ANNUAL REPORT

& AUDITED STATEMENT OF ACCOUNTS

2016 - 2017

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH BHUBANESWAR

www.niser.ac.in

Annual Report
&
Audited Statement of Accounts
2016 - 2017

National Institute of Science Education
And Research Bhubaneswar
www.niser.ac.in

CONTENT

THE BOARD OF GOVERNORS

Chairman

Prof. S K Joshi,
Ex-DG, CSIR, NPL, New Delhi

MEMBERS

Prof. V Chandrsekhar (Ex-officio)
Director, NISER,Bhubaneswar

Prof. Maninder Agrawal
IIT Kanpur

Prof. T K Chandrasekhar
Ex- Secretary, SERB, New Delhi

Prof. A Srinivasan
Professor, NISER

Joint Secretary (Finance)
Department of Atomic Energy
or his/her representative

Prof. J Maharana
Adjunct Professor, NISER

Dr. S K Apte
Ex- Gr. Director, BARC, Mumbai

Prof. V Muruganandam
Professor, NISER

Joint Secretary (R&D) (Ex-officio)
Department of Atomic Energy
or his/her representative

Mr. G V V Sarma (Ex-Officio)
Principal Secy, Dept of Higher Education, Govt. of Odisha

SECRETARY

Dr. A. K. Naik
Registrar, NISER

ACADEMIC COUNCIL

Chairman

Prof. V. Chandrasekhar
Director, NISER Bhubaneswar

PRESENT MEMBERS

Prof. V Chandrasekhar
Director, NISER, (Ex-Officio)

Prof. S Panda
Director, IOP (Ex-Officio)

Prof. Vidyanand Nanjundiah
IISc, Bangalore

Prof. Sandeep Verma,
Department of Chemistry, IIT Kanpur

Prof. V. Ravishankar
Dept. of Physics, IIT Delhi

Prof. Srinivas Vasudevan
TIFR, Mumbai

Prof. D K Maity
Associate Dean, HBNI

Prof. T. K. Chandrashekar
Sr. Prof. SCS, NISER

Prof. V. Muruganandam
NISER, Bhubaneswar

Prof. A. Srinivasan
Dean (R&D), NISER

Dr. Palok Aich
Chairman Library Advisory Committee, NISER

Prof. B. Rabindran
Adjunct Prof. NISER -Invitee

Prof. Binayak Rath,
Ex-visiting Prof. NISER - Invitee

Prof. V Krishna Kumar
Visiting Professor, SMS NISER

Chairperson
School of Biological Sciences, NISER

Chairperson
School of Chemical Sciences, NISER

Chairperson
School of Mathematical Sciences

Chairperson
School of Physical Sciences, NISER

Chairperson
School of HSS, NISER

Dr. Harapriya Mohapatra
Faculty-in-Charge Academic Affairs

Dr. Rudresh Acharya
Chairperson, PGCI, NISER - Invitee

Dr. Dipak Dalai
Chairperson, UGCI, NISER - Invitee

Mr. Anidya Ghatak
Student Representative (PG) - Invitee

Ms. Manaswini Kar
Student Representative - Invitee

SECRETARY

Dr. A. K. Naik
Registrar, NISER

FROM THE DIRECTOR

"Our duty is to encourage every one in his struggle to live up to his own highest idea, and strive at the same time to make the ideal as near as possible to the Truth."

- Swamy Vivekananda

With the proud possession of the wisdom of the passing year and the promises of the one that beckons, I am delighted to present the annual report of National Institute of Science Education and Research (NISER) for the financial year 2016-17.

The year 2016-17 was an extremely meaningful one. The year has been brimming with commendable academic achievements of our meritorious students and motivated faculty members. Among the major achievements during this year, the stand out one has been the quality and quantity of research publications by NISER faculty members.

> "Post the dedication of the Institute to the Nation by the Honourable Prime Minister Shri Narandra Modi in February 2016, we have been trying to share his vision for an Institute of our kind- to focus on creating indigenous knowledge and socially meaningful technology for serving the nation."

It is a matter of immense pride to note the success stories scripted by our students that graduated in 2016. Since the first batch graduated in 2012, our alumni have been continuously keeping the NISER flag flying at some of the most sought after places all over the globe. Most of the students of class on 2016 have enrolled for Ph.D programmes with fellowships from esteemed Universities and Institutes like, University of Illinois at Urbana-Champaign, University of Wisconsin-Madison, Texas A&M University, University of Michigan, University of Oxford, RWTH Aachen University, University of British Columbia, Rice University, TIFR, NCBS, IISc, IITs, etc.

which reinforces the mandate that NISER is committed to create quality manpower for research in different areas of basic sciences. The constraints associated with shifting to the permanent campus have almost been put to rest. The permanent campus has offered new work environment and the entire NISER family has more or less settled and is extremely upbeat about the days to come. Facilities in the new campus including the academic and residential complexes, hospital, playground, a unique yoga centre on the hill top, etc. that have given the campus a holistic look. In addition to these, facilities for a green house, an animal house, rainwater harvesting, fire fighting, sewage water plants, etc. have also been put in place.

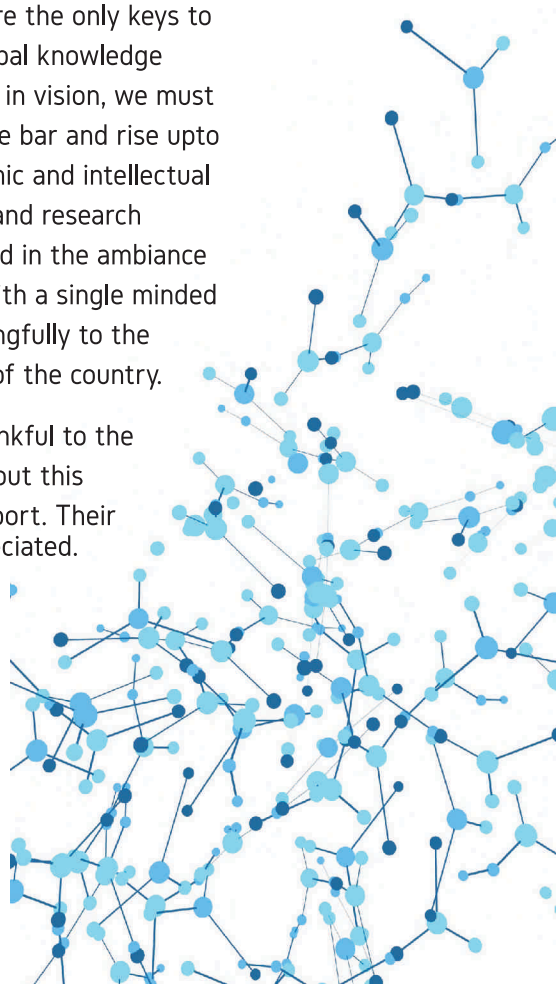
The Department of Atomic Energy has been extremely generous in providing continuous financial support to establish NISER in the forefront of research and development. We do place on record our gratitude to the DAE for that. To add further to our research and development activities, extramural funding is also coming thick and fast from various sources underpinning our pursuit of research. Research being done here in our laboratories must translate into tangible benefits to humankind justifying the public funding that we receive and also reinforcing our commitment to pay back to the society at large. During the financial year ending in March 2017, our faculty members have added twenty two new sponsored projects with funding to the tune of Rs 7.87 crores from non-DAE sources. Some of the major non-DAE sources include Dept. of Science and Technology (DST), Dept. of BioTechnology, (DBT) Science and Engineering Research Board (SERB), Indian Council of Medial Research (ICMR) and Council of Scientific and Industrial Research (CSIR).

The youthful and vibrant faculty members are relentlessly working towards taking research activities at NISER to newer heights. Interdisciplinary and cutting edge research have created an enviable synergy that is contributing immensely to the Institution building. I take this opportunity to thank each one of them for choosing to grow with this growing Institution and congratulate them for their persistent efforts in bagging academic fellowships and awards, publishing in high impact journals, being invited for talks, attending conferences, engaging in collaborative research with leading Universities across the globe, etc.

At NISER, we 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 upto 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.

Finally, 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 centered 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, 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 M.Sc (iM.Sc) 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. Recently, NISER has added two schools, one in Computer Sciences (CS) and other one being Earth and Planetary Sciences (EPS). In 2016, NISER started post-B.Sc Integrated Ph.D programme in Physics. Going forward, it will be extended to other schools as well.

NISER shifted from its transit campus at Institute of Physics, Bhubaneswar to its permanent campus at Jatni, Khurda and the Institute has been dedicated to the nation by Honorable Prime Minister of India Shri Narendra Modi on February 07, 2016. The permanent campus has over 700 students spread over five batches of students admitted to the flagship M. Sc programme through a pan-Indian entrance test known as National Entrance Screening Test (NEST). NISER also cariies out Doctoral Programme in all Basic Sciences and Humanities and Social Sciences.

Curriculum

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

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

NISER recognizes that modern scientific research is carried out in a domain transcending conventional academic boundaries. The undergraduate students and research scholars are being nurtured in the ambience of this scientific culture. Going forward, there would be many centres of research in inter-disciplinary areas opening more and bigger windows for cutting edge scientific research. In the academic session 2016-17, NISER started an integrated post-B. Sc Ph.D programme in Physics. Going forward, NISER will extend the integrated Ph.D programme to other schools.

School of Biological Sciences

Since its inception, the School of Biological Sciences (SBS) has been involved in mixing and imparting traditional wisdom with modern technology by developing a research programs 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 M.Sc programme, 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. To further strengthen the SBS research program, an Integrated Ph.D program initiative is under progress.

The school is on a mission

- To strive to become a centre of excellence in education and research in biological sciences providing training at undergraduate, graduate, doctoral and post-doctoral level.
- To provide effective interdisciplinary learning ambience through extensive subject coverage in all fields of modern biology and inter-phasing with other scientific disciplines.
- To equip its students to keep pace with recent developments in the field of scientific research.
- To undertake high quality research activities in defined areas of biosciences so as to make an impact at national and international level.
- To impart professional training for skilled human resource development across the state and country through short term training courses.
- To strive to develop state of the art infrastructure comparable to best anywhere in the world.

Facilities for Research and Teaching

- Δ Confocal Microscope Facility
- Δ DNA sequencing and Surface Plasmon Resonance Facility
- Δ Micro-array facilities for Genomics

School of Chemical Sciences

Chemistry as a subject has considerable impact on our everyday lives and on other scientific disciplines. The aim of the School of Chemical Sciences at NISER is to impart high quality undergraduate and postgraduate level of knowledge to students coupled with cutting-edge research activity by the faculty and the students of the school. In addition to traditional organic, inorganic, physical and theoretical chemistry areas, the school embarks on teaching and research activity in the interface areas of Biology, Material Sciences and Medicine. The teaching philosophy at NISER is not only to impart high quality training to students to make them talented and motivated scientific personnel but also to inculcate human values and concern for societal needs and environment. The School of Chemical Sciences offers one of the best integrated M.Sc. programme and the syllabus is designed not only to teach basic principles but also to have hands on practical experience by research projects as a part of the curriculum. The Ph.D. programme of School of Chemical Sciences has also been initiated since 2009. Till date, 84 integrated M.Sc students and 13 Ph.D students have been graduated from the School. The Integrated M.Sc students are in BARC training school program, pursuing research in various institutes in India as well as abroad. The Ph.D students are doing their postdoctoral research in abroad.

Facilities created for Research and Teaching for the year

1) X and Q-band EPR
2) CHN Analyzer
3) Circular Dichroism instrument

School of Mathematical Science

The School of Mathematical Sciences (SMS) 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 center 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.

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.

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 degree of Ph.D.

- 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

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 forth 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 programme in Humanities and Social Sciences from the even semester of academic year 2015-16.

LIBRARY

"Libraries store the energy that fuels the imagination. They open up windows to the world and inspire us to explore and achieve, and contribute to improving our quality of life"

-Sidney Sheldon

This year will be remembered as the Institute Library has been shifted to its permanent building from a transit location. It was formally inaugurated by the then Director Prof. V. Chandrasekhar on January 16th, 2017 in presence of Dr. Palok Aich, Chairman Library Committee, Deans, members of library committee, staff and students.

Currently NISER Library is offering possible support based on funding available to enhance the learning, teaching and research experiences of NISER faculty and students. Library houses around 19,000 (approx) books and subscribes around 3,865 journals and 10,100 e-books in the disciplines of Biology, Chemistry, Mathematics, Physics, Computer Science, Humanities and other interdisciplinary areas mostly in electronic version and a few important databases such as SciFinder, Scopus, Pubmed, ISI WebofScience. Wherever possible, NISER Library becomes part of DAE consortium to cater more services to maximise utilization of limited funding. Resource discovery remains a cornerstone to the services we deliver to the Institute. Library services propelled with the constitution of new Library committee and a bold plan reframing traditional services in ways that embrace technology.

Self Check in Kiosk and Book dropper are installed in Library for convenience of its users.

Details of some of the major developments during the year 2016- 17 are pointed below:

- RemoteXs is activated in library to provide access to online resources of library anywhere at any time in digital gadgets. RemoteXs will facilitate automated user management, integrated resource management and monitored access to digital content.
- Internet based Plagiarism prevention tool "Turnitin" is activated in NISER to improve student writing and check Institution's scholarly output to avoid plagiarism.
- Log in based access to library online resources initiated to curb unauthorized access from both on and off campus.Online access to British Council Library, Kolkata division is renewed for 2017.

Number of books and journals added during the year are as follows:

Sl. No.	Library Material	Status as on 31st March 2016	Additions during the year 2016 -17	Status as on 31st March 2017
1	Print Books	17200	1554	18754
2	Electronic Books	9000 (approx)	1100	10100 (approx)
3	Electronic Journals	3850	15	3865
4	Databases	8	1	9
5	CD/DVDs	250	NA	250

International Affairs and Resource Planning (IARP)

The activities of International Affairs and Resource Planning (IARP) office are gaining momentum in the Institute. Some of the major activities / events conducted by IARP during the year are as follows:

1. Alumnus Lectures

a) "Quantum interference effects in H + D2 Reaction" by Ms. Mahima Sneha, Department of Chemistry, Stanford University.

b) "Force Field Parameter Development for Protein-Ligand Systems" by Mr. Leela Sriram Dodda, Department of Chemistry, Yale University.

2. International project student

David Datzkiw, an international student, from, University of Winnipeg, Canada spent 6 months in the laboratory of Palok Aich of SBS, NISER. David was a recipient of Queen Elizabeth Scholarship and visited NISER as Queen Elizabeth Scholar (QES).

During his visit, he mainly worked on a project related to probiotic and adipogenesis and as a QES fellow, he was also allowed to learn diversity of Indian culture and made a few small trips around certain areas of India like Kerala and West Bengal besides visiting local sites in Odisha. He also made his debut in scientific publication from Aich's group at NISER. A figure from his first publication also could made a place in the cover page of the journal. A link for his first paper can be found at: http://press.mu-varna.bg/ojs/index.php/bmr/article/view/2108.

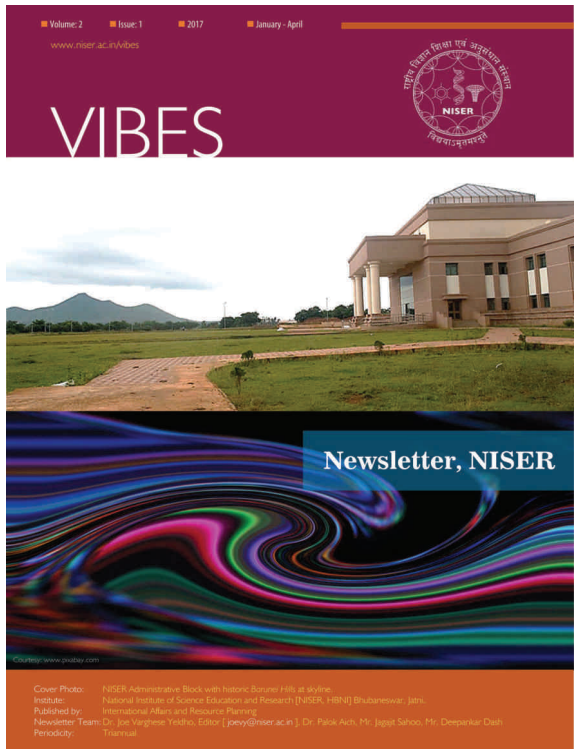
Overall his experience was great as can be seen by exploring the link http://www.uwinnipeg.ca/graduate-studies/features/bioscience-student-david-datzkiw-on-research-and-being-a-qe-scholar.html.

