles and Calixbenzophyrins: Synthesis and Receptor Studies. Scheme No.: 01(3070)/21/EMR-II; Funding Agency: CSIR, New Delhi.

Professor Himansu Sekhar Biswal

- "Vibrational Signatures of Chirality, Chiral Recognition and Chirality Transfer through Novel Noncovalent Interactions". Funding Agency: SERB (Project File No: CRG/2022/001096.

Dr. Jogendra Nath Behera

- Conductive Metal organic framework (MOFs) derived nanostructure materials as electrocatalyst for water splitting, Funding agency: SERB, DST, And Duration: 36 months.

Dr. Moloy Sarkar

- Received Grants for SERB proposal under TARE scheme.

Dr. Nagendra Kumar Sharma

- CRISPR-RNA-Cas9 System: Syntheses and Biochemical Evaluations of Nucleobase Modified tropolonyl-Ribose Nucleoside in CRISPR-RNA. Department of Biotechnology (DBT), Ministry of Science & Technology, Government of India, New Delhi.
- Synthesis of Functional DNA Comprising Aminotropnyl 2'-deoxyuridine Analogues for Cross-linking with Peptides. Science and Engineering Research Board (SERB) - Department of Science and Technology, Government of India, New Delhi.

Dr. Ponneri C. Ravikumar

- SERB Core Research Grant; Royal Society of Chemistry Grant; DBT Welcome trust (Co-investigator).

Dr. Bishnu Prasad Biswal

- Awarded, SRG by SERB, Govt. of India (2022-24).

School of Earth and Planetary Sciences

Dr. Jayesh Mahendra Goyal

- Unravelling the Atmospheres of Far Away Worlds with Adaptable Planetary Atmosphere Model, SERB Start-up Research Grant (SRG), 2 years.

Dr. Pathikrit Bhattacharya

- Analytical and numerical analysis of landslide slope stability under non-linear prescriptions of frictional strength, SERB-MATRICS, 3 years.

School of Humanities and Social Sciences

Dr. Amarendra Das

- Concurrent Evaluation of District Mineral Funds in Keonjhar and Sundargarh Districts, in collaboration with NABCONS, Bhubaneswar. Funded by Government of Odisha.

School of Mathematical Sciences

Dr. Kamal Lochan Patra

- Graphical Indices associated with different central parts of connected graphs, Funding agency:SERB, India, Duration**:** 3 Years (From 5th Jan 2023).

Dr. Binod Kumar Sahoo

- SERB Core Research Grant, File No.: CRG/2022/000344, Duration: 36 months.

Dr. Sanjay Parui

- MT1902 : Lacunary Maximal functions for Dunkl operators , SERB 05/02/2020-04/02/2023

Dr. K. Senthil Kumar

- SERB MATRICS GRANT, Funding agency: Department of Science and Technology, Govt. of India. Duration: 2022-2024.
- **Dr. Sutanu Roy**
- MATRICS by Science and Engineering Research Board (SERB), Department of Department of Science and Technology (DST), India from December 2020 to December 2023.

Dr. Ramesh Manna

- Inspire research grant
- National Post-Doctoral Fellowship (NPDF, Dr. Debkumar Giri) (Project code:MT2202)

School of Physical Sciences

Professor Bedangadas Mohanty

- "Indian participation in the ALICE experiment at CERN". Funding Agency: DAE, Govt. of India. Duration: 2021-2026.
- "J. C. Bose Fellowship". Funding Agency: SERB-Department of Science and Technology, Govt. of India. Duration: 2018-2023.

Dr. Colin Benjamin

- Funding agency: SERB, DST, Government of India, CRG grant on "Josephson junctions with strained Dirac materials and their application in quantum information processing". Grant No. CRG/2019/006258 from Mar. 2020-Sep. 2023.

Dr. Ajaya Kumar Nayak

- Stabilization of non-trivial magnetic skyrmions from trivial bubbles by helicity locking in centrosymmetric magnets. Funding agency: SERB. Duration: 2023-2026 (Three Years).

Dr. Tapan Mishra

- Simulating interacting Quantum Walks using Quantum Computers, MeitY, Govt. of India, 2 years.

Dr. Shovon Pal

- Microcavity enhanced terahertz nonlinearities of topological states: Towards ultrafast spintronics, SERB-SRG, 3 months.

Centre for Medical and Radiation Physics

- Capital project of NISER titled "Basic Research in physical and Multidisciplinary sciences" for medical physics course/department. Duration: 2021-24, agency: DAE, Govt. of India.

Conferences/ Seminars/ Workshops/Webinars

Participated

Professor Chandan Goswami

- National Symposium on Biotechnology for sustainable development-2022 at RGCB. Thiruvananthapuram, 27th July
- EMBO workshop on "An integrated view of early land plant evolution" at NISER, 8-11thNov 2022
- Teachers' Training Program entitled "One Week Workshop on Hands-on Experiences on High-end Instruments" organized by the Institute of Chemical Technology-Indian Oil Odisha Campus (ICT-IOC), Bhubaneswar in association with SDI Bhubaneswar. 3-4th Feb
- Symposium on Interdisciplinary Sciences (SIS-1) conference at NISER. 27-28th Jan 2023
- Electron Microscope Society of India, Delhi 8-10th Feb 2023.

Professor Palok Aich

- 4th International Genomics Analysis and Technology Conference (GATC), April 7-9, 2023, in Stem, Bangalore
- Science, Society and Communication. National Conference on Science in Everyday Life. March 24-25, 2023. School of Humanities and Social Sciences, NISER Bhubaneswar, India.
- 6th Biennial Conference of Pai & International Symposium on Psychobiotics and Gut: Potential in Neurological Disorders, December 5-6, 2022. Organized by: Probiotic Association of India, in association with ICAR-National Dairy Research Institute, Karnal & DUVASU, Mathura, India.

Dr. Abdur Rahaman

- 2nd HBNI Life Sciences Meet at SINP Kolkata 16-17 Feb 2023

Dr. Asima Bhattacharyya

- "Study of extracellular vesiclesreleased from Helicobacter pylori-infected gastric epithelial cells and determining their protein content". Samal S., Dixit P., Banerjee S., Poirah I., Chakraborty D., Bhattacharyya A*. 7th Warsaw Conference on Perspectives of Molecular Oncology (virtual), Maria Skłodowska-Curie National Research Institute of Oncology, Warsaw, Poland, 6-7 October, 2022.
- "CEACAM dynamics in hypoxia determines gastric carcinogenesis". Poirah I, Chakraborty D, Dixit P, Samal S, Chakraborty S, Singh SP, Singer BB, Bhattacharyya A*. 91st Annual Meeting of Society of Biological Chemists (India) on "Life at the Confluence of Biology and Chemistry", Society of Biological chemists (I) Kolkata Chapter, 8th-11th December, 2022.
- "Determination of the characteristics and protein signature of extracellular vesicles released by Helicobacter pylori-infected gastric epithelial cells". Samal S, Dixit P, Banerjee S, Poirah I, Chakraborty D, Bhattacharyya A*. HBNI Theme Meeting on Life Sciences, Raja Ramanna Centre for Advanced Technology, Indore, 7-10 September, 2022.
- "Siah2 regulates expression of CEACAMs in H. pylori-infected gastric epithelial cells".Chakraborty D, Dixit D,Poirah I, Samal S, Singer B B, Rout N, Singh S P, Bhattacharyya A*.International Conference on Recent Trends in Biotechnolgy 2022. Centurion University of Technology & Management, Bhubaneswar, 22-23 June 2022.
- "Hypoxia-responsive and HIF1 -regulated AAA+ ATPase ATAD2 shows high oncogenic potential in stomach cancer."Roychowdhury

A*, Nayak A, Kumar S, Dixit A, Bhattacharyya A. AACR Annual Meeting, New Orleans, 2022.

Dr. Debasmita Pankaj Alone

- 28th Annual Meeting of the Indian Eye Research Group, LVPEI Hyderabad, 9th-11th September, 2022.
- XLV All India Cell Biology Conference and International Symposium on Biology of Development and Disease, Banaras Hindu University, Varanasi, 20th-22nd January, 2023

Dr. Kishore CS Panigrahi

- EMBO workshop Nov. 2022 and Agrivision Jan 2023

Dr. Manjusha Dixit

- Frontiers in Cancer Science (FCS)-2022, 7th-9thNov 2022, NUS, Singapore
- Cell Biology Conference at Varanasi (BHU) in January 2023 (Oral Presentation)

Dr. Praful Singru

- 8th ASSOPICON 2022, Department of Physiology, All India Institute of Medical Sciences (AIIMS), Nagpur, October 14-16, 2022.
- 72nd Indian Pharmaceutical Society (IPC) Congress, RTM Nagpur University, Nagpur, Jan. 19-22, 2023.

Dr. Ramanujam Srinivasan

- Yeast India 2023: Fundamentals to Applications of Yeast and Fungi. 10th - 14thMarch, 2023, IISER Mohali, India.
- CEM3DISI 3rd Annual Symposium. 17th Dec 2022. IISER Pune, India. Partitioning DNA in bacteria.
- EMBO Practical Course CEM3DIP 2022: Single Particle Cryo-EM of Macromolecular Assemblies and Cellular Tomography 4th-16th December, 2022, Pune, India.

Dr. K. Himabindu Vasuki

- International EMBO workshop on "An Integrated view of Early Land Plant Evolution" from 8-11th November 2022, Organized by SBS, NISER, Bhubaneswar, India.

Dr. Rittik Deb

- EMBO Workshop in Plant Sciences. NISER. 8-11 November 2022

Dr. Swagata Ghatak

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

Dr. Bhargava B.L.

- HBNI Chemistry Meeting, NISER - Bhubaneswar, January 2023

Dr. Chandra Sekhar Purohit

- FORCS -IICS, 2022, Agra, 28th - 31st July, 2022
- RSC-COFS, 2022, IIT Roorkee, 01-04, December, 2022
- Nano tools for Drug Development and its impact on Pharma Sector- Opportunities & Challenges" Barpali, Odisha, 17th, March, 2023.

Dr. Jogendra Nath Behera

- HBNI, Chemistry Meet, NISER

Dr. Moloy Sarkar

- Gave a Talk in National Symposium, " Chemical Dynamics in Complex Systems (CDCS-2022)" conducted by IISER Bhopal, IIT Bombay and JNU in May 2022.
- Gave Invited Talk in International Conference in BITS Goa (IC-AIE-FA 2022) in DEC 2022.

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, Bhubaneswar.

Dr. Ponneri C. Ravikumar

- Organo- & Electrocatalysis for Sustainable Synthesis, IIT Bhubaneswar, 22nd & 23rd December 2023.

Dr. Prasenjit Mal

- "Supramolecular Catalysis and Visible Light Photocatalysis in Organic Synthesis" National Seminar on Recent Advances in Chemical Sciences (RACS - 2023) on March 16-17, 2023 at the Department of Chemistry, Dr. Harisingh Gour Vishwavidyalaya (A Central University), Sagar, MP.
- "Supramolecular Catalysis and Visible Light Photocatalysis in Organic Synthesis" Emerging Trends in Chemical Sciences-2023 (ETCS-2023), on 2nd - 4th March 2023. NEHU, Shillong, Meghalaya.
- "Supramolecular Catalysis in Organic Synthesis" Kaleidoscope 2022, Udaipur, Rajasthan on 28th to 31st July 2022.
- "Supramolecular Catalysis in Organic Synthesis" CONTEMPORARY FACETS IN ORGANIC SYNTHESIS (CFOS), Department of Chemistry, IIT Roorkee, December 01 - 04, 2022.

Dr. S. Peruncheralathan

- Flow Chemistry e-symposium, NIPER-Kolkata, during 08-10 December, 2021
- Main-group Molecules to Materials-II (MMM-II), NISER-Bhubaneswar, during 13-15 December 2021 (On-line)

Dr. Sharanappa Nembenna

- International Conference held at IISER Tiruvananthapuram

Dr. Sudip Barman

- International conferences on Catalysis and chemical engineering at Rome, Italy (20/03/2023 -21/03/2023).
- International Conferences on Material Science and Engineering at Paris, France (27/03/2023-28/03/2023).

Dr. Upakarasamy Lourderaj

- Faraday Discussions on Unimolecular Reactions, Oxford, June 2022
- Quantum Reactive Scattering, Hungary, September 2022
- Spectroscopy and Dynamics of Molecules and Clusters (SDMC), November 2022
- HBNI Meet, NISER Bhubaneswar, January 2023
- Machine Learning for Science, Kodaikanal, March 2023

Dr. Arindam Ghosh

- International Symposium on NMR: 28th meeting of national magnetic resonance society (NMRS 2023), IISER Berhampur.

Dr. Bishnu Prasad Biswal

- National Conference on Chemistry & Environment, March 17-18, 2023 SPU, Gujarat.
- Emergent Materials for Energy and Environment (EMEE-2023)" during March 04-05, 2023, IIT Roorkee.
- 27th ISCB International Conference (ISCBC-2022), 16 - 19th Nov 2022 at BIT Mesra.

Dr. Subhankar Mishra

- ACM CODS COMAD 2023
- ECML PKDD 2023
- COINS 2022
- ENERGYCON 2022

Dr. Liton Majumdar

- Cloud Academy 3: Cloud Formation and Properties in Extrasolar Planets, Les Houches Advanced School for Physics, France, March 26-31, 2023

Dr. Jayesh Mahendra Goyal

- Astrophysics Seminar, IISc Bangalore , 14-15 September 2022
- Pune Knowledge Cluster Exoplanets Course (Workshop), Online, 7th February 2023
- Astronomical Society of India (ASI March 2023) Conference IIT Indore, Plenary Session, 1st-5th March 2023
- Planet ESLAB 2023, ESA ESTEC Netherlands, 20-24th March 2023

Dr. Priyadarshi Chowdhury

- IISc-NTU Meet, IISc Bengaluru, 02.03.2023 to 03.03.2023

Dr. Pranay Kumar Swain

- Remembering Vienna Circle: Logical empiricism and Critical rationalism, National Seminar on Science in Everyday Life, RC-28, ISS and NISER, Bhubaneswar, at NISER Bhubaneswar, 24-25 March 2023.
- Everyday Lives of Contractual Teachers in Government Schools of Odisha: Stories of Precarity and Hope, National Seminar on Exploring Aspects of Everyday Life, Indian Sociological Society, at Institute for Development Studies Kolkata, 27-28 June 2022.

Dr. Amarendra Das

- OEA' Odisha Vision 2036 Conclave at Utkal University and NISER Bhubaneswar during January 12-14, 2023.
- 57th TIES Conference at University of Hyderabad, Telangana during January 04-06, 2023.
- 55th Annual Conference of Odisha Economic Association at Kalahandi University, Bhawanipatna, during February 10-12, 2023.
- 6th Annual Conference of South Odisha Economic Association at Berhampur University during December 10-11, 2022.

Professor Brundaban Sahu

- 5th EU/US Workshop on Automorphic Forms and Related Topics (August 1-13, 2022), University of Sarajevo, Bosnia and Herzegovina.
- Workshop on Jacobi forms (December 12--24, 2022), IIT Guwahati.
- Conference on "Motives and Automorphic Forms" in Honour of G. Harder's 85th Birthday (March 06--10, 2023), Max Planck Institute for Mathematics, Bonn, Germany

Dr. Kamal Lochan Patra

- Conference in memory of Prof. Pravir Dutt, Prof. Arbind Kumar Lal and Prof. Sudipta Dutta (5 - 7 November 2022), Department of Mathematics and Statistics, IITKanpur, India.
- Graph Spectra, Combinatorial Graph Theory, Group Theory and Nano-Molecular Electronic Devices (Virtual) (28 - 30 March 2023), University of Malta, Malta.

Dr. Binod Kumar Sahoo

- Conference on "Group Theory and Related Topics", 27 February 2023 - 04 March 2023, SMS, NISER Bhubaneswar.
- Conference in Memory of Prof. Pravir Dutt, Prof. Arbind Kumar Lal and Prof. Sudipta Dutta, November 5-7, 2022, Department of Mathematics and Statistics, IIT Kanpur.

Dr. Jaban Meher

- L-functions, circle method and applications, ICTS, Bengaluru, 27 June–1 July, 2022
- NCM workshops on Jacobi forms, IIT Guwahati, 12–24 December, 2022.
- National workshop on role of Mathematics in science and emerging technology, Sri Sri University, Cuttack, 20 January, 2023.
- National seminar on mathematical analysis and its applications, Kendrapada Autonomous College, 18–19 March, 2023.

Dr. Anupam Pal Choudhury

- Inter IISER-NISER Mathematics Meet (IINMM) 2022 at IISER Kolkata.
- Advanced Instructional School on Inverse Problems held in TIFR-Centre for Applicable Mathematics in July 2022.

Dr. K. Senthil Kumar

- NCMW- Elliptic Curves, Elliptic Functijons and Transcendence, HRI, Prayagraj, 24 Nov- 3 December 2022.

Dr. Nabin Kumar Jana

- Inter IISER-NISER Math Meet, IISER Kolkata, 31st May-2nd June, 2022

Dr. Krishanu Dan

- Topics on Algebraic Geometry and Commutative Algebra (International Conference), SRM University (AP), July 18-23, 2023.

Dr. Chitrabhanu Chaudhuri

- Vector Bundles in Chennai, IIT Madras, 6-11 February 2023.
- Topics in Hodge Theory, ICTS Bangalore, 20-25 February 2023.

Dr. Sudhir Kumar Pujahari

- 2022 (20th - 24th June) Equidistribution and Arithmetic Dynamics, Oklahoma State University.
- 2022 (20^{th} - 25^{th} February, 2023), Workshop on Number Theory, NISER.

Dr. Ramesh Manna

- Attend a Three day symposium at IISc Bangalore, July, 2022.

Professor Bedangadas Mohanty

- XXIXth International Conference on Ultra-relativistic Nucleus-Nucleus Collisions (Quark Matter 2022), April 4 - 10, 2022, Krakow, Poland.
- RHIC/AGS Annual Users' Meeting, June 7 - 10, 2022.
- 20th International Conference on Strangeness in Quark Matter (SQM 2022), June 13 - 17, 2022, Busan, Republic of Korea.
- XLI International Conference on High Energy Physics (ICHEP 2022), July 06-13, 2022, Bologna, Italy.
- International Conference on Identification of Dark Matter 2022, July 18-22, 2022, Austria, Vienna.
- XI International Conference on New Frontiers in Physics (ICNFP 2022), Aug. 30 - Sep. 11, 2022, Kolymbari, Crete, Greece.
- INPC2022 - 28th International Nuclear Physics Conference 2022, Sep. 11-16, 2022, Cape Town, South Africa.
- International conference on Critical Point and Onset of Deconfinement (CPOD 2022), Nov. 28 - Dec. 2, 2022.
- 66th DAE Symposium on Nuclear Physics, Dec. 01-05, 2022, Cotton University, Guwahati, Assam, India. XXV DAE-BRNS High Energy Physics Symposium, Dec. 12-16, 2022, IISER Mohali, India.
- International Conference on Physics and AstroPhysics of Quark Gluon Plasma (ICPAQGP), Feb. 07-10, 2023, Puri, Odisha, India.

- National Conference on Science in Everyday Life, Mar 24-25, 2023, NISER, India
- Horizons in Accelerators, Particle/Nuclear Physics and Laboratory based Quantum Sensors for HEP/NP, November 14-17, 2022, ICTS, Bangalore.
- Odisha research Conclave, Nov 14-16, 2022, Ravenshaw University, Cuttack.
- Organizing Committee member of QCD with Electron Ion Collider (QEIC) II, IIT Delhi, 18-20 December 2022
- International Nuclear Physics Conference 2022, Cape Town, South Africa, September 2022.

Dr. Anamitra Mukherjee

- Attended Q-MAT2022, IIT Kanpur 18-22 Sep 2022
- Attended PSCES, IISER Pune, 15-17 March 2023

Dr. Colin Benjamin

- Attended online summer School on Quantum Information and Quantum Technology in June 2022 organized by IISER Kolkata.

Dr. Nishikanta Khandai

- 28-30th November 2022, Indian Academy of Science and NCRA Meeting on Gas in Galaxies, Orange County, Coorg, Karnataka.
- 2-5 February 2023, IUCAA Workshop GALFLOWS 2023, Pune, Maharashtra.

Dr. Amaresh K Jaiswal

- Conference on Hot QCD Matter 2022, Goa, May 12-14, 2022
- ALICE-India collaboration meeting, VECC Kolkata, September 5-8, 2022
- Excited QCD 2022, Sicily, Italy, October 24-28, 2022
- CETHENP 2022, VECC Kolkata, November 15-17, 2022
- 66th DAE Symposium on Nuclear Physics, Guwahati, December 1-5, 2022
- ICPAQGP Puri, February 7-10, 2023
- HHHPS 2023, IIT Gandhinagar, March 24-25, 2023
- MAGIC 2023, Kovalam Kerala, March 28-April 1, 2023

Dr. Ashis Kumar Nandy

- "DD Transition" Meeting in Goa August 5 – 7, 2022, India.
- QMAT-2022, IIT Kanpur, September 18 - 22, 2022, Kanpur, India.
- National Conference on Electronic Structure 2022 (NCES2022) November 14 - 16, 2022, Goa University, Goa, India.
- Evolution of Electronic Structure Theory and Experimental Realization (EESTER) 2023, 3rd Edition January 4 -12, 2023, IIT Chennai, India.
- "Focused meet on Quantum Matter" January 24, 2023 S.N.Bose National Centre for Basic Sciences, Kolkata, India.

Dr. Kush Saha

- APS March Meeting 2023, Las Vegas, Naveda, 5^{th} -10^{th} March, 2023.
- Quantum Condensed Matter (QMAT 2022) 2022, IIT Kanpur, 18^{th} -22^{nd} September, 2022.

Dr. Tapan Mishra

- QMAT, IIT Kanpur, 18-22 September 2022.

Dr. Victor Roy

- Attended ICPAQGP 2023, Puri.
- Emergent topics in relativistic hydrodynamics, chirality, vorticity and magnetic field
- Heavy hadrons in heavy-ion to particle collisions at Indian Institute of Technology Gandhinagar, India March 24-25, 2023.

Dr. V Ravi Chandra

- Novel Phases of Matter in frustrated magnets,

Organised by CEFIPRA in University of Bordeaux, France, October 17th-20th (Presented invited talk).

Dr. Narayan Rana

- International Meeting on High Energy Physics (IMHEP II)

Dr. Shovon Pal

- Ultrafast Science (UFS) 2022, IISER Trivandrum, 3-5 Nov 2022.

Dr. Sudakshina Prusty

- Digital and Dynamic Holography with Applications (GIAN Course), IIT Patna, 12.12.2022-17.12.2022.

Dr. G. Santosh Babu

- Attended Webinars on FPGA design

Dr. Shuddha Shankar Dasgupta

- APCTP workshop for the Electron Ion Collider (EIC) in Seol South Korea - November 2, 2022 to November 4, 2022.
- QEIC-II, held at IIT Delhi from December 18-20, 2022
- Theme meeting on CBM: Science and Technology held at NISER from Februrary 4, 2023 to February 6, 2023.
- ICPAQGP conference in Puri from February 7-10, 2023
- Particle Therapy Master Class held at NISER on March 31, 2023

Dr. Ganesh Jagannath Tambave

- XXV DAE-BRNS High Energy Physics symposium held at IISER, Mohali from December 12 -16, 2022
- QEIC-II, held at IIT Delhi from December 18-20, 2022
- ICPAQGP conference in Puri from February 7-10, 2023
- Theme meeting on CBM: Science and Technology held at NISER from Februrary 4, 2023 to February 6, 2023.
- Particle Therapy Master Class held at NISER on March 31, 2023
- Hands on detector session, 5th India ALICE-STAR School at Institute of Physics, November 1 - 12, 2022.