Science Communication

While science is important to understand nature and to make our living better it is more important to make people understand the value of Science. To make people aware of potentials of science is through proper communication. What is Science, what is its value, how is it done, what scientists do and why do they do it and many more questions must roam around in the minds of people. Onus is on us to make people understand and get clarified on all these issues. Moreover, Scientists do what they do using the tax payers or people's money. Therefore, it is our moral obligation to ensure that work is disseminated appropriately and regularly to them. It is also important that senior scientists make an effort to make the juniors understand the value and need of science communication. With this goal, Dr. Palok Aich of School of Biological Sciences (SBS), NISER initiated an effort to train some interested young minds of NISER in science communication.

3. Publication of NISER's Triannual News Letter "VIBES"

Link to download an electronic copy of Volume – 2, Issue – 1, January – April is given below: http://www.niser.ac.in/sites/default/files/newsletter/VIBES_Vol-2_Issue-1.pdf



4. FRRO

Foreigner (visitor) registration which is mandatory as per Government of India rules has been activated in NISER. Online login IDs are created for each School / Department. The link for Form – C registration of a foreign visitor is given here: https://indianfrro.gov.in/frro/FormC

5. Alumnus Registration

The IARP office is also assigned with the task of handling alumni affairs. The alumni online registration system has been activated recently, the link to the form for alumni registration is given below:

https://docs.google.com/forms/d/e/1FAIpQLSdkpHiGBcWMogxuznrTXnPATThmUCDimGX4H7Lc1pqlVie86w/viewform?c=0&w=1

FACULTY

School of Biological Sciences

Sl. No.	Name & Designation	Field of Specialization
01	Dr. Palok Aich Associate Professor	Systems Biology
02	Dr. Asima Bhattacharyya Associate Professor	Physiology / Host-Pathogen Interaction, Cancer Biology
03	Dr. Chandan Goswami Associate Professor (Chairperson)	Cell Biology
04	Dr. Abdur Rahaman Reader-F	Biochemistry
05	Dr. Harapriya Mohapatra Reader-F	Microbiology
06	Dr. Kishore CS Panigrahi Reader-F	Plant Biology
07	Dr. Debasmita Pankaj Alone Reader-F	Human Genetics
08	Dr. Manjusha Dixit Reader -F	Human Genetics
09	Dr. Pankaj Vidyadhar Alone Reader-F	Molecular Biology
10	Dr. Praful Singru Reader-F	Neurobiology
11	Dr. Subhasis Chattopadhyay Reader-F	Immunology
12	Dr. V Badireenath Konkimalla Reader-F	Bioinformatics
13	Dr. Rudresh Acharya Reader-F	Macromolecular X-ray Crystallography, Structural Bilogy, De Novo Protein Design
14	Dr. Tirumala Kumar Chowdary Reader-F	Structural Virology
15	Dr. Ramanujam Srinivasan Reader-F	Bacterial Pathogenesis, Cytoskeletal Dynamics and Functions
16	Dr. Renjith Mathew Reader-F	Cell Biology, Development Biology

School of Chemical Sciences

Sl. No.	Name & Designation	Field of Specialization
01	Prof. V. Chandrasekhar Professor	Synthetic Inorganic Chemistry
02	Prof. T.K. Chandrashekar Sr. Professor	Inorganic Chemistry Bio-Inorganic Chemistry-Expanded porphyrin Chemistry
03	Dr. A. Srinivasan Professor (Chairperson)	Inorganic Chemistry Bio-Inorganic Chemistry-Pyrrole Based Receptors
04	Dr. M. Sarkar Associate Professor	Physical Chemistry Fluorescence Spectroscopy
05	Dr. Sanjib Kar Associate Professor	Inorganic Chemistry Bio-inorganic chemistry: Metals in Medicine
06	Dr. Arindam Ghosh Reader-F	Physical Chemistry Methodology development in NMR
07	Dr. B.L. Bhargava Reader-F	Physical Chemistry Computational studies of Materials
08	Dr. C.S. Purohit Reader-F	Organic Chemistry Bio-organic and Organic Synthesis
09	Dr. C. Gunanathan Reader-F	Organic Chemistry Organomettallic Chemistry and Catalysis
10	Dr. J.N. Behera Reader-F	Inorganic Chemistry Law temperature multiferroics from single source precursors and Porous Magnetic Materials
11	Dr. N.K. Sharma Reader-F	Inorganic Chemistry Bio-Organic and Organic Synthesis
12	Dr. Prasenjit Mal Reader-F	Inorganic Chemistry Supramolecular chemistry and Photochemistry
13	Dr. S. Peruncheralathan Reader-F	Organic Chemistry Synthetic Organic chemistry and Asymmetric Catalysis
14	Dr. Sharanappa Nembenna Reader-F	Inorganic Chemistry Main Group Organometallic chemistry and Low oxidation state metal chemistry
15	Dr. Subhadeep Ghosh Reader-F	Physical Chemistry Single Molecule Spectroscopy, Molecular Dynamics

16	Dr. Sudip Barman Reader-F	Physical Chemistry Synthesis and Functionalization of Graphene
17	Dr. U. Lourderaj Reader-F	Physical Chemistry Theoretical and Computational Chemistry
18	Dr. V. Krishnan Reader-F	Inorganic Chemistry Catalysis and Materials Synthesis
19	Dr. Himansu Sekhar Biswal Reader-F	Laser Spectroscopy and Instrumentation
20	Dr. P.C. Ravikumar Reader-F	Inorganic Chemistry

School of Mathematical Sciences

Sl. No.	Name & Designation	Field of Specialization
01	Prof. V. Muruganandam Professor	Harmonic Analysis
02	Dr. Anil Kumar Karn Associate Professor	Theory of operator spaces
03	Dr. Sanjay Parui Reader-F	Harmonic Analysis
04	Dr. Biond Kumar Sahoo Reader-F	Representations of Geometries
05	Dr. Brundaban Sahu Reader-F	Number Theory
06	Dr. Deepak Kumar Dalai Reader-F	Cryptography
07	Dr. Kamal Lochan Patra Reader-F	Algebraic Graph Theory
08	Dr. Nabin Kumar Jana Assistant Professor	Probability Theory
09	Dr. Shyamal Krisha De Assistant Professor	Topology
10	Dr. Manas Ranjan Sahoo Assistant Professor	Differential Equations

11	Dr. Jaban Meher Assistant Professor	Number Theory
12	Dr. Amit Tripathi Assistant Professor	Algebraic Geometry
13	Dr. Ritwik Mukherjee Assistant Professor	Differential Geometry
14	Dr. Sutanu Roy Assistant Professor	Functional Analysis
15	Dr. Panchugopal Bikram Assistant Professor	Functional Analysis
16	Dr. Sarath Sasi Assistant Professor	Differential Equations
17	Dr. Dinesh Kumar Keshari Assistant Professor	Functional Analysis
18	Dr. K. Senthil Kumar Assistant Professor	Number Theory

School of Physical Sciences

Sl. No.	Name & Designation	Field of Specialization
01	Prof. Bedangadas Mohanty Professor	Experimental High Energy Physics
02	Dr. Subhankar Bedanta Associate Professor	Experimental condensed matter physics (Nanomagnetism and multiferroics)
03	Dr. Subhasis Basak Reader-F	HEP Theory: Lattice QCD
04	Dr. Sanjay Kumar Swain Associate Professor	Experimental HEP: LHP Physics
05	Dr. A.V. Anil Kumar Reader-F	Statistical Mechanics and Modeling of Soft Matter
06	Dr. Ashok Mohapatra Reader-F	Ultra cold Atoms and Bose-Einstein Condensation
07	Dr. Chethan N. Gowdigere Reader-F	String Theory

08	Dr. Colin Benjamin Reader-F	Theoretical CMP and Quantum Information
09	Dr. Joydeep Bhattacharjee Reader-F	Computational Condensed Matter Physics
10	Dr. Kartikeswar Senapati Reader-F	Experimental CMP
11	Dr. Prasanjit Samal Reader-F	Theoretical CMP, Atomic and Molecular Physics
12	Dr. Pratap Kumar Sahoo Reader-F	Nano fabrication and Ion/Photon matter interaction
13	Dr. Prolay Kumar Mal Reader-F	Experimental High Energy Physics (Collider experiments)
14	Dr. Ritwick Das Reader-F	Nonlinear optics, and Integrated Optics
15	Dr. Sumedha Reader-F	Special Mechanics and Interdisciplinary Applications
16	Dr. Yogesh Kumar Srivastava Reader-F	String Theory
17	Dr. V. Ravi Chandra Reader-F	Theoretical Condensed Matter Physics
18	Dr. Prolay Kumar Mal Reader-F	Experimental High Energy Physics
19	Dr. Nishikant Khandai Reader-F	Astrophysics and Cosmology
20	Dr. Anamitra Mukherjee Reader-F	Condensed Matter Physics
21	Dr. Victor Roy Assistant Professor	High Energy Nuclear Physics (Theory/Phenomenology)
22	Dr. Ajaya Kumar Nayak Assistant Professor	Condensed Matter Experiment: Magnetism

School of Humanities and Social Sciences

Sl. No.	Name & Designation	Field of Specialization
01	Dr. Pranay K. Swain Reader-F	Public Policy and Governance, Science-Society Interface, Contemporary Social Issues
02	Dr. Debashis Pattanaik Assistant Professor	Social Innovation, Social Network Analysis, Social Study of Sciences and Technology
03	Dr. Rooplekha Khuntia Assistant Professor	Business Ethics, Ethical Cynicism, Organizational Behavior and Leadership
04	Dr. Joe Varghese Yeldho Assistant Professor	Critical History and Narratives of Race
05	Dr. Amarendra Das Assistant Professor	Natural Resource Management, Public Economics

School of Earth and Planetary Sciences

1.	Prof. R. Ramesh Sr. Professor	Global Change, Stable Isotope Mass Spectrometry, Mathematical modeling, Oceanography and Paleoclimatology.

School of Computer Sciences

Dr. Rishiraj Bhattacharyya Reader – F	Cryptography
Dr. Anisur Rahaman Molla Assistant Professor	Theoretical Computer Science

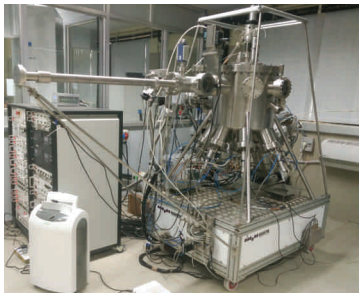
COURSES OFFERED

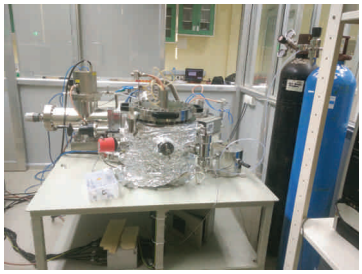
School of Biological Sciences

Endocrinology, Plant Developmental Biology, Quantitative Biology, Biological techniques: Theory and practice, Science of Life, Biology II: Cellular and Genetic basis of life, Biophysics and Biostat, Cell biology, Genetics, Ecology, Advance Molecular Biology, Advance Neurobiology, Cancer biology, Advanced Biochemistry, Microbiology, Biochemistry, Physiology I (Animal Physiology), Physiology II (Plant Physiology), Neurobiology, Principles of Drug design, Molecular genetics Infection and immunity, Molecular Biology, Immunology, Endocrinology, Plant Developmental Biology, Quantitative Biology, Biotechniques, Enzymology, Virology, Structural biology, Mol Biology Laboratory, Immunology Laboratory, Physiology I (Animal Physiology) Lab, Physiology II (Plant Physiology) Lab, Cell biology Laboratory, Genetics Laboratory, Microbiology Laboratory, Biochemistry Laboratory, Bioinformatics.

School of Chemical Sciences

Theory: Chemistry I, Quantum Chemistry I, Physical Methods in Chemistry II, Nuclear Magnetic Resonance, Basic Inorganic Chemistry, Polymer Chemistry, Advanced Organic Chemistry, Classics in Molecules, Physical Organic Chemistry, Organic Chemistry I, Organic Chemistry II, Organic Chemistry III, Supramolecular Chemistry, Organic Photochemistry, Advanced Bio-Organic Chemistry, Magnetism, Solid State Chemistry, Crystallography.Laboratory: Chemistry Lab I, Chemistry Lab II, Chemistry Lab III, Physical Chemistry Lab -1, Biomolecular Lab, Electronics Lab, Inorganic Chemistry Lab.





School of Mathematical Sciences

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

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,

School of Humanities and Social Sciences

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.

ACADEMIC ACHIEVEMENTS AND RESEARCH OVERVIEW

School of Biological Sciences

Dr. Prof. B. Ravindran, Adjunct Professor

"Very broadly my laboratory is interested in studying Immunobiology of infectious diseases. We use a variety animal models and human diseases to seek insights into pathogenesis of disease processes, analysis of parasite components that induce host responses (inflammation and adaptive immune response), immunoregulatory network that determine pathology and/or outcome of infection process. More specifically, we characterize host response in the context of co-infections in animal models and in human communities. The experimental models allow us to understand effect of two pathogens with opposing immune response in the host. The other major project in the laboratory is directed towards inflammation mediated by pathogens and endogenous molecules broadly classified as DAMPs and the interplay and cross-talk between the two. We expect these studies to offer insights into how mammalian hosts 'deal' with pathogens and non-pathogenic commensal microbes. Our studies on regulation of inflammation and innate immunity have also led us into understanding macrophage biology and approaches to re-programme macrophage activity in inflammatory diseases. Investigations on co-infections in human communities have given us opportunities to address genetic basis of infectious diseases and relationship between some of the infectious diseases and autoimmunity".

Dr. Palok Aich, Associate Professor

Modern day world requires more work than play. While such demand puts us under various stressors (cause of stress) with the potential to perturb homeostasis, physiologically we try to restore normalcy by adjusting parameters of several physiological processes of a system. How we achieve the restoration, how are balancing acts performed among different physiological processes such as immunity, metabolism etc. are a few of the interests of my laboratory. My lab tries to develop methodologies to quantify psychological stress status of individuals, correlating stress with disease susceptibility (e.g. metabolic syndromes and infectious diseases) as well as how innate immunity can be primed to prevent against such diseases. For priming, we use mainly select probiotics and host defense peptides. We also try to enhance efficacy of these immune modulators by nanotechnology. In addition, we also attempt to understand how metagenome of gut microbiome regulates us. As we are more metagenomic than genomic, my main emphasis is to understand cross talk between host genome and metagenome of resident microbiomes under different conditions. Our results are leading to an insight that correlation of genomic and metagenomic (especially for gut microbiota) properties of individuals could perhaps lead to a better understanding of physiology and perhaps better maintenance of health. We use a combination of experimental and theoretical methodologies to achieve our goals

Signaling systems in plants, Light perception, flowering time control, circadian rhythm and biological clock

Odisha Health Consortium, Bhubaneswar:

Health research without participation of clinicians is not meaningful. Dr Aich spearheaded an initiative to form a consortium at national and local level. In May 2016 the consortium kicked off with its first meeting involving clinicians from AIIMS, Bhubaneswar and SCB Medical College, Cuttack.

Dr. Kishore CS Panigrahi, Reader-F

As a living organism, plants are unique in many ways compared to animals. Like animals they also sense and perceive environmental stimuli and react to it. However, unlike animals they cannot run away from the unfavorable environmental conditions. They have also mechanisms that anticipate diurnal and seasonal changes that in turn are required for its reproductive fitness. Undoubtedly, they have evolved with amazingly intricate but well defined signaling networks tuned to suit its neighboring environment. We would like to explore these signaling networks in plants and would employ molecular, genetic, proteomic and cell-biological approaches. These researches would lead to identify possible regulators that would help the plant to withstand the effects of global warming and climate change. Furthermore, we will also explore some of the locally available medicinal plants and their extracts under the framework of chemical genetics. We wish to start with the following areas first and would expand our research interest with time and need. 1. Light signaling and flowering time control in plants 2. Plant response to stress. Proteomic and microarray profiling in different tissues and regions of a plant. 3. Screen for early or late photo-periodic flowering regulators influenced by the diurnal temperature differences.

Dr. Abdur Rahaman, Reader-F

Nuclear remodelling is a universal process that occurs in all eukaryotes. It is relevant to human health, since a number of known human diseases are linked to nuclear remodelling. In spite of extensive research using higher eukaryotic systems, some basic questions related to nuclear remodeling remains unanswered. Specifically the mechanism of nuclear envelope expansion including the lipid addition to the nuclear envelope is not clearly understood. Tetrahymena undergoes closed mitosis and nuclear envelope expands ~10 folds during specific stages in cell conjugation. My group is interested on nuclear remodelling in Tetrahymena, specifically understanding the mechanism and cell cycle regulation of nuclear envelope expansion. 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.

Dr. Chandan Goswami, Reader-F

TRP channels at the peripheral neurons act as “pain receptors” and are sensitive to stimuli like low pH, high temperature, noxious compounds, immune system and psychological state. In most cases, the pain is “acute” and thus decays fast if not vanishes in absence of these stimuli. However, in case of long-lasting chronic pain, there is no effective medical treatment. The factors involved in the development of chronic pain remain unclear. The chronic pain can be partially explained by the permanent changes in the neuronal signaling events and by alternate neuronal connections. Understanding of different molecules, cellular components like mitochondria and cytoskeleton as well as their complex regulation in the context of pain chronification is the main focus of this lab.

Dr. Debasmita Pankaj Alone, Reader-F

With the shifting demographics towards older age, there is a major concern for age-related disorders. 90% of individuals dying each year are due to age-related causes. Understanding the genome, epigenome and proteome between healthy and diseased state of these individuals pave a way for unravelling bio-markers for early diagnosis and/or therapeutics for various diseases. Our goal is to find these underlying players that change the micro-environmental niche differently in a diseased state during the developmental process of aging and hence are responsible for these age related-disorders. We are currently focusing on understanding the pathomechanism of two neurodegenerative eye disorders (Glaucoma, the

leading cause of irreversible World Blindness and Corneal Endothelial Dystrophies) as well as Cancer using a pleothora of cellular, biochemical, genetics, genomics and molecular biology techniques involving human samples, Drosophila models as well as in vitro cell lines.

Dr. Harapriya Mohapatra, Reader-F

Over past few years opportunistic pathogenic bacteria have exhibited drastic increase in drug resistance. Our lab is involved in comparative study of multidrug resistant environmental and clinical bacterial isolates. We work on Klebsiella pneumoniae and Enterobacter cloaceae on two different aspects of drug resistance: Role of membrane proteins in resistance and virulence: In Enterobacter cloaceae, rise of efflux pump mediated drug resistance is of concern, especially in clinical settings, owing to non-specificity of pumps towards efflux substrate(s). Research work done over the years have developed a fair understanding on structural aspects of the efflux pump proteins. However, understanding on their physiological significance is just beginning to be explored. We are interested unravelling the diversity of efflux pump genes present in multidrug resistant clinical bacterial isolates, develop an understanding on the regulation of multidrug efflux pumps under different physiological and environmental conditions including host-pathogen interactions. At present we are studying modulation of expression of acrAB-tolC efflux proteins in Enterobacter sp.

Persister cell formation as a mechanism of drug tolerance: Another aspect of drug resistance in bacteria is the formation of persister cells. Certain wild type populations of bacteria, when subjected to antimicrobial agents, undergo a rapid cell death, with a small fraction of the population surviving. Though being genetically identical to the wild type parent, they enter into a non-dividing, non-metabolising state, allowing them to 'persist' in presence of the drug. Such sub-populations of "persister cells" have been implicated in the recalcitrance of infections to antimicrobial treatment as well as in the chronicity of diseases. Our lab has previously found an environmental isolate of Klebsiella pneumoniae that exhibited persistence and could survive in the presence of antimicrobial compounds belonging to different classes. Our long term goal now is to gain insight to molecular pathways regulating formation of persister cells in clinical and environmental isolate of K. pneumoniae.

We utilize various microbiological, biochemical, molecular biology and cell culture techniques for understanding these mechanisms.

Dr. Manjusha Dixit Reader-F

Abnormal growth of new blood vessels plays an important role in many diseases, including cancer. To treat cancer, various potential anti-angiogenesis drugs have been tested with limited success. Blocking just one regulatory pathway may not be enough. Till date, all these angiogenic-switch regulatory molecules and their mechanism are not known. In order to do that, my research group is interested towards the validation and elucidation of the molecular mechanism of putative angiogenic regulators. We are also interested in finding out the role and molecular mechanism of these newly identified angiogenesis regulators, in tumorigenesis and tumor angiogenesis. Another major area includes understanding molecular mechanism of gallbladder cancer and establishment of genetic risk factors in Indian population. Based on distinctive environmental risk factors and genetic composition of population, it's very important to establish molecular mechanism in our own population. This will also help in developing population specific and personalized therapeutic strategies.

Dr. V. Badireenath Konkimalla, Reader-F

Rational drug discovery and development requires a streamlined interdisciplinary effort from researchers working in a specialized area. From active collaboration, drug discovery process can be and has been shortened to a great extent by addressing

bottlenecks in drug discovery (such as high-thoroughput screening, specificity and chemoresistance). Our research efforts focus on some of these unaddressed questions that would potentially contribute in chemotherapy. On the other hand, while novel compounds are in great demand to be translated as a drug, nevertheless, it is hard to predict its activity (anti-cancer, anti-diabetic or as any chemotherapeutic) in the first instance. Therefore, as a pre-screening step we first try to understand the cellular response of the ligand or its affinity to a molecular target by applying different computational and experimental methods (biochemical, molecular biology, microscopy or on cell lines).

Dr. Pankaj Vidyadhar Alone, Reader-F

Protein biosynthesis is an important step in the life cycle of cells 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, which controls gene expression. My research interests are to understand a) 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. I am using a range of genetic, biochemical and biophysical techniques in the yeast model system.

Dr. Subhasis Chattopadhyay, Reader-F

The fundamental consequences of cellular responses towards altered physiological processes during infection, cancer and/or tumor progression, inflammation and immunogenic responses in various cases of altered host cell functions and phenotypes are the prime interest of our ongoing research. We have been working in the field of host cell responses and cellular immunology with special interest of ongoing immune-regulatory responses, cellular function and phenotypes associated to cell mediated immunity (CMI) of T cells and accessory antigen presenting cells. Currently, we have major interest groups, where we are investigating expression and function of Toll like receptor (TLR) and Transient Receptor Potential (TRP) Channels in CMI, analyzing cellular and immunological response(s) of host cells associated to experimental cellular inflammation, Chikungunya virus (CHIKV) infection, mice model of tumor progression as major projects. Research with cell lines, primary cells, in animal model and also with the human blood samples from normal donors and patients 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

Dr. Rudresh Acharya, Reader-F

Our research focuses on structural biology of membrane, and soluble proteins. We use X-ray crystallography as a tool to elucidate the structures of proteins. We are interested in elucidating structures viroporins. The channel structure provides insights into molecular mechanism for channel activity, and also aid in designing antiviral drugs. Our interest is also to determine the structures of TM domain of bacterial histidine kinase sensors (HKs) to decipher the molecular mechanism for signal transduction across the membrane. This understanding is essential in general, and critical for pharmaceutically relevant therapeutic targets. Our research also focuses on understanding helix-helix interactions in membrane proteins with respect to dynamics, stability and structure-function correlations. The knowledge based parameters will be put into test by computational protein design of transmembrane proteins and characterization by various biophysical experiments. We are also open to widen our interests on the other systems.

Dr. Tirumala Kumar Chowdary, Reader - F

We are interested in biology of emerging infectious viruses, with emphasis on viral entry into host cell and virus-host protein interactions. We use molecular virology, structural biology, biophysical and biochemical techniques to study viral cell-entry machinery and its interactions with cellular receptor(s). Broad goal of our research is to develop knowledge for novel therapeutic strategies that prevent viral entry, and hence infection.

Dr. Praful S. Singru, Reader-F

We have been interested in studying the complexity of neural circuitries, the multisynaptic pathways, and the neuroactive substances involved in the regulation of feeding, energy balance, reward and neuropsychiatric disorders. We are also exploring the neural pathways and interaction of neurotransmitters in the preoptic area and hypothalamus which links reproduction with energy status, and governs the neuroendocrine regulation of seasonal reproductive cycle and reproductive behavior.

Dr. Asima Bhattacharyya, Reader F

Gastric cancer is a major cause of mortality. Although various causative agents have been associated with this disease, Helicobacter pylori, a microaerophilic, gram-negative bacterium has been identified as one of the main carcinogens causing gastric cancer and contributing in gastric cancer metastasis. Like many epithelial-origin solid tumors, dissemination or gastric cancer (gastric cancer metastasis) is mediated by epithelial to mesenchymal transition (EMT), a mechanism that converts immotile epithelial cells into motile and invasive mesenchymal cells. Hypoxia is known to aggravate the EMT and metastatic properties. The molecular events in H. pylori and hypoxia-driven gastric cancer progression and metastasis are complex and multi-factorial. We are involved in identifying the molecular events and pathways that contribute in gastric cancer progression and metastasis.

Dr. Renjith Mathew, Reader-F

Biology is rife with compartmentalizations - topics, classes, segments, stages, groups; so on and so forth. These are mostly artificial boundaries set for human convenience. Studying development has classically involved studying the development of an organism from when it is a single celled zygote to when the structures necessary for its survival as a full organism have developed, or the development of tissues or organs from precursor cells, for example. Biological phenomena however operate in reality as a continuum of interlinked complex processes that start at the beginning and end at the end. What if developmental biology is taken beyond this somewhat abstract border? That is what we plan to do in our lab. The processes that drive the developmental programmes do not stop when we consider development to be complete. They continue to operate to maintain the structure and function of different organs and tissues post-establishment, till the death of the organism. For this homoeostatic function they constantly resist degenerative influences, a fight they gradually lose as the organism ages, resulting in degeneration of organ and tissue architectures.

Thus by continuing the study of development beyond "development" we hope to reveal how tissues and organ structures degenerate with age. This will help to understand the mechanistic basis for functional loss with age. We conduct these experiments using Drosophila melanogaster, a favorite tool of developmental biologists, as our model organism. Our research currently investigates the Drosophila respiratory system, and will progressively include more tissue and organ types. We combine classical methods of developmental biology with modern tools. This involves visualizing organ structure at cell and tissue levels using advanced staining and microscopy techniques. After establishing the tissue architecture of young adult

organs, we will analyze the changes occurring to these structures with age. Once the senile phenotype of organ structure is determined, we will employ genetic and biochemical tools to reveal the metabolic and genetic pathways that regulate or influence the senile degeneration.

Dr. R. Srinivasan, Reader F

The identification of cytoskeleton in bacteria represents a major paradigm shift in biology. The bacterial cytoskeleton provides a framework to understand the mechanical basis of spatial organization and functions, such as cell integrity, cell shape establishment, DNA segregation, and cell division. Such force requiring functions in eukaryotic cells require the coordinated action of molecular motors with the cytoskeleton. However, no molecular motors have been identified so far in bacteria. So, how do bacterial cytoskeletal proteins generate force in the absence of molecular motors? Our long-term goal is to address this question and in order to do so we focus on the two of the cellular processes that underlie any living cell: partitioning of its genetic (mitosis) and cytoplasmic (cytokinesis) components. We are also interested in studying the role of cell division and morphology control in intracellular pathogens (e.g. Salmonella and Mycobacteria). Further, we have recently become interested in the evolutionary divergence of division mechanisms in organelles as it was intracellularization of a bacteria that lead to the development of organelles like mitochondria and chloroplast in eukaryotic lineages. While these studies will add new knowledge to the field of cytokinesis and membrane fission, we are also interested in identifying small molecules targeting these novel cytoskeletal (especially the ones portioning the virulence plasmids) and developing next generation antibiotics.

Research Publications

1. Pal S, Konkimalla VB. (2016) Sulforaphane regulates phenotypic and functional switching of both induced and spontaneously differentiating human monocytes. Int Immunopharmacol. 35, 85-98.
2. Rath S, Das L, Kokate SB, Ghosh N, Dixit P, Rout N, Singh SP, Chattopadhyay S, Ashktorab H, Smoot DT, Swamy MM, Kundu TK, Crowe SE, Bhattacharyya A. (2016) Inhibition of histone/lysine acetyltransferase activity kills CoCl2-treated and hypoxia-exposed gastric cancer cells and reduces their invasiveness. Int J Biochem Cell Biol. 82, 28-40
3. Den Hartog G, Chattopadhyay R, Ablack A, Hall EH, Butcher LD, Bhattacharyya A, Eckmann L, Harris PR, Das S, Ernst PB, Crowe SE. (2016) Regulation of Rac1 and Reactive Oxygen Species Production in Response to Infection of Gastrointestinal Epithelia. PLoS Pathog. 12:e1005382
4. Rath S, Anand A, Ghosh N, Das L, Kokate SB, Dixit P, Majhi S, Rout N, Singh SP, Bhattacharyya A. (2016) Cobalt chloride-mediated protein kinase Cα (PKCα) phosphorylation induces hypoxia-inducible factor 1α (HIF1α) in the nucleus of gastric cancer cell. Biochem Biophys Res Commun. 471, 205-12
5. Das L, Kokate SB, Rath S, Rout N, Singh SP, Crowe SE, Mukhopadhyay AK, Bhattacharyya A. (2016) ETS2 and Twist1 promote invasiveness of Helicobacter pylori-infected gastric cancer cells by inducing Siah2. Biochem J. 473, 1629-40
6. Majhi RK, Kumar A, Yadav M, Kumar P, Maity A, Giri SC, Goswami C. (2016) Light and electron microscopic study of mature spermatozoa from white pekin duck (Anas platyrhynchos): An

ultra-structural and molecular analysis. Andrology 4, 232-44

7. Mohanty G, Swain N, Goswami C, Kar S, Samanta L. (2016) Histone retention, protein carbonylation and lipid peroxidation in spermatozoa: Possible role in recurrent pregnancy loss. Systems Biology in Reproductive Medicine 62, 201-12

8. Das JK, Mahapatra R, Patro S, Goswami C, Suar M. (2016) Lactobacillus acidophilus binds to MUC3 component of cultured intestinal epithelial cells with highest affinity. FEMS Microbiology Letters 363, 8

9. Kumar A, Majhi RK, Swain N, Giri SC, Kar S, Samanta L, Goswami C. (2016) TRPV4 is endogenously expressed in vertebrate spermatozoa and regulates intracellular calcium in human sperm. Biochemical and Biophysical Research Communications. 473, 781-8

10. Sanyasi S, Majhi RK, Kumar S, Mishra M, Ghosh A, Suar M, Satyam PV, Mohapatra H, Goswami C, Goswami L. (2016) Carboxy Methyl Tamarind Polysaccharide-capped silver Nanoparticles (AgNP) inhibit biofilm formation by blocking FtsZ-FtsA complex-mediated microbial cell division. Scientific reports 6, 24929

11. Ghosh A, Kaur N, Kumar A, Goswami C. (2016) Why individual thermo sensation and pain perception varies? Clue of disruptive mutations in TRPVs from 2504 human genome data. Channels 10, 339-345.

12. Singh U, Kumar S, Shelkar G, Yadav M, Kokare D, Goswami C, Lechan R, Singru P. (2016) Transient receptor potential vanilloid (TRPV3) in the ventral tegmental area of rat: role in modulation of the mesolimbic-dopamine reward pathway. Neuropharmacology 110 (Pt A), 198-210

13. Singh O, Kumar S, Singh U, Kumar V, Lechan RM, Singru PS. (2016) Cocaine-and amphetamine regulated transcript peptide (CART) in the brain of zebra finch, Taeniopygia guttata: Organization, interaction with neuropeptide Y, and response to changes in energy status. J Comp Neurol. 524, 3014-41

14. Jacob R, Das S, Ghosh S, Anoop A, Jha N, Khan T, Singru P, Kumar A, Maji S. (2016). Amyloid formation of growth hormone in presence of zinc: Relevance to its storage in secretory granules. Scientific Reports 6, 23370.

15. Kim KH, Ko DK, Kim YT, Kim NH, Paul J, Zhang SQ, Murray CB, Acharya R, DeGrado WF, Kim YH, Grigoryan G. (2016) Protein-directed self-assembly of a fullerene crystal. Nat Commun. 7, 11429

16. Pradhan B, Guha D, Ray P, Das D, Aich P. (2016) Comparative Analysis of the Effects of Two Probiotic Bacterial Strains on Metabolism and Innate Immunity in the RAW 264.7 Murine Macrophage Cell Line. Probiotics Antimicrob Proteins. 8, 73-84.

17. Patil R, Bhand S, Konkimalla VB, Banerjee P, Ugale B, Chadar D, Saha SK, Praharaj PP, Nagaraja, CM, Chakrovarty D. Salunke-Gawali S. (2016) Molecular association of 2-(n-alkylamino)-1, 4-naphthoquinone derivatives: Electrochemical, DFT studies and antiproliferative activity against leukemia cell lines. Journal of Molecular Structure. 1125, 272-281.

18. Pal S and Konkimalla VB. (2016) Data on sulforaphane treatment mediated suppression of autoreactive, inflammatory M1 macrophages. Data in Brief. 7, 1560-4.