Mr. Kirti Prakash Sharma

- Theme meeting on CBM: Science and Technology held at NISER from Februrary 4, 2023 to February 6, 2023.
- ICPAQGP conference in Puri from February 7-10, 2023
- Particle Therapy Master Class held at NISER on March 31, 2023
- Hands on detector session, 5th India ALICE-STAR School at Institute of Physics, November 1 - 12, 2022.

Dr. Raveendrababu Karnam

- Theme meeting on CBM: Science and Technology held at NISER from Februrary 4, 2023 to February 6, 2023.
- XXV DAE-BRNS High Energy Physics symposium held at IISER, Mohali from December 12--16, 2022
- Particle Therapy Master Class held at NISER on March 31, 2023
- Hands on detector session, 5th India ALICE-STAR School at Institute of Physics, November 1 - 12, 2022.

Organized

Professor Chandan Goswami

- EMBO workshop on "An integrated view of early land plant evolution" at NISER, 8-11th Nov 2022 as Co-convenor.

Dr. Debasmita Pankaj Alone

- Outreach Talk Series and popular talks at NISER.
- Vigyan Pratibha Teacher's training workshops with Kendriya Vidyalaya, Jawahar Navodaya Vidyalaya and AECS teachers from Odisha and Chhattisgarh region 31st Aug- 3rd Sept, 2022 and 12th-15th Dec., 2022.

Dr. Kishore CS Panigrahi

- Convener, EMBO workshop: Integrated View on Land Plant Evolution organized at Swosti Premium and NISER, Bhubaneswar, 9-12 Nov 2022.

Dr. Pankaj Vidyadhar Alone

- SBS-NISER meet 2022.

Dr. Ramanujam Srinivasan

- CEMBIOSS 2023

Dr. Tirumala Kumar Chowdary

- CEMBIOS 2023 - Cryo Electron Microscopy of Biological Systems, Feb 13-14, 2023, NISER, Bhubaneswar

Dr. Aniruddha Datta Roy

- · Workshop on molecular phylogenetics, Venue: LaCONES, CCMB, Hyderabad Dates: October 3-7, 2022.
- Hands-on workshop on molecular phylogenetics, Venue: Mizoram University, Mizoram Dates: March 9-13, 2023.

Professor A. Srinivasan

- Session Chair for the conference, "Main-group Molecules to Materials-II"

Dr. Chandra Sekhar Purohit

- HBNI interaction meeting in chemical sciences, 18th - 20th January 2023

Dr. Krishnan Venkatasubbaiah

- International Conference on Main-group Molecules to Materials-II (MMM-II), NISER, 13-15th December 2021.

Dr. Nagendra Kumar Sharma

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

Dr. Sharanappa Nembenna

- 1st HBNI interaction meeting in Chemical Sciences

Dr. Subhankar Mishra

- CS Katha Barta, Talk series inviting Academicians and Industry persons.
- Yantriki, a magazine made of collaboration of articles in robotics and
- Hackduino, a robotics idea fabricating competition.

Dr. Pathikrit Bhattacharya and Dr. Priyadarshi Chowdhury

- "Short Course on Experimental Rock Deformation and Rheology of Earth Materials", NISER, 17/12/2022-18/12/2022.

Dr. Pranay Kumar Swain

- National Seminar on Science in Everyday Life, RC-28, ISS and NISER, Bhubaneswar, at NISER Bhubaneswar, 24-25 March 2023

Dr. Amarendra Das

- OEA' Odisha Vision 2036 Conclave at Utkal University and NISER Bhubaneswar during January 12-14, 2023.
- 55th Annual Conference of Odisha Economic Association at Kalahandi University, Bhawanipatna, during February 10-12, 2023
- NISER Colloquy on "Input Tax Credit and Evasion Control Mechanism in GST" by Sumanta Kumar Samantaray, OFS, Commercial Tax and GST Officer, Enforcement Unit, Rourkela on November 25, 2022.
- Workshop on Ethics in Social Science Research and Review of Literature organised by NISER and Odisha Economic Association on August 18, 2022 at SHSS, NISER.

- Panel Discussion on RBI's Annual Report 2021-22 by DEPR, RBI on August 12, 2022 at NISER Bhubaneswar.

Dr. Rooplekha Khuntia

- Positive Life Skills for Stress Management and Happiness' - 1st of the two series webinar talk by Dr. Narendra NathSamantaray, Dept. of Clinical Psychology, School of Medical & Paramedical Science, Mizoram University, 8th April, 2022.
- Managing Worry and Anxiety - 2nd talk of the two series webinar talk by Dr. Narendra NathSamantaray, Dept. of Clinical Psychology, School of Medical & Paramedical Science, Mizoram University, 30th April, 2022.
- Overcoming Anxiety', organized two group session for NISER students 18th November, 2022 and 20th January, 2023.

Professor Brundaban Sahu

- Workshop on Number Theory (February 20-25, 2023), NISER Bhubaneswar

Dr. Kamal Lochan Patra

- Annual Foundation School - II, SMS NISER Bhubaneswar, 6th June - 2nd July 2022
- Conference on Group Theory and Related Topics, SMS NISER Bhubaneswar, 27th Feb -4th March 2023

Dr. Binod Kumar Sahoo

- Conference on "Group Theory and Related Topics", 27 February 2023 -04 March 2023, SMS, NISER Bhubaneswar (Organizers: Binod Kumar Sahoo, Kamal Lochan Patra, Sumana Hatui, Tushar Kanta Naik).
- Annual Foundation School-II, June 6, 2022 - July 2, 2022, SMS, NISER Bhubaneswar (Organizers: Binod Kumar Sahoo, Kamal Lochan Patra).

Dr. Jaban Meher

- Workshop on Number Theory, 20–25 February, 2023.

Dr. K. Senthil Kumar

- Workshop on Number Theory, 20-25 February 2023, NISER, Bhubaneswar.

Dr. Sudhir Kumar Pujahari

- 2023 (March 26th) Pi Day, NISER
- 2023 (20th - 25th February, 2023), Workshop on Number Theory, NISER

Dr. Tushar Kanta Naik

- Group Theory and Related Topics, NISER Bhubaneswar, February 27 - March 04, 2023.

Dr. Sumana Hatui

- Organized a Conference "Group Theory and Related Topics" at NISER Bhubaneswar, February 27 to March 04, 2023 (with Binod K. Sahoo, Kamal L. Patra, Tushar K. Naik).

Professor Bedangadas Mohanty

- Theme Meeting on Compressed Baryonic Matter (CBM) Experiment - Science and Technology at NISER from 3rd to 4th February 2023.
- P. K. Parija Memorial Lecture in Life Sciences at NISER and IISER Berhampur, 24 March 2023
- As part of the ALICE Outreach Board organized a visit for collaboration members to visit the 600-MeV Synchrocyclotron at CERN. 67 collaborators signed up for the tour.
- Visit of Prof. Antonio Ortiz Velasquez of ICN, Universidad Nacional Autónoma de México to NISER for discussions on building detector for measuring muons as part of the proposed ALICE 3 project at LHC-CERN.
- International Conference on Physics and AstroPhysics of Quark Gluon Plasma (ICPAQGP), Feb. 07-10, 2023, Puri, Odisha.

- World Cancer Day Awareness program at NISER, 4th February 2023
- Visit of Prof. Nu Xu, Lawrence Berkeley National Laboratory, USA, ex-spokesperson of STAR experiment to NISER for research collaboration.
- Visit of Prof. Jurgen Schukraft, first spokesperson of ALICE experiment at CERN-LHC for research collaboration.
- National Conference on Advances in Physics (NCAP-2023), Jan 3-4, 2023, P. G. Department of Physics, Vani Vihar, Bhubaneswar, Odisha, India.
- Visit of Prof. Rupak Mahapatra of Texas A&M University at NISER for research collaboration, 23 December 2022.
- Visit of Prof. Abhay Deshpande of Stony Brook University, New York, USA to NISER on 21st December 2022 for research collaboration.
- Visit of CERN-Task Force from Geneva, Switzerland and DAE, Mumbai to NISER on 20th December 2022.
- 5th India ALICE-STAR School at Institute of Physics, 1-12, November 2022.
- India-ALICE-STAR Webinar Series, 2022, a Special Lecture Series on Heavy Ion Physics
- Visit of Dr. Luciano Musa, Spokesperson ALICE Collaboration, CERN-LHC, Geneva Switzerland, 31st October 2022.
- Organizing Committee member of QCD with Electron Ion Collider (QEIC) II, IIT Delhi, 18-20 December 2022
- Workshop on setting up Population based Cancer registry for Khordha district. October 10-15, 2022.

Dr. Anamitra Mukherjee

- Organized Young Investigators Meet on Quantum Condensed Matter Theory, NISER, 31st Oct-1st Nov 2022.

Dr. Subhankar Bedanta

- Webinar series on spintronics (W2S-2021), Successfuly completed 100 webinars of this webinar series. The 100th talk was given by Prof. Stuart Parkin.

Dr. Yogesh Srivastava

- Regional String Meeting 5-9th September 2022

Dr. Amaresh K Jaiswal

- Emergent Topics in Relativistic Hydrodynamics, Chirality, Vorticity and Magnetic Field, NISER (Toshali Sands, Puri), 02-05 February 2023.

Dr. Ashis Kumar Nandy

- Young Investigators Meet on Quantum Condensed Matter Theory, NISER, Bhubaneswar, 28 October to 1st November, 2022.

Dr. Kush Saha

- "Young Investigator Meet on Quantum Condensed Matter Theory 2022" at NISER, Bhubaneswar, 29th Oct-1st Nov, 2022.

Dr. Sumedha

- Organised Discussion meeting on "Statistical Physics of Complex Systems", from 19-23 December 2022 at ICTS, Bengaluru, India (https://www.icts.res.in/discussion-meeting/SPCS2022)

Dr. Tapan Mishra

- Young Investigators Meet on Quantum Condensed Matter Theory, NISER, Bhubaneswar, 28 October to 1st November, 2022.

Dr. Ravi Chandra

- Co-organiser of "Young Investigator Meet on Quantum Condensed Matter Theory", October 29th- November 2, 2022, NISER Bhubaneswar.

Dr. Victor Roy

- Emergent topics in relativistic hydrodynamics, chirality, vorticity and magnetic field, Toshali Sands, Puri, Odisha, 02 - 05 Feb 2023

Dr. Ganesh J Tambave, Dr. Raveendrababu Karnam, Mr. Kirti Prakash Sharma

- Hands on detector session, 5th India ALICE-STAR School at Institute of Physics, 1-12, November 2022.

Centre for Interdisciplinary Sciences

Conference

Name- SIS 1Conference

Date - 27th - 28th January 2023

Venue: Pathani Samanta Auditorium, NISER

CIS Seminar

Title: Functional DNA nanotechnology: origami, aptamers and their applications

Date: 5th December 2022

Venue: CIS conference hall

Speaker name: Dr Banani Chakraborty, from Department of Chemical Engineering, IISc Bangalore

Program Committee

Professor Chandan Goswami

- Electron Microscope Society of India, Delhi 8-10thFeb 2023

Dr. Debasmita Pankaj Alone

- Steering Committee member, India Investigator Network (IIN), supported by EMBO.

Dr. Kishore CS Panigrahi

- EMBO workshop: Integrated View on Land Plant Evolution organized at Swosti Premium and NISER, Bhubaneswar, 9-12 Nov 2022.

Dr. Mohammad Saleem

- Symposium for Interdisciplinary Sciences, NISER (Organizing committee)

Dr. K. Himabindu Vasuki

- Committee member for International EMBO workshop on "An Integrated view of Early Land Plant Evolution" from 8-11th November 2022, Organized by SBS, NISER, Bhubaneswar.

Professor A. Srinivasan

- 1st HBNI Interaction meeting in Chemicalciences, 18th to 20th January 2023 at NISER.

Dr. Chandra Sekhar Purohit

- HBNI interaction meeting in chemical sciences

Dr. Jogendra Nath Behera

- Main-group Molecules to Materials-II (MMM-II) from 13-15 December 2021, SCS, NISER

Dr. Ponneri C. Ravikumar

- Chair for Oral Talk Session, 3rd Anatolian Conference on Organic Chemistry. Antalya, Turkey, 13th-16th March 2023.
- Chair for a Technical Session, Organo- & Electrocatalysis for Sustainable Synthesis, 22nd & 23rd December 2023.
- Co-Chair for Judging Poster Session, Frontiers in Chemical Sciences, IIT Guwahati, Assam, 4th December 2022.
- Co-Chair for Judging Poster Session, 30th Chemical Research Society of India (CRSI) Conference, held at Jawaharlal Nehru University, 2nd February 2023.

Dr. Sharanappa Nembenna

- International Conference held at IISER Tiruvananthapuram

Dr. Upakarasamy Lourderaj

- Organizing committee member, HBNI Meet, NISER Bhubaneswar, January 2023.

Dr. Aritra Banik

- Walcom 2023

Dr. Liton Majumdar

- Scientific Organizing Committee (SOC) Member, 41st meeting of The Astronomical Society of India, Indian Institute of Technology (IIT) Indore, 1-5 March 2023.

Dr. Amarendra Das

- Secretary in OEA' Odisha Vision 2036 Conclave at Utkal University and NISER Bhubaneswar during January 12-14, 2023.
- Executive Committee Member in 57th TIES Conference at University of Hyderabad, Telangana during January 04-06, 2023.
- Secretary in 55th Annual Conference of Odisha Economic Association at Kalahandi University, Bhawanipatna, during February 10-12, 2023.
- Acted as an evaluator in the Odisha Research Conclave Organised by Odisha State Higher Education Council and Ravenshaw University during November 14-16, 2023 at Ravenshaw University.

Dr. K. Senthil Kumar

- Convenor of the Integrated-PhD screening committee

Dr. Sudhir Kumar Pujahari

- 2023 (March 26th) Pi Day, NISER (Program coordinator)

Dr. Ramesh Manna

- Organising the workshop in Analysis, geometry and mathematical physics, July 2023.
- Coordinate and host seminars by SMS postdoctoral fellows

Dr. Sumana Hatui

- Member of organizing Summer Outreach Program in Mathematics, SMS.
- Member of the Monitoring committee for Ph.D students.
- Member, PGCS-SMS.
- **Professor Bedangadas Mohanty**
- International Advisory Committee Member of the 9th Asian Triangle Heavy Ion Conference (ATHIC 2023), Apr 24-27, 2023 Hiroshima, Japan.
- Organizing Committee Member of National Conference on Advances in Physics (NCAP-2023), Jan 3-4, 2023, P. G. Department of Physics, Vani Vihar, Bhubaneswar, Odisha, India.
- National Organizing Committee Member of XXV DAE Symposium in High Energy Physics, December 2022, IISER Mohali.
- Executive Committee member of Odisha Bigyan Academy
- Organizing Committee member, 66th DAE Symposium in Nuclear Physics, December 1-5, 2022, Cotton University, Assam
- Organizing Committee Member of International Conference on Physics and AstroPhysics of Quark Gluon Plasma (ICPAQGP) , Feb. 07-10, 2023, Puri, Odisha, India
- International Advisory Committee, Asia-Europe-Pacific School of High Energy Physics, 5-18, October 2022, Pyeongchang, South Korea
- International Advisory Committee member, Quark Matter Conference, Krakow, Poland, April 4-10, 2022.

Dr. Anamitra Mukherjee

- Convener, Young Investigators Meet on Quantum Condensed Matter Theory, NISER, 31st Oct-1st Nov 2022

Dr. Colin Benjamin

- International Advisory Committee of International Conference on Quantum Computing and Communications (QCC-2023) at Baba Farid College, Bathinda from 09-11 February, 2023

Dr. Amaresh K Jaiswal

- Session chair in ICPAQGP Puri, February 7-10, 2023.

Dr. Victor Roy

- ATHIC 2023 (International Advisory Committee), Hiroshima, Japan

Dr. Shuddha Shankar Dasgupta

- Local organizer, QEIC-II, held at IIT Delhi from December 18-20, 2022

Dr. Raveendrababu Karnam

- Local organizer, Theme meeting on CBM: Science and Technology, held at NISER from Februrary 4, 2023 to February 6, 2023.

Conferences/ Seminars/ Workshops/ Webinars/ Short Courses Organised by School

School of Biological Sciences

EMBO International Workshop

- The long awaited EMBO International Workshop on "An integrated view of early land plant evolution" was successfully counducted during November 8th - 11th, 2022 by SBS at NISER, Bhubaneswar, Odisha, India. There were 219 registered participants (148 attended in-person while 71 attended virtually) from various institutions / Universities across the globe. The formal inauguration of the workshop on 8th November 2022 was chaired by Prof. Mitsuyasu Hasebe as chief guest and Prof Liam Dolan as Guest of Honor. The keynote address was made by Prof. Hasebe throwing light into the history of the first meeting dedicated to bryophytes that took place in Mumbai, India, way back in 1998, organized by TIFR.
- This meeting was held with 24 Invited talks of about 30 minutes each and 18 short talks of 15 mins each. There were 49 posters selected, including 33 presented both online and offline while the rest were only on online mode. Both the offline and online posters were evaluated by a jury consisting in three invited speakers and three best posters were awarded. Thanks to the judges, Prof. Claus Schwenheimer, (Germany), Prof. John Bowman (Australia) and Prof. Imran Siddqui (India). Similarly the Short talks of the early carrier researchers were also evaluated by Prof. Hasebe (Japan) and Prof Liam Dolan (Austria).
- On November 8th evening the Padmashree Dr.Aruna Mohanty performed the famous Odishi dance forms. This cultural program brought many complements from on-site participants. In the last day of the conference an excursion was planned as a part of the Workshop. Participants visited the famous Black Pagoda and a nearby beach town Puri by a trip organized by the organizers. The Organiser Dr. Kishore Panigrahi, SBS, extended his gratitude and sincere thanks to NISER, DBT, ICAR, DAE, INSA and CSIR for their generous support and EMBO for offering travel grants, child care grants, webpage support, virtual platform support and support towards the international travel expanses of the speakers etc.

CEMBIOS 2023

- A two days symposium on "Cryo Electron Microscopy of Biological Systems", was organized by SBS on Feb 13-14, 2023, at NISER, Bhubaneswar.

School of Earth and Planetary Sciences

- "Short Course on Experimental Rock Deformation and Rheology of Earth Materials", NISER, 17/12/2022-18/12/2022.

School of Humanities and Social Sciences

- Remembering Vienna Circle: Logical Empiricism and Critical Rationalism, National Seminar on Science in Everyday Life, RC-28, ISS and NISER, Bhubaneswar, at NISER Bhubaneswar, 24-25 March 2023.
- OEA' Odisha Vision 2036 Conclave at Utkal University and NISER Bhubaneswar, at NISER Bhubaneswar, January 12-14, 2023.
- Workshop on Ethics in Social Science Research and Review of Literature organised by NISER and Odisha Economic Association, at NISER Bhubaneswar August 18, 2022.

School of Mathematical Sciences

- Workshop on Number Theory (February 20-25, 2023), SMS, NISER, Bhubaneswar.
- Conference on "Group Theory and Related Topics", 27 February 2023 -04 March 2023, SMS, NISER Bhubaneswar.
- Annual Foundation School-II, June 6, 2022 - July 2, 2022, SMS, NISER Bhubaneswar
- Pi Day conducted on March 26th2023, SMS, NISER, Bhubaneswar.

Centre for Medical and Radiation Physics

- Particle Therapy Master Class held at NISER on March 31, 2023
- Hands on detector session, 5th India ALICE-STAR School at Institute of Physics, November 1-12, 2022.
- Regular biweekly seminars on Friday regarding Medical Physics for M.Sc students from experts in the field.

New Research Facility

School of Biological Sciences

- Automated Peptide Synthesiser (GYROS PROTEIN Technologies) @ CIF2A
- Metal Ion Imager (Zeiss) @ Imaging facility

School of Chemical Sciences

- Glove Box Workstation Easylab pro, Dielectric Impedance Analyser, Mass Spectrometer
- Stirred Reactor System, Microwave Synthesizer, Expression Compact Mass Spectrometer, P-series Binary HPCL with PDA Detector System with Accessories, Agilent 990 Micro GC System, Laser Head of Super Resolution Confocal Microscope etc.

School of Computer Sciences

- Added Multi-GPU system at NISER for machine learning research

School of Earth and Planetary Sciences

- Seismometers
- Thin section preparation Unit (partly)
- Polarizing Microscopes

School of Humanities and Social Sciences

- Audio-visual facility in the SHSS conference room.

School of Physical Sciences

- THz time-domain spectroscopy setup in the research lab of Dr. Shovon Pal
- Development of in-house Spin-orbit torque set-up in the research lab of Dr. Subhankar Bedanta.
- Development of in-house Spin-Seebeck effect set-up in the research lab of Dr. Subhankar Bedanta.

Centre for Medical and Radiation Physics

- Muography laboratory: A laboratory for cosmic muon based imaging has been setup. The lab is being used for development of RPC based portable muon radiography setup. Development of detectors for muon tomography (used for high Z material identification) is also being explored.
- MicroPattern-Gaseous-Detector (MPGD) laboratory: AnMPGD laboratory has been setup at CMRP where R & D on Micro Pattern-Gaseous-Detectors for single photon detection is being performed. The lab will be used for developing devices for medical imaging, particle physics research and social security purposes.
- Silicon detector laboratory: A silicon detector lab has been setup where Silicon Pad detectors and Silicon Photomultiplier detectors are being tested. R & D on silicon detectors for high energy physics and societal imaging applications will be carried out in this laboratory.
- ISO-6 Cleanroom: An ISO-6 cleanroom with approximately 300 sq. ft of area has been established with passbox facility. It is being used to assemble and test both MPGD and silicon detectors.
- 6 channel gas mixing system: The 6-channel gas mixing system is being used for gas detector R & D. It is currently catering to both Resistive Plate Chamber detectors for Muography as well as MPGD detectors for imaging and particle physics research. It has the capability to mix 6 gases in desired proportions for use in gaseous detectors.
- Fast digitizer and ASIC based frontend electron.