19. Gade CR, Dixit M, Sharma NK. (2016) Dideoxy nucleoside triphosphate (ddNTP) analogues: Synthesis and polymerase substrate activities of pyrrolidinyl nucleoside triphosphates (prNTPs). Bioorg Med Chem. 24, 4016-22.

20. Kumari D, Tiwari A, Choudhury M, Kumar A, Rao A, Dixit M. (2016) A novel KERA mutation in a case of autosomal recessive cornea plana with primary angle closure glaucoma. J Glaucoma.

25, e106-9.

21. Paula A, Carranza S, Singh A, Steinberger K, Panigrahi KC, Palme K, Dovzhenko A, Dal Bosco C (2016) Hydrolases of the ILR1-like family of Arabidopsis thaliana modulate auxin response by regulating auxin homeostasis in the endoplasmic reticulum. Scientific Reports 6, 24212.
22. Mishra P, Kumar A, Mamidi P, Kumar S, Basantray I, Saswat T, Das I, Nayak TK, Chattopadhyay S, Subudhi BB, Chattopadhyay S. (2016) Inhibition of Chikungunya Virus Replication by 1-[(2-Methylbenzimidazol-1-yl) Methyl]-2-Oxo-Indolin-3-ylidene] Amino] Thiourea (MBZM-N-IBT). Scientific Reports. 6, 20122.
23. Tripathy B, and Acharya R (2017) Production of Computationally Designed Small Soluble- and Membrane-Proteins: Cloning, Expression and Purification. Methods in Molecular Biology Computational Protein Design. 529:95-106. Published by Springer (Book chapter)
24. Badapanda C, Sahoo GC, Middha A, Majhi MC, Nayak R. (2016) Functional Annotation and Epitope Prediction of Hypothetical Proteins of Mycobacterium tuberculosis H37Rv: An Immunoinformatics Approach. J Bioengineer & Biomedical Sci 6, 196.
25. Satpathy R, Konkimalla VB, Ratha J. (2016) In Silico Phylogenetic Analysis and Molecular Modelling Study of 2-Haloalkanoic Acid Dehalogenase Enzymes from Bacterial and Fungal Origin. Advances in Bioinformatics. Article ID 8701201.
26. Priyadarshini S. Aich P. (2016) Understanding effects of Psychological Stress on physiology and disease through human stessome - An integral algorithm. Current Bioinformatics 11, 277-290
27. Konkimalla VB. (2016) An Improved Comparative Docking Approach For Developing Specific Glycogen Phosphorylase Inhibitors Using Pentacyclic Triterpenes. Curr Top Med Chem. (Accepted).
28. Dash TK, Konkimalla VB. (2016) Comparative Study of Different Nano-Formulations of Curcumin for Reversal of Doxorubicin Resistance in K562R Cells. Pharmaceutical Research. (Accepted).
29. Dash TK, Konkimalla VB. (2016) Formulation and Optimization of Doxorubicin and Biochanin A Combinational Liposomes for Reversal of Chemoresistance. AAPS Pharm Sci Tech. (Accepted).
30. Palani S, Chew T.G, Srinivasan R, Kamnev A, Harne S, Chapa-Y-Lazo B, Hogg R, Sevugan M, Mishra M, Gayathri P. and Balasubramanian MK. (2016) Motor Activity Dependent and Independent Functions of Myosin II Contribute to Actomyosin Ring Assembly and Contraction in Schizosaccharomyces pombe. Curr. Biol. 27, 751-757.
31. Pal S, Salunke-Gawali S, Konkimalla VB. (2017) Induction of Autophagic Cell Death In Apoptosis-Resistant Pancreatic Cancer Cells Using Benzo [a] Phenoxazines Derivatives, 10-Methyl-Benzo [a] Phenoxazine-5-One And Benzo [a] Phenoxazine-5-One. Anti-cancer agents in medicinal chemistry. 17, 115-125.
32. Mundlapati VR, Sahoo DK, Ghosh S, Purame UK, Pandey S, Acharya R, Pal N, Tiwari P, Biswal HS. (2017) Spectroscopic Evidences for Strong Hydrogen Bonds with Selenomethionine in Proteins. J Phys Chem Lett. 8, 794-800.
33. Rath S, Das L, Kokate SB, Ghosh N, Dixit P, Rout N, Singh SP, Chattopadhyay S, Ashktorab H, Smoot DT, Swamy MM, Kundu TK, Crowe SE, Bhattacharyya A (2017) Inhibition of histone/lysine acetyltransferase activity kills CoCl2-treated and hypoxia-exposed gastric cancer cells and reduces their invasiveness. Int J Biochem Cell Biol. 82, 28-40.
34. Nayak TK, Mamidi P, Kumar A, Singh LPK, Sahoo SS, Chattopadhyay S, Chattopadhyay S. (2017) Regulation of Viral Replication, Apoptosis and Pro-Inflammatory Responses by

17-AAG during Chikungunya Virus Infection in Macrophages. Viruses, 9, 3

35. Kar UP, Dey H and Rahaman A. (2017) Regulation of Dynamin Family Proteins by Post-Translational Modifications. Journal of Biosciences. (Accepted)
36. Hansda AK, Tiwari A, Dixit M. (2017) Current Status and Future Prospect of FSHD Region Gene 1. Journal of Biosciences. 42(2):345-353.
37. Sanyasi S, Kumar S, Ghosh A, Majhi RK, Kaur N, Choudhury P, Singh UP, Goswami C, Goswami L. (2017) A modified polysaccharide-based hydrogel for enhanced osteogenic maturation and mineralization independent of differentiation factors. Macromolecular Bioscience (Accepted)
38. Yadav M, Goswami C (2017) TRPV3 mutants causing Olmsted Syndrome induce impaired cell adhesion and nonfunctional lysosomes. Channels (Accepted)
39. Singh O, Kumar S, Singh U, Singru PS. (2016). Role of isotocin in the regulation of hypophysiotropic dopamine neurons in the preoptic area of the catfish, Clarias batrachus. Journal of Neuroendocrinology (Accepted)
40. Kumar S, Singh U, Singh O, Goswami C, Singru PS. (2017) Transient receptor potential vanilloid 6 (TRPV6) in the mouse brain: Distribution and estrous cycle-related changes in the hypothalamus. Neuroscience (Accepted)
41. Kumar S, Singh U, Goswami C, Singru PS. (2017) Transient receptor potential vanilloid 5 (TRPV5), a highly Ca2+ -selective TRP channel in the rat brain: relevance to neuroendocrine regulation. J Neuroendocrinol. (Accepted)
42. Das L*, Kokate SB*, Dixit P, Rath S, Rout N, Singh SP, Crowe SE, Bhattacharyya A. (2017) Membrane-bound β-catenin degradation is enhanced by ETS2-mediated Siah1 induction in Helicobacter pylori-infected gastric cancer cells. Oncogenesis (Accepted)
43. Singh SK, Mishra M, Sahoo M, Patole S, Mohapatra H. (2017). Efflux mediated colistin resistance in diverse clones of Klebsiella pneumoniae from aquatic environment. Microbial Pathogenesis. 102, 109-112.
44. Jha G, Sahu PK, Panda S, Singh DV, Patole S, Mohapatra H and Sarkar M. (2017) Synthesis, Photophysical Studies on Some Anthracene–based Ionic Liquids and their Application as Biofilm Formation Inhibitor. Chemistry Select, 2, 2426 – 2432
45. Antony AC and Alone PV. (2017) Defect in the GTPase activating protein (GAP) function of eIF5 causes repression of GCN4 translation. 486 (4), 1110-1115. Biochem Biophys Res Comm.
46. Tiwari A, Mukherjee B, Dixit M. (2017) MicroRNA Key to Angiogenesis Regulation: miRNA Biology and Therapy. Curr Cancer Drug Targets. (Accepted)

Conferences/Seminars/Colloquium etc. organized by the School

Conferences

Second Meeting of the Indian Immunology Society-Odisha Chapter

Date: 06 Jan 2017

Venue: School of Biological Sciences

Description: This one-day event had a total of 6 acclaimed immunologist from India as speakers. Nearly 300 student and faculty participants mostly from in and around Bhubaneswar have attended this meeting.

Lights on: Applications of fluorescence imaging in endocrine research

Date: 05 Dec 2016 to 10 Dec 2016

Venue: School of Biological Sciences

Description: The Indian Society for Comparative Endocrinology (ISCE) and SBS, NISER jointly organized this workshop. There were 12 participants from all over India and total 30 students participated in the workshop. This 5-day event had 6 speakers from Academia, 4 speakers from Industry who also participated in "hands-on-training sessions" to 3 high-end imaging systems. In addition, Dr. Graham Wright, Head, Microscopy Unit, Institute of Medical Biology (IMB), has also taught during the workshop. Students were taught basics of microscopy, confocal microscopy, live cell imaging, use of imaging to explore the steroid-ion channel cross talk, and imaging the membrane dynamics and exocytosis. Participants were given hands on training in transcardial perfusion, dissection and sectioning of pituitary gland, immunofluorescence, and live cell imaging. This was another exemplary Industry-Academia partnership between NIKON, NISER and Indian Society of Comparative Endocrinology (ISCE)

Workshop and course on Advanced Microscopy and Imaging

Date: 04 Aug 2016 to 06 Aug 2016

Venue: School of Biological Sciences

Description: This 3-day event was conducted in NISER, Bhubaneswar. This event had 6 speakers from Academia, 6 speakers from Industry, 33 students' percipients and "hands-on-training sessions" to 3 high-end imaging systems. This was an exemplary Industry-Academia partnership between Olympus and NISER.

2nd Orientation Workshop on Laboratory Animal Sciences

Date: 26- 29 Apr 2016

Venue: School of Biological Sciences

Description: A Four day intensive workshop on laboratory animal science was jointly organized by NISER and ILS for research scholars and students involved with research with animals. The objective of this workshop was to prime researchers with basic facts and principles that are essential for the humane use and care of animals. The contents of the workshop also covered the recommendations of the Committee for the purpose of Control and Supervision of Experiment on Animals (CPCSEA).

Seminars

1. 18th May 2016, By Dr. Pradeep Kumar
   Rajiv Gandhi Centre for Biotechnology Thycaud PO, Poojappura, Trivandrum 695014, Kerala.
   Title: "Identification of molecular markers of male factor subfertility"

2. 13th June 2016, By Dr. Aseem Mishra.
   UGC-Assistant Professor, P.G. Department of Biotechnology, Utkal University, Vani Vihar, Bhubaneswar.
   Title: "Understanding aggregation and membrane interactions of Amylin"

3. 1st July 2016, By Dr. Sudip Mondal
   Department of Mechanical Engineering. The University of Texas at Austin, Texas 78712, USA
   Title: "High-resolution three-dimensional imaging of C. elegans"

4. 13th July 2016, By Dr. Soumen Chakraborty
   Scientist-E, Institute of Life Science, Bhubaneswar
   Title: "BCR-ABL mediated repression of miR-223 results in the activation of MEF2C and PTBP2 in chronic myeloid leukemia"

5. 4th Aug 2016, By Dr. Santi Senapathi
   Scientist-D, Institute of Life Sciences, Bhubaneswar
   Title: "Identification and validation of drugs against pancreatic cancer associated fibroblast or stellate cells through drug repositioning"

6. 23th Aug 2016, By Dr. Sunish Radhakrishanan
   IISER TVM
   Title: "Topoisomerase IV activity in bacteria gets a redox switch"

7. 7th Sep 2016, By Prof. Ullas S. Kolthur
   DBS, TIFR, Mumbai
   Title: "(CoA) gulating metabolic inputs, As(SIRT)ing communication and MICRO-managing mitochondria during health and Aging"

8. 8th Sep 2016, By Dr. Kannan
   Scientist-D, C-CAMP, Bangalore
   Title: "Metabolomics and its future applications"

9. 15th Sep 2016, By Dr. Arati Ramesh
   NCBS, TIFR, Bengaluru
   Title: "Structure to signaling: Understanding biological roles and mechanisms of non-coding RNAs in bacteria."

10. 16th Sep 2016, By Prof. Parimal Sen
    BOSE Institute, Calcutta
    "Remodelling the cellular calcium homeostasis with a synthetic dihydropyrimidone, Nifetepimine: A targeted approach towards immune-rejuvenation and cancer regression"

11. 31st Aug 2016, By Prof. M R S Rao
    JNCASR, Bangalore.
    Title: "Non-coding RNA"

12. 23rd Sep 2016, By Dr. Paul Held
    BIOTEK USA
    Title: "Imaging and image analysis"

13. 17th Oct 2016, By Dr. Tapas Manna
    IISER TVM
    Title: "Architecture of Spindle-Chromosome Interface: how far we are to build it."

14. 24th Oct 2016. By Prof. Naga Mohan
    BITS Pilani-Hyderabad
    Title: "Variants of Uncertain Significance: The conundrum of 15q11.2 CNVs"

15. 26th Oct 2016. By Dr. Debasish Choudhary, Institute of Physics, Bhubaneswar
Title: "Boundary-compliant compaction and positioning of E.coli chromosomes"

16. 6th Dec 2016. By Dr. Sourav Haldar
Section on Integrative Biophysics, Eunice Kennedy Shriver National Institute of Child Health and Human Development, Bethesda, Maryland 20892, USA
Title: "Lipid Membrane Organization, Lipid-Protein Interaction and Viral Fusion"

17. 8th Dec 2016. By Prof. N. G. Chakraborty
UCHC, CT, USA
Title: "Manipulation of Regulatory T cells to improve Therapeutic outcome for Cancer"

18. 9th Dec 2016. By Dr. Shiva Prasad
NCBS, Bangalore
Title: "Insights into Small RNA biogenesis and their functions in plants"

19. 19th Dec 2016. ByProf. Sutapa Chakrabarti
Institute of Chemistry and Biochemistry, Free University Berlin, Germany
Title: "Molecular mechanisms of targeted mRNA degradation"

20. 23rd Dec 2016. By Prof. MRN Murthy
MBU, IISc
Title: "Structure based functional annotation of proteins"

21. 27th Dec 2016, By Dr. Mukesh Nyati
University of Michigan, Ann Arbor, MI
Title: "Development of a potential Drug: Peptide to Small molecule and Road Blocks"

22. 25th Jan 2017. By Dr. P Gopinath
Institute of Medical Biology, Biomedical Science Institutes 8A, biomedical grove, Singapore-138648.
Title: "Can injury cause cancer? Epithelial carcinomas hijack a molecular switch from wound healing to promote their invasion"

23. 6th Feb 2017. ByDr. Bhabatosh Das
THSTI, Delhi
Title: "Microbial Ecology in the Gut of Healthy Indians living in Urban and Rural Areas"

24. 7th Feb 2017. By Dr. Bhabatosh Das
THSTI, Delhi
Title: "Molecular Insights into Antimicrobial Resistance Traits of Multidrug Resistant Enteric Pathogens isolated from India"

25. 13th Feb 2017, By Dr. Dipanjan Guha
NISER, Bhubaneswar
Title: "Understanding role of probiotic Lactobacillus delbruckei sp. bulgaricus in mouse model on host response and gut microbiome"

26. 17th Feb 2017, By Dr. Tina Mukherjee
INSTEM, Bangalore
Title: "Sensory Perception in Myeloid Cell Development and Function"

27. 15th Mar 2017, By Dr. Hari Anutthaman
Science Academy of India (SAI), Non-profit research lab/science outreach organisation in Chennai, India Title: "Unusual enzymes from anaerobic bacteria: biochemistry andrelevance to the environment and human health"

28. 17th Mar 2017, By Dr. P Babu.
National Centre for Biological Sciences -TIFR, Glycomics and Glycoproteomics & Biologics Characterization, GKVK Post, Bangalore 560065
Title: "A "Sweet" Tale of Two Regenerative model Organisms"

Colloquia

1. "Assembly and activation of the divisome in E. coli" by Prof. Joe Lutkenhaus, Kansas Medical Center, USA, December 2nd, 2016.

2. "Scope of health care workers and current status of medical education in India today" by Prof. Dr. Ashok Mahapatra, Former Director, AIIMS Bhubaneswar, November 4, 2016

3. "Regulation of mammalian genome dynamics at the level of Chromosome Territories & Replication Forks" by Prof. B. J Rao, Department of Biological Sciences, TIFR, Mumbai, September 16, 2016

4. "Geometry, Cholesterol and Kala-azar" by Dr. Roop Mallik, Department of Biological Sciences, TIFR, Mumbai, August 19, 2016

5. Nanotechnology Applications in curing blindness" by Prof. Rajiv Mohan, University of Missouri, Coloumbia, USA, June 15, 2016

Awards/recognition received during the year

- Dr. Palok Aich has became Member of DBT TASK Force for Biotechnology Ignition Grant (BIG) of the Department of Biotechnology (DBT)-Biotechnology Industry Research Assistance Council (BIRAC), Government of India (GoI), since June 2016

- Dr. Chandan Goswami served as a jury member of "Monitoring meeting of PAC in Health Sciences, DST-SERB" on 7th-8th Feb, 2017.