Research and Development Projects: Extramural Funding

Sl No	Project Code	Name of the P.I/Co.PI	Dept	Sponser Dept	Project Title	Cost of the Project (₹)	Duration		Total Year
							From	To	
1	CH2201	Dr. Bishnu Prasad Biswal	SCS	SERB	Design and fabrication of composite hellow fiber membranes using organic cage linked coordination polymers and waste plastic for olefin-paraffin separation	₹ 31,31,250.00	09.09.2022	08.09.2024	2
2	PH2202	Dr. Mriganka Mouli Mondal	SPS	SERB	Ramanujam Fellowship	₹1,19,00,000.00	11.08.2022	10.08.2027	5
3	PH2203	Dr. Shamik Banerjee	SPS	SERB	Secattering Amplitudes and Flat Space Holography	₹ 64,49,800.00	14.02.2022	13.02.2027	5
4	BL2202	Dr. Swagata Ghatak	SBS	SERB	Aberrant interaction of two pore domain leak potassium channels with Amyloid B in modulating neuronal hyperactivity in Alzheimer's Disease.	₹ 29,26,000.00	10.11.2022	09.11.2024	2
5	PH2204	Dr. Shovon Pal	SPS	SERB	Microcavity enhanced terahertz nonlinearities of topological states: Towards ultrafast spintronics.	₹ 19,41,178.00	05.12.2022	04.12.2024	2
6	CH2202	Dr. Pratap Kumar Chhotaray, Mentor: Dr. Molay Sarkar	SCS	SERB	Teachers Associateship for Research Excellence (TARE)	₹ 10,05,000.00	02.11.2022	01.11.2025	3
7	CH2203	Professor Himansu Sekhar Biswal	SCS	SERB	Vibrational Signatures of Chirality, Chiral Recognition and Chirality Transfer through novel Nonvovalent Interactions.	₹ 36,96,000.00	27.12.2022	26.12.2025	3
8	EPS2201	Dr. Jayesh M Goyal	SEPS	SERB	Unravelling the Atmospheres of Far Away World with Adaptable Planetary Atmosphere Model.	₹ 30,50,344.00	27.12.2022	26.12.2024	2
9	MT2201	Dr. Kamal Lochan PatraSMS		SERB	Graphical indices associated with different central parts of connected graphs.	₹ 6,60,000.00	05.01.2023	04.01.2026	3

10	CS2202	Dr. Aritra Banik	SCoS	SERB	Graph Clustering: A Theoretical Perspective.	₹ 6,60,000.00	04.01.2023	03.01.2026	3
11	PH2205	Dr. Anamitra Mukherjee	SPS	SERB	Novel Recursive Green's function technique in the Fock space & Applications	₹ 6,60,000.00	09.01.2023	08.01.2026	3
12	CH2204	Dr. R Arunachalam Mentor: Dr. Chidambaram Gunanathan	SCS	SERB	National Post Doctoral fellowship	₹ 21,31,200.00	05.12.2022	04.12.2024	2
13	MT2202	Dr. Debkumar Giri (NPDF) Mentor: Dr. Ramesh Manna	SMS	SERB	National Post Doctoral fellowship	₹ 21,31,200.00	02.01.2023	01.01.2025	2
14	BL2203	Dr. Rittik Deb	SBS	SERB	Can gut microbes influence host sexual selection and speciation: a study using agricultural pest Tribolium castaneum	₹ 28,71,000 NISER received ₹ 20,57,547/-	21.01.2022	20.01.2024	2
15	EPS2202	Dr. Pathikrit Bhattacharya	SEPS	SERB	Analytical and numerical analysis of landslide slope stability under non-linear prescriptions of frictional strength.	₹ 6,60,000.00	10.01.2023	09.01.2026	3
16	MT2203	Dr. Binod Kumar Sahoo	SMS	SERB	Linear codes of the symplectic geometry over finite flelds of even characteristic	₹ 27,36,096.00	06.02.2023	05.02.2026	3
17	PH2206	Dr. Jayaseelan Dhakshinamoorthy (NPDF) Mentor: Dr. Ajaya Ku. Nayak	SPS	SERB	National Post Doctoral fellowship	₹ 21,31,200.00	20.01.2023	19.01.2025	2
18	PH2207	Dr. Ajaya Kumar Nayak	SPS	SERB	Stabilization of non-trivial magnetic skyrmions from trivial bubbles by helicity locking in Centrosymmetric magnets	₹ 45,11,289.00	20.02.2023	19.02.2026	3
19	MT2204	Dr. Mithun Ku. Das	SMS	DST	INSPIRE Faculty Fellowship	₹ 22,00,000.00	26.09.2022	25.09.2024	1
20	EPS2203	Dr. Guneshwar Thangjam	SEPS	Dept. of Space	Lunar Mantle exposed or missed in South Pole Aitken basin-Insights from Chandrayaan-2 IIRS	₹ 24,03,520.00	28.02.2023	27.02.2026	3
21	PH2304	Dr. Subhankar Bedanta	SPS	SERB	Spin wave dispersions and nanoscale imaging of magnons using Brillouin light scattering spectro-microscopy		22.02.2023	21.02.2026	3

Doctoral Degree Awarded

Researcher	Thesis Title	Supervisor Name
Raktim Mukherjee	The impact of starch- and fat-rich diets on intestinal microbiota, metabolism and immunity in differentially immune=biased C57BL/6 and BALB/c mice	Prof. Palok Aich
Shubhant Pandey	Mechanistic insights into the functioning of a novel pH directed multi-substrate specific Polysaccharide Lyase (PL) SMLT1473 and analyses of conserved 'substrate-pH of activity' pairing among diverse PL folds.	Dr. Rudresh Acharya
Rasmita Das	Characterization of TRPV4-mediated channelopathies and effect of TRPV4 in mitochondrial function and regulation	Dr. Chandan Goswami
Sanjai Kumar P	Role of TRP Channels in Experimental Cell Mediated Immunity	Dr. Subhasis Chattopadhyay
Shashank Patole	Study on persister cell formation in a clinical isolate of Klebisella pneumoniae	Dr. Harapriya Mohapatra
Durga Prasad Biswal	Light and phytohormone interaction in the development of Physcomitrella patens	Dr. Kishore C. Panigrahi
Anup Kumar Ram	Molecular characterization of non-AUG codon recognition in the translation initiation fidelity defective mutant on the regulation of differential protein expression	Prof. Pankaj V. Alone
Anamika Singh	Role of GIGANTEA on the developmental regulation of Arabidopsis thaliana.	Dr. Kishore C. Panigrahi
Bibhuti Bhusana Palai	Synthesis and Biochemical Evaluation of Tropolonyl-Peptide/Nucleic acid Analogues	Dr. Nagendra Kumar Sharma
Biplab K. Pandia	Manganese Pincer Catalyzed Organic Transformations	Dr. C. Gunanathan
Rajat Kumar Tripathy	Metal-Organic Frameworks (MOFs) and their derived materials as electrocatalyst for energy conversion and storage	Dr. J. N. Behera
Arpita Chatterjee	Studies of N-Arylation, Ring-opening, and Dearomatization of 5-Aminopyrazoles	Dr. S. Peruncheralathan
Krishna Mishra	Studies of Photophysical Processes in Semiconductor Materials and their Applications	Dr. Subhadip Ghosh
Manjari Chakraborty	Assessing the behaviour of some monocationic, dicationic and binary mixtures of monocationic ionic liquids through spectroscopic investigations	Dr. Moloy Sarkar

Smruti Ranjan Mohanty	Transition Metal Catalyzed Alkenylation and Alkylation of Inert C-H bonds	Dr. P. C. Ravikumar
Kasturi Sahu	Synthesis, Characterization, and Applications of Free-base and Metal complexes of *β*-Thiocyanatocorroles	Dr. Sanjib Kar
Gopal Krushna Das Adhikari	Synthesis of Hexahydrobenzo[c]phenanthridine and b-Carboline-1-one derivatives via Transition Metal Catalyzed C-H Bond Activation	Dr. P. C. Ravikumar
Komal Yadav	Computational Studies of the Mechanisms and Dynamics of Chemical Reactions	Dr. Upakarasamy Lourderaj
Sruti Mondal	Synthesis and spectroscopic characterization of metallocorroles and porphyrins and their applications	Dr. Sanjib Kar
Shyamal Kanti Bera	Metal-free Approaches towards the Construction of Heterocycles	Dr. Prasenjit Mal
Priyabrata Biswal	Activation of methanol as a C1 source using Pd, Ru, and Co-compounds to make new C-C bonds	Dr. V. Krishnan
Sudip Sau	Sustainable Approaches towards C-X (-N, -C, -O) Bond Formation Reactions in Organic Synthesis	Dr. Prasenjit Mal
Subhrakant Jena	Ground and Excited-State Dynamics of Sulfur and Selenium Containing Molecules of Biological Significance	Dr. Himansu S. Biswal
Nabin Sarkar	Conjugated Bis-Guanidinate (CBG) Stabilized Aluminum Complexes: Synthesis and Their Catalytic Applications	Dr. Sharanappa Nembenna
Ranjit Mishra	Design of Inorganic-Carbon composites, Porous Carbon for Sustainable Environmental and Electrochemical Energy Storage & Conversion application	Dr. Sudip Barman
Somnath Banerjee	Photophysical Studies on Some Organic Aggregates and Inorganic-Organic Hybrid Nanomaterials	Dr. Moloy Sarkar
Malaya K. Sahoo	Inorganic-Organic Hybrid Frameworks & Their Derived Materials Towards Clean Energy Applications	Dr. J. N. Behera
Shalini Pandey	Enhancement of diaCEST MRI contrast Efficiency: Hydrogen Bonding and Carbon Dots	Dr. Arindam Ghosh
Naupada Preeyanka	Synthesis, Characterization, and Photophysical Studies on Some Inorganic, Organic and Inorganic-Organic Hybrid Nanomaterials	Dr. Moloy Sarkar
Mehboobun Nahar Milky	Disrupted Lives: A Qualitative Study of Experiences of Living with Cancer Patients and Their Family Caregivers	Dr. Amarjeet Nayak

Atibur Rahaman	Examples of braided quantum groups in C*-algebraic framework	Dr. Sutanu Roy
Dinesh Pandey	Centrality in connected graphsand some related indices	Dr. Kamal Lochan Patra
Abhrojyoti sen	Solutions in the class of measures for some hyperbolic systems of conservation laws and scalar conservation laws with discontinuous flux	Dr. Manas Ranjan Sahoo
Puspendu Pradhan	Combinatorial characterizations of point and line sets in PG (3;q) with respect to a quadric	Dr. Binod Kumar Sahoo
Subir Sen	Magnetic antiskyrmions in Heusler shape memory alloys	Dr. Ajaya Kumar Nayak
Samapan Bhadury	Formulation of relativistic dissipative hydrodynamics of spin-1/2 particles from kinetic theory	Dr. Amaresh K. Jaiswal
Abhishek Mondal	Role of pump beam topology in nonlinear frequency-conversion processes	Dr. Ritwick Das
Anupa Kumari	Studies on Linear and Nonlinear Optical Properties of Subwavelength Structures	Dr. Ritwick Das
Mrinal Kanti Sikdar	Defect Engineering in ZnO Nanostructures for Optoelectronic Applications	Dr. Pratap Kumar Sahoo
Jagannath Santara	Holomorphic and Numerical Bootstrap Studies of Conformal Field Theory	Dr. Chethan N. Gowdigere
Mahammad Mustakim	Structure and Dynamics of Binary Colloids in an External Potential: Role of Depletion Interaction	Dr. A.V. Anil Kumar
Gour Jana	Finite temperature study of strongly correlated systems	Dr. Anamitra Mukherjee
Purbasha Sharangi	Spinterface in metal/organic semiconductor thin film	Dr. Subhankar Bedanta

Master's Degree Awarded

Master of Science in Biological Science	
Akshita Baiju Gopal	Alex M
Alok Kumar Sagar	Ananya Das
Anjaly Yadav	Anup Pramanik
Anushka Jain	Biplab Behera
Chetash Ranjan Meher	Dheemanth Reddy Regati
Gopika Menon	H Subham Kumar
Jagati Vishwa	Jyotirmayee Debadarshini
Konthalapalli Hradini	Koushani Biswas
Lakshmipriya Ramjeeban	Loknath Behera
Madhusmita Behera	Manisha Sahu
Navita Lal	Priyanshu Singh
Puspen Mondal	Rehan Khan
Rifa Iqbal V V	Sajith K P
Sanaa Qahera Khan	Shanice Jessica Hermon
Soumyadeep Chakraborty	Sudipta Biswas
Supradeep Sahoo	Tanya Pattnaik
Aniruddha Bera	Bhumika Garkhal
Narendra Chhatria	Aniket Modak

Master of Science in Chemical Science	
A Ganesh Patro	Abhijeet Singh Bhadauria
Abhishek Raj	Anurag Kumar
Aradhana Pradhan	Arnav Paul
Shukla Ashish Dharmendra	Asmita Rani Asmi
Astha Linda	Azmeera Vrithik Kumar
Chabathula Manoj Sampath	Chandan Chittapriya Sahu
Chinmay Routray	Deepak Kumar Nayak
Deepak Kumar Swain	Dhairya Patel
Gogada Nikhil	Himangshu Dutta
J Siddharth Jaya Sajeevan	Jyotiprakash Parida
Keerthana Anil C	Kiran Meena
Madan Mohan Urma	Nilesh Monohar Sethi
Pratibha Bachhley	Rahul Kumar
Rimilmandrita Ghosh	Srimoy Nayak
Riya Singh	Sameer Sethi
Sanat Kumar Mahankudo	Sandeep Kumar Behera
Sarandev S	Shivam Mahapatra
Shrishti Barethiya	Smrutimedha Parida
Sourav Behera	Subham Pradhan
Suritra Bandyopadhyay	Bikash Ranjan Jally
Sarmista Sagaria	

Master of Science in Mathematical Science	
Akash Kumar Prasad	Prem Nigam Kar
Archisman Bhattacharjee	Gaurav Swansi
K Prahlad Narasimhan	N K U Sarada Anoushka
Anagha R Nair	Deepak Kumar
Himanshu Bimal	Anagha C
Anuj Verma	Gourav Kumar Meher
Singh Sagar	

Master of Science in Physical Science	
Abhinav Sharma	Naini Dudhe
Aman Upadhyay	Anna Roy
Avnish Singh	Sharun P Shaji
Bhavya Singhal	Spandan Anupam
Dripto Biswas	E A Sreeram
Karan	Jyotirmoy Sarkar
Moningi Vaishakhi	Akilan K
Nitesh Kumar Patel	Ankit Mohapatra
Sahel Mohammad Iqbal	B Varun Govind
Sournyadeep Khandual	S Danush
Suyash Chandrakant Fokane	Abbas Hasnain Hirkani
Divyanshu Gupta	Kishore Sourav
Adarsha Mohit Sahu	Nisarg Vyas
Anamika Jatheendran Pinky	Praneet Nandan
Ayush Singh	Shivam Raj
Chandranathan. A	Susree Sucharita
Mohapatra	
Hiranmay Das	Harisankar K R
Kishan Deka	

11th Graduation Ceremony

The 11th graduation ceremony was observed in NISER on 15th July, 2022. In the 11th graduating batch, 125 Integrated MSc Students, 9 Integrated PhD students and 29 PhD Scholar were graduated.

The students who own various awards in the 11th Graduating Batch are mentioned below:

Gold Medal for Outstanding Overall Performance 2022

Suritra Bandyopadhyay
School of Chemical Sciences
5 Year Integrated Master of Science Program

Ritwika Majumder
School of Physical Sciences
Master of Science (Integrated PhD Program)

Silver Medal for the Best Academic Performance 2022

Tanya Pattnaik
School of Biological Sciences

Suritra Bandyopadhyay
School of Chemical Sciences

Archisman Bhattacharjee
School of Mathematical Sciences

Chandranathan A
School of Physical Sciences

Best Master of Science Thesis Award 2022

Rehan Khan
School of Biological Sciences

Subham Pradhan
School of Chemical Sciences

Archisman Bhattacharjee
School of Mathematical Sciences

S Danush
School of Physical Sciences

Sudipta Das
School of Physical Sciences

Memorial Awards 2022

Sarat Chandra-Annapurna Memorial Award	:	Mr. Chandranathan A
Smt. Jayalaxamma Memorial Award	:	Mr. Suritra Bandyopadhyay
Prof. Tribikram Pati Memorial Award	:	Mr. Archisman Bhattacharjee
Dr. Sumitra Maharana Memorial Award	:	Ms. Tanaya Pattnaik
Mrs. Kanak Benjamin Memorial Award	:	Ms. Tanaya Pattnaik
Ishwar-Parbati Memorial Award	:	Ms. Tanaya Pattnaik

Infrastructure

NISER Bhubaneswar project at Jatni was undertaken and completed by M/s L&T under the supervision of Directorate of construction, service and Estate Management (DCSEM), Mumbai along with the help of Institute Works Department (IWD), NISER. It covers an area of around 300 acres and is located at Jatni along Jatni-khurda road. Odisha at a distance of about 6 km from NH-5.

Academic building consists of Schools Of chemical science, Biological Science, Library, Physical Science, Mathematical Science, Humanities and Social Science, Green House, Animal House, Auditorium, Workshop and Meditation Centre, Amenities building consist of Health Centre, Bank and Post Office, Primary School, Community Centre and Shopping Complex, Student Activity Centre and Aquatic Complex. Service building consists of AC Plant room, Main receiving Station (MRS) Local Control Substation (LCS), Gas Bank, water works and Gate House. Residential Building consists of Flats of A, B, C, D and individual duplex houses like E type, Dean Bungalow and Director Bungalow. Hostels consist of Double Occupancy and Single Occupancy.

PLANTATION DRIVE commenced on 15th August 2022

This year on the occasion of VANA MAHOTSAV Forest Department of Govt of Odisha has agreed to do the plantation of around 17000 plants in different locations and will maintain those tree saplings for 3 years without any extra cost to NISER. The Office of Forest Range Officer, Bhubaneswar at/PO Patrapada had extended the support this plantation drive inside the NISER campus. Till now 17523 plants have been planted across various locations like around Center for Medical and Radiation Physics (CMRP) is 1776,

Near E Type housing and DAYA hostel 909 plants and along the road towards Sewerage Treatment Plant (STP) is 5263, Animal House to Cricket field is 6600 and at the bottom of the Hill top is 2975.

Types of plants planted around CMRP is AMLA, BAHADA, HARIDA, GANGASIULI, RAKTA CHANDAN, BAULA, PISTA, KANCHANA, NEEM, JAMU, KARANJA, ASHOKA, DRUMSTICK, TECOMA and that of E type side GUAVA, JACKFRUIT, CUSTRAD APPLE, AMDA, CHIKOO, MANGO, KAITHA, KARAMNGA, BARAKOLI, BELA along with ASHOKA, TECOMA. Similarly, the plants planted around the periphery of Rainwater harvesting pond near community centre are GANGASIULI, TECOMA, BAULA, ASHOKA, PISTA, NEEM, KARANJA, KAJU, CHAITANI and that around meditation center Banyan, Peepal, Arjuna, Simarua, Neem, Karanja, Chaita and Amla, Ashoka, tecoma, Ganagsiuli, Harida, Bahada, Rakta chandan, sunari etc.

This is a one step ahead in the Vision of making the NISER campus as the greenest campus as told by Hon'ble Prime Minster while dedicating NISER to Nation on 16.02.2016. The green cover will add to the plantation drive done earlier would enable NISER to have maximum greenery in the campus along with the STP, Rain water harvesting structures, Bio gas plant as well as dual flushing arrangement in the campus along with polycarbonate sheet for day lighting in the academic buildings.

Nisargruna Bio-Gas Plant

Capacity : 1000 kg per day capacity

Space Required : 200 Sq. Mtr (20 L x 10 B) Min

Manpower : Skilled Operator - 1, Unskilled Worker - 4

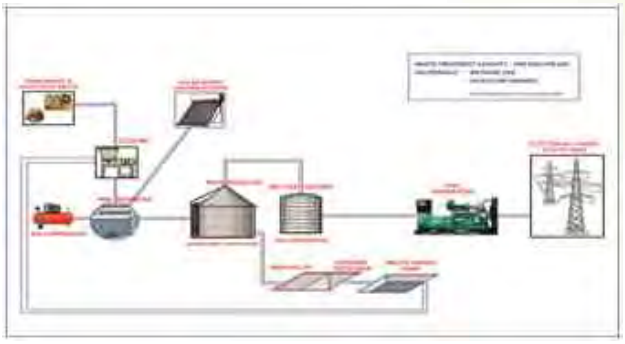
Power Supply : 3 Phase AC-8 HP

Water Requirement: 1200 Liters per day

Input: Kitchen waste, Paper Waste, Green Grass,Leaf Litter, Animal remains in Abattoirs, Green Plant Waste, Cattle Dung, Crop residues, Sugarcane bagasse, Water hyacinth.

Output :1 Ton Biogas plant will generate about 40 Kgs of Methane gas every day, which can be used for cooking with special burners or generation of electricity.

The Biogas plant will produce excellent manure of 1000 litres/day in liquid form which can be used for Organic Farming.



Crusher (1 MT/Hr)

Pre-Digester Tank (10 Cu M)

Main Digester Tank (50 Cu M)

National Flag Mast: Commissioning of 30.50mt (100 feet) high National Flag Mast along with peripheral development at NISER campus.

Ht of Mast : 30.50mtr (100')

Size of Flag : 20' x30'

Dimension : Base plate dia@840mm, tapered to top dia@150mm

Plate thickness: top(3mm), middle(4mm) to Bottom (5mm)

Make : Bajaj Electricals

Raising-lowering of Flag: Motorized (Integral motor with 2Hp capacity)

Computer Centre

Cyber Security Awareness Event

Schedule and Location: January 5th and 6th 2023, NISER Bhubaneswar

Cyber security awareness programs are an important aspect of protecting an organization's systems and networks from cyber threats. These programs typically aim to educate individuals and organizations about the potential risks they face and the measures they can take to protect themselves. They are often targeted at employees, students, and other stakeholders, and are designed to help them understand the importance of cybersecurity and how to identify and prevent cyber-attacks.

The event aimed to create awareness about cyber security among the students, staff and researchers and also to discuss the current trends and challenges in the field of cyber security.

The event covered various topics such as Network security, Cryptography, IoT security, Web security, and Cybercrime Investigation.

The event attempted to cover the broad spectrum of effect of cyber security for all strata of the NISER fraternity and to give day to day awareness required in this domain despite the security systems deployed across the campus network and digital devices and to protect the digital assets both at official as well as personal level.

The event was opened by the Director of NISER, Prof. Sudhakar Panda, on January 5th, 2023. The opening speech encompassed the broad outlook on cyber security and personal experiences on the subject and set the perfect platform for the upcoming sessions by the invited speakers of the event.

Honorable Director have administered the Cyber Security Pledge taken by the audience.

First day event featured two speakers, Dr. P. Thiyagarajan, Associate Professor of Cyber Security at RGNIYD Sriperumbudur and Mr. Jyoti Ranjan Samantaray, Inspector of Police for Kendrapara District, Odisha.

In the first session, Dr. Thiyagarajan's presentation was on the topic of Cyber Crime and Cyber Laws, discussing current trends and challenges in the field of cybercrime and legal frameworks to address them.

In the second session honorable Registrar, NISER introduced the speaker and shared with the audiences about his own experiences regarding the subject.

Mr. Samantaray's presentation was on the topic of Cyber Crime Awareness, focusing on IT laws and mobile-related issues.

The presentations provided valuable insights and information on the current state of cybercrime and strategies for addressing it from the perspective of law enforcement agencies.

Attendees had the opportunity to ask questions and engage in discussions with the speakers.

Second day event was started by Dr. Abhaya Kumar Naik, Registrar of NISER Bhubaneswar on January 6th, 2023.

The first session was opened by Dr. Tapas Samanta, Scientific Officer H at VECC/DAE Kolkata, who delivered a talk on Cyber Security: A General Awareness, providing an overview of the current state of cyber security and strategies for increasing awareness and protecting against cyber threats.

The second speaker was Dr. Balaji R, Associate Director at CDAC Bangalore, whose topic was Internet Security for all, discussing ways to ensure that all users have access to secure internet services and ways to improve the overall security of the internet. Domain Name System (DNS) and its implication on Cyber Security was explained by him in very simple terms.

The session provided a platform for attendees to ask questions and engage in discussions with the speakers.

An offline quiz program was conducted, and prizes were distributed to winners in the staff and student categories.

Certificates were distributed to the winners of the quiz by the Director of NISER Bhubaneswar during the closing ceremony.

The event provided a platform for networking and knowledge sharing among the participants.

Data Centre Expansion

Our new datacenter extension project is a significant upgrade that will greatly enhance the infrastructure capabilities of NISER Bhubaneswar. The electrical aspect of the project involves retrofitting the LT panel and installing a chiller electrical panel to ensure a more efficient and reliable power supply. With the installation of two 150KVA modular UPS and two 30KVA UPS for chiller pump installation, we can provide adequate power backup and stability, minimizing the risk of power outages. The internal electrical cabling with cable trays will ensure proper organization and management of cables for an organized setup, improving the overall safety and accessibility of the system. The project also includes the installation of six wall-mounted PACs of 3TR capacity each and three 50KW RDHx to augment the cooling system for computational devices with high power density. This upgrade will ensure optimal temperature control and improve the efficiency of the data center, leading to better performance and stability. Lastly, the BMS installation and commissioning will ensure proper management and monitoring of the entire electrical and HVAC system, allowing us to identify and address issues quickly and efficiently.