- Dr. Chandan Goswami received Travel Award for attending EMBO/EMBL Symposium: Molecular and Cell Biology of Membranes, Heidelberg, Germany

- Best paper award to Mr. Rakesh Kumar Majhi. Annual Convention of Society of Veterinary Biochemists & Biochemists & Biotechnologists of India (SVBBI) and the National Symposium on "Use of Advanced Technology of Biochemistry and Biotechnology in Livestock Health, Production and Reproduction" 2016. OUAT, Bhubaneswar.

- "Special Jury presentation award" to Mr. Manoj Yadav. 2nd International Conference on Translational Research: Applications in Human Health and Agriculture. 14-16th Oct 2016, Bhubaneswar,

- "Best Poster award" to Md. Khurshidul Hassan. 10th year celebration of excellence in science at IISER Kolkata "Advances in Life Sciences" during January 13-15, 2017.

Invited lectures by SBS members:

- Invited lecture given by K. V. S. Badireenath on IC-RTCBSMNPDD-2017. Mar 03-05, 2017. Organized by Berhampur University, India

- Invited talk and chairing of a session by Dr. Asima Bhattacharyya at the 3rd International Meet on Advanced Studies in Cell Signaling Network (CeSiN-2016). 18-20 Dec, 2016, IICB, Kolkata. Title: Siah1 enhances invasiveness of Helicobacter pylori-infected gastric cancer cells.

- Invited lecture given by Dr. Asima Bhattacharyya at the Department of Physiology, University of Calcutta, 16 Dec 2016. Title: Oxidative stress.

- Invited lecture by Dr. Rudresh Acharya, Indian National Science Academy, Anniversary General Meeting, 28-30 December, 2016, NISER, Bhubaneshwar
  Title: "Four-helix bundles in de novo protein design",

- Invited lecture given by Dr. Subhasis Chattopadhyay on "Skill Based Workshop on Science paper writing and editing" in PG Department of Zoology at Utkal University on 19th March 2017, sponsored by UGC, India.
  Title: "How to ask and how to perform: Approaches from Experimental Cell Mediated Immunity"

- Invited lecture given by Dr. Chandan Goswami, Workshop on "To Develop a Scientific Program for Research on Rare Diseases" at Indian National Science Academy, New Delhi. 23rd April, 2016
  Title: Olmsted Syndrome: The molecular and cellular mechanism behind the TRPV3-mediated channelopathy

- nvited lecture given by Dr. Chandan Goswami, World Veterinary Day, 30th April 2016. FSB, Cuttack

- Invited lecture given by Dr. Chandan Goswami, Workshop and course on Advanced Microscopy and Imaging, 5th August 2016. NISER, Bhubaneswar
  Title: Regulation of sub-cellular functions by Mechano-sensitive ion channels

- Invited lecture given by Dr. Chandan Goswami, 2nd International Conference on Translational Research: Applications in Human Health and Agriculture
  KIIT University, Bhubaneswar, 16th Oct 2016
  Title: Regulation of TRP channels by steroids: Implications in physiology and diseases

- Invited lecture given by Dr. Chandan Goswami, 9th World congress on "Preventive and regenerative medicine: Stem cells-innovation-rejuvenation-regulation" KIIT Campus, Bhubaneswar, 14th Nov 2016
  Title: Regulation and misregulation of TRP ion channels: Importance in physiology and diseases

- Invited lecture given by Dr. Chandan Goswami, Lights on: Applications of fluorescence imaging in endocrine research, 9th Dec 2016
  Title: Cross talk between steroids and TRPs: For physiology and diseases

- Invited lecture given by Dr. Chandan Goswami, National Conference on "Bioprospecting in Life Sciences Research for Human Welfare" and 41st Annual Conference of Orissa Botanical Society. Sambalpur University. 24th to 26th December 2016.
  Title: TRPV3 mutants causing Olmsted Syndrome induce impaired cell adhesion and non-functional lysosomes

- Invited lecture given by Dr. Chandan Goswami, ZEISS Confocal user meet and Workshop, 30th Jan, Bangalore
  Title: TRPV channel-induced pathophysiology and microscopy

- Invited lecture given by Dr. Chandan Goswami, 50 years of MRS Rao- chromatin lab and reunion. TIFR, Mumbai. 18th Feb 2017. Title: TRPV4 channel - Cholesterol – Mitochondria – Sperm and pathophysiology

- Invited lecture given by Dr. Chandan Goswami, UGC-DRS-III National Seminar on "Stress Management in Plants". Utkal University, Bhubaneswar, 17th Mar 2017
  Title: TRPV channel-induced pathophysiology and plant products

- Invited lecture given by Dr. Manjusha Dixit, at World Digestive Health Day "Diet and the Gut" 29th May 2016. Organized by Indian Society of Gastroenterology Orissa Chapter and Kalinga Gastroenterology Foundation, Bhubaneswar.
  Title: Diet and Gallbladder cancer in Odisha

- Invited lecture given by Dr. Subhasis Chattopadhyay in NATIONAL SEMINAR ON

"SCIENCE AND TECHNOLOGY FOR NATIONAL DEVELOPMENT IN INDIA", 12th-13th December 2016 organized by Indian Science congress association (ISCA) Bhubaneswar Chapter in association with KIIT University Bhubaneswar, Venue: KIIT University, Odisha, INDIA.
Title: "Experimental Cell mediated Immunity and its implication in Bio-medical Sciences"

- Invited lecture given by Dr. Subhasis Chattopadhyay in 2nd IIS-Odisha Chapter" on 6th Jan 2017, organized by NISER, ILS and TACT, Bhubaneswar, India Title: "An ongoing journey with experimental cell mediated immunity"

- Invited lecture given by Dr. Subhasis Chattopadhyay as the chief guest in MITS School Of Biotechnology, MITS Group of Institutions, Bhubaneswar on 24th Feb 2017.
Title: Title: "Cellular Immunology: Basic to experimental research"

Research Facilities created in the School:

* Animal house transit facility (for Mouse, rat and Zebra Finch)
* Animal cell culture facility
* Green house and Phytotron facility for plant development research
* Fly facility
* Microbial facility
* Radioactivity
* Imaging facility
* Proteomics and genomics and drug discovery facility
* Flow cytometry facility
* Crystalization and X-ray diffraction facility
* Low-temperature storage facility
* Computational facility

School of Chemical Sciences

Prof. V Chandrasekhar, Professor

Prior to joining NISER as Director in January 2014, Prof. Chandrasekhar worked at the Tata Institute of Fundamental Research, Centre for Interdisciplinary Sciences, Hyderabad as a Senior Professor and Dean (2012-14) and at IIT Kanpur at the head of the Department of Chemistry and Dean of Faculty Affairs. His current research interests are in the area of molecular materials, main-group- and organometallic chemistry. He is the recipient of several national and international awards including the Shanti Swarup Bhatnagar Award, the Friedrich-Wilhelm Bessel Award, and the national J. C. Bose Fellowship. He is a fellow of all the academies of sciences in India as well as the academy of sciences of the developing world, Trieste, Italy.

Prof. T. K. Chandrashekar, Sr. Professor

Our research activities are centered on synthesis and application of tetrapyrrole pigments and related macrocycles. Mainly focuses on; (1) To understand such macrocycles in the biological world; (2) Structure – Function correlations; (3) To find out their potential applications as Non-liner Optical materials, Photodynamic therapeutic drugs and receptor properties and (4) Use as versatile catalysts for many industrial inorganic reactions.

Dr. A. Srinivasan, Professor

Pyrrole Based Receptor Materials. Our research interests are: (1) synthesis of various metallocenyl incorporated calixpyrrole and calixphyrin – normal and expanded derivatives, structural analysis and receptor properties; (2) Calixbenzophyrins with Aggregation Induced Enhanced Emission Characteristics and applications as Hg(II) chemosensor; (3) Synthesis and structural analysis of normal, expanded and contracted porphyrinoids; (4) N-confused porphyrinoids – as Sensitizer for Photodynamic therapeutic applications and (5) Metal assisted macrocyclic synthesis.

Dr. Sanjib Kar, Reader F

Transition metal complexes are important in catalysis, materials synthesis, photochemistry, and biological systems. Display diverse chemical, optical and magnetic properties. In that context we are exploring the synthesis, structural characterization, spectroscopic properties (Raman, IR, NMR), electrochemistry, magnetic properties and chemical reactions of novel transition metal complexes.

To design and synthesis of newer classes of iron and manganese complexes incorporating selective combination of porphyrin and corrole ligand functionalities in order to achieve synthesis of the relevant iron and manganese complexes whose oxidation levels, electronic properties and mode of reactivity can be tuned by selective introduction of suitable donor or acceptor groups in the porphyrin/corrole frameworks. We will analyze the use of high-valent iron and manganese complexes of corrole and porphyrinin atom transfer and dioxygen evolvingcatalysis. Study of transition metal complexes of corrole and porphyrin will lead to discovery of excellent catalysts, in terms of stability and efficiency, for a variety of synthetic reactions. We will also investigate the efficacy of these complexes to intervene tumor growth. Preliminary study indicates that the proposed compounds indeed is able to induce apoptosis in vitro, an elaborate investigation is warranted to fully understand their mechanism of action and also the effectiveness in suppressing the tumor in vivo. Thus the present work will have a great translational importance in therapeutic intervention of tumor.

Water oxidation catalyzed at the oxygen-evolving center (OEC) in photosynthesis is one of the most important and fundamental chemical processes in nature. A manganese cluster consisted by four

manganese ions in higher plants plays an important role as a catalyst for water oxidation and oxygen evolution. It is our aim to establish artificial OEC models not only for understanding and simulating the photosynthetic OEC, but also to construct artificial photosynthesis, which is attracting a great deal of interest to convert solar energy into fuels.

The enzyme family cytochrome P-450 (cytochrome P-450s are oxidation enzymes, which bear a thiolate group as an axial ligand and catalyze the oxidation of organic substances by oxygen activation) catalyzes the incorporation of one oxygen atom from O_2 into a variety of organic substrates. We prepare chemical models (metal porphyrin) of cytochrome P-450 for catalytic oxygenation of olefins and hydrocarbons.

Dr. Arindam Ghosh, Reader-F

Our group works on method developments in the field of small molecules as well as large bio-molecules, digital signal processing techniques applicable to spectroscopy. Currently we are working on four different projects. The first aims at investigating, both theoretically and experimentally, the noise profiling of different rapid data acquisition techniques. The second project try to find solution against some of the fundamental challenges of NMR such as background noise, overlapping of signals, presence of undesired signals etc using digital signal processing techniques. The third project focuses on developing a MATLAB based programming package which will both simulate NMR spectra and help in product operator formalism at the same time. In addition we also work on NMR metabonomics and method developments associated with it.

Dr. B. L. Bhargava, Reader-F

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 the 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 the 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 be studied using molecular dynamics.

Dr. Chandra Shekhar Purohit, Reader-F

Peptide Nucleic Acid as a Tool for Sequence Specific DNA Cleavage. The manipulation of DNA serves as a tool for genetic engineering and DNA nanotechnology. It can even be possible to use these tools in cancer therapy for these following reasons. Cancer is caused by unregulated cell division in the tissue. One of the chemotherapy approaches for its cure is to damage the DNA, thereby stopping the cell to divide further which leads to apoptosis of the cell. cis-Platin is one of the chemical agent used to treat cancer. The function of cis-Platin is to cross linking two DNA strands, thereby stopping the cell division. Another way of stopping cell division is to damage the DNA which cannot be repaired by the cellular mechanism. Single nick on the DNA by cleaving phosphate bond is usually repaired by the enzymes. However, a second damage around the damaged site is hard to repair and leads to apoptosis. Because of possible chemotherapy agents and other uses in biotechnology, there has been a lot of interest in preparing molecules and metal complex that cleave DNA. The major disadvantage with these molecules is their non-sequence specific cleavage of DNA. Therefore, new chemical agents are required which can cleave DNA with sequence specificity. In principle, this is possible if these molecules will have two components. One, which targets the DNA sequence specifically, and binds to it and a second component, cleaves the DNA at that position. This strategy will be used to synthesize few molecules and study their properties during the project execution.

Dr. C. Gunanathan, Reader-F

Chemistry of Pincer Complexes: Developing Sustainable Catalytic Processes. Sustainable development is accepted as an essential goal for achieving societal, economic and environmental objectives. Chemists have a prominent role to play for such a development by devising new environmentally benign methodologies. Discovery of new reactions to make advanced synthetic intermediates and target molecules in minimal steps also could save time, investment and minimize chemical waste.

Chemistry of Pincer Complexes is an important and rapidly growing discipline in Science. The focus of our research is centered on developing new pincer complexes and their applications as catalysts for synthesis, bond activations, and activation of small molecules. Hence, our group opens up a research discipline that focus on the fundamental studies of design and synthesis of new pincer complexes, and their organometallic chemistry with the perspective of developing efficient and green catalytic transformations through new discoveries. We also plan to foray into multi-component reactions and development of new lanthanide complexes for catalysis.

Dr. Jogendra Nath Behera, Reader-F

There is a considerable interest in multimetallic oxides incorporating heavy main group (lead and bismuth) and transition metals because of their attractive properties, such as ferro- and piezoelectricity, multiferroism, catalysis, and superconductivity. However, the preparation of lead-containing mixed oxides by traditional high-temperature solid state synthesis is often difficult to control because of the volatility of PbO. It is well-known that some heterometallic coordination complexes with suitable ligands can be used as single-source precursors (SSPs) to obtain crystalline oxide materials upon their decomposition at significantly lower temperatures compared with the solid state or multisource precursor approaches. The most common application of metal β-diketonates as precursors for the metals and metal oxides is based on their high volatility and clean, low-temperature decomposition pattern. To understand the importance of lead-containing transition hetero-bimetallic oxides, we are synthesizingc respective hetero-bimetallilc diketonates as single source precursors by both solution and solid-state methods.

While metal-organic frameworks have shown much promise and potential in interactions with small molecules (i.e; gas adsorption, etc), few studies report electronic or ionic conductivity in such porous compounds. To induce electronic conductivity, we will develop new frameworks with select metal cations and ligands to enhance electron transfer throughout the framework.

The most remarkable characteristic of MOFs relevant to catalysis, which makes them unique, is the lack of non-accessible bulk volume and thus, the mass transport in the pore is not hindered. Secondly, different strategies can be applied to introduce catalytically-active sites to facilitate the reaction inside MOFs. One approach is to utilize the metal-connecting points which coordination environments is saturated with coordinated water or other solvent molecules that can be easily removed without destroying the parent framework In another approach, the catalytic sites are incorporated directly into the bridging ligands used for the construction of MOFs. Importantly, the MOFs allow thedesired incorporation of catalytic sites in the controlled fashion, oriented towards the pore interiorand specifically organic-grafting, therefore, can offer unique applications in heterogeneous catalysis.

Dr. Moloy Sarkar, Reader-F

We are mainly interested in the photophysical behavior of electron donor-acceptor (EDA) molecules in both conventional solvents and in room temperature ionic liquids. We are interested to study important photo-processes such as electron transfer, proton transfer reactions etc. of different

EDA molecules by examining the spectral and temporal behavior of the systems using steady state and time-resolved absorption and fluorescence techniques.