The 50KW RDHx, which is being installed as part of the data center extension project, will be supplied with chilled water from 2 nos. of 40TR air-cooled water chillers. This setup will ensure that the RDHx has access to a continuous supply of chilled water, which is essential for maintaining optimal temperatures in the high power density racks of the data center. The air-cooled water chillers are designed to efficiently remove heat from the water, ensuring that the water remains at the required temperature. This chilled water is then circulated through the RDHx, where it absorbs the heat generated by the data center equipment. The warm water is then returned to the chillers for re-cooling, completing the cycle. This setup will provide a reliable and efficient cooling solution for the data center, ensuring that the temperature is maintained at optimal levels inside the high density racks for the smooth and uninterrupted operation of the devices.

Overall, this project will result in a more secure, reliable, and efficient data center infrastructure, providing better performance and stability for the data center of NISER Bhubaneswar. With these upgrades, we can continue to provide world-class computational facilities to students and researchers in the field of science, reinforcing NISER's position as an esteemed institute of national importance.

Ipv6 implementation across the NISER Campus LAN

Based on the "National IPv6 Deployment Roadmap" and circulars from the Department of Telecommunication, Govt of India, IPv6 adoption has been rolled out progressively across the IP based network of NISER Campus.

The network team of Computer Centre have started implementing IPv6 across the NISER Campus LAN using the existing infrastructure. The entire knowledge base creation, simulation, planning and implementation is being done in house. At present IPv4/IPv6 in Dual Stack is implemented across the network segments of Hostels and Computer Centre and Data Centre. Very soon the remaining portion of the network shall be covered. The public servers including the one hosting the NISER website are communicating both on IPv4 and IPv6. NISER is now placed in the club of very few academic institutes in India who have adopted IPv6.

E-Waste Management

As per the E-waste management rule 2016, NISER falls under the "Bulk consumer" category, which means that it has certain responsibilities regarding the management of e-waste.

Responsibilities of bulk consumers. Bulk consumers of electrical and electronic equipment listed in Schedule I shall ensure that e-waste generated by them shall be handed over only to the registered producer, refurbisher or recycler.

We are proud to report that Computer Center of NISER has taken a proactive approach towards environmental sustainability by constituting a committee with representatives from almost every school/section of NISER to oversee an E-waste collection and disposal program in accordance with the E-waste management rule 2016 of the Ministry of Environment, Forest and Climate Change.

We floated an E-waste tender which only authorized recyclers or collection centers by the central or state pollution control board could participate in. By doing so, we ensured that the selected recycler possessed the necessary expertise and technology required for the proper disposal of E-waste.

By following the E-waste management rule 2016, the committee has successfully collected all E-waste materials from various schools and departments. The involvement of representatives from almost every school/section of NISER ensures that the E-waste collection and disposal program is executed in a responsible and environmentally friendly manner. We have engaged an authorized E-waste recycler who possesses the specialized expertise and technology required for the proper disposal of E-waste.

We believe that it is important to take a leadership role in managing E-waste, and our actions demonstrate our commitment to environmental stewardship. We hope that our program serves as an example for other institutions and individuals to follow.

Overall, our E-waste collection and disposal program is a positive step towards creating a sustainable future in accordance with the E-waste management rule 2016 of the Ministry of

Environment, Forest and Climate Change. We remain committed to environmental sustainability, and we will continue to take proactive steps towards responsible management of E-waste in the future.

Network Infrastructure

Armored Cat6 cabling laid across E-Type area to further enhance the network connectivity to the quarters. New End Point Security solution was procured and deployed for officially procured end point devices.

Health Centre

Health centre in NISER, Bhubaneswar has been established to provide health care facility to the Institute faculties and staffs and their dependent entitled family members, students, research fellows and retired employees of DAE enrolled under CHSS. It 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 and dietary advices.

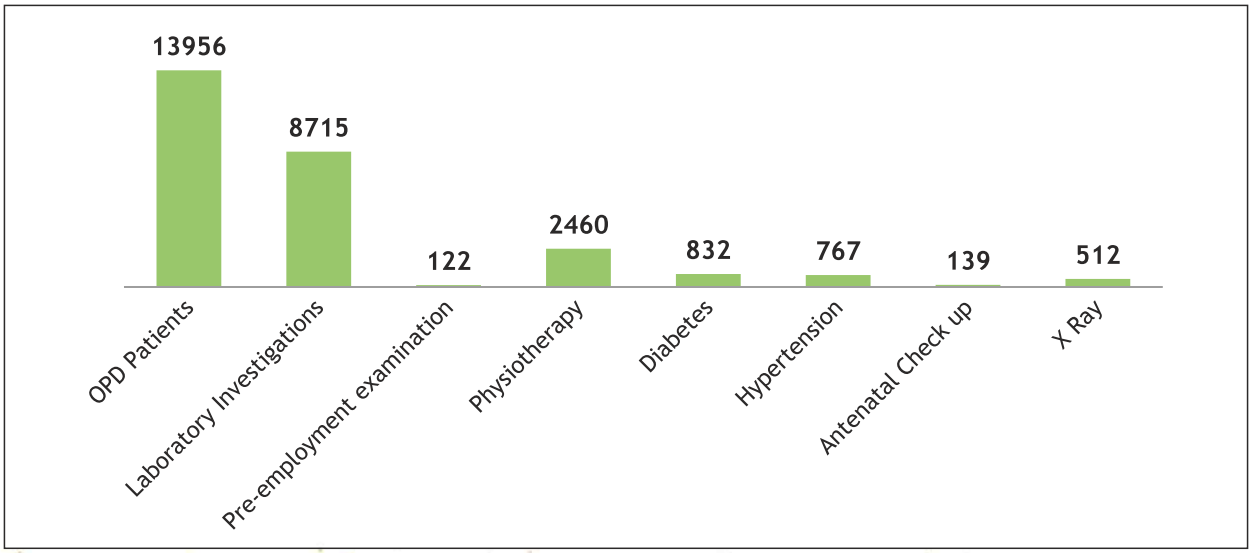
The healthcentre at present is staffed by four doctors, five staff nurses, one physiotherapist, one radiographer, one medical laboratory technician and one pharmacist. During the year 2022-23, one part time Clinical Psychologist was appointed to provide psychological counselling to members. One-part 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 facility. Two basic life support ambulances are also available to shift patient during emergency 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, AMRI Hospital at Bhubaneswar are empanelled under CHSS Scheme for providing treatment under different speciality. Further Dr Agarwals Eye Hospital is also empanelled to provide specialised service for eye diseases.

Facilities:

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

Statistics (01-04-2022 to 31-03-2023):



Miscellaneous Activities

Independence Day Celebration

NISER celebrated the occasion of the 76th Independence Day by unfurling our national flag in the campus. The celebration continued with a cultural program by our students followed by the inauguration of the Biogas plant (NISARGRUNA) by our Director. The program ended with a mass plantation drive by the NISER community as part of the "Azadi ka Amrit Mahotsav".

Observance of Sadbhavana Diwas, 2022

To commemorate the birth anniversary of former Prime Minister, Late Shri Rajiv Gandhi, the NISER community took the Sabhavana Diwas pledge on August 19, 2022. Our Director administered the pledge on this auspicious occasion.

Foundation Day

In keeping with NISER's tradition of celebrating its Foundation Day by inviting eminent scientists to deliver pertinent talks, a lecture was arranged in the Pathani Samanta Auditorium on September 6, 2022. The speaker, Prof. Ashoke Sen from the International Center for Theoretical Sciences, Bengaluru, graced the occasion by giving a talk on "The Future of Our Universe".

Rajbhasa Hindi Diwas Celebration in the Institute/ संस्थान में राज भाषा हिन्दी दिवस समारोह

In order to promote the importance of Hindi, several programs and competitions were organized at the institute under the Official Language Hindi Fortnight from 14th September to 29th September, 2022. The institute's students, staff, and faculty members participated enthusiastically in all the programs and competitions.

The National Flag Mast

To give a position of honour to our National flag, which represents hopes and an inspirations of the people of our country, an hundred feet National Flag Mast was installed at NISER on October 20, 2022.

Observance of Rashtriya Ekta Diwas

To commemorate the birth anniversary of Shri Sardar Vallabhbhai Patel, popularly known as the 'Iron Man of India', the NISER community passionately celebrated the National Unity Day by taking Rashtriya Ekta Diwas Pledge.

Vigilance Awareness Week

Observed over the course of a week from October 31st to November 6th, 2022, the vigilance awareness week came to an end with a pledge-taking ceremony on 2nd November. Our Director administered the pledge on this occasion.

Observance of Constitution Day

The NISER Community took the Constitution Day pledge on November 25, 2022 to commemorate the adoption of the Constitution of India and reaffirm our commitment to upholding its

ideology. Our Registrar administered the pledge on this occasion.

Observance of Republic Day

On the occasion of India's 73rd Republic Day on January 26, 2023, commemorating the adoption of the Indian Constitution, NISER joined in the nationwide festivities by hosting an event to hoist our National Flag, presided over by Honorable Director, Prof. Sudhakar Panda, followed by an inspiring speech, addressed to the faculty and staff members. The Director took this opportunity to express his appreciation for all administrative and technical staff who play an invaluable role in ensuring seamless functioning of various activities within NISER and acknowledged their efforts with a well-deserved award.

Observance of Swachha Pakhwada

The 14-day-long Swachhata Pakhwada was inaugurated on March 18, 2023 by the Director, of NISER Professor Sudhakar Panda followed by a speech by Chairperson, Swachha Bharat Abhiyan Committee, NISER Dr. Amarendra Das. Both speakers highlighted the importance of cleanliness and hygiene and need to keep our campus clean. After the inauguration a swachhata march was done in campus, where students, housekeeping staff, and swachhata committee members spread awareness on waste segregation with placards and slogans in the residential and hostel complexes.

A slogan contest was held on Day 2 to motivate the campus people to support the campaign on cleanliness. On day-3, an essay contest was held on the topic "Role of Cleanliness in Nation building." Day 4 was observed with a competition on the theme "Best out of Waste" for female residents of campus. A number of Innovative products were displayed by the resident women of NISER made from waste materials.

On day 5 cleanest hostel and office spaces were selected by a jury. A separate best out of waste competition was organised for the students and staff of NISER. On Day-6, The documentary "Rethinking the World's Waste: Circular Economy" was shown by the film club. The documentary raises serious concern over the alarming pace of the growth of plastic garbage and some of the tactics used to combat it. On day-7, we conducted a quiz on General awareness about cleanliness in India and various schemes launched by the government.

On day-8, a graffiti competition was held on the theme waste problems on the planet earth.

On day-9, the cleanliness drive was organized where, student volunteers collected the trash in teams and separated it into distinct piles for wet and dry biodegradable and non-biodegradable waste. On day 10, a drawing and painting competition was organized for students. A separate drawing and painting competition was organized for staff on day -11 on the theme "Innovations for a greener and cleaner future".

On day -12, guest speakers were invited to deliver talk on waste management. Mr. Dillip Kumar Mohanty, the executive of the Jatni Municipality, and a sanitation specialist spoke on the measures taken by Jatni Municipality for waste segregation, collection and management. A debate competition was held on Day-13 on the theme "Garbage tourism: Can it showcase India's waste management challenges and promote eco-tourism?".

On Day 12 and Day 13, students of H 205 exhibited academic posters on different themes related to waste segregation, collection and management. A closing ceremony to mark the end of Swachhata Pakhwada was organized on day-14. Winners of various competitions were given prizes by the Director, NISER. A documentary based on all events of Swachhata Pakhwada was shown to the audience.

Cancer Hospital and Research Centre in the NISER Campus

NISER have recently obtained approval of the competent authorities for the establishment of cancer hospital and research centre in the NISER campus. This is an INR 650 Cr. project of which 250 Cr. is the contribution from Tata Trusts and 400 Cr. is the commitment from the Department of Atomic Energy. Tata Trusts will build the hospital and handover to us for operations. The DAE funds will be utilized for residential quarters, dharmashala, hostels, equipment and manpower. This project is likely to be commissioned in three years from the date of starting. This centre will be able to offer affordable health care to millions of people in need and also add a new chapter to cancer research at NISER.

Official Language Hindi in NISER

NISER being a central autonomous institution under DAE is making all effortsto promote & implement the Official Language Policy of the Union. An Official Language Implementation Committee (OLIC) consisting of all the Deans, Chairpersons, FICs, Registrar & other Section Heads under the Chairmanship of Director 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, tenders, and reports are already being done in bilingual. Staff members those who have been trained through various official language Hindi courses and many others are doing their official work in Hindi up to their best possible extent. To encourage and motivate more employees of the institute to execute their official work in Hindi, the 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 the essential part of Hindi Pakhwada / Hindi Diwas celebrations in the Institute every year. Some of such major events and activities conducted during the year 2022-23 are being reported here:

- **Participation in the Hindi Diwas Celebration & Second All India Official Language Conference:** As per suggestion from the Official Language Department, Government of India three officials from the Institute have participated in the Hindi Diwas Celebration on 14th September 2022 and Second All India Official Language Conference on 15th September 2022 conducted by Official Language Department, Ministry of Home Affairs, Govt. of India at Surat, Gujrat.

- **Hindi Pakhwada (Fortnight) Celebration at NISER:** The official language Hindi Pakhwada (fortnight) was celebrated in the institute from September 16th to 30th, 2022. During the pakhwada (fortnight) various competitions for students & employees were conducted in the institute which are given below:

दिनांक / कार्यक्रम/ प्रतियोगिता	सहभागिता समूह
19.09.2022 **टिप्पण आलेखन प्रतियोगिता**	इस प्रतियोगिता में संस्थान के कर्मचारियों ने भाग लिया
21.09.2022 **नाइसर कर्मचारियों द्वारा हिन्दी में निबंध लेखन प्रतियोगिता**	इस प्रतियोगिता में संस्थान के कर्मचारियों तथा अधिकारियों ने भाग लिया
23.09.2022 **हिन्दी चलचित्र पर आधारित प्रश्नोत्तरी प्रतियोगिता**	प्रतियोगिता में संस्थान के छात्र-छात्राओं, कर्मचारियों तथा अधिकारियों ने भाग लिया
24.09.2022 **नाइसर छात्रों** द्वारा **हिन्दी में निबंध लेखन प्रतियोगिता** की	इस प्रतियोगिता में संस्थान के छात्र-छात्राओं ने सहभागिता

28.09.2022 **राजभाषा हिन्दी कार्यशाला**	कार्यशाला में संस्थान के कर्मचारियों तथा अधिकारियों ने सहभागिता की
30.09.2022 **हिन्दी मे संक्षिप्त मौखिक भाषण /ब्याख्यान**	इस प्रतियोगिता में संस्थान के कर्मचारियों, अधिकारियों तथा छात्र-छात्राओं ने भाग लिया

- **Official Language Hindi Workshop:** On September 28, 2022, an insightful in-house Hindi workshop took place. Attended by 25 institute officials, the workshop was a comprehensive platform for enhancing Hindi language skills.This initiative marked a significant step towards bolstering inter-office communication and promoting linguistic diversity.

Training Programme: A Faculty Development Programme for Junior / Senior Translation Officers of DAE was conducted in NISER during March 7th to 12th, 2022 by Administrative Training Institute (ATI), DAE.

The XXXVII DAE Sports & Cultural Meet 2022-23 Bridge event

The event was organized by the NISER Gymkhana Club from March 6th to 10th, 2023, at the NISER Community Centre. Seven teams participated: AJANTA, DWARKA, ELLORA, GOLCONDA, PUSHKAR, RAMESHWARAM, and KONARK (host team). Three ladies' pairs, one each from AJANTA, ELLORA, and DWARKA, also took part.

The tournament kicked off with a Managers Meeting, where representatives from all teams discussed various aspects. The Bridge event included multiple categories:

Team Duplicate Matches Event: Six teams competed in a league format, each playing 10 boards in 5 rounds (totaling 50 boards per team). The top 4 teams proceeded to the semifinals, and the winners played in the finals.

IMP Pair Event and DAE Team Selection: An IMP pair event was conducted in two rounds. The top 6 pairs from this event were proposed for the DAE team, with the top 3 pairs selected for the team and the rest as reserves.

MP Pair Event: Each team sent two pairs for this event, which was played in a single round of 26 boards.

Ladies Pair: Three pairs participated, and their scores were considered within the Open IMP pair event.

The Opening Ceremony, held on March 6th, featured cultural programs and speeches. Dr. Sudhakar Panda, Director of NISER, inaugurated the event, and Mr. Suvendu Patnaik, President of Odisha Bridge Association, was the chief guest. The Closing Ceremony on March 10th included a report on the event, cultural performances, and prize distribution. Mr. Suvendu Patnaik awarded prizes to winners and runners-up in various categories and officially closed the event.

In summary, the XXXVII DAE Sports & Cultural Meet 2022-23 Bridge event was a competitive and culturally enriched gathering of teams where various Bridge categories were contested and concluded with a successful closing ceremony.

Outstanding Performance Award

Our Administrative and Technical staff play an invaluable role in ensuring the smooth functioning of all Institute activities. This year on Republic Day, the Institute acknowledged the contributions made by them and felicitated several members of the NISER family for their devotion to duty for the year 2022.

Shri Dinesh Bahadur Singh

Shri Souvagya Mahapatra
Scientific Officer -E

Shri Bidyut SS Mohanty
Scientific Assistant-C

Dr. Mriganka Sadhukhan
Technician-D

Ms. Bishnupriya Das
Upper Division Clerk

Outreach Activities

NISER Outreach Brief Report 2022-23

The Outreach Program at NISER aims to communicate the importance and ideologies of science with the community. These programs are instrumental in promoting scientific literacy, inspiring future scientists, and bridging the gap between the scientific community and the public. These programs serve as a vital bridge, ensuring that the benefits of scientific knowledge are accessible to all, ultimately contributing to a more informed, innovative, and interconnected society.

Faculty members representing various schools at NISER have played an instrumental role in the NISER Outreach program. These dedicated individuals include:

- Dr. Debasmita P. Alone, Associate Professor, SBS
- Dr. U. Lourderaj, Associate Professor, SCS
- Dr. Pankaj V. Alone, Associate Professor, SS
- 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	20
Outreach Talk Series	4
Popular Talks	5
Student Internship	1
Other events	5
Total Number of Outreach Events in the year 2022-23	35

Educational Visits 2022-23

About the Event: Educational Visits to a research laboratory are considered to be fundamentally enriching educational experiences. There are year-round visits of students and faculty from various institutions nationwide who get first-hand experience of a state-of-the-art Scientific Institution. The students are inspired through interactions with the NISER faculty, Scientific Officers, and its students. During their visits on any Friday (with a prior appointment), the school/ college students are exposed to a few experiments and get to observe people's work-life balance at NISER. This helps in a better understanding of what is expected of oneself if the students undertake science as a career and enhance the scientific, social, and emotional development of all the participants. The students are left with a sense of imagination and a newfound interest in science.

Upon their arrival at the NISER campus, students undergo an initial orientation session by Dr. Debasmita P. Alone. During this session, they are familiarized with NISER's offerings, including its diverse range of courses, state-of-the-art facilities, and exciting array of extracurricular activities. Subsequently, they are guided to specific laboratories within their respective academic buildings. The school students are exposed to the following schools at NISER: School of Biological Sciences, School of Chemical Sciences, School of Physical Sciences, School of Earth and Planetary Sciences, School of Mathematical Sciences, School of Computer Sciences, and the Centre for Interdisciplinary Sciences. These visits are coordinated by the Scientific Officers at various schools namely:

- Dr. Arun Kumar, SCS
- Dr. Shyamashree Ghosh, SBS
- Dr. Sudakshina Prusty, SPS
- Dr. Priyanka Pandey, SCS
- Dr. Chandramohan Bathrachalam, SBS
- Dr. Saralasrita Mohanty, SPS
- Dr. Santosh Babu Gunda, SPS; and
- Dr. Ajay Kumar Dash, SEPS

Other faculty members have demonstrated their unwavering commitment to the program and helped with motivating the students during the visits on various occasions. These members are:Prof. A. Srinivasan, Professor, SCS; Prof. Bedangadas Mohanty, Professor, SPS; Dr. Debasmita P. Alone, Associate Professor,SBS; Dr. Anupam Pal Choudhury, Assistant Professor, SMS; Dr. Subhankar Bedanta, Professor, SPS; Dr. Kartikeswar Senapati, Associate Professor, SPS; Dr. Tirumala Kumar Chowdhary, Associate Professor, SBS; Dr. Kishore Chandra Panigrahi, Associate Professor, SBS; Dr. Ajaya Nayak, Associate Professor, SPS; Dr. Sutanu Roy, Reader-F, SMS; Dr. Kaushik Majumder, Reader-F, SMS; Dr. Krishanu Dan, Assistant Professor, SMS; and Dr. Chitrabhanu Chaudhuri, Assistant Professor, SMS. Their contributions have significantly enriched the program's outreach efforts.

In the year 2022-23, the Outreach cell has conducted a total of 20 such educational visits. These visits were from various schools and colleges in Odisha, where approximately 1200

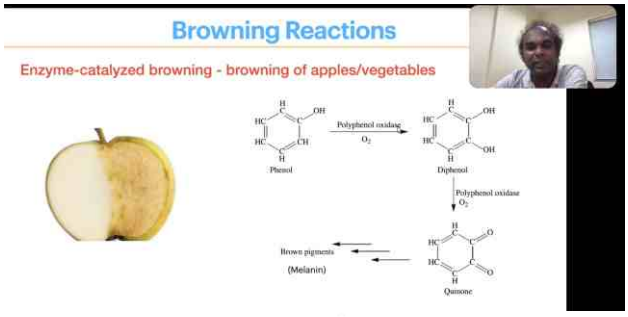
students and 250 teachersparticipated. These educational institutes include GHVM School, Jupiter College, JNV Khurda School, School of Forensic Science, Centurion University, Jatni, Rajdhani College, Carmel School, KV Khurda Road, Sailabala Women's Autonomous College, Carmel School, GIET University, DPS Paradip Refinery, JNV Mundali, Cuttack, Mahamayee Mahila Mahavidyalaya, BJB High School, Odisha Adarsh Vidyalaya Sangathan, Saraswati Sishu Vidya Mandir, Cuttack, Odisha Adarsh Vidyalaya Sangathan, DPS Dhenkanal, Freedom International School, Cuttack, Rajdhani College, Prananath College (Autonomous), Khordha, NIIS Group of Institutions, BBSR, KV No. 3, Bhubaneswar.

Outreach Talk Series 2022-23

Total Outreach Talks for the year 2022-23: 4

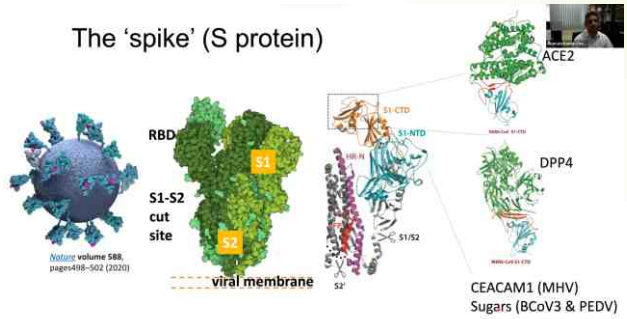
About the Events: To celebrate the 75th year of Independence, a monthly NISER Outreach Talk Series was initiated at NISER for school students from Class IX to XII and First-year College students. The talks are based on relatable concepts and are structured to be interactive, emphasizing question-answer sessions. These talks are usually given by NISER faculty members from various schools and are online and offline or both.

There were four talks conducted in the year 2023-24 in which approximately 600 students had participated.



"Culinary Reactions" by Dr. U. Lourderaj, SCS

"Quantum Sensors" by Dr. Ashok Mohapatra, SPS



"Where the COVID-19 pandemic virus, SARS-CoV-2, come from? - A difficult question to answer" by Dr. Tirumala Chowdary, SBS

"Exoplanets and the Search for Habitable Worlds" by Dr. Jayesh M Goyal

Outreach Popular Talks 2022-23

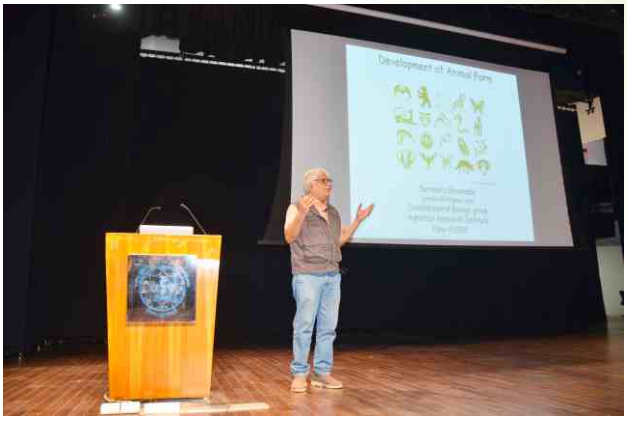
Total Popular Talks for the year 2022-23: 5

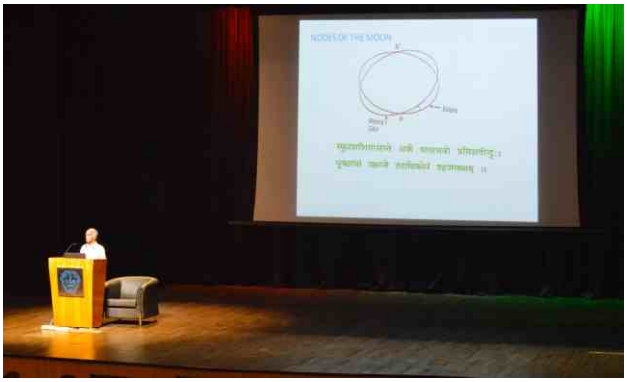
About the Events: A part of NISER's Outreach activity, where eminent scientists from the country and abroad are invited to deliver a talk at NISER. These talks are aimed at the students of NISER, school students from Class IX to XII, and

College students. These talks are usually based on topics related to modern science and technology to which the participants can relate to.

In the year 2022-23, a total of five popular talks were organized by the Outreach cell in which approximately 2200 people had participated. The participants included students from schools like Carmel English Medium School, Khordha and KV Khurda Road, NISER students, faculty and staff and students from other educational institutions. These talks were given by esteemed scientists such as

- Prof. Richard Zare, Department of Chemistry, Stanford University, USA (Online)
- Prof. N. Sathyamurthy, Honorary Professor, IISER Mohali
- Prof. S. Ghaskadbi, Developmental Biology Group, MACS-Agharkar Research Institute, Pune
- Prof. S. Balachandra Rao, Former Director, Gandhi Centre of Science and Human Values, Bengaluru; and
- Prof. Venugopal Padmaja, Professor and Head, Department of Mathematics, SJB Institute of Technology, Bengaluru.





Students' Internship 2022-23

About the event: NISER Outreach Cell has taken the initiative to conduct a 15-day long internship for school students ranging from standard IX to XII. In this internship, the students were assigned a laboratory of their choice to learn about various activities and experiments conducted in a research lab. They got an idea of what research is and how researchers work in a scientific atmospherewhich was very well appreciated by the students in their feedback.

In the AY 2022-23, eleven students from Sai International School and four students from Krypton Higher Secondary got the opportunity to participate in this internship program. The program was successful with the dedicated efforts of NISER's faculty members namely:

- Dr. Anupam Pal Chowdary, Assistant Professor, SMS
- Prof. Chandan Goswami, Professor, SBS
- Dr. Debasmita P. Alone, Associate Professor, SBS
- Dr. Harapriya Mohapatra, Associate Professor, SBS
- Dr. Joe V. Yeldho, Reader-F, SHSS
- Dr. Pankaj V. Alone, Associate Professor, SBS
- Dr. Pratap K. Sahoo, Associate Professor, SPS
- Dr. R. Srinivasan, Associate Professor, SBS
- Prof. Subhankar Bedanta, Professor, SPS
- Dr. U. Lourderaj, Associate Professor, SCS

IGNITE 2022

IGNITE 2022 was an online science event consisting of science talks (previously mentioned), an art competition, a story-writing competition, subject-specific quizzes and video-making competition. This event was aimed especially towards high school and undergraduate students. The main objective of this event was to stimulate creativity and inculcate scientific temperament among the students and to bring out their abilities of problem-solving and critical thinking.

It took place in the month of April 2022 as a part of the "Azaadi ka Amrit Mahotsav" celebration.

More than 1,500 schools and colleges were invited to participate. The event was organized by the student-led Science Activities Club at NISER under the guidance of Dr. Debasmita P. Alone. Various faculty and staff members namely from NISER were invited to be the judges for the competitions, namely, Dr. Pankaj V. Alone, SBS; Dr. U. Lourderaj, SCS; Dr. Satyaprasad P. Senanayak, SPS; Dr. Shyamashree Ghosh, SBS. In the end, around 66 participants were selected as winners.

Other Related Events

Apart from the above mentioned activities, the NISER Outreach Cell had also conducted other Science Outreach events in collaboration with various educational and government organizations, in which approximately 500 people had participated. The events were as follows:

NISER, in collaboration with the Odisha Bigyan Academy, observed World Thalassemia Day on May 8, 2022, at the Pathani Samanta Auditorium, NISER. The event featured a highly informative lecture on thalassemia by Dr. Dipika Mohanty, Senior Consultant in the Hematology Department at Apollo Hospital, Bhubaneswar. Distinguished guests included Prof. Bibhuti Bhusan Mishra, President of Odisha Bigyan Academy; Prof. Sudhakar Panda, Director, NISER; and Er. Narendra Kumar Panda, Secretary of Odisha Bigyan Academy.

The Rotary Club of Bhubaneswar generously contributed a portable telescope to NISER,

enhancing our capacity to engage in a wide range of Astronomy-related Outreach activities. This valuable addition allows students to directly observe and study various celestial bodies and astronomical phenomena, further enriching their learning experience.

NISER Outreach Cell successfully organized a panel discussion where distinguished speakers from the Department of Economic and Policy Research at the Reserve Bank of India took center stage to delve into the contents of RBI's Annual Report for the year 2021-22. This engaging session prompted an enthusiastic exchange of ideas, as participants posed numerous queries spanning the realm of finance, encompassing topics like Cryptocurrency, Stocks, and more. The event was coordinated by Dr. Amarendra Das, SHSS.

To celebrate the essence of the 75th Year of Independence, "Azadi ka Amrit Mahotsav," NISER Outreach Cell celebrated Outreach Week at NISER which included a week full of Science Outreach activities.

The Outreach week commenced with the announcement of the IGNITE 2022 results, accompanied by a brief presentation of the event by a SAC Coordinator, Anshuman Padhi. Subsequently, the winners were recognized and awarded prizes and certificates, with the esteemed presence of Prof. Sudhakar Panda, Director, NISER who graciously felicitated the achievers. Next on the agenda was an insightful session on Waste Water Management, skillfully demonstrated by the Institute Works Department at NISER. This informative demonstration was followed by an engaging site visit, graced by the enthusiastic participation of invitees from Jatni Municipal Corporation, led by Mr. Dilip Kumar Mohanty, Executive Officer of Jatni Municipality coordinated by Shri. Ashank Vishwakarma, Scientific Officer, Institute Works Department, NISER. During the Outreach week, an enriching educational visit unfolded, attracting 58 students from the School of Forensic Science at Centurion University, Jatni. Following this educational excursion, a Science Outreach Talk on Cancer Awareness was delivered by Dr. Prashant Kumar Parida, an Associate Professor in Medical Oncology at Acharya Harihar Regional Cancer Research Centre, Cuttack. The talk's focal point was "Lifestyle and Cancer." A pivotal moment in the Outreach Week celebration was the official launch of the NISER Outreach website. As an additional highlight, an online photography competition was conducted to commemorate World Photography Day, along with the student-led Photography Club, Sapsara featuring the theme "Day-to-day Science through your lens." This event garnered widespread interest, with invitations extended to over 2000 schools and colleges, resulting in more than 200 entries. The esteemed panel of judges comprised Dr. Debasmita P. Alone, SBS and Dr. Subhankar Mishra, SCPS.

In conclusion, our outreach activities have been marked by dedication, collaboration, and a commitment to sharing knowledge and fostering engagement with our community. These outreach activities have significantly heightened the demand for science education and exposure among various educational institutions. We have witnessed a growing interest, with an increasing number of institutions eager to participate in these outreach activities. As we move forward, we remain steadfast in our mission to inspire curiosity, promote learning, and contribute positively to society. We look forward to continuing these outreach efforts, forging new partnerships, and making a lasting impact in the years to come.

Vigyan Pratibha Brief Report

About the Vigyan Pratibha Project at NISER:

Vigyan Pratibha, a pioneering initiative of the central government, is dedicated to crafting a distinctive learning ecosystem. Our primary objective is to integrate various pedagogical tools grounded in constructivism and collaborative learning methodologies. Presently, our dedicated team at the National Institute of Science Education and Research (NISER) in collaboration with Institute of Physics (IOP) are working closely with students and educators from the 8th, 9th, and 10th grades of Kendriya Vidyalaya (KV), Jawahar Navodaya Vidyalaya (JNV), and Atomic Energy Central Schools throughout the states of Odisha and Chhattisgarh. This is achieved by bringing scientists, teachers, and educators together to develop activity modules by Homi Bhabha Centre for Science Education (HBCSE), named 'learning units'. These meticulously designed units seamlessly align with the curriculum of the National Council of Educational Research and Training (NCERT). They are strategically structured to empower students with a profound and critical comprehension of specific scientific concepts.

Vigyan Pratibha is not just an initiative; it's a transformative journey toward enhancing science education that actively engages young minds and equips them with the knowledge and skills necessary for a promising future.

The Vigyan Pratibha team at NISER remains actively engaged in a myriad of events throughout the year. This dedicated team comprises of faculty members and associated project staff;

- 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

The Vigyan Pratibha project extends its influential reach across the Odisha and Chhattisgarh region, under the able leadership Dr. Debasmita P. Alone at NISER. Her visionary guidance has been instrumental in advancing the project's objectives and impact.

The following activities have been conducted in the year 2022-23 under the VP project:

Sl. No.	Date of the	Title of the Activities Event	Participating Educational Institutes	Number of participants
1	30.08.2022 - 03.09.2022	First Vigyan Pratibha Teachers' Training Workshop	KVs and JNVs, Odisha, and Chhattisgarh	43 teachers
2	26.10.2022 - 27.10.2022	VP School Visit (Components of Wood Ash)	KV 2, Bhubaneswar	24 students (Class 9)
3	29.10.2022	VP School Visit (Osmosis in Raisins)	JNV Konark, Puri	39 students (Class 9)
4	12.12.2022 - 15.12.2022	Second Vigyan Pratibha Teachers' Training Workshop	KVs and JNVs. Odisha, and Chattisgarh	40 teachers
5	2022-23	Learning Units conducted in schools	KVs and JNVs, Odisha, and Chattisgarh	557 students

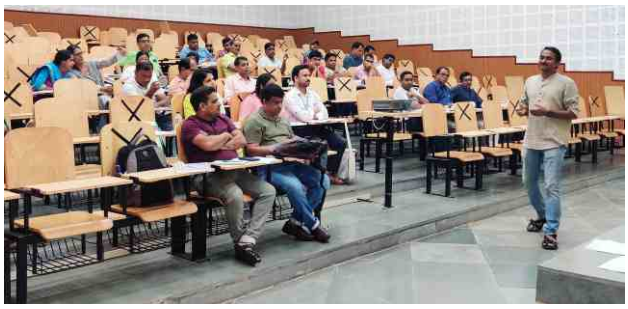
Vigyan Pratibha Teachers' - Training Workshops

The essence of the Vigyan Pratibha project lies in its vision to conduct biannual teachers' training workshops hosted at the prestigious NISER campus. These workshops, meticulously designed, are geared towards equipping educators from diverse schools, with a particular focus on TGTs from Kendriya Vidyalayas (KVs), Jawahar Navodaya Vidyalayas (JNVs), and Atomic Energy Central Schools (AECs).

Teachers participating in these workshops undergo intensive and systematic training through the learning units. After the initial workshop, teachers return to their respective schools, armed with specific learning units, and conduct these modules within their classrooms, offering students a dynamic learning experience. The uniqueness of Vigyan Pratibha shines through in the second workshop, where participating teachers engage with an entirely new set of learning units. Here, they share their invaluable experiences, reflecting upon the triumphs and challenges they faced while conducting these modules with their students. This cyclic process enriches the teachers with fresh perspectives and infuses their teaching methodologies with novel ideas and approaches. The ripple effect is felt in classrooms across the nation as these enthusiastic teachers return to nurture their students' scientific curiosity and excellence, thus advancing the cause of scientific education and literacy in our society.

Vigyan Pratibha 1st Teachers'-Training Workshop

Vigyan Pratibha 2nd Teachers'- Training Workshop



Vigyan Pratibha School Visits

The VP team at NISER helps the teachers conduct the said learning modules in their school and observe the same. These sessions allow us to understand the students' mindset and their relationship with their teachers.

The teachers once trained with the learning units in the teachers' training workshop conduct them with their students. The following teachers conducted such learning units and submitted the details about the same on the Vigyan Pratibha official website: Amlawati Lakra from JNV Jashpur; Bhabani Sankar Mohanty from KV Puri; Lambodar Rout from JNV Belpada; Manisha Kumari from KV Gopalpur; V.V. Narsamma from KV Kirandul; Swarupa Nanda Das from JNV Mayurbhanj; Anil Ekka from KV Bilaspur; Bomnath Mazumdar from KV Sukma; and Swati Singh from KV Raigarh. A total of 557 students have been trained by the teachers under the Vigyan Pratibha project in 2022-23.

School Visit for VP: JNV Konark

School Visit for VP: KV BBSR CRPF

Learning Units Conducted in Schools

In conclusion, the Vigyan Pratibha Initiative have successfully empowered our teachers with valuable tools, resources, and strategies to enhance our country's education quality. The knowledge sharing, collaborative discussions, and skill-building exercises have equipped them with the means to create more engaging and effective learning environments. As we move forward, we must continue to support and nurture our educators, as they play a pivotal role in shaping the future of our youth.

Students Activities

Various Club Events

Tree Trail: Seasonwatch August tree festival

Oorna and Seasonwatch organized Tree Trail: a tree walks during the August Tree Festival. The August Tree Festival is a nationwide monsoon fest which has multiple interesting challenges for everyone to compete for. This was a 2-day long event, held on 20th and 21st August, 2022. The tree walk was led by Dr. Geetha Ramaswami (Project Head, Seasonwatch). During this walk, students learned about plants, seasons and how the two are linked.

Birdwatching Session

This will be a great opportunity for everyone to explore and know the winged neighbors of our campus. With around 100 species of birds identified on campus, It is a really enjoyable experience to go around the campus looking for birds.Apps like ebird and merlin were used to observe and identify the birds respectively. This event was held for 2 days, evening of 2nd September, 2022 and early morning of 3rd September, 2022.No. of participants= 75

World Wildlife Week 2022

Oorna organized the World Wildlife Week 2022

celebration in the NISER campus for the very first time! Every year, World Wildlife Week is celebrated globally to celebrate the many beautiful and varied forms of wild fauna and flora and to raise awareness of the multitude of benefits that their conservation provides to people. At the same time, the celebration reminds us of the urgent need to step up the fight against wildlife crime and human-induced reduction of species, which have wide-ranging economic, environmental and social impact.

Timeline of the weeklong events

21st October: Tree Crickets use Tools to Amplify their Mating Calls - HOW and WHY? **Talk by Dr. Rittik Deb,** SBS, NISER **&** Let's Go Herping! **Herping Session for Beginners**

22nd October: Commencement of "Nature on Canvas": Art event organized in collaboration with Arts Club

23rd October: Pitch Perfect: **Talk by Ashlesh Pattnaik**, Dr. Aniruddha Datta Roy's Lab, SBS,

NISER **&**Katydid or Katy-did'nt: **Bioacoustic session**

24th October: Hike with Nature: Morning **Hike to Barunei** Hills

Nature Walk

Oorna's events in 2023 started off with the nature walks which were held 20th January and 21st January, 2023. We were glad to see the enthusiastic crowd. We spotted interesting creatures like the Black crowned Night heron and the Eurasian Hoopoe.

Prerana 2022 - World Children's Day

On 19th November, Oorna in collaboration with Zaariya, TFR (The Free Radicals), NAC (NISER Astronomy Club), RoboTech Club, MathematiX (Maths Club) and Vikiran (Physics club) is organizing ପ୍ରେରଣା ୨୦୨୨ (Prerana 2022) which aims at introducing the children of NISER's general workforce to the vibrant world of science that we inculcate here at NISER. All the aforementioned Clubs showcased their respective fields through interactive activities and sessions.

Campus Bird Count

Oorna organized a Campus Bird Count from February 11-12, 2023. Held as part of the Great Backyard Bird Count, it is a bird watching event held every year in February. During the event, we spotted many species like common myna, alexandrine parakeet, yellow wattled lapwing, and red whiskered bulbul. No of participants-20.

Treasure Hunt

As a part of Tvisha '23, NISER's cultural cum sports fest, Oorna conducted a Treasure Hunt which involved the participants being tested on their knowledge of the marine creatures, trees and birds in three different rounds. This was held on 19 March, 2023. No. of participants-160.

Campus Phenology Network

Oorna is a part of the Campus Phenology Network, a nationwide network of campuses who monitor trees. Oorna has been monitoring 60 trees in campus since April 2022.No. of participants-12.

NISER Open Day 2023

On April 7,Oorna conducted a series of events which included a documentary screening, a tree walks and an insect exhibit. No. of participants-40.

Drama and Music Club

The Dance and Music Club (DMC) organized several events and initiatives:

Independence Day Celebration: DMC arranged an annual cultural program for India's 76th Independence Day, featuring a National anthem choir and cultural performances attended by dignitaries and NISER members.

Weekly Musical Sessions: DMC introduced a "weekend jamming session" series where students gathered every Saturday in the music

room for discussions and music-related activities. The aim was to nurture music enthusiasts at NISER and enhance their technical knowledge and appreciation of music.

Koffee with Kishore: An event named "Koffee with Kishore" was held to honor the multifaceted artist Kishore Kumar Ji. It served as a platform to celebrate his contributions and legacy.

Inter-IISER Cultural Meet: DMC represented NISER at the Inter-IISER Cultural Meet hosted by IISER Pune. NISER participants excelled in music and drama events, with their drama piece "FALAK" receiving acclaim for its storytelling. NISER also performed well in events like Battle of Bands, Mehfil, and Solo/Duet singing.

NISER's Inter-College Fest "TVISHA":

DMC organized music and drama events as part of NISER's first inter-college fest. The events included Rangamanch (stage play competition), Dristi (nukkad-natak event), Battle of Bands, and Solo/Duet singing, drawing participation from neighboring institutes like IIT BBSR, Silicon Institute of Technology, IIIT, CV Raman Global University, and ITER.

Participation in Other College Fests: NISER's music and drama teams took part in external college fests including Alma Fiesta by IIT Bhubaneswar and KAIRAAN by NLU Odisha, showcasing their talents beyond the campus.

Quizone

In August 2022, NISER's Quizone club teamed up with IIT Bhubaneswar's quiz club to organize a dynamic General quiz. Over a hundred students participated in teams of two from both institutions. Eight teams excelled in the written prelims, progressing to the intense finals, featuring captivating rounds of quizzing and cleverly designed questions. In October, Quizone

hosted an Insta quiz on their Instagram page, running for 15 days with rapid-fire questions and daily winners. March brought two more quizzes - Cognizzia, a general quiz hosted by Mr. Somnath Chanda, and Pop goes the culture, the MELA quiz, drawing significant engagement from college students in both intra and inter college categories.

The Free Radicals (TFR) Club

The Free Radicals (TFR), the chemistry club of NISER was formally inaugurated by the Director, Prof. Sudhakar Panda at the School of Chemical Sciences (SCS) Meet, 19th April, 2022. After its inception, the club has held a series of alumni talks, student talks, and chemistry-themed activities to invigorate the passion for the subject beyond the classroom. Along with that, outreach activities were held to popularize science among school students and the general public.

Student Talks:

1. Kinetic Investigations of the Catalytic Hydration of Nitriles to Amides by Mr. Shivam Mahapatra, 5th Year Integrated M.Sc., SCS. (29th April, 2022)

Alumni Talks:

1. Local Excitations in Crystalline Point Defects with Multireference Density Matrix Embedding Theory by Mr. Abhishek Mitra (Batch of 2014), University of Chicago, USA (10th June, 2022).

2. Competing reaction dynamics with second-order saddles by Ms. Richa Rashmi (Batch of 2016), University of California, San Diego, USA (29th August, 2022).

3. Tackling Multireference Quantum Chemistry by Incorporating Selected Configuration Interaction in Moment Energy Expansions by Ms. Swati Snigdha Priyadarsini (Batch of 2016), Michigan State University, USA (4th January, 2023).

4. Hybrid QM: QM methods for adsorption of ethanol in H-MFI by Mr. Dipansu Kumar (Batch of 2016), Radboud University, Netherlands (6th January, 2023).

5. Structure, Assembly, and Properties of Cephalopod Protein-Based Materials by Dr. Preeta Pratakshya (Batch of 2012), University of California, Berkeley (6 February, 2023).

Outreach Activities

1. Prerana 2022 (19th November, 2022)

Prerana 2022 was an expository outreach program for the children of NISER's general workforce. TFR participated in the event with an exhibitional chemistry session. Several fun chemistry experiments like elephant toothpaste, baking soda rocket, liquid nitrogen freezing, fluorescence demonstrations, and flame tests, were performed in front of the children. After each experiment, the science was explained to the children in a lucid manner. The exhilarating event was enjoyed and well appreciated by the children of different age-groups in the audience.

2. Science Camp 2023 (6th - 7th April, 2023)

TFR was involved in teaching high-school students about real-life applications of chemistry. Forensic chemistry was chosen to be the matter of exposition and students were given a case study of a murder case. The theory behind the chemical tests they would perform to solve the case was explained. The students were grouped to attempt the problem, after performing the analytical tests, they explained the cause and culprit of murder.

3. Open Day 2023 (8th April, 2023)

TFR was involved in coordinating the exhibitional chemistry session for the School ofChemical Sciences. Many eye-catching experiments were performed for high school students. The science behind the experiments was explained following which the students expressed their satisfaction in learning new concepts in chemistry.

Departmental Events

1. SCS Meet 2022 (19th April, 2022)

The club was formally inaugurated at this event. Prof. K.V.R. Chary (Director, IISER Berhampur) and Prof. Swapan K. Ghosh (Distinguished Professor, HBNI) was the Chief Guest and Guest of Honour, respectively. Cultural events were also a part of the proceedings, which were arranged and coordinated by TFR.

2. Aromatte 2022 (22nd October, 2022)

Aromatte 2022 was a Mini-Symposium cum Fresher's Program for M.Sc. Batch '21, Int. Ph.D. '22, and Ph.D. '22 of the School of Chemical Sciences. The morning was devoted to research talks showcasing the work being pursued by the various groups at SCS. The evening was filled with cultural activities, games, and ice-breaking

sessions, organized by TFR, for the newly-admitted members of the department.