Dr. Nagendra K. Sharma, Reader-F

Specialization in Bio-organic chemistryand dealing with following research area, Design, Chemical Synthesis and biological evaluation of Nucleic Acid & Peptide analogues, Synthesis of Inhibitors, to study the DNA/Protein and protein/protein Interaction in vitro, Mechanistic studies of Isoprenoids Enzymes and biosynthesis of natural products

Dr. Prasenjit Mal, Reader-F

Ion sensing, particularly as it could be applied to the emerging area of nano-technology and in parallel provide a platform to the drug-discovery, is a key area in which scientific and technological progress may be translated into economic growth. Prasenjit Mal has developed several new concepts in supramolecular chemistry while working in Prof. Michael Schmittel's laboratory at University of Siegen (Germany) as a Humboldt fellow, in Dr. Jonathan R. Nitschke's laboratory at University of Cambridge and also at NISER Bhubaneswar and so has proved his abilities in this related domain i.e., development of transition metal ion sensor (submitted). In next few years, he is going to work in an area where the major focus will be to develop ratiometric fluorescent probes for monitoring transition metal ion triggered cellular uptake of bioactive molecules. Cellular delivery of bioactive molecules by passive diffusion is usually restricted to small nonpolar molecules, while large or polar/charged compounds are not membrane permeable unless actively transported to the interior of the cell by specific mechanisms (e.g. endocytosis). Beside the general challenge of effective cellular delivery, accumulation of a drug (or diagnostic agent) at its target site is a central aim of modern delivery techniques to make products more effective and selective and, as a result, safer. In general, fluorescence-based probes provide highly sensitive or accurate informationthat are suitable for the visualization of trace metal ions in biological environments. Specific requirements in terms of probe design will be taken into account for terpyridine/phenanthroline metal binding unit and proper functionalization of the probe for conjugation to other molecules. The terpyridine chelating unit is known to be an efficient binder for transition metal like Zn(II) or Fe(II), and also the phenanthroline unit can easily accommodate Cr(III) . The project includes organic synthesis, photophysical characterization and probe application to live cells using fluorescence microscopy. Thus, successful execution of the proposed idea would lead both to the introduction of new tools into the toolkit of chemical biology, in addition to preparation of new materials that might be of potential use for are of medicinal chemistry.

Dr. S. Peruncheralathan, Reader-F

Over the decades chemistry has changed the way from alchemy to nanoworld. However, one facet remains constant; that's the ability to create molecules in a stereo and regio controlled manner. In this regards, synthetic chemists play a vital role in assembling molecules by using different strategies. Among them, the use of catalysis to promote organic transformations is a key tool. Our research focuses on developing new catalytic approaches for synthesizing fine chemicals and enantiopure target molecules those are having unexplored physical and biological properties.

We are interested in engaging our research activities in the following areas: Enantioselective Organocatalysis, Metal-Mediated Molecular Synthesis

Dr. Sharanappa Nembenna, Reader-F

Main Group Organometallic and Synthetic Inorganic Chemistry. Development of new ligand systems, Synthesis and characterization of main group metal complexes, Metal complexes with metal-metal bonds, Synthesis of low oxidation state metal complexes

Dr. Sudip Barman, Reader-F

Graphene is new allotrope of carbon, a 'thinnest material in the world'. It is two-dimensional sheet of sp^2 hybridized carbon. In spite of profound interest and continuing experimental success by experimental scientists, widespread implementation of graphene has yet to occur. Just like other newly discovered carbon allotrope (Carbon nano tube, Flulerene) material synthesis and processibility have been the rate-limiting steps in evaluation of graphene application. The outstanding electrical and mechanical and chemical properties of graphene make it attractive element for application in electronics. However, efforts to make patterned conducting graphene have been hampered by the lack of specialist methods for electrical modification of graphene for its application. One of the main interests of my work is to develop new synthetic route for large scale production of graphene. The functionalization of graphene will be done by using well-known chemical reactions.

Dr. V. Krishnan, Reader-F

The chemistry in my group will be interdisciplinary which includes inorganic, polymer and organic. My research focuses on the development of new synthetic routes for application in catalysis, and materials chemistry and fall into the following general areas viz., cooperative catalysts for CO_2 fixation, chiral counterions, hybrid inorganic-organic materials.

Dr. P.C. Ravikumar, Reader -F

He did his Ph.D from IISc Bangalore under the guidance of Prof. A. Srikrishna in the field of total synthesis of natural products. Subsequently after completing his Ph.D he moved to Duquesne University, Pittsburgh USA in the group of Prof. Fraser Fleming as a postdoctoral associate in 2007. He then moved to Yale University in the group of Prof. Seth Herzon in 2009. For a short period he worked as adjunct faculty in Duquesne University. In 2010 he returned back to India and joined as assistant professor at I.I.T. Mandi. In December 2015 he moved to NISER Bhubaneswar as Reader F, currently he is setting up his research lab in the school of chemical sciences and planning to work on the area of developing new CH activation methodologies and its application to synthesis of natural product targets.

Facilities created for Research and Teaching for the year

1)X and Q-band EPR

2)CHN Analyzer

3)Circular Dichroism instrument

Symposia:

·INSA Annual Meeting – 28.12.2016 to 30.12.2016

Awards and Honours:

1)Dr. C. Gunanathan received "ECRP Award-2016"

Publications

1 R. Surya Narayanan, V. Chandrasekhar* Molecular, 1D and 2D assemblies from hexkis(3-pyridyloxy)cyclophosphazene containing, 20-membered metallamacrocyclic motifs, Dalton Trans.2016, 2273 – 2283.

2 J. Goura, J. Brambleby, C. V. Topping, P. A. Goddard, R. Suriya Narayanan, A. Bar, V. Chandrasekhar, Heterometallictrinuclear {CoIII2LnIII}(Ln = Gd, Tb, Ho and Er) complexes in a bent geometry. Field- induced single- ion magnetic behavior of the ErIII and TbIII analogues, Dalton Trans. 2016, 9235-9249.

3 S. Kundu, N. Nagapradeep, B. Mohapatra, S. Biswas, S. Verma, V. Chandrasekhar, Organostannoxane- supported nucleobase arrays: synthesis and supramolecular structures of polymeric and molecular organotin complexes containing guanine, uracil and 2-aminopurineCrystEngComm 2016, 18, 4807-4817.

4 S. Biswas, S. Das, G. Rogez, V. Chandrasekhar, Hydrazone- Ligand- Based Homodinuclear Lanthanide Complexes: Synthesis, Structure, and MagnetismEur. J. Inorg. Chem. 2016, 2016, 3322-3329.

5 S. Biswas, J. Goura, S. Das, C. V. Topping, J. Brambleby, P. A. Goddard, V. Chandrasekhar, OctanuclearHeterobimetallic {Ni4Ln4}Assemblies Possessing Ln4 Square Grid [2 × 2] Motifs: Synthesis, Structure, and MagnetismInorg. Chem. 2016, 55,8422–8436.

6 S. Biswas, S. Das, S. Hossain, A. Bar, J-P. Sutter, V. Chandrasekhar, Tetranuclear Lanthanide(III) Complexes Containing a Square- Grid Core: Synthesis, Structure, and MagnetismEur. J. Inorg. Chem. 2016, 2016, 4683-4692.

7 A. Chakraborty, J. Goura, P. Bag, A. Bar, J-P. Sutter, V. Chandrasekhar, Windmill- shaped octanuclear ZnII4 /LnIII4 (LnIII = Dy, Tb, Ho) heterometallic ensembles supported by a tetraferrocene scaffoldDalton Trans. 2016, 17633-17643.

8 S. Biswas, S. Das, T. Gupta, S. Singh, M. Pissas, G. Rajaraman, V. Chandrasekhar, Observation of Slow Relaxation and Single- Molecule Toroidal Behavior in a Family of Butterfly- Shaped Ln4 ComplexesChem. Eur. J.2016, 22, 18532-18550.

9 D. Dhara, D. Mandal, A. Maiti, C. B. Yildiz, P. Kalita, N. Chrysochos, C. Schulzke, V. Chandrasekhar, A. Jana, Assembly of NHC-stabilized 2- hydrophosphasilenes from Si(IV) precursors: a Lewis acid- base complexDalton Trans. 2016, 19290-19298.

10 S. Biswas, P. Bag, S. Das, S. Kundu, J. van Leusen, P. Koegerler, V. Chandrasekhar, Heterometallic [Cu2Ln3] (Ln = DyIII, GdIII and HoIII) and [Cu4Ln2] (Ln = DyIII and HoIII) Compounds: Synthesis, Structure, and MagnetismEur. J. Inorg. Chem. 2017, 1129-1142.

11 S. Biswas, S. Das, J. Acharya, V. Kumar, J. van Leusen, P. Koegerler, J. M Herrera, E. Colacio, V. Chandrasekhar, HomometallicDyIII Complexes of Varying Nuclearity from 2 to 21: Synthesis, Structure, and MagnetismChem. Eur. J.2017, 23, 5154-5170.

12 Syntheses of Bipyricorroles and their meso-meso coupled dimers. B. Adinarayana, Ajesh P. Thomas, Pardhasaradhi Satha and A. Srinivasan. Org. Lett. 2017, 19, 1986-1989.

13 Smaragdyrins and Sapphyrins Analogues. T. Chatterjee, A. Srinivasan, M. Ravikanth and T. K. Chandrashekar. Chem. Rev. 2017, 117, 3329-3376.

14 Carbatriphyrin(3.11)-A distinct Coordination approach of BIII to generate organoborane and weak C-H...B interactions. B. Adinarayana, A. P. Thomas, P. Yadav, V. Mukundam, A. Srinivasan, Chem. Eur. J. 2017, 23, 2993-2997.

15 Guhathakurta, B.; Basu, P.; Purohit, C. S.; Bandyopadhyay, N.; Kumar, G. S.; Chowdhury, S.; Naskar, J. P., Synthesis, characterization, structure, DNA binding aspects and molecular docking study of a novel Schiff base ligand and its bis(μ-chloro) bridged Cu(II) dimer. Polyhedron 2017,126, 195-204.

16 Mal, S. K.; Chattopadhyay, T.; Fathima, A.; Purohit, C. S.; Kiran, M. S.; Nair, B. U.; Ghosh, R., Synthesis and structural characterization of a vanadium(V)-pyridylbenzimidazole complex: DNA binding and anticancer activity. Polyhedron 2017,126, 23-27.

17 Mal, S. K.; Mitra, M.; Yadav, H. R.; Purohit, C. S.; Choudhury, A. R.; Ghosh, R., Synthesis, crystal structure and catecholate activity of a vanadium(V) Schiff base complex. Polyhedron 2016,111, 118-122.

18 Satha, M. P.; Illa, M. G.; Ghosh, A.; Purohit, C. S., Guest-Induced, Self-Assembled Supramolecular Capsule: Effect of Guest and Counter Anions. ChemistrySelect 2016,1, 1630-1635.

19 Teja Illa, G.; Satha, P.; Purohit, C. S., Consecutive introduction of Ag(I) to an anionic homoleptic Co(III) complex: variable Ag(I) coordination mode. CrystEngComm 2016,18, 5512-5518.

20 Kisan, S.; Krishnakumar, V.; Gunanathan, C. Ruthenium-Catalyzed Anti-Markovnikov Selective Hydroboration of Olefins. ACS Catal. 2017, 7, 5950-5954.

21 Thiyagarajan, S.; Gunanathan, C. Facile Ruthenium(II)-Catalyzed α-Alkylation of Arylmethyl Nitriles Using Alcohols Enabled by Metal–Ligand Cooperation.ACS Catal. 2017, 7, 5483-5490.

22 Krishnakumar, V.; Chatterjee, B.; Gunanathan, C. Ruthenium-Catalyzed Urea Synthesis by N-H Activation of Amines. Inorg. Chem. 2017, 56, 7278–7284

23 Chatterjee, B.; Gunanathan, C. Ruthenium-Catalysed Multicomponent Synthesis of Borasiloxanes. Chem. Commun. 2017, 53, 2515 - 2518

24 Chatterjee, B.; Krishnakumar V.; Gunanathan, C. Selective α-Deuteration of Amines and Amino Acids Using D2O. Org. Lett. 2016, 18, 5892–5895

25 Kaithal, A.; Chatterjee, B.; Gunanathan, C. Ruthenium-Catalyzed Selective Hydroboration of Nitriles and Imines.J. Org. Chem. 2016, 81, 11153–11161

26 Kaithal, A.; Chatterjee, B.; Gunanathan,C. Ruthenium-Catalyzed Regioselective 1,4-Hydroboration of Pyridines. Org. Lett. 2016, 18, 3402-3405

27 "Spectroscopic Evidences for Strong Hydrogen Bonds with Selenomethionine in Proteins" V. Rao Mundlapati, Dipak Kumar Sahoo, Sanat Ghosh, Umesh Kumar Purame, Shubhant Pandey, Rudresh Acharya, Nitish Pal1, Prince Tiwari and Himansu S. Biswal* J. Phys. Chem. Lett. (2017), 8, 794

28 "Experimental and theoretical studies on the oxidation of lomefloxacin by alkaline permanganate" RM Kulkarni, MS Hanagadakar, RS Malladi and Himansu S. Biswal; Desalination and Water Treatment (2016), 57, 10826.

29 "Water exchange reaction of a manganese catalase mimic: oxygen-17 NMR relaxometry study on (aqua) manganese (III) in a salen scaffold and its reactions in a mildly basic med`ium" VR Mundlapati, P Jena, AN Acharya, AK Kar, AC Dash and Himansu S. Biswal* RSC Advances (2016), 6, 11739

30 "The Role of Molecular Polarizability in Designing Organic Piezoelectric Materials" AA Gagrai, VR Mundlapati, DK Sahoo, H Satapathy and Himansu S. Biswal* Chemistry Select (2016), 1, 4320

31 "Efficient SO2 Capture through Multiple Chalcogen Bonds, Sulfur Centered Hydrogen Bonds and S••• π Interactions: A Computational Study" DK Sahoo, VR Mundlapati, AA Gagrai and Himansu S. Biswal* Chemistry Select (2016), 1, 168

32 R. K. Tiwari, J. Kumar and J. N. Behera, The First Organically Templated Open-Framework Metal-Sulfites with Layered and Three-Dimensional Diamondoid Structures, Chem. Commun., 2016, 52, 1282 – 1285.

33 S, Bhowmick, S. Chakraborty, S. Marri, J. N. Behera, A. Das, and Das, Mixed Pyrazine/Pyridine Tectons: Synthesis, Self-Assembly and Conformational Selectivity in Host Guest Interaction, RSC Adv., 2016, 6, 8992 – 9001.

34 S. Rath, S. R. Marri, J. N. Behera and C. S. Rout, High Energy Density Supercapacitors based on Patronite/ Single Walled Carbon Nanotubes/Reduced Graphene Oxide Hybrids, Eur J. Inorg. Chem., 2016, 259-265.

35 S. Prabhakar, R. Gupta, J. N. Behera and F. Hussain, Sandwich type organic-inorganic hybrid of silicotungstates[{Cu2(1,10-phen)2(μ-CH3COO)2}Ln(α-SiW11O39)2]11 "{Ln = PrIII(1a), NdIII(2a), SmIII(3a), EuIII(4a), GdIII(5a) andDyIII(6a)}: Syntheses, crystal structures, photoluminescence and magnetic properties, Inorg. Chem. Commun., 2016, 72, 117.

36 S. R. Marri, J. Kumar, K. Panyarat, S. Horike and J. N. Behera, Kagome-type isostructural 3D-transition metal fluorosulfates with spin 3/2 and 1: Synthesis, Structure and Characterization, Dalton Trans., 2016, 45, 17792.

37 R. Gupta, S. Prabhakar, J. N. Behera and F. Hussain, Sandwich type organic-inorganic hybrid of 3d–4f heterometallic containing germanotungstates [{Cu2(1,10-phen)2(μ-CH3COO)2}Ln(α-GeW11O39)2]11 ": Syntheses, crystal structures, magnetic and photoluminescence properties, Inorg. Chem. Commun., 2016, 74, 72.

38 A. S. Singh, R. K. Tiwari, M. M. Lee, J. N. Behera, S.-S. Sun and V. Chandrashekhar, Structural Tuning of Anion Templated Motifs with External Stimuli Through Crystal-to-Crystal Transformation, Chem. Eur. J. 2017, 23, 762,

39 S. R. Marri, S. Mahana, D. Topwal and J. N. Behera, Synthesis and characterization of layered metal sulfates containing MII3(μ3 -OH/F)2(M = Mg, Co) diamond Chains, Dalton Trans., 2017, 46, 1105.

40 S. R. Marri, S. Rath, C. S. Rout and J. N. Behera, 3D cuboidal vanadium diselenide embedded reduced graphene oxide hybrid structures with enhanced supercapacitor properties, Chem. Commun., 2017, 53, 228.

41 S. Bhowmick, A. Jana, S. R. Marri, P. Gupta, J. N. Behera, B. B. Mandal, and N. Das, Pyrazine based Pt(II) bis-alkynyl organometallic complexes: synthesis, characterization, and cytotoxic effect on A549 human lung carcinoma cells,Appl Organometal Chem.,2017, (accepted, DOI: 10.1002/aoc.3824).

42 R. K. Tiwari and J. N. Behera, Organic-inorganic-organic hybrid three-dimensional metal sulphite-oxalate with honeycomb-like structures, Dalton Trans., 2017, 46, 5911.

43 P. Koya, K. Yerraguntla, S. Jettiboina, P. R. Rao and J. N. Behera, A dense I103 hybrid superhydrophobic network, exhibits selectivity towards CO2 gas sorption, Inorg. Chem., 2017, 56, (accepted).