Other

1. Khojo to Jaane!!! (18th March, 2023)

Khojo to Jaane!!! was a chemistry-themed treasure hunt organized by TFR during NISER's intercollege fest Tvisha. The event involved locating various interconnected clues littered around the campus by application of the knowledge of chemistry.

NISER Astronomy Club

1. The NISER Astronomy Club (NAC) is devoted to fostering enthusiasm towards astronomy. NAC conducted telescope training sessions for the new joinees of the club in September-October 2022. Students were oriented about the 6-inch equatorial mount telescope and directed to set it up by themselves.

2. Mr. Chandan Kumar Sahu and Ms. Dibya Bharati Pradhan were elected as the club representatives of the NISER Astronomy Club for the session 2022-23. They functioned as the contact point of NAC for the club activities and events. Dr. Tuhin Ghosh (SPS), Dr. Luke Chamandy (SPS), Dr. Liton Majumdar (SEPS), and Dr. Jayesh Goyal (SEPS) took the responsibility of being the faculties-in-charge of NAC. They provided support and guidance for the functioning of the club.
3. An observation session for the partial solar eclipse on October 25, 2022, and lunar eclipse on November 8 was organized for all members of NISER by NAC, where students, faculties and their family members witnessed the events with binoculars and telescopes while breaking the myths associated with eclipses.
4. NAC trained junior members to handle the 8-inch equatorial mount telescope and take photographs of Jupiter and its moons using a CMOS camera. This was a three-week observation run conducted in November 2022, led by Vasanth Kashyap (4th year Int. MSc.) to study the revolution period of Jupiter and its moons, calculate the mass of Jupiter and their orbital synchronization using Kepler's laws of planetary motion.
5. On the occasion of Children's Day, NAC conducted an interactive session with school children followed by a demonstration of telescopes, led by Srusti Sampanna (2nd year Int. MSc.).
6. In association with the NISER Outreach Committee, NAC hosted a session for visiting teachers and professors from various institutes in November 2022.
7. NAC launched the 4th edition of its in-house magazine 'Kshitij' in December 2022, which is the first and longest student-led magazine of

NISER. In this edition, content calls were also made to students of other national science institutes, and entries from IISER Pune and IISER Thiruvananthapuram were published.

8. NAC organized two events in the inter-college fest TVISHA organized in March 2023, namely ANTARIKSH Astronomy Quiz and GAGAN Astrophotography Contest supervised by Abhinav Roy (3rd year Int. MSc.) and Aheesh Hegde (4th year Int. MSc.). Members from different institutes participated in the events. Trophies and cash prizes worth 12K ere awarded to the winners of the events.
9. NAC organized interaction sessions with students of various schools and motivated them towards astronomy, astrophysics and space science on the occasion of Open day in April 2022. NAC demonstrated the appearance of a black hole in space and explained the physics behind the phenomena.
10. The club frequently conducts observation sessions and talks on astrophysics and cosmology for all residents of NISER, expanding their knowledge and motivating people towards astronomy and astrophysics. NAC has organized a total of 12 weekend talks between August 2022 and April 2023.

Brain Matters Club

The BRAIN MATTERS club hosted 2 talks during the 2022-2023 academic year. These are:

1. Student talk on "Flies, Stains and Individuality Neurons: My experience asan intern at Paris Brain Institute" by Shubham Kumar (B18, Int. MSc, SBS) on September 16, 2022. Around 100-120 students attended.
2. Faculty talk on "Excitatory/Inhibitory (E/I) Imbalance in Neurological Disorders" by Dr. Swagata Ghatak (Assistant Professor, SBS) on February 3, 2022. Around 100-120 students attended.

Film Club

This section outlines Film Club's activities from April 1, 2022, to March 31, 2023. The club maintained a steady Friday schedule, showcasing diverse movie genres and hosting special events like a Halloween horror movie marathon. Notably, they continued their tradition of organizing Oscar movie marathons, exposing students to acclaimed films. Student talks on topics such as "Colours in Film as a Storytelling Device" and "Maternity and Monstrosity in Horror Cinema" were held on September 2 and October 31, 2022, respectively. The club actively engaged in filmmaking, creating two short films and participating in the IICM short film competition. A documentary project titled "Life in a Day - NISER" captured daily life experiences, and an interview with departing faculty Dr. Ritwick Das was conducted. Additionally, Film Club played a role in NISER's intercollege fest, Tvisha 2023, which offered a rich tapestry of cultural and sports events from March 15 to 19.

Robotics Lab

The Line Follower team of RTC bagged top positions in inter-college robotics competitions held at Silicon Institute, Bhubaneswar and IIT Bhubaneswar.

Software Development Group

Throughout the year, the club organized diverse events fostering collaboration, teamwork, and problem-solving. The highlights included a Code Golf challenge in June 2022, where participants aimed to write the shortest code for a given problem. In September 2022, the Bug Bomber event had students competing to identify and x errors in NISER's intranet ecosystem. November 2022 brought the Webpage Design Competition, testing participants' creativity and design skills in creating attractive and functional websites. The grandest event of all was the January 2023 Blitz Byte.

Tvisha- Intercollege Fest of NISER

The fest embraced arts, sciences, and entertainment. Noteworthy were events like Short Film and Captivating Covers for film enthusiasts, Gagan for astrophotography lovers, and Terpsichore, Battle of Bands, and more for music and drama enthusiasts. Integrating science, events like Astro Quiz, Blitz Byte, and Integration +C combined learning with fun.

Starnight was a highlight, with captivating performances by Gamak band, DJ Zyphertone, and Italian DJ Olly Esse creating an electric atmosphere. The fest's sports competitions fostered healthy competition and sportsmanship.

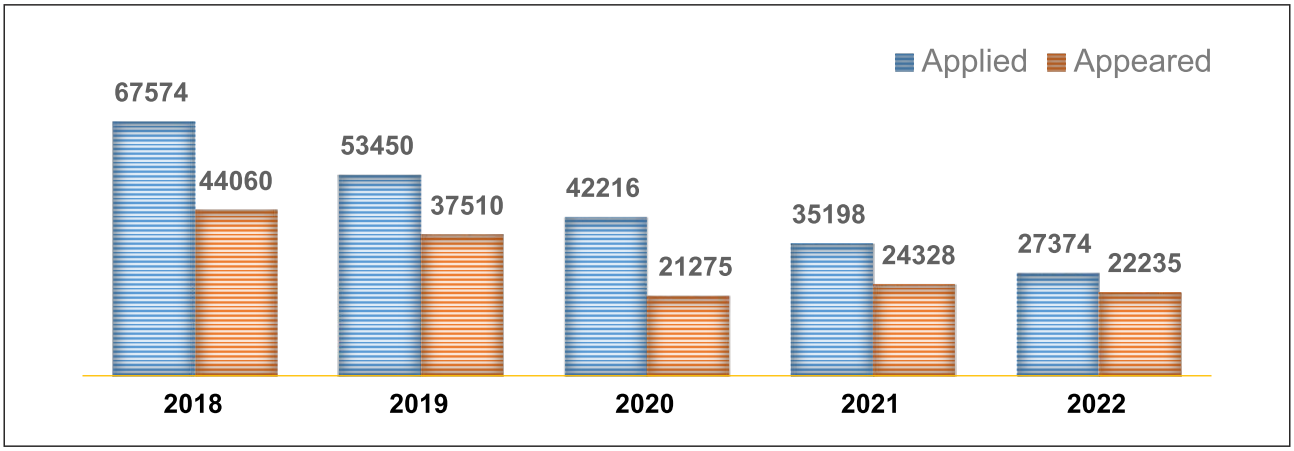
Tvisha facilitated intercollegiate bonding and networking, connecting students with experts in their fields. The fest's success was evident in enthusiastic participation and campus-wide energy, symbolizing unity and talent.

In essence, Tvisha's diverse events, intercollegiate camaraderie, and memorable experiences exemplify its significance as a platform for talent, fostering unity, and celebrating creativity. It stands as a cherished memory in NISER's history, inspiring future generations.

National Entrance Screening Test (NEST)

National Entrance Screening Test (NEST) is an annual entrance exam conducted by National Institute of Science Education and Research (NISER), Bhubaneswar and 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-2022 examination was conducted nationally on the 18th of June, 2022. 22,235 candidates appeared for the exam out of which 10,200 were from Odisha and Kerala, the two states from which most students over the years have appeared for the exam. The exam was conducted in two sessions in about 116 cities 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 5th of July, 2022. A total of 199 candidates were admitted (1st round) to the Integrated MSc program of NISER for the Academic Session 2022-27.

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	5847	417	3590	1018	385	81	25	11257
Male	5617	565	3211	1184	401	76	45	10978
								22235

State of Domicile	Number	Percentage	State of Domicile	Number	Percentage
Odisha	7261	32.656	Gujarat	192	0.864
Kerala	2939	13.218	Assam	188	0.846
Uttar Pradesh	1741	7.830	Jammu and Kashmir	137	0.616
West Bengal	1648	7.412	Punjab	128	0.576
Maharashtra	1260	5.667	Tripura	93	0.418
Telangana	755	3.396	Puducherry	74	0.333
Tamil Nadu	711	3.198	Chandigarh	28	0.126
Bihar	698	3.139	Goa	18	0.081
Rajasthan	668	3.004	Meghalaya	16	0.072
Delhi	571	2.568	Arunachal Pradesh	15	0.067
Andhra Pradesh	464	2.087	Ladakh	12	0.054
Karnataka	445	2.001	Andaman and Nicobar Islands	9	0.040
Haryana	444	1.997	Dadra and Nagar Haveli	8	0.036
Madhya Pradesh	409	1.839	Lakshadweep	5	0.022
Jharkhand	384	1.727	Manipur	4	0.018
Himachal Pradesh	365	1.642	Sikkim	3	0.013
Chhattisgarh	345	1.552	Nagaland	1	0.004
Uttarakhand	195	0.877	Daman and Diu	1	0.004
				Total	**100.000**

Faculty

School of Biological Sciences

Name of the Faculty	Field of Specialization
Chandan Goswami, Professor PhD (Freie University of Berlin, Germany)	Cell biology of thermosensitive ion channels, microscopy
Palok Aich, Professor PhD (Saha Institute of Nuclear Physics)	Microbiome
Abdur Rahaman, Associate Professor PhD (Indian Institute of Science, Bangalore)	Cell Biology, Biochemistry, Membrane Remodelling, Nuclear Expansion
Asima Bhattacharyya, Associate Professor PhD (Jadavpur University (Bose Institute), West Bengal)	Cancer Biology, Gastroenterology, Hypoxia, Oxidative Stress, Host-Pathogen Interaction.
Debasmita Pankaj Alone, Associate Professor PhD (Banaras Hindu University, Varanasi)	Molecular Genetics and Epigenetics of Aging Disorders
Harapriya Mohapatra, Associate Professor PhD (University of Delhi South Campus, New Delhi)	Molecular Microbiology
Kishore CS Panigrahi, Associate Professor PhD (Tata Institute of Fundamental Research, Mumbai)	Plant Developmental Biology
Manjusha Dixit, Associate Professor PhD (Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow)	Angiogenesis and Tumorigenesis Regulation
Pankaj Vidyadhar Alone, Associate Professor PhD (National Institute of Immunology, New Delhi)	Molecular biology of protein biosynthesis
Praful Singru, Associate Professor PhD (Nagpur University, India)	Neural circuits, neuropeptides and behavior
Ramanujam Srinivasan, Associate Professor PhD (Indian Institute of Science, Bangalore)	Bacterial And Archaeal Cytoskeleton
Rudresh Acharya, Associate Professor PhD (Indian Institute of Science, Bangalore)	Protein Crystallography, Protein engineering, De-novo protein design
Subhasis Chattopadhyay, Associate Professor PhD (Indian Institute of Chemical Biology, West Bengal)	Immunology
Tirumala Kumar Chowdary, Associate Professor PhD (Centre for Cellular and Molecular Biology, Hyderabad)	Viral Structural Biology
V Badireenath Konkimalla, Associate Professor PhD (University of Heidelberg, Germany)	Pharmaceutical Biology

Aniruddha Datta Roy, Reader-F PhD (University of Mysore)	Phylogenetics, Biogeography, Phylogeography
Mohammed Saleem, Reader - F PhD (University of Münster, Germany)	Membrane Biochemistry/Biophysics
Renjith Mathew, Reader-F PhD (Indian Institute of Science, Bangalore)	Cell and Tissue Biology
Kilambi Himabindu Vasuki, Assistant Professor PhD (University of Hyderabad)	Plant functional genomics, proteomics & metabolomics
Rittik Deb, Assistant Professor PhD (Indian Institute of Science, Bangalore)	Behaviour, Ecology, Evolution, Bio-acoustics, Gut-microbial ecology, Community dynamics
Swagata Ghatak, Assistant Professor PhD (Indian Institute of Science, Bangalore)	Neuroscience, stem cell Biology

School of Chemical Sciences

Name of the Faculty	Field of Specialization
A. Srinivasan, Professor PhD (Indian Institute of Technology, Kanpur)	Bio-Inorganic Chemistry
Chidambaram Gunanathan, Professor PhD (Central Salt and Marine Chemicals Research Institute, Bhavnagar)	Organometallic Chemistry, Catalysis and Organic Synthesis
Himansu Sekhar Biswal, Professor PhD (Tata Institute of Fundamental Research, Mumbai)	Spectroscopy and Computational Chemistry
Bhargava B.L., Associate Professor PhD (Jawaharlal Nehru Center for Advanced Scientific Research, Bangalore)	Computational Modeling of Condensed Phase Systems
Chandra Shekhar Purohit, Associate Professor PhD (Indian Institute of Technology, Kanpur)	Organic Chemistry, Bio-Organic Chemistry
Jogendra Nath Behera, Associate Professor PhD (Indian Institute of Science, Bangalore)	Inorganic and Material Chemistry
Krishnan Venkatasubbaiah, Associate Professor PhD (Indian Institute of Technology, Kanpur)	Hybrid Organic Inorganic Materials
Moloy Sarkar, Associate Professor PhD (University of Hyderabad, Hyderabad)	Fluorescence Spectroscopy
Nagendra Kumar Sharma, Associate Professor PhD (University of Pune, Maharashtra)	Organic Syntheses and Bioorganic Chemistry
Ponneri C. Ravikumar, Associate Professor PhD (Indian Institute of Science, Bangalore)	Synthetic Organic Chemistry

Prasenjit Mal, Associate Professor PhD (Indian Institute of Technology, Kanpur)	Organic Chemistry
S. Peruncheralathan, Associate Professor PhD (Indian Institute of Technology, Kanpur)	Synthetic Organic Chemistry
Sanjib Kar, Associate Professor PhD (Indian Institute of Technology, Bombay)	Bioinorganic chemistry
Sharanappa Nembenna, Associate Professor PhD (Goettingen University, Germany)	Main group Organometallics, Inorganic synthesis and Catalysis
Subhadip Ghosh, Associate Professor PhD (Indian Association for the Cultivation of Science, West Bengal)	Single-molecule and ultrafast fluorescence spectroscopy
Sudip Barman, Associate Professor PhD (Indian Institute of Science, Bangalore)	Materials and Physical Chemistry
Upakarasamy Lourderaj, Associate Professor PhD (Indian Institute of Technology, Kanpur)	Theoretical and Computational Chemistry
Arindam Ghosh, Reader - F PhD (Indian Institute of Science, Bangalore)	NMR Spectroscopy, MRI
Bidraha Bagh, Reader-F PhD (University of Saskatchewan, Canada)	Organometallic Chemistry and Catalysis
Bishnu Prasad Biswal, Assistant Professor PhD (CSIR-National Chemical Laboratory, Pune)	Physical and materials chemistry
Dipak Samanta, Assistant Professor PhD (Indian Institute of Science, Bangalore)	Inorganic and Materials Chemistry

School of Computer Sciences

Name of the Faculty	Field of Specialization
Aritra Banik, Reader-F PhD (Indian Statistical Institute, Kolkata)	Algorithms, Computational Geometry
Subhankar Mishra, Reader-F PhD (University of Florida)	Machine Learning, Computer Sciences
Manoj Mishra, Reader-F PhD (Indian Institute of Technology, Bombay)	Secure Multiparty Computation
Anup Kumar Bhattacharya, Assistant Professor PhD (Indian Institute of Technology, Delhi)	Algorithms, Theoretical Computer Science

School of Earth and Planetary Sciences

Name of the Faculty	Field of Specialization
Guneshwar Singh Thangjam, Reader-F PhD (Max Planck Institute for Solar System Research/ Clausthal University of Technology, Germany)	Planetary Geoscience
Liton Majumdar, Reader-F PhD (University of Calcutta, Kolkata) Exoplanets and their Atmospheres	Star and Planet Formation, Astrochemistry/Molecular Astrophysics,
Jaya Khanna, Assistant Professor PhD (Princeton University, USA)	Regional hydroclimatology, land-climate coupling
Jayesh M. Goyal, Assistant Professor PhD (University of Exeter, England)	Planetary Science, Atmospheric Science, Astrophysics
Pathikrit Bhattacharya, Assistant Professor PhD (Princeton University, USA)	Geophysics
Priyadarshi Chowdhury, Assistant Professor PhD (Ruhr University Bochum, Germany) systems, Diffusion kinetics in geosciences	Petrology, Lithosphere dynamics, Early Earth
Surya Snata Rout, Assistant Professor PhD (University of Muenster, Germany)	Cosmochemistry, Meteoritics, Planetary Science

School of Humanities and Social Sciences

Name of the Faculty	Field of Specialization
Pranay K. Swain, Associate Professor PhD (Indian Institute of Technology, Kanpur)	Science-Society Interface, Public Policy and Governance, Social Entrepreneurship, Contemporary Social Issues
Amarendra Das, Reader - F PhD (Centre for Development Studies, Thiruvananthapuram, Jawaharlal Nehru University, New Delhi)	Natural Resource Management, Public Economics
Amarjeet Nayak, Reader - F PhD (Indian Institute of Technology, Kanpur) Indian English Literature, Diaspora Studies	Postcolonial Theory and Literature, Translation Studies, Speculative Fiction,
Joe Varghese Yeldho, Reader - F PhD (Indian Institute of Technology, Kanpur)	Critical History and Narratives of Race
Debashis Pattanaik, Assistant Professor PhD (Indian Institute of Technology, Kanpur) Social Study of Sciences and Technology	Social Innovation, Social Network Analysis,
Rooplekha Khuntia, Assistant Professor PhD (Indian Institute of Technology, Kharagpur)	Business Ethics, Ethical Cynicism, Organizational Behavior and Leadership

School of Mathematical Sciences

Name of the Faculty	Field of Specialization
Brundaban Sahu, Professor PhD (Harish-Chandra Research Institute, Prayagraj)	Number Theory
Anil Kumar Karn, Associate Professor PhD (University of Delhi, Delhi)	Order theoretic Functional Analysis
Biond Kumar Sahoo, Associate Professor PhD (Indian Institute of Science, Bangalore)	Incidence Geometry
Deepak Kumar Dalai, Associate Professor PhD (Indian Statistical Institute, Kolkata)	Cryptography and Boolean function
Jaban Meher, Associate Professor PhD (Harish-Chandra Research Institute, Allahabad)	Number Theory, Modular forms, L-functions
Kamal Lochan Patra, Associate Professor PhD (Indian Institute of Technology, Kanpur)	Algebraic Graph Theory
Manas Ranjan Sahoo, Associate Professor PhD (TIFR CAM, Bangalore)	Partial Differential Equations
Sanjay Parui, Associate Professor PhD (Indian Statistical Institute, Bangalore)	Harmonic Analysis
Anupam Pal Choudhury, Reader-F PhD (TIFR CAM, Bangalore)	Analysis and Partial differential equations
Dinesh Kumar Keshari, Reader-F PhD (Indian Institute of Science, Bangalore)	Functional Analysis
K. Senthil Kumar, Reader-F PhD (Harish-Chandra Research Institute, Allahabad)	Number Theory
Nabin Kumar Jana, Reader-F PhD (Indian Statistical Institute, Kolkata)	Probability Theory
Panchugopal Bikram, Reader-F PhD (Institute of Mathematical Sciences, Chennai)	Functional Analysis
Ritwik Mukherjee, Reader - F PhD (Stony Brook University)	Differential Geometry
Sutanu Roy, Reader-F PhD (Georg-August-Universität Göttingen, Germany)	Quantum groups, Operator Algebras, Noncommutaive Geometry
Chitrabhanu Chaudhuri, Assistant Professor PhD (Northwestern University, Evanston IL, USA)	Alegebraic Geometry, Complex Geometry
Kaushik Majumder, Assistant Professor PhD (Indian Statistical Institute, Kolkata)	Combinatorics

Krishanu Dan, Assistant Professor PhD (Institute of Mathematical Sciences, Chennai)	Algebraic Geometry
Ramesh Manna, Assistant Professor PhD (Harish-Chandra Research Institute, Allahabad)	Harmonic Analysis
Sudhir Kumar Pujahari, Assistant Professor PhD (Indian Institute of Science Education and Research, Pune)	Number Theory
Rekha Biswal, Assistant Professor PhD (Institute of Mathematical Sciences, Chennai)	Representation Theory
Sumana Hatui, Assistant Professor PhD (Harish Chandra Research Institute, Allahabad)	Algebra
Tushar Kanta Naik, Assistant Professor PhD (Harish-Chandra Research Institute, Prayagraj)	Algebra

School of Physical Sciences

Name of the Faculty	Field of Specialization
Sudhakar Panda, Senior Professor PhD (Institute of Physics, Bhubaneswar)	String Theory
Bedangadas Mohanty, Professor PhD (Institute of Physics, Bhubaneswar)	Experimental High Energy Physics and Dark Matter
Sanjay Kumar Swain, Professor PhD (University of Hawaii, USA)	Experimental High Energy Physics
Anamitra Mukherjee, Associate Professor PhD (Harish-Chandra Research Institute, Prayagraj)	Condensed Matter Theory
Ashok Mohapatra, Associate Professor PhD (Tata Institute of Fundamental Research, Mumbai)	Experimental Condensed Matter Physics
Chethan N. Gowdigere, Associate Professor PhD (University of Southern California, Los Angeles, USA)	String Theory
Colin Benjamin, Associate Professor PhD (Institute of Physics, Bhubaneswar)	Theoretical Condensed Matter Physics, Quantum Information Theory, Game Theory
Kartikeswar Senapati, Associate Professor PhD (Indian Institute of Technology, Kanpur)	Superconductivity
Nishikanta Khandai, Associate Professor PhD (Harish-Chandra Research Institute, Prayagraj)	Astrophysics and Cosmology
Pratap Kumar Sahoo, Associate Professor PhD (Indian Institute of Technology, Kanpur)	Experimental Condensed Matter Physics