44 K. Dhanunjayarao, V. Mukundam, Krishnan Venkatasubbaiah* Ratiometric sensing of fluoride anion through selective cleavage of Si-O bond, Sens. Actuators, B.2016, 232, 175 – 180.

45 K. Dhanunjayarao, V. Mukundam, Krishnan Venkatasubbaiah* Tetracoordinate Imidazole-Based Boron Complexes for the Selective Detection of Picric Acid, Inorg. Chem. 2016, 55, 11153–11159.

46 M. Ramesh, V. Mukundam, K. Dhanunjayarao, Krishnan Venkatasubbaiah* Cyclometalated Palladium Pre-catalyst for N-alkylation of Amines using Alcohols and Regioselective Alkylation of Sulfanilamide using Aryl Alcohols, Tetrahedron 2017, 73, 2225–2233.

47 V. Mukundam, K. Dhanunjayarao, S. Samal,

Krishnan Venkatasubbaiah*, Variation of para Substituent on 2-Phenol of Tetraaryl-Substituted Imidazole-Boron Difluoride Complexes: Synthesis,Characterization, and Photophysical Properties, Asian J. Org. Chem. 2017,6,1054–1062.

48 D. Majhi, A. Pabbathi and M. Sarkar, Probing the aggregation behavior of neat imidazolium-based alkyl Sulfate (alkyl= ethyl, butyl, hexyl and octyl) ionic liquids through time resolved fluorescence anisotropy, NMR and fluorescence correlation spectroscopy (FCS) study. J. Phys. Chem. B, 2016, 120, 193–205.

49 D. Majhi, P. K. Sahu, S. Seth and M. Sarkar, Probing interactions of structurally similar but chemically distinguishable organic solutes with 1-ethyl-3-methylimidazolium alkylsulfate(alkyl = ethyl, hexyl and octyl) ionic liquids through fluorescence, NMR and fluorescence correlation spectroscopy (FCS) study. Phys. Chem. Chem. Phys., 2016, 18, 22343-22354.

50 P. K. Sahu and M. Sarkar, Reorientational dynamics of charged and neutral solutes in 1-alkyl-3-methylimidazoilum bis(trifluoromethylsulfonyl)imide ionic liquids: Realization of ionic component of hydrogen bond. Chem. Phys. Lett., 2016, 652, 177–183.

51 S. S. Dandpat, P. K. Sahu and M. Sarkar, Studies on the mechanism of fluorescence quenching of CdS quantum dots by 2-amino-7-nitrofluorene and 2-(N,N-dimethylamino)-7-nitrofluorene. Chemistry Select, 2016, 1, 2290–2298.

52 P. K.Sahu, S. K.Das, and M. Sarkar, Studies on intramolecular electron transfer reaction in donor–spacer–acceptor systems in room-temperature ionic liquids. J. Mol. Liq. 2016, 214, 24 –31.

53 P. K. Sahu, R. Nanda, S. Seth, A. Ghosh and M. Sarkar, Nuclear magnetic resonance, fluorescence correlation spectroscopy and time-resolved fluorescence anisotropy studies of intermolecular interactions in bis(1-methyl-1H-imidazol-3-ium-3-yl)dihydroboratebis (trifluoromethylsulfonyl) amide and its mixtures with various cosolvents. Chem. Phys. Lett.2016, 661, 100-106.

54 S. K. Das, D. Majhi, P. K. Sahu and M. Sarkar, Linking diffusion-viscosity decoupling and jump dynamics in a hydroxyl-functionalized ionic liquid: Realization of microheterogeneous nature of the medium. Chem. Phys. Chem. 2017, 18, 198-207.

55 M. Z. K. Baig, D. Majhi, R. N. P. Tulichala, M. Sarkar and M. Chakravarty, Easy access to new anthracenyl π-conjugates: Generation of distinct AIE-active materials. J. Mater. Chem. C, 2017, 5, 2380-2387.

56 G. Jha, P. K. Sahu, S. Panda, D. V. Singh, S. Patole, H. Mohapatra, and M. Sarkar Synthesis, photophysical studies on some anthracene-based ionic liquids and their application as biofilm formation inhibitor. Chemistry Select, 2017, 2, 2426-2432

57 R. S. Dhale, P. K. Sahu, and M. Sarkar, Understanding the Microscopic Behavior of the Mixture of Ionic Liquid/Ethylene Glycol/Lithium Salt through Time-Resolved Fluorescence, Nuclear Magnetic Resonance (NMR), and Electron Paramagnetic Resonance (EPR) Studies. J. Phys. Chem. B, 2017, DOI: 10.1021/acs.jpcb.7b04585.

58 D. Majhi, and M. Sarkar, Probing the microscopic structural organization of neat ionic liquids (ILs) and ionic liquid-based gels through resonance energy transfer (RET) studies. Phys. Chem. Chem. Phys., 2017, DOI: 10.1039/C7CP04728B.

59 C. R. Gade, M. Dixit, Nagendra. K. Sharma* Dideoxy Nucleoside Triphosphate (ddNTP) Analogues:Synthesis and Polymerase Substrate Activities of Pyrrolidinyl Nucleoside Triphosphates (prNTPs). Bioorg. Med. Chem2016, 24, 4016.

60 C. Balachandra, Nagendra. K. Sharma* Novel fluorophores: Syntheses and photophysical

studies of Boron-aminotroponimines, Dyes and Pigments 2017, 137, 532.

61 PardhasaradhiSatha, Giriteja Illa, Arindam Ghosh and Chandra Shekhar Purohit*, Chemistry Select, 1, 1630 (2016)

62 Prabhat Kumar Sahu, Raju Nanda, Sudipta Seth, Arindam Ghosh, and Moloy Sarkar*,Chemical Physics Letters, 66, 100 (2016)

63 Somnath Koley, Manas Panda, Kiran Bharadwaj, and Subhadip Ghosh* Spectroscopic and Calorimetric Studies of Molecular Recognitions in a Dendrimer-Surfactant Complex Langmuir 2017, Invited Article (Accepted)

64 Somnath Koley and Subhadip Ghosh* Encapsulation and Residency of a Hydrophobic Dye within the Water Filled Interior of a PAMAM Dendrimer Molecule. J. Phys. Chem. B 2017, 121, 1930–1940

65 Somnath Koley and Subhadip Ghosh* A deeper insight to an intriguing acetonitrile-water binary mixture: synergistic effect, dynamic stokes shift, fluorescence correlation spectroscopy and NMR studies. Phys ChemChem Phys 2016, 18, 32308-32318

66 Somnath Koley and Subhadip Ghosh*; Study of electron transfer reactions in a dendrimaric assembly: a proper utilization of dendrimer fluorescence. Phys ChemChem Phys (Communication) 2016, 18, 24830-24834.

67 Somnath Koley, Manas Ranjan Panda, and Subhadip Ghosh*; Study of Diffusion Assisted Bimolecular Electron Transfer Reactions: CdSe/ZnS Core Shell Quantum Dot Acts as an Efficient Electron Donor as well as Acceptor. J. Phys. Chem. C 2016, 120, 13456-13465.

68 Insights into the structure and dynamics at the hexadecane droplet - water interface in the presence of 1-alkanols as emulsifiers: Molecular dynamics studies. Sourav Palchowdhury and B.L. Bhargava. Journal of Molecular Liquids 234, 249-259 (2017).

69 Glycine molecules in ionic liquid based reverse micelles: Investigation of structure and dynamics using molecular dynamics simulations.Sourav Palchowdhury and B.L. Bhargava.Journal of Molecular Liquids 230, 384-394 (2017)

70 Time-Dependent Density Functional Theoretical Investigation of Photoinduced Excited-State Intramolecular Dual Proton Transfer in Diformyl Dipyrromethanes R. Pradhan, A. K. Harshan, G. S. K. Chandrika, A. Srinivasan, and U. Lourderaj, J. Phys. Chem. A 120, 9894 (2016)

71 Ashish Bahuguna, Suneel Kumar, Vipul Sharma, KumbamLingeshwar Reddy, Kaustava Bhattacharyya, P. C. Ravikumar and Venkata Krishnan, Nanocomposite of MoS2-RGO as facile, heterogeneous, recyclable and highly efficient Green catalyst for one-pot synthesis of indole alkaloids, ACS Sustainable Chem. Eng., 2017 DOI: 10.1021/ acssuschemeng.7b00648

72 Reena Sharma, SonaMohammadi-Ostad-Kalayeh, Frank Stahl, Carsten Zeilinger, Gerald Drager, Andreas Kirschning, P. C. Ravikumar, Two new labdane diterpenoids and one new β-lactam from the aerial parts of Royleacinerea, Phytochemistry Letters, 2017, 19, 101.

73 Ashish Bahuguna, Reena Sharma, Prateep Singh Sagara and P. C. Ravikumar, Exploration of aberrant behavior of Grignard reagents with Indole 3- carboxaldehyde: Application to synthesis of natural products, Turbomycin B and Vibrindole A derivatives, Synlett, 2017, 28, 117.

74 Vivek Kumar Mishra, P. C. Ravikumar and Martin E. Maier, Formal Total Synthesis of Amphidinolide Q, J. Org. Chem., 2016, 81 , 9728.

75 Vivek Kumar Mishra, Ponneri C. Ravikumar and Martin E. Maier, C–H-Activation approach towards the core structure of the alkaloid g-lycorane. Tetrahedron, 2016, 72, 6499.

76 Catalytic selective deuteration of halo(hetero)arenes, ManojkumarJanni and S. Peruncheralathan, Org. Biomol. Chem., 2016, 14, 3091-3097.

77 Double Heteroannulation of S,N-acetals: a Facile Access to Quinolone Derivatives, ManojkumarJanni, Sahil Arora and S. Peruncheralathan, Org. Biomol. Chem., 2016, 14, 8781-8788.

78 Copper Catalyzed Chemoselective Ullmann Coupling at Room Temperature: A Facile Access to 2-Aminobenzo[b]thiophenes, ManojkumarJanni, Sahil Arora and S. Peruncheralathan, Chem.Commun. 2017, 53, 8439-8442.

79 S. Maiti and P. Mal, Dehydrogenative Aromatic Ring Fusion for Carbazole Synthesis via C–C/C–N Bond Formation and Alkyl Migration, Org. Lett., 2017, 19, 2454-2457.

80 S. Maiti, T. K. Achar and P. Mal, An Organic Intermolecular Dehydrogenative Annulation Reaction, Org. Lett., 2017, 19, 2006-2009.

81 K. Chowdhuri, T. Achar and P. Mal, Iodine Triggered Aerobic Oxysulfonylation of Styrenes, Adv. Synth. Catal., 2017, In Press, 10.1002/adsc.201700772.

82 T. K. Achar, P. K. Sahoo and P. Mal, Cation-π Assisted Synthesis of Alkyl Aryl Ethers via C-CN Functionalization of 1,2-Dicyano Pyrazines, ChemistrySelect, 2017, 2, 1944-1949.

83 T. K. Achar, A. Bose and P. Mal, Mechanochemical Synthesis of Small Organic Molecules, Beilstein J. Org. Chem., 2017, 13, Accepted Manuscript.

84 P. K. Sahoo, C. Giri, T. S. Haldar, R. Puttreddy, K. Rissanen and P. Mal, Mechanochemical Synthesis, Photophysical Properties, and X-ray Structures of N-Heteroacenes, Eur. J. Org. Chem., 2016, 1283-1291.

85 C. Giri, P. K. Sahoo, K. Rissanen and P. Mal, Capturing Hydrophobic Trifluoroiodomethane in Water into an M4L6 Cage, Eur. J. Inorg. Chem., 2016, 4964-4967.

86 B. N. Ghosh, M. Lahtinen, E. Kalenius, P. Mal and K. Rissanen, 2,22 :62 ,23 -Terpyridine Trimethylplatinum(IV) Iodide Complexes as Bifunctional Halogen Bond Acceptors, Cryst. Growth Des., 2016, 16, 2527-2534.

87 T. K. Achar, S. Maiti and P. Mal, PIDA-I2 mediated direct vicinal difunctionalization of olefins: iodoazidation, iodoetherification and iodoacyloxylation, Org. Biomol. Chem., 2016, 14, 4654–4663.

88 IsovalentAgIII/AgIII, AgII/AgII and Mixed-valent AgII/AgIII in ??????Linked [Bis{corrolato-silver}]n Complexes. Bratati Patra, Sebastian Sobottka,Woormileela Sinha, Biprajit Sarkar, and SanjibKar Chemistry-A European Journal 2017.

89 Grignard Reagent Mediated Demetallation of Silver Corrole Complexes. Patra, Bratati, Sajal Kumar Patra, Payel Mukherjee, Yogesh Kumar Maurya, Woormileela Sinha, and SanjibKar. European Journal of Inorganic Chemistry17. 2363-2368, 2017.

90 Ruthenium–Ruthenium Bonded [Bis {corrolato ruthenium (III)}] n (n= 0,+ 1," 1) Complexes: Model Compounds for the Photosynthetic Special Pair. Sinha, Woormileela, Michael G. Sommer, Lara Hettmanczyk, Bratati Patra, VasileiosFilippou, Biprajit Sarkar, and SanjibKar. Chemistry-A European Journal 23. 2396-2368, 2017.

91 Structural, electrochemical and spectroelectrochemical study on the geometric and electronic structures of [(corrolato) Au III] n (n= 0,+ 1," 1) complexes Sinha, Woormileela, Michael G. Sommer, Margarethe van der Meer, Sebastian Plebst, Biprajit Sarkar, and SanjibKar. Dalton Transactions, 45, 2914-2923, 2016.

92 Tanmay Bhowmik, Manas Kumar Kundu, and Sudip Barman*, ACS Catalysis., 2016, 6,1929–1941

93 Tanmay Bhowmik, Manas Kumar Kundu, and Sudip Barman*, ACS Appl. Mater. Interfaces, 2016, 8, 28678–28688

94 Tanmay Bhowmik, Manas Kumar Kundu, and Sudip Barman*, International journal of

hydrogen energy 2016 41,14768 -14777

95 Tanmay Bhowmik, Manas Kumar Kundu, and Sudip Barman*, International journal of hydrogen energy, 2017, 42, 212 -217

96 Mriganka Sadhukhan, Manas Kumar Kundu, Tanmay Bhowmik, and Sudip Barman*, International journal of hydrogen energy 2017,42, 9371-9383.

97 A. Baishya, L. Kumar, M. Kr. Barman, H. S. Biswal and S. Nembenna* N- Heterocyclic carbene-carbodiimide ("NHC-CDI") adduct or zwitterionic type neutral amidinate supported Mg(II) and Zn(II) complexes Inorg. Chem. 2017, 56, 9535-9546

98 A. Baishya, T. Peddarao and S. Nembenna* Organomagnesium amide catalyzed cross-dehydrocoupling of organosilanes with amines Dalton Trans.201746(18) 5880-5887

99 M. Kr. Barman, A. Baishya, and S. Nembenna* Magnesium amide catalysed selective hydroboration of esters Dalton Trans.2017, 46, 4152-4156

100 V. K. Jakhar, M. Kr. Barman and S. Nembenna* Soluble aluminium monohydride catalysed selective hydroboration of carbonyl compounds Org. Lett. 2016, 18(18), 4710-4713

101 T. Peddarao, A. Baishya. M. Kr. Barman, A. Kumar and S. Nembenna* Metal free access of N,N'-diarylcarbodiimides and their reduction: FormamidinesNewJ. Chem.2016, 40, 7627 - 7636.

102 M. Kr. Barman, A. K. Sinha and S. Nembenna* An efficient and recyclable thiourea-supported copper(I) chloride catalyst for azide–alkyne cycloaddition reactions Green Chem., 2016, 18, 2534-2541

103 M. Kr. Barman and S. Nembenna* Mixed guanidinato-amidoGe(IV) and Sn(IV) complexes with Ge=E (E = S, Se) double bond and SnS4, Sn2Se2 rings RSC Adv.2016, 6, 338-345.

104 A. Baishya. L. Kumar, M. Kr. Barman, T. Peddarao, and S. Nembenna* Air Stable N-Heterocyclic Carbene-Carbodiimide ("NHC-CDI") Adducts: Zwitterionic Type Bulky AmidinatesChemistrySelect2016, 3, 498-503.