Prasanjit Samal, Associate Professor PhD (Indian Institute of Technology, Kanpur)	Density Functional Theory
Ritwick Das, Associate Professor PhD (Indian Institute of Technology, Delhi)	Nonlinear Optics and Lasers
Shamik Banerjee, Associate Professor PhD (Homi Bhabha National Institute, Mumbai)	String Theory
Subhankar Bedanta, Associate Professor PhD (University of Duisburg-Essen, Duisburg, Germany)	Experimental condensed matter physics (Nanomagnetism and multiferroics)
Subhasis Basak, Associate Professor PhD (University of Calcutta)	Theoretical High Energy Physics
Yogesh Kumar Srivastava, Associate Professor PhD (Ohio State University, USA)	High energy theory, String theory
A.V. Anil Kumar, Reader-F PhD (Indian Institute of Science, Bangalore)	Theoretical Condensed Matter Physics
Ajaya Kumar Nayak, Reader-F PhD (Indian Institute of Technology, Bombay)	Condensed Matter Experiment
Amaresh Kumar Jaiswal, Reader-F PhD (Tata Institute of Fundamental Research, Mumbai)	Theoretical high energy physics
Ashis Kumar Nandy, Reader - F PhD (Indian Association for the Cultivation of Science, Kolkata)	Condensed Matter Theory
Joydeep Bhattacharjee, Reader-F PhD (Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore)	Condensed Matter Theory
Kush Saha, Reader-F PhD (Indian Association for the Cultivation of Science, Kolkata)	Condensed Matter Theory
Luke Robert Chamandy, Reader-F PhD (Inter-University Centre for Astronomy and Astrophysics, Pune)	Astrophysics
Najmul Haque, Reader-F PhD (Saha Institute of Nuclear Physics, Kolkata)	Theoretical High Energy Physics
Prolay Kumar Mal, Reader-F PhD (Tata Institute of Fundamental Research, Mumbai)	Experimental High Energy Physics
Sayantani Bhattacharyya, Reader-F PhD (Tata Institute of Fundamental Research)	String Theory
Sumedha, Reader-F PhD (Tata Institute of Fundamental Research, Mumbai)	Statistical Mechanics

Tapan Mishra, Reader-F PhD (Indian Institute of Astrophysics, Bangalore)	Theoretical Condensed Matter Physics
Tuhin Ghosh, Reader-F PhD (Inter-University Centre for Astronomy and Astrophysics, Pune)	Astrophysics and Cosmology
V. Ravi Chandra, Reader-F PhD (Indian Institute of Science, Bangalore)	Condensed Matter Theory
Victor Roy, Reader-F PhD (Homi Bhabha National Institute (VECC, Kolkata))	High energy heavy-ion collisions
Atul Varshney, Assistant Professor PhD (Tata Institute of Fundamental Research, Mumbai)	Structure Formulation and Mechanical Response of Model Amorphous Systems
Narayan Rana, Assistant Professor PhD (Institute of Mathematical Sciences, Chennai)	Theoretical High Energy Physics
Satyaprasad P Senanayak, Assistant Professor PhD (Jawaharlal Nehru Centre For Advanced Scientific Research, Bangalore)	Semiconductor, Nanoelectronics and Device Physics
Shovon Pal, Assistant Professor PhD (Ruhr-Universität Bochum, Bochum, Germany)	Ultrafast THz optics and quantum Materials

Administrative Staff

Dr. Abhaya Kumar Naik Registrar, Administration
Shri Pradeep Kumar Panda Finance Officer, Finance & Accounts
Shri Deepak Srivastava Stores & Purchase Officer, Stores & Purchase
Shri Ramakant Kar Administrative Officer-III, Administration
Shri Satya Narayan Mohanty Deputy Controller of Accounts, Finance & Accounts
Shri Abhaya Kumar Mohanty Administrative Officer-I, Faculty Affairs
Shri Chandra Sekhar Mahapatra Administrative Officer-I, School of Humanities and Social Sciences, School of Mathematical Sciences
Shri Dhaneswar Nayak Administrative Officer-I, Administration
Shri Dinesh Bahadur Singh Administrative Officer-I, School of Biological Sciences
Shri Dolananda Pradhan Administrative Officer-I, School of Physical Sciences
Shri Gopal Krishna Rath Administrative Officer-I, Finance & Accounts
Shri Hiralal Das Administrative Officer-I, Finance & Accounts
Shri Pradeep Kumar Mishra Administrative Officer-I, Academic Affairs
Shri Purna Chandra Sahu Administrative Officer-I, Stores & Purchase
Shri Rajeev Kumar Singh Administrative Officer-I, Student Affairs
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Shri Nabin Kumar Sahoo Office Assistant (MS), Earth & Planetary Sciences
Shri Ranjan Kumar Das Office Assistant (MS), Stores & Purchase
Shri Sujit Kumar Bastia Office Assistant (MS), Academic Affairs
Shri Jogendra Jena Operator (General Function), School of Mathematical Sciences
Smt. Sasmita Sahoo Operator (General Function), Stores & Purchase
Shri Subrat Ranjan Hota Operator (General Function), Finance & Accounts
Shri Tusar Kanta Sahoo Operator (General Function), Faculty Affairs
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Smt. Babita Pradhan Upper Division Clerk, Finance & Accounts
Smt. Banita Pradhan Upper Division Clerk, Finance & Accounts
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Shri Biplab Kanungo Upper Division Clerk, School of Physical Sciences

Kum. Bishnupriya Das Upper Division Clerk, Research & Development	**Smt. Lopamudra Sahoo** Upper Division Clerk, Academic Affairs
Shri Chittaranjan Nayak Upper Division Clerk, School of Chemical Sciences	**Shri M. Siba Prasad Rao** Upper Division Clerk, Administration
Shri D.Lingaraj Upper Division Clerk, Stores & Purchase	**Kum. Monalisa Baliarsingh** Upper Division Clerk, Finance & Accounts
Smt. Elina Das Upper Division Clerk. Stores & Purchase	**Kum. Sandeepa Sahoo** Upper Division Clerk, Administration
Smt. Lipsa Das Upper Division Clerk, Academic Affairs	**Smt. Smruti Kanungo** Upper Division Clerk, Administration
Shri Vijay Singh Upper Division Clerk, Student Affairs	**Shri Susanta Kumar Sethi** Upper Division Clerk, Directorate

Scientific and Technical Staff

Dr. Arun Kumar Scientific Officer-F, School of Chemical Sciences	**Shri Dilip Jha** Scientific Officer-E (Electrical), Institute Works Dept.
Dr. Shyamasree Ghosh Scientific Officer-F, School of Biological Sciences	**Shri Souvagya Mahapatra** Scientific Officer-E (Civil), Institute Works Dept.
Dr. Sudakshina Prusty Scientific Officer-F, School of Physical Sciences	**Dr. Ananda Raman A.** Scientific Officer-D, Computer Centre
Shri Saikat Hira Scientific Officer-F, Computer Centre	**Dr. Chandramohan Bathrachalam** Scientific Officer-D, School of Biological Science
Dr. Bandita Dash Scientific Officer-E, Health Centre	**Dr. Ganesh Jagannath Tambave** Scientific Officer-D, Centre for Medical and Radiation Physics
Dr. Biswajit Mishra Scientific Officer-E, Health Centre	**Dr. Haraprasanna Lenka** Scientific Officer-D, School of Physical Sciences
Dr. Ranbir Singh Scientific Officer-F, School of Physical Sciences	**Dr. Priyanka Pandey** Scientific Officer-D, School of Chemical Sciences
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Dr. Saurabh Chawla Scientific Officer-E, School of Biological Sciences	**Dr. Saralasrita Mohanty** Scientific Officer-D, School of Physical Sciences

Dr. Sibananda Jena Scientific Officer-D, Health Centre
Dr. Sudha Shankar Dasgupta Scientific Officer-D, CMRP
Dr. Varchaswi KS Kashyap Scientific Officer-E, School of Physical Sciences
Dr. Ajay Kumar Dash Scientific Officer-C, Earth & Planetary Sciencess
Dr. Sitaram Scientific Officer-C, Health Centre
Shri Anindya Kumar Baral Scientific Officer-C, CMRP
Shri Ashank Vishwakarma Scientific Officer-C (Mechanical), Institute Works Dept.
Shri Kapil Kumar Gupta Scientific Officer-C, Central Library
Shri Kirti Prakash Sharma Scientific Officer-C, CMRP
Shri Lalatendu Mishra Scientific Officer-C, CMRP
Shri Prasanna Kumar Muduli Scientific Officer-C, Central Library
Shri Amit Kumar Panigrahi Scientific Assistant-E (Electrical), Institute Works Dept.
Shri Bhagaban Dhal Scientific Assistant-E (Electrical), Institute Works Dept.
Shri Dipak Kumar Rout Scientific Assistant-E, Computer Centre
Dr. Jitendra Narayan Dash Scientific Assistant-E, Central Library
Shri Pramod Kumar Nath Scientific Assistant-E (Civil), Institute Works Dept.
Shri Ranjan Kumar Rana Scientific Assistant-E (Electrical), IWD
Shri Sambid Ranjan Pradhan Scientific Assistant-E (Civil), Institute Works Dept.

Shri Bidyut Siba Sankar Mohanty Scientific Assistant-D, Central Library
Shri Binod Bhagat Scientific Assistant-D (Civil), IWD (On Deputation)
Shri Deepankar Dash Scientific Assistant-D, Computer Centre
Shri Sujit Kumar Raut Scientific Assistant-D (Mechanical), IWD
Shri Ajit Kumar Mohanty Scientific Assistant-C (Mechanical), IWD
Shri Alok Sahoo Scientific Assistant-C, Computer Centre
Shri M Suryanarayan Scientific Assistant-C (PET), Student Affairs
Smt. N Bharati Reddy Scientific Assistant-C (Nurse-A), Health Centre
Smt. Sibani Bhuyan Scientific Assistant-C (Nurse-A), Health Centre
Smt. Smrutirekha Behera Scientific Assistant-C (Nurse-A), Health Centre
Kum. Susama Pachalasingh Scientific Assistant-C (Nurse-A), Health Centre
Smt. Binodini Behera Scientific Assistant-C (Nurse-A), Health Centre
Shri Adhikari Suryakanta Dash Scientific Assistant-B (Pharmacist), Health Centre
Shri Bhola Nath Karmali Scientific Assistant - B (Medical Laboratory Technician), Health Centre
Shri Debasis Barik Scientific Assistant-B (Mechnical), Centre for Medical and Radiation Physics
Shri Deepak Kumar Scientific Assistant-B (Electronics & Instrumentation), CMRP
Shri Jyotiranjan Sahoo Scientific Assistant-B (Physiotherapist), Health Centre

Shri Ram Jeet
Scientific Assistant-B (Radiography), Health Centre

Shri Subhas Das
Scientific Assistant-B, Central Library

Shri Umakanta Sasmal
Scientific Assistant-B (Mechanical), Central Workshop

Kum. Suchismita Dash
Technician-F, Central Library

Shri Alok Kumar Jena
Technician-F, School of Biological Sciences

Shri Bikash Chandra Behera
Technician-F, School of Biological Sciences

Shri Rabindra Kumar Maharana
Technician-F, Central Library

Shri Ram Prasad Panigrahi
Technician-F, School of Physical Sciences

Smt. Anuradha Das
Technician-F, School of Chemical Sciences

Shri Amit Sankar Sahu
Technician-D, School of Chemical Sciences

Shri Mriganka Sadhukhan
Technician-D, School of Chemical Sciences

Shri Prafulla Kumar Sethi
Technician-D, School of Physical Sciences

Shri Prakash Chandra Behera
Technician-D, School of Chemical Sciences

Shri Pravakar Mallick
Technician-D, School of Physical Sciences

Shri Rudranarayan Mohanty
Technician-D, School of Physical Sciences

Shri Sanjaya Kumar Mishra
Technician-D, School of Chemical Sciences

Shri SK. Safatulla
Technician-D, Central Library

Shri Tapan Kumar Panigrahi
Technician-D, Computer Centre

Shri V.A. Sakthivel
Technician-D, School of Physical Sciences

Kum. V Shiny Jerusha Joseph
Technician-C, School of Biological Sciences

Shri Debasis Das
Technician-C, School of Physical Sciences

Shri Deepak Kumar Behera
Technician-C, School of Chemical Sciences

Shri Deepak Kumar Pattanaik
Technician-C, Central Workshop

Shri Kuna Mahara
Technician-C, School of Biological Sciences

Shri Mukesh Kumar Meena
Technician-C, School of Biological Sciences

Shri Rakesh Kumar Behera
Technician-C (Mechanical), Institute Works Dept.

Shri Sandeep Kumar Behera
Technician-C (Electrical), Institute Works Dept.

Shri Srikrushna Sahu
Technician-C, School of Physical Sciences

Shri Subhransu Sekhar Panda
Technician-C, Computer Centre

Shri Susanta Kumar Parida
Technician-C, School of Physical Sciences

Smt. Ashwini Babrubahan Sethi
Technician-C, School of Biological Sciences

Shri Basudev Mallick
Technician-B, Central Workshop

Shri Banoth Sridhar
Technician-B, Central Workshop

Shri Ganesh Mandi
Technician-B (Electrical), Institute Works Dept.

Shri Satyajit Pani
Technician-B (Mechanical), Centre for Medical and Radiation Physics

Employee Data

Employee Data on SC, ST, OBC and PWD (As on 31.03.2023)							
Academic				Non-Academic			
SC	ST	OBC	PWD	SC	ST	OBC	PWD
01	NIL	14	NIL	15	9	20	1

Right to Information Act Data

Duration of Report	Information provided for RTI Request			
April 1st 2022 to March 31st 2023	RTI Request (s) disposed of	Within 30 days	After 30 days	Remarks
78	78	78	NIL	NA

Duration of Report	Information provided for RTI Appeals		
April 1st 2022 to March 31st 2023	RTI Appeal (s) disposed of	Within 30 days	After 30 days
5	5	5	NIL

Audited Statement of Accounts
&
Statutory Auditor's Report
for the
Financial Year 2022 - 2023

National Institute of Science Education and Research
Bhubaneswar

Auditor

NAYAK RATH & ASSOCIATES

CHARTERED ACCCOUNTANTS

Plot-367, Jagamara, Khandagiri, Behind HDFC Bank, Bhubaneswar-751030, Odisha

INDEPENDENT AUDITORS' 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 2023, 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

HEAD OFFICE: Plot No. 367, Jagamara, Khandagiri, Behind HDFC Bank, Bhubaneswar-751030, Odisha
Tel: +91 - 0674 - 2961791/2350230, 9437278791, Email: canayakrath@gmail.com
BRANCH OFFICES : NEW DELHI, KENDRAPRA, BALASORE, BARGARH & NAYAGARH

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, 2023.

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 - 23307292BGWOPM8328

Place: Bhubaneswar
Date: 18.08.2023

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS 2022-23
BALANCE SHEET AS AT 31ST MARCH, 2023

Amount in (₹)

Particulars	*Schedule*	*As at 31st March, 2023*	*As at 31st March, 2022*
A. CAPITAL FUND & LIABILITIES :			
1. Capital Fund	1	6,91,91,72,383	7,27,81,51,705
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	5,11,28,080	6,59,39,393
TOTAL		*6,97,03,00,463*	*7,34,40,91,098*
B. ASSETS :			
1. Fixed Assets	8	6,66,26,37,070	6,90,54,70,002
2. Investments of Earmarked/Endownment Funds	9	-	-
3. Investments *(Others)*	10	22,63,10,252	31,79,18,869
4. Current Assets, Loans & Advances etc.	11	8,13,53,141	12,07,02,227
TOTAL		*6,97,03,00,463*	*7,34,40,91,098*
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 : 23307292BGWOPM8328
Place: Bhubaneswar
Date: 18-08-2023

Deputy Controller of Accounts

Finance Officer

Director

NAYAK RATH & ASSOCIATES * BHUBANESWAR * CHARTERED ACCOUNTANTS

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)

ANNUAL ACCOUNTS

2022-23

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2023

Amount in (₹)

Particulars	*Schedule*	*For the Year Ended 31st March, 2023*	*For the Year Ended 31st March, 2022*
A. INCOME :			
1. Income from Sales/ Services	12	-	-
2. Grant/ Subsidies	13	1,26,49,98,499	1,09,48,38,757
3. Fees/ Subscriptions	14	4,60,68,262	2,86,85,299
4. Income from Investment	15	-	-
5. Income from Royalty, Publication etc.	16	-	-
6. Interest Earned	17	1,00,93,429	1,94,43,590
7. Other Income	18	-	-
8. Increase/(Decrease) in stock of *Finished Goods & Work-in-Progress*	19	-	-
TOTAL (A)		*1,32,11,60,190*	*1,14,29,67,646*
B. EXPENDITURE :			
1. Establishment Expenses	20	83,95,49,935	60,18,81,021
2. Other Administrative Expenses etc.	21	53,87,44,754	28,83,07,831
3. Expenditure on Grants, Subsidies etc.	22	-	-
4. Prior Period Income (Adjustment)		1,94,43,590	2,01,71,458
5. Interest	23	-	-
6. Depreciation *(Net total at the year-end-corresponding to Schedule-8)*		79,30,71,623	79,30,54,950
TOTAL (B)		*2,19,08,09,902*	*1,70,34,15,260*
Balance being Excess of Expenditure over Income *(A-B)*		**(86,96,49,712)**	**(56,04,47,614)**
BALANCE BEING SURPLUS/(DEFICIT) CARRIED TO CORPUS/ CAPITAL FUND		*(86,96,49,712)*	*(56,04,47,614)*
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 : 23307292BGWOPM8328
Place: Bhubaneswar
Date: 18-08-2023

Deputy Controller of Accounts

Finance Officer

Director

NAYAK RATH & ASSOCIATES * BHUBANESWAR * CHARTERED ACCOUNTANTS

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)

ANNUAL ACCOUNTS

RECEIPTS AND PAYMENTS ACCOUNT FOR THE PERIOD FROM 1ST APRIL, 2022 TO 31ST MARCH, 2023

2022-23

Amount in (₹)

RECEIPTS	*For the Year Ended 31st March, 2023*	*For the Year Ended 31st March, 2022*	*PAYMENTS*	*For the Year Ended 31st March, 2023*	*For the Year Ended 31st March, 2022*
I. Opening Balances			**I. Expenses**		
			a) Establishment Expenses		
a) Cash in Hand	-	-	*(corresponding to Schedule 20)*		
b) Bank Balances:			*i) Pay & Allowances*	84,35,57,618	60,50,36,944
i) In Current Accounts	1,53,14,803	2,46,56,522			
			b) Administrative Expenses		
ii) In Savings Accounts	9,12,34,198	21,91,00,273	*(corresponding to Schedule 21)*		
			i) Other Administrative Expenditure	28,91,20,935	20,58,26,959
II. Grants Received			*ii) NISER Plan Expenses*	24,72,55,952	8,02,94,520
a) From Government of India	1,77,56,68,889	1,29,23,38,757			
			II. Expenditure on Fixed Assets & Capital Work-in-Progress		
III. Interest Received			a) Purchase of Fixed Assets	53,10,56,991	42,54,80,097
a) On Bank Deposits *(SBI & IOB)*	1,02,16,561	1,94,43,590	b) Expenditure on Capital WIP	1,91,51,835	2,11,39,308
IV. Other Income			**III. Finance Charges *(Interest Refunded)***	1,94,43,590	2,01,71,458
a) Registration Fee *(MSc & PhD)*	1,82,52,481	1,85,22,454			
b) Job Application Fee	51,000	1,10,500	**IV. Other Payments**		
c) RTI Application Fees	90	292	a) NISER R&D	39,11,162	5,96,53,907
d) Sale of Tender Paper	3,24,383	2,47,466	b) Deposit *(Asset : LC)*	16,90,32,506	33,54,23,605
e) Guest House Rent	15,70,331	2,41,996	c) Security Deposit *(Refundable)*	52,86,770	28,79,243
f) License Fees *(Rent of Quarter/Bank Branch)*	25,25,010	14,69,462	d) Duties & Taxes	11,88,45,863	6,97,71,953
g) Transcript Fees	27,300	23,800	e) EMD	1,62,500	3,44,826
h) Identity Card/Health Card *(Deplicate Fee)*	12,595	9,580	f) Statutory Recoveries	3,87,93,141	3,21,80,948
i) Lease Rent	1,98,000	10,60,913	g) Student Dues	31,96,990	31,56,684
j) Water Charges	3,16,828	3,83,951	h) Loans & Advance *(Asset)*	1,94,23,400	31,93,857
k) Sale of Assets	4,31,550	4,29,615	i) Liabilities for Expenses	-	8,80,08,425
l) Liquidated Damage	27,29,206	55,41,562			
m) Sample Testing Charges	75,000	37,000	**V. Closing Balances**		
n) Service Book Fees		1,000	a) Cash-in-Hand	-	-
			b) Bank Balances:		
V. Any other receipts *(Loans, Advances & Expenses Recovered)*					
a) Security Deposit *(Refundable)*	30,00,886	34,87,129	*i) In Current Accounts*	3,36,22,470	1,53,14,803
b) E.M.D	3,70,000	4,55,623	*ii) In Savings Accounts*	2,68,34,084	9,12,34,198
c) Duties & Taxes	11,74,98,571	7,22,20,511			
d) Statutory Recoveries	4,31,80,098	3,54,72,212			
e) Student Dues	26,99,571	1,30,03,633			
f) Deposit *(Asset : LC)*	25,99,06,127	22,72,23,936			
g) Loans & Advance *(Asset)*	1,47,10,084	4,95,27,105			
h) NISER R&D Receivable	47,32,245	7,41,02,853			
i) CBM Theme Meeting	2,50,000	-			
j) CERN Alice VECC Project	34,00,000	-			
	2,36,86,95,807	*2,05,91,11,735*		*2,36,86,95,807*	*2,05,91,11,735*

*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 : 23307292BGWOPM8328
Place: Bhubaneswar
Date: 18-08-2023

Deputy Controller of Accounts

Finance Officer

Director

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

2022-23

Schedule -1 : Capital Fund
(Schedule forming part of the accounts for the period ended on 31.03.2023)

Amount in (₹)

Particulars	*Current Year*		*Previous Year*	
Balance as at the beginning of the year	10,15,47,46,000		10,00,47,46,000	
Add : Contribution towards Capital Fund	51,06,70,390	10,66,54,16,390	15,00,00,000	10,15,47,46,000
		10,66,54,16,390		**10,15,47,46,000**
Add/(Deduct) : Balance of net Income/ *(Expenditure)* transferred from the Income & Expenditure Account	-	(3,74,62,44,007)	-	(2,87,65,94,295)
TOTAL		*6,91,91,72,383*		*7,27,81,51,705*

Schedule -2 : Reserves & Surplus
(Schedule forming part of the accounts for the period ended on 31.03.2023)

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

Deputy Controller of Accounts | **Finance Officer** | *Director*

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)

ANNUAL ACCOUNTS

2022-23

Schedule -3 : Earmarked / Endowment Fund

(Schedule forming part of the accounts for the period ended on 31.03.2023)

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 ★ CHARTERED ACCOUNTANTS ★ BHUBANESWAR

Deputy Controller of Accounts

Finance Officer

Director

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

2022-23

Schedule - 4 : Secured Loans and Borrowings
(Schedule forming part of the accounts for the period ended on 31.03.2023)

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

Finance Officer

Director

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)

ANNUAL ACCOUNTS

2022-23

Schedule -5 : Unsecured Loans & Borrowings

(Schedule forming part of the accounts for the period ended on 31.03.2023)

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 31.03.2023)

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 * CHARTERED ACCOUNTANTS * BHUBANESWAR

Deputy Controller of Accounts

Finance Officer

Director

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

Schedule -7 : Current Liabilities & Provisions

(Schedule forming part of the accounts for the period ended on 31.03.2023)

2022-23

Amount in (₹)

Sl. No.	Particulars	Current Year		Previous Year	
A.	**CURRENT LIABILITIES**				
1.	**Acceptances**	-	-	-	-
2.	**Sundry Creditors:**				
	a) For Goods	35,31,598		-	
	b) Others - EMD	23,37,006	58,68,604	93,53,097	93,53,097
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	9,12,900		9,13,714	
	ii) TDS *(CGST)*	1,58,178		3,94,939	
	iii) TDS *(SGST)*	1,58,177		3,94,939	
	iv) TDS *(IGST)*	4,46,727		16,92,109	
	v) Labour Cess	3,81,952	20,57,934	-	33,95,701
6.	**Other Current Liabilities**				
	a) Student Dues :				
	(i) Internal Amenitie S.D.	2,51,000		1,57,000	
	(ii) Excess Prog. Regd. Fees	32,668		32,668	
	(iii) Caution Money *(Labrotary)*	13,000		13,000	
	(iv) Caution Money *(Library)*	27,27,680		26,14,300	
	(v) Caution Money *(Institute)*	49,30,250		46,19,250	
	(vi) Caution Money *(Hostel)*	3,51,931		1,52,640	
	(vii) CSIR Contingency	94,513		2,44,529	
	(viii) Alumuni Association Subscription	2,17,420		1,62,220	
	(ix) Student Welfare Fund	4,66,860		4,11,660	
	(x) Kotak Mahindra Scholarship Payable	98,950		98,950	
	(xi) DBT Scholarship *(Ph.D)*	26,210		26,210	
	(xii) HDFC Scholarship	28,759		28,759	
	(xiii) Inspire Scholarship *(Ph.D)*	75,57,926	1,67,97,167	80,83,400	1,66,44,586
	(b) Smart City Fund		2,974		2,974
	(c) Odisha State Fund		43,805		43,805
	(d) CBM Theme Meeting (CMRP)		44,670		-
	(e) CERN Alice (VECC)		34,00,000		-
	(f) NISER R&D Payable		1,29,97,226		1,21,85,258
	(g) Security Deposit :				
	- Thames Consultant Pvt. Ltd.	-		22,722	
	- Airway Bhubaneswar	-		28,000	
	- Ashok Kumar Nayak	-		5,000	
	- Amarendra Ojha	3,961		77,886	
	- 4S Interiors	-		25,39,832	
	- Avantor	40,000		40,000	
	- Axenic Systems	6,68,914		-	
	- Bigyan Kumar Pradhan	2,35,757		2,83,506	
	- Bijay Kumar Behera	3,98,245		5,27,819	
	- Bhagarathi Sahoo	-		22,638	
	- B. K. Giri	-		18,133	
	- Bi Biotech	10,000		10,000	
	- Indo Electricals	-		16,666	
	- Firestep Sales and Services	12,359		44,327	
	- Uma Fire Services Pvt. Ltd.	84,255		5,58,159	
	- Biswajeet Kandi	-		69,608	
	- Deepak Kumar Mishra	-		39,028	

ANNUAL ACCOUNTS

Schedule -7 : Current Liabilities & Provisions

(Schedule forming part of the accounts for the period ended on 31.03.2023)

2022-23

Amount in (₹)

Sl. No.	Particulars	Current Year	Previous Year
	- Geeken Seating Collection Pvt. Ltd.	-	55,36,542
	- Genamy Scientific Pvt. Ltd.	-	12,000
	- Giridhari Lal	4,73,520	4,73,520
	- Green Innovative Power Ltd.	67,615	-
	- Bharat Martha	-	15,000
	- HAK Electrical & Engineering Works	2,13,732	2,35,091
	- H Electrical Engg. Works	-	16,439
	- Henxtix Biotech	20,000	20,000
	- Hindustan Engineering Company	69,300	-
	- Indian Plant Feeds	3,85,992	3,23,323
	- Jagannath Refrigeration Services	-	3,200
	- Jagannath Electricals	24,700	-
	- Praksh Chandra Dhal & Co.	8,168	-
	- Rabindra Kumar Mallick	57,268	99,859
	- Ramakanta Sahani	17,535	40,515
	- Subhashree Engineering	-	4,890
	- Pest Control India Pvt. Ltd.	-	360
	- Biswajit Mishra	-	97,889
	- Canara Lighting Industries Pvt. Ltd.	14,04,939	14,04,939
	- Carbofill	34,000	-
	- Daikin Airconditioning India Ltd.	18,690	-
	- Deepana Electricals & Consultancy	97,246	-
	- Nobel Enterprises	2,000	2,000
	- Nirmal Chandra Sar	1,50,541	1,41,933
	- New Odisha Enterprises	34,895	-
	- Numeric Power Systems Ltd.	-	14,343
	- Deepak Kumar Das	-	19,234
	- Laser Science Services (I) Pvt. Ltd.	-	4,50,900
	- Laxman Senapati	-	5,000
	- Lab India	30,000	30,000
	- Maa Dakhilachandi Catering Services	-	1,00,000
	- Bichitrananda Samantaray	-	27,013
	- Bikramajit Singh	-	5,000
	- Chandan Electrical	-	10,000
	- Central Ware House Corporation	98,040	49,182
	- Ensure Support Services India Ltd	-	5,000
	- Everest Computers	-	5,000
	- IN2IT Technology Pvt. Ltd.	-	5,000
	- J N Sharma	-	1,00,000
	- Johnson	-	6,34,285
	- Krishik Infrastructure Devlopers Pvt. Ltd.	-	1,72,967
	- Jyotiranjan Tripathy	-	2,95,873
	- Kalinga Combines Pvt. Ltd.	4,25,661	4,25,661
	- Kumar Electricals	-	5,000
	- Manor Computers	-	5,000
	- Maxim Systems	-	5,000
	- Nablok Das	-	5,000
	- Ray Electricals	-	2,30,084
	- Sahai Exclusive Contracts Pvt. Ltd.	8,42,164	8,42,164
	- Santosh Kumar Paikaray	-	5,000
	- SP Power System	-	13,975
	- Suvidha Engineers Pvt. Ltd.	-	71,593
	- Tarsun	10,000	10,000
	- Chemix Speciality Gases & Equipment	22,319	22,319
	- Wizertech Informatices Pvt. Ltd.	-	5,000
	- Sai Aircon	-	28,009
	- Sanjeeb Kumar Das	-	5,000
	- Sridhar Routray	-	5,000
	- Sritam Computers	72,380	6,73,833
	- Sujit Kumar Nahak	-	44,579
	- Supdex Services Pvt. Ltd.	6,083	20,064
	- Indu Enterprises	-	19,783
	- Invitrogen	22,000	22,000
	- Mangaraj Hati	-	29,379
	- Martha Engineerings & Suppliers	-	19,641
	- Namah Shivaya Enterprise	-	1,14,081
	- Rabindra Electricals	33,849	78,261
	- Saraj Kumar Das	-	17,879
	- Durga M Harichandan	-	62,775
	- Eco Pest Control & Engineering Services	5,952	5,952
	- Sonatech Infosolutions Pvt. Ltd.	1,41,940	-

ANNUAL ACCOUNTS

Schedule -7 : Current Liabilities & Provisions

(Schedule forming part of the accounts for the period ended on 31.03.2023)

2022-23

Amount in (₹)

Sl. No.	Particulars	Current Year		Previous Year	
	- Enva Water Technology (P) Ltd.	1,16,842		78,300	
	- Bansidhar Hati	1,48,064		53,515	
	- G D Anklesaria & Co.	2,42,725		2,42,725	
	- Bibekananda Patra	18,737		1,33,837	
	- Electro Crafts	-		22,645	
	- GL Solutions	48,525		48,525	
	- Enhance Ecotech Solutions Pvt. Ltd.	1,15,500		1,15,500	
	- O. P. Gupta & Co.	-		1,32,177	
	- Gupta Sports	-		23,098	
	- Utkal Engineering	-		25,498	
	- Vadilal Chemical Ltd.	1,70,000		1,70,000	
	- Vijaypower Generators Ltd.	2,65,555		10,81,187	
	- Golden Bell & Co.	4,289		4,289	
	- Lacminarayan Enterprises	-		3,210	
	- Laxminarayan Enterprises	1,98,052		47,670	
	- Living Creation Pvt. Ltd.	-		87,995	
	- Manoranjan Pradhan	-		35,000	
	- Mira Engineering Services	444		444	
	- Mohapatra Scientific Supply	10,000		10,000	
	- Nandighosh Trading Agency	-		19,193	
	- Nihar Ranjan Parida	-		2,49,770	
	- Oberai Equipment	-		4,66,049	
	- Odisha General Electronics	31,533		1,00,559	
	- Oriental Security Services	8,10,755		9,40,636	
	- Palit Equipment Sales Pvt. Ltd.	4,601		4,601	
	- Fabtech Technologies International Ltd.	94,335		94,335	
	- Schneider Electric Infrastructure Ltd.	1,08,560		1,08,560	
	- Shubh Construction	-		57,266	
	- Sainath Fabric Care Pvt Ltd.	-		36,626	
	- Sai Rasoi Sanstha	-		1,00,000	
	- Sign World	32,651		-	
	- Sanjay Kumar Khuntia	-		13,215	
	- Rashmita Traders	-		3,670	
	- Shri Arya Prakash Champatiray	-		6,95,664	
	- Mahima Enterprises	21,444		21,444	
	- Mishra Associates	-		4,764	
	- Millenium Business associates	70,908		70,908	
	- SAINEZ	37,025		37,025	
	- NIPS, Anandpur	-		2,00,000	
	- Novel Telenet (P) Ltd	51,870		51,870	
	- Precision Engineers	-		2,18,371	
	- Shri Samaresh Chottaray	11,393		38,698	
	- SPK & Co.	25,133		13,079	
	- Shinryo Engineering P Ltd	58,986		-	
	- Shree Enterprises	22,656		-	
	- SRS Enterprises	37,188		-	
	- Shuvendu Kumar Mohanty	2,37,702		-	
	- WIS Construction & Consultancy P Ltd.	1,368		-	
	- Zero Degree Cooling System P Ltd	18,600		-	
	- The Seal Coat Structural Works (P) Ltd.	11,516		11,516	
	- Yatri Bhojan (P) Ltd.	-		2,00,000	
	- Tathagata Engineering	1,96,279	94,67,256	6,49,655	2,41,74,742
	(h) Statutory Recoveries :				
	i) NPS Recovery	3,72,794		1,38,230	
	ii) Professional Tax	75,650	4,48,444	1,000	1,39,230
	Sub-Total (A)		*5,11,28,080*		*6,59,39,393*
B.	***PROVISIONS***				
1.	***For Expenses Payable :***				
	Sub-Total (B)		-		-
	Total (A+B)		*5,11,28,080*		*6,59,39,393*

For Nayak Rath & Associates
Chartered Accountants
FRN - 021051N

CA Manas Ranjan Pradhan
(Partner)
M. No. 307292

Deputy Controller of Accounts | Finance Officer | *Director*

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

2022-23

Schedule -8 : Fixed Assets
(Schedule forming part of the accounts for the period ended on 31.03.2023)

Amount in (₹)

			GROSS BLOCK					DEPRECIATION			NET BLOCK	
Sl. No.	*Particular of Assets*	*Rate*	*WDV as on 01.04.2022*	*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 31.03.2023*	*As at the Previous year-end on 31.03.2022*
				> 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%	1,99,31,13,177	13,79,964	1,96,27,315	-	2,01,41,20,456	20,04,30,680	-	20,04,30,680	1,81,36,89,776	1,99,31,13,177
3	Building (Residential)	5%	2,35,57,74,610	-	-	-	2,35,57,74,610	11,77,88,731	-	11,77,88,731	2,23,79,85,879	2,35,57,74,610
4	Electrical Installation	10%	19,81,07,257	-	89,64,532	-	20,70,71,789	2,02,58,952	-	2,02,58,952	18,68,12,837	19,81,07,257
5	Furniture & Fixtures	10%	24,00,04,473	1,12,05,028	31,98,182	-	25,44,07,683	2,52,80,859	-	2,52,80,859	22,91,26,824	24,00,04,473
6	Computers	40%	3,03,42,916	67,86,302	1,96,78,925	-	5,68,08,143	1,87,87,472	-	1,87,87,472	3,80,20,671	3,03,42,916
7	Software	40%	54,40,964	7,12,655	39,750	-	61,93,369	24,69,398	-	24,69,398	37,23,971	54,40,964
8	Lab Equipments	15%	94,55,39,947	2,40,75,985	4,03,94,961		1,01,00,10,893	14,84,72,012	-	14,84,72,012	86,15,38,881	94,55,39,947
9	Tools Equipments	15%	56,208	-	-	-	56,208	8,431	-	8,431	47,777	56,208
10	Books	40%	89,20,053	7,99,008	32,33,605	-	1,29,52,666	45,34,345	-	45,34,345	84,18,321	89,20,053
11	Journals	40%	11,54,55,043	6,96,09,606	2,00,46,496	-	20,51,11,145	7,80,35,159	-	7,80,35,159	12,70,75,986	11,54,55,043
12	Air Conditioners	15%	1,13,04,683	2,29,229		-	1,15,33,912	17,30,087	-	17,30,087	98,03,825	1,13,04,683
13	Vehicles	15%	8,40,568	-	-	-	8,40,568	1,26,085	-	1,26,085	7,14,483	8,40,568
14	Bicycle	15%	1,365	-	-	-	1,365	205	-	205	1,160	1,365
15	Machinery & Equipments	15%	95,98,05,388	8,71,06,725	23,74,50,966	-	1,28,43,63,079	17,48,45,639	-	17,48,45,639	1,10,95,17,440	95,98,05,388
16	EPABX	15%	4,274	-	-	-	4,274	641	-	641	3,633	4,274
17	Kitchen Equipments	15%	19,88,280	-	-	-	19,88,280	2,98,242	-	2,98,242	16,90,038	19,88,280
18	Telephones	10%	46,847	-	-	-	46,847	4,685	-	4,685	42,162	46,847
19	Capital Assets(WIP)	0%	1,11,06,544	73,82,158	1,17,69,677	2,34,52,378	68,06,001	-	-	-	68,06,001	1,11,06,544
	Total		*6,90,54,70,002*	*20,92,86,660*	*36,44,04,409*	*2,34,52,378*	*7,45,57,08,693*	*79,30,71,623*	-	*79,30,71,623*	*6,66,26,37,070*	*6,90,54,70,002*

For Nayak Rath & Associates
Chartered Accountants
FRN - 021051N

CA Manas Ranjan Pradhan
(Partner)
M. No. 307292

Deputy Controller of Accounts

Finance Officer

Director

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

2022-23

Schedule -9 : Investments - Earmarked/ Endowment Funds
(Schedule forming part of the accounts for the period ended on 31.03.2023)

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 31.03.2023)

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	22,63,10,252	31,79,18,869
TOTAL	*22,63,10,252*	*31,79,18,869*

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 **Finance Officer** **Director**

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 31.03.2023)

2022-23

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	64,39,175		61,29,123	
b) SBI A/C - 37871572767	2,71,83,295		91,85,680	
c) IOB A/C - 373701000000001	1,16,83,339		2,71,55,394	
d) IOB A/C -147601000015510	16,14,682		8,30,717	
e) SBI A/C - 38629236942	1,35,36,063	**6,04,56,554**	6,32,48,087	**10,65,49,001**
Total (A)		*6,04,56,554*		*10,65,49,001*
B. LOANS, ADVANCES AND OTHER ASSETS:				
1. Loans & Advances				
a) Security Deposit :		63,21,610		63,21,610
b) Staffs:				
i) Ashish Pandav	1,30,320		1,93,895	
ii) Kishore Chandra Panigrahi	2,73,600		1,00,000	
iii) Prottay Das (Phd Student)	4,99,500		5,18,688	
iv) Swati Saha (Phd Student)	4,50,000		5,18,688	
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	63,000			
x) Debasish Mallick	1,30,320			
xi) Debasmita P Alone	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	1,35,000			
xix) Molay Sarkar	1,48,401			
xx) Panchugopal Bikram	74,000			
xxi) Pratap Kumar Sahoo	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	1,40,000			
xxviii) Sudip Barman (SCS)	2,47,500			
xxix) Vijaya Singh	20,000	**40,47,241**		**13,31,271**

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 31.03.2023)

2022-23

Amount in (₹)

Particulars	*Current Year*		*Previous Year*	
c) Others				
i) DCS & EM,Mumbai	65,00,000		65,00,000	
ii) Director, NIPGR	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) Imprest Advance	25,385		345	
x) TDS & TCS Receivable	7,03,983	1,05,27,736	-	65,00,345
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)		*2,08,96,587*		*1,41,53,226*
TOTAL (A+B)		*8,13,53,141*		*12,07,02,227*

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

Finance Officer

Director

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

2022-23

Schedule -12 : Income from Sales/Services
(Schedule forming part of the accounts for the period ended on 31.03.2023)

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 31.03.2023)

Amount in (₹)

Particulars	*Current Year*	*Previous Year*
(Irrevocable Grants & Subsidies Received)		
1) Central Government		
a) Revenue *(Salary & General)*	1,26,49,98,499	1,09,48,38,757
TOTAL	*1,26,49,98,499*	*1,09,48,38,757*

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

Finance Officer

Director

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

2022 -23

Schedule -14 : Fees/Subscriptions
(Schedule forming part of the accounts for the period ended on 31.03.2023)

Amount in (₹)

Particulars	*Current Year*	*Previous Year*
1. Registration Fees *(MSc & PhD)*	1,82,35,461	1,93,35,934
2. License Fees	25,25,010	14,69,462
3. Sale of Tender Paper	3,24,383	2,47,466
4. RTI Application Fees	90	292
5. Transcript Fees	27,300	23,800
6. Identity Card/Health Card Fee	12,595	9,580
7. Guest House Rent	15,80,981	2,51,396
8. Job Application Fees	51,000	1,10,500
9. Sample Testing Charges	75,000	37,000
10. Lease Rent	1,98,000	9,84,874
11. Misc. Receipt *(EMD & SD Lapsed))*	1,95,54,224	-
12. Liquidated Damages	27,29,206	55,41,562
13. Water Charges *(Income)*	3,23,462	3,83,951
14. Service Book Fees	-	1,000
15.Sale of Assets	4,31,550	2,88,482
TOTAL	*4,60,68,262*	*2,86,85,299*

Schedule -15 : Income from Investments
(Schedule forming part of the accounts for the period ended on 31.03.2023)

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
FRN - 021051N

CA Manas Ranjan Pradhan
(Partner)
M. No. 307292

Deputy Controller of Accounts

Finance Officer

Director

NAYAK RATH & ASSOCIATES * BHUBANESWAR * CHARTERED ACCOUNTANTS

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS 2022 -23

Schedule -16 : Income from Royalty, Publication etc.

(Schedule forming part of the accounts for the period ended on 31.03.2023)

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 31.03.2023)

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	1,00,93,429	1,94,43,590
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	*1,00,93,429*	*1,94,43,590*

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

Finance Officer

Director

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

2022-23

Schedule -18 : Other Income
(Schedule forming part of the accounts for the period ended on 31.03.2023)

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 31.03.2023)

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 31.03.2023)

Amount in (₹)

Particulars	*Current Year*	*Previous Year*
a) Pay and Allowances	40,86,88,409	31,72,15,281
b) Manpower *(Outsourced)*	11,07,57,147	9,50,14,258
c) Contribution to NPS	5,30,32,174	4,07,87,886
d) Leave Travel Concession	36,05,099	17,23,894
e)Fellowship	15,17,37,741	12,60,09,014
f) Honorarium & Scholarship	1,10,03,565	80,19,393
g) PRIS	7,25,02,865	-
h) Medical Expenses	1,54,28,295	38,33,864
i) Children Education Allowance	31,59,000	10,05,000
j) Leave Encashment	35,11,843	7,78,917
k) Professional Update Allowance	60,36,402	57,93,892
l) Gratuity	87,395	16,99,622
TOTAL	*83,95,49,935*	*60,18,81,021*

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 | **Finance Officer** | **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 31.03.2023)

2022-23

Amount in (₹)

Particulars	*Current Year*	*Previous Year*
A. Other Administrative Expenses :		
Academic Expenditure	5,40,385	4,05,577
Freight & Forwarding Expenses	19,89,638	10,30,782
Purchases *(Consumables)/ Supplies & Materials*	5,94,76,643	3,89,86,457
Repair & Maintenance	6,21,13,866	5,18,55,619
Advertisement	17,74,879	25,92,834
Audit Fees	59,000	-
Bank Charges & Commission	69,982	1,25,569
CRA Service Charges	32,386	24,387
Electricity Charges	9,45,43,158	7,08,91,226
Fuel for DG Set	6,91,204	3,43,944
Hospitality Expenses	1,22,850	-
House Keeping Expenses	2,25,74,555	1,66,12,623
Legal Fees	32,68,000	13,44,015
Meeting Expenses	63,83,370	13,75,177
News Papers & Periodicals	1,53,200	94,148
Postage & Telegram	2,38,997	1,59,418
Printing & Stationery	4,74,312	2,50,204
Seminar/Workshop Expenses	19,36,014	3,95,558
Telephone & Internet Charges	93,01,767	90,13,792
Travelling & Conveyance - Domestic	66,27,031	12,03,347
T.A. on Transfer	9,28,836	3,79,616
Travelling & Conveyance - Foreign	46,25,072	2,59,166
Vehicle Maintenance Expenses	84,71,901	60,29,085
Professional Charges	1,07,130	17,82,384
Publication Charges	26,93,397	9,65,197
Horticulture & Plantation Expenses	45,280	9,580
Subscription Expenses	8,62,847	8,47,758
Thesis Evaluation Fee Expenses	-	2,11,848
Water Charges	1,30,200	94,500
Hindi Divas Expenses	-	22,000
B. NISER PLAN EXPENSES :		
a) Domestic Travel	18,38,533	55,445
b) Fellowships	3,56,90,030	11,10,151
c) Foreign Travels	35,67,982	-
d) Salary Expenses	19,47,215	94,73,345
e) Other Expenses	3,67,72,088	2,54,964
f) Supplies & Materials	16,57,27,252	7,01,08,115
g) Meeting Expenses	20,03,181	-
h) Repaire & Maintanance	9,62,573	-
TOTAL====>	*53,87,44,754*	*28,83,07,831*

For Nayak Rath & Associates
Chartered Accountants
FRN - 021051N

CA Manas Ranjan Pradhan
(Partner)
M. No. 307292

Deputy Controller of Accounts | **Finance Officer** | **Director**

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (NISER)
ANNUAL ACCOUNTS

2022-23

Schedule -22 : Expenditure on Grants, Subsidies etc.

(Schedule forming part of the accounts for the period ended on 31.03.2023)

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 31.03.2023)

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 * CHARTERED ACCOUNTANTS * BHUBANESWAR

Deputy Controller of Accounts

Finance Officer

Director

SCHEDULE 24 – SIGNIFICANT ACCOUNTING POLICIES

(Schedule forming part of the accounts for the period ended on 31.03.2023)

About the Organization:

The National Institute of Science Education and Research (NISER)wasset 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) Master's programme in Medical &Radiological Physics at the Centre for Medical & Radiation Physics.

Presently NISER has 825 students continuing in 5 year M.SC programme in the various streams of Basic Sciences. Moreover NISER has 475 research Scholar (Ph D) in its roll& 10 M Sc students in CMRP .

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. As on 31st March, 2023 ,value of CWIP is Rs.68,06,001/-

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 2022-23 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.

NAYAK RATH & ASSOCIATES CHARTERED ACCOUNTANTS BHUBANESWAR

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 - 23307292BGWOPM8328

Deputy Controller of Accounts | Finance Officer | Director

Place: Bhubaneswar
Date: 18.08.2023

NAYAK RATH & ASSOCIATES * CHARTERED ACCOUNTANTS * BHUBANESWAR

Schedule -25: Contingent liabilities & Notes on Accounts

(Schedule forming part of the accounts for the period ended on 31.03.2023)

A) CONTINTENT LIABILITIES	Amounts in Rs. (In Crores)
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. 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, 2023 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 - 23307292BGWOPM8328
Place: Bhubaneswar
Date: 18.08.2023

Deputy Controller of Accounts

Finance Officer

Director

Azadi Ka Amrit Mahotsav

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH
(An autonomous Institution under Department of Atomic Energy, Govt. of India)
P.O.- JATNI, DISTRICT - KHORDHA, PIN-752050, ODISHA, INDIA
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