List of Conferences and Seminars attended

1. Title: CTC based Molecular Capsules: Synthesis and Characterization.
   Conference on : "Recent Trends in Chemical Sciences" (RETICS-2017) at Jyotivihar burla during 22-23 March, 2017.(Dr.C .S. Purohit)
2. Inter-IISER Chemistry Meet - 2017 (IICM - 2017), IISER Bhopal, Jan' 20-22, 2017.(Dr.C. Gunanathan)
3. INSA Anniversary General Meeting, NISER Bhubaneswar, December 28, 2016. (Dr.C. Gunanathan) (Dr.C. Gunanathan)
4. School of Chemistry, University of Hyderabad, July 20, 2016. (Dr.C. Gunanathan)
5. "Sulfur Centered Hydrogen Bond (SCHB): Spectroscopy Meets Theory" June 23-25, 2016, "EVB-2016" Uppsala University, SWEDEN (Dr.Himansu S. Biswal)
6. "Novel Non-covalent Interactions in Biomolecules" Jan-12, 2017, Centurion University, INDIA(Dr.Himansu S. Biswal)
7. "Noncovalent Interactions with Sulfur/Selenium where Electronegativity Retires (NISER)" February 16-19, 2017, "SDMC-2017" Pondicherry, INDIA(Dr.Himansu S. Biswal)
8. "Mass Resolved Laser Spectroscopy of Peptides and Its Implication in Drug Discovery" March 03-05, 2017, Berhampur University, INDIA(Dr.Himansu S. Biswal)
9. "Advancing the Frontiers of (Bio)Chemistry with Valence Bond Approaches-2016", June 23-25, 2016, Uppsala University, SWEDEN. (Dr.Himansu S. Biswal)

10. "30th Annual Conference of Orissa Chemical society", KIIT University, Bhubaneswar, Odisha. (Dr.Himansu S. Biswal)
11. Spectroscopy and Dynamics of Molecules and Clusters (SDMC- 2017), February 16-19, 2017; RKN Beach Resorts, Pondicherry, India. (Dr.Himansu S. Biswal)
12. "Recent Trends of Chemical & Bilological Sciences in Medicine, Natural Product and Drug Discovery", March 03-05, 2017, Berhampur University, Odisha. (Dr.Himansu S. Biswal)
13. "Peptides and Proteins", 09-10-2016; "Chemistry Olympiad" Ravenshaw University, Cuttack. (Dr.Himansu S. Biswal)
14. "Hands on Experience in Computational Chemistry", 26-10-2016; "Faculty Development Program" CET, Bhubaneswar. (Dr.Himansu S. Biswal)
15. "Quantum Chemistry and Spectroscopy: Carrots are Orange but Tomatoes are Red", 10-03-2017; Utkal University, Bhubaneswar. (Dr.Himansu S. Biswal)
16. Vanadium Chalcogenides/RGO hybrids for supercapacitor application, "Development of Nanomaterials for Energy, Environment and Sustainability"/DNEES-2016, ITER, SOA University, Bhubaneswar(Dr. Jogendra Nath Behera)
17. High Energy Supercapacitors based on Vanadium Chalcogenides-RGO/CNTs Hybrids, Inter-IISER Chemistry Meet 2017 (IICM 2017)'/IISER, Bhopal(Dr. Jogendra Nath Behera)
18. Hybrid Materials for Clean Energy Applications, March, 18, 2017, ITER, SOA University, Bhubaneswar(Dr. Jogendra Nath Behera)
19. Krishnan Venkatasubbaiah, Imidazole and Pyrazole based Boron Compounds: Synthesis, Characterization and Photophysical Properties (IMEBORON XVI), The Chinese University of Hong Kong, July, 9-13th 2017. (Dr.V.Krishnan)
20. Invited Talk"SOA University, Bhubaneswar, Orissa, August, 2016). "Understanding the behavior of some liquid and solid materials through fluorescence". (Dr.Moloy Sarkar)
21. In Indo-Japan Meeting at IIT Kanpur, Nov-2016. "Studies on Solute and Solvent Dynamics in Some Monocationic and Dicationic Room-Temperature Ionic Liquids". (Dr.Moloy Sarkar)
22. In Inter IISER-NISER Chemsitry Meet, January, 2017, IISER, Bhopal. "understanding the behavior of dicationic room-temperature ionic liquids through fluorescence and NMR studies". (Dr.Moloy Sarkar)
23. Self assembly of cations in aqueous ionic surfactant solutions.. Theoretical Chemistry Smyposium, December 2017, Hyderabad, India. (Dr. B.L. Bhargava)
24. Spectroscopy and Dynamics of Molecules and Clusters, Puducherry, February 2017 (Dr.U. Lourderaj)
25. International Conference on Molecular Energy Transfer in Complex Systems, Innsbruck, Austria, January 2017(Dr.U. Lourderaj)
26. Kaleidoscope 2016, July 5-8, 2017, International Centre Goa. Soft Force Relay in Organic Synthesis (Dr.Prasenjit Mal)
27. NCL Pune, 06 June 2017. Soft ForceRelay in Organic C-N Bond Synthesis (Dr.Prasenjit Mal)
28. RDOAC-2017 at KIIT Bhubaneswar 18 March, 2017 Soft Force Relay in Organic C-N Bond Synthesis(Dr.Prasenjit Mal)
29. RDSC-2017 at Dibrugarh University, Assam, March 10-11, 2017 Soft Force Relay in Organic Synthesis(Dr.Prasenjit Mal)
30. NIT Rourkela, 13 May 2016 Enabling Non-conventional Pathway for Organic Synthesis (Dr.Prasenjit Mal)
31. Kaleidoscope 2016, July 13-17, 2016, International Centre Goa. Enabling Non-conventional Pathway for Organic Synthesis (Dr.Prasenjit Mal)
32. Inter-IISER Chemistry meet 2017 Organized by IISER Bhopal Jan-20-22, 2017 Title: Main Group Catalysis: Molecular Compounds for Organic Transformations (Dr. Sharanappa Nembenna)

School of Earth and Planetary Sciences

Research Activity

Response of a coastal tropical pelagic microbial community to changed salinity and temperature

Studies on the responses of tropical microbial communities to changing hydrographic conditions are presently poorly represented. Our mesocosm experiments, conducted jointly with Universities of Gothenburg and Kristianstad, Sweden and the College of Fisheries, Karnataka, yielded the following results. A mesocosm study was conducted in southwest (SW) coastal India to investigate how changes in temperature and salinity will affect a tropical microbial community. The onset of algal and bacterial blooms, the maximum production and biomass, and the interrelation between phytoplankton and bacteria was studied in replicated mesocosms. The treatments were set up featuring ambient control (28 °C, 35 PSU), decreased salinity (31 PSU), increased temperature (31 °C) and a double stressed treatment with increased temperature and decreased salinity (31 °C, 31 PSU). The reduced salinity treatment had the most considerable influence manifested as significantly lower primary production, and the most dissimilar phytoplankton species community. The increased temperature acted as a positive catalyst in the double manipulated treatment, and higher primary production was maintained in this treatment. We investigated the dynamics of the microbial community with a structural equation model approach, and found a significant interrelation between phytoplankton and bacterial biomass. Using thismethodology it became evident that direct and indirect effects influence the different compartments of the microbial loop. In the face of climate change, we conclude that in relatively nutrient replete environments, such as the tropical coastal zones, nutrient assimilation is dependent on salinity and temperature and will have significant effects on the quantity and the character of microbial biomass and production. This work was done in collaboration with Fisheries College, Mangalore and University of Gothenburg, Sweden.

Wind Strength Variability in the Western Arabian Sea since the Last Glacial Maximum: Southwest vs. Northeast Monsoon Modes

Both the southwest monsoon (SWM) and the northeast monsoon (NEM) winds are responsible for the variations in the biological productivity in the western Arabian Sea (WAS), as recorded in the Arabian Sea sedimentary planktic foraminiferal record. While earlier studies from this region ascribe the total observed variability predominantly to SWM, here we attempt to differentiate between the two monsoons based on the relative abundances of depth stratified planktic foraminifera assemblages. We observe a number of intervals of enhanced SWM. The first intensification (SWMI-I) occurred during ~16 to 12 ka and is possibly an outcome of early deglacial melting and stepwise increase in SWM strength after the end of the last glacial maximum (LGM). The second intensification (SWMI-II) is recorded at around ~10 ka, after the gradual strengthening from the end of the Younger Dryas cold episode. The last interval of intensification (SWMI-III) occurred around (~8.2 to 7.8 ka). In addition, there are two intervals of enhanced NEM: NEMI-I at around 19 to 17 ka and NEMI-II (~8.0 to 5.4 ka). These intervals of two enhanced NEM and three SWM wind strengths are bridged by decline in the SWM at different intervals, such as SWMD-I (~17 to 16 ka), SWMD-II (~12 to 11 ka) and SWMD-III (9.7 ka to 8.2 ka). This work was done in collaboration with University of Delhi.

Publications

1. Kiran Kumar. P., Singh. A., Ramesh. R., Nallathambi. T. (2017). N2 fixation in the EasternArabian Sea: Probable Role of Heterotrophic Diazotrophs. Frontiers in Marine Science. Doi:10.3389/fmars.2017.00080.
2. Sandeep, K., Shankar, R., Warrier, A.K., Yadava, M.G., Ramesh, R., Jani, R.A., Weijian, Z., Zuefeng, L., 2017, A multiproxy record of Indian summer monsoon variability during the Holocene in Southern India, Paleogeog., Palaeoclimatol., Palaeoecol., 476:1-14
3. Gurpreet Kaur-Kahlon, Sanjeev Kumar, Ann-Sofi Rehnstam-Holm, Ashwin Rai, P.S. Bhavya, Lars Edler, Arvind Singh, BjörnAndersson, Indrani Karunasagar, Rengaswamy Ramesh, Anna Godhe, 2017, Response of a coastal tropical pelagic microbial community to changed salinity and temperature, Aquatic Microbial Ecology, A 1785, DOI:10.3354/ame01785.
4. Ramesh, R., Borgaonkar, H., Band, S. and Yadava, M.G. (2017) Proxy climatic records of past monsoon, in: (M. N. Rajeevan and S. Nayak, eds.) Observed climate variability and Change over the Indian region, Springer, Singapore,pp.271-284.
5. Ramesh, R. and Singh, A. 2017. Applications of nitrogen and carbon isotopes in Oceanography, IANCAS Bullettin,17,51-51.

Invited Talks

R. Ramesh

1. Invited talk at the "National Workshop on Climate Change Impact on the marine environment-CCMIE 17" at The Bharathidasan University, Tiruchirappalli, 2-3 Feb. 2017
2. Invited talk at the "International Brainstorming Session and Workhop on Quaternary Environments and Climate: Focus on Holocene and Anthropocene" at the Birbal Sahni Institute of Plaeosciences, Lucknow, 21-23 Feb 2017.

Recognitions

R. Ramesh

1 Member, Research Advisory Council, NGRI, Hyderabad

2 Chairman, Research Advisory Council, CMLRE, Kochi

3 Conferred with National J.C. Bose Fellowship.

School of Mathematical Sciences

Dr. Varadharajan Muruganandam, Professor

Fourier Algebra and Fourier-Stieltjes Algebra: I am generally interested in the study of a Fourier algebra and Fourier-Stieltjes algebra of a locally compact group G. They are commutative Banach algebras and can be identified with the predual of the Von-Neumann algebra of the group and the dual of C*-algebra of G respectively. If the group G is amenable, then the space of multipliers of A (G) can be identified with B(G). In 1989, there appeared a path-breaking paper due to Cowling and Haagerup (M. Cowling and U. Haagerup, Completely bounded multipliers of the Fourier algebra of a simple Lie group of real rank one, Invent. Math. 96 (1989), 507-549) which connects operator algebras and multipliers of A (G); and creates certain exotic invariants called Haagerup constants. I gave a simpler proof of their work. Encouraged by this paper, Eymard suggested me to look into the Fourier algebras of hypergroups.

Besides, there is a general problem in this field which reads as follows: For every $\lambda \geq 1$, does there exist a von-Neumann algebra Γ such that $\lambda(\Gamma) = \lambda$? I am fascinated by this problem. I am exploring the possibility of having the von-Neumann algebras associated to hypergroups. As there is much to be done in the context of Fourier algebras of hypergroups, I initiated the study of Fourier algebras of hypergroups with particular reference to Fourier-Jacobi algebras which turn out to be Fourier algebras of Gelfand-pairs associated to simple Lie groups of rank one for some discrete parameters.

There is a long way to go and my current concern is to study the amenability of hypergroups on one hand and Fourier algebras of hypergroups that arise from H-type groups on the other hand.

Dr. Anil Kumar Karn, Associate Professor

Order structure of C*-algebra: I am interested in the study of the order structure of a C*-algebra. Let us recall that the self-adjoint part of a C*-algebra may be characterized by as an abstract-M space. (An abstract-M space is a Banach lattice with some additional properties.) Further, we note that the self-adjoint part of a non-commutative C*-algebra (for example: B(H), dim(H) $\geq$ 2) is not a Banach lattice. However, a `non-commutative' lattice-type structure can be `seen' in the self-adjoint part of a non-commutative C*-algebra. This structure is a lattice if and only if the $C*-algebra is commutative. I am very close to find an abstract characterization of this structure. As soon as this gap is filled, a non-commutative Banach latice theory may be proposed. This programme may lead to an abstract order theoretic characterization of a non-commutative C*-algebra. Not to mention seperately that this programme uses heavily the theory of matrix ordered spaces.

Dr. Deepak Kumar Dalai, Reader-F

Algebraic Attacks and Algebraic Immunity of Stream ciphers: Cryptology is the science of secure communications where Mathematical techniques are used to hide the information for secure communication. Stream Cipher is one of the class of techniques. Algebraic attack is one of the cryptanalysis of all techniques which is very effective in the case of stream cipher. Algebraic Immunity (AI) is a cryptographic term which measures the strength of a cipher (technique) against algebraic attack. In this research topic, we study the AI of different stream ciphers and find different ways to implement algebraic attacks on stream ciphers.

Dr. Sanjay Parui, Reader-F

My research interest includes Harmonic Analysis on Euclidean spaces and Heisenberg group. I am now

working on problems related to Dunkl transform on Euclidean spaces. Dunkl transform is a generalization of Fourier transform. We don't have explicit formula for Dunkl kernel and very little is known for translation operator. I am planning to develop Littlewood Paley g function theory for Dunkl Hermite operator which may lead to multiplier theory for Dunkl Hermite operator. I am interested in establishing L^p, L^q mapping property for wave operators related to Dunkl and Dunkl Hermite Operator.

Dr. Amit Tripathi, Assistant Professor

My research interest lies in the subject of complex algebraic geometry. More specifically, I study vector bundles over hypersurfaces in complex projective space. I study them from the point of view of finding cohomological obstructions to splitting a bundle into direct sum of line bundles as well as conditions for extending it over the ambient projective space. In algebraic geometry, the study of vector bundles over projective space and its subvarieties is a theme which can be classified into following (by no means exhaustive) list of major open ended problems:

1) Moduli space problem: Giving a "geometrical" structure to the set of vector bundles with certain fixed invariants?
2) Splitting problem: Finding to what extend vector bundles on projective space or its sub varieties behave like line bundles?
3) Extendibility: Finding under what conditions does a bundle on a sub variety of $\p^n$ comes from restriction of bundle on $\p^n$ itself.
4) Construction of new bundles:How to construct nontrivial vector bundles of specific rank (> 1) on projective space?
5) Relation between bundles and subvarieties: What does the existence of a nontrivial vector bundle reveals about the geometry of that variety?

Each of the above question has been studied extensively over last few decades and though progress has been made, vector bundles (even of rank 2!) are very much mysterious objects over varieties as simple as P^n. So far I have been interested in the problems (2) and (3) above.

Dr. Shyamal Krishna De, Assistant Professor

My research interests involve two areas, namely multiple hypothesis testing for sequentially collected data and multistage or purely sequential methods of estimation. For testing simple versus simple and some special types of composite hypotheses, I have been developing stopping and decision rules such that desired error rates such as Generalized Family wise Error Rates (GFWER) and tail probabilities of False Discovery Proportion (FDP) and False Non-discovery Proportions (FNP) are controlled at pre-specified levels keeping the expected sample size as low as possible. I am interested in developing sequential procedures for testing multiple composite hypotheses that can control both False Discovery Rate (FDR) and False Non-discovery Rate (FNR) at some prescribed levels. In another direction of sequential multiple testing, I plan to develop methodologies for discriminating between two or more distributions controlling the probabilities of misclassification at some desired level.

In the area of sequential estimation, my interest is to develop the theory and methodology for fixed width, fixed accuracy, fixed proportional closeness, and bounded length interval estimation of certain parameters of interest such that attained coverage probabilities are nearly the same as the prescribed level. In a non-parametric setting, I am also interested to develop sequential and multistage procedures for minimum risk point estimation and bounded-length interval estimation of Gini index which is considered to be the most widely used measure of economic inequality.

Dr. Manas Ranjan Sahoo, Assistant Professor

Systems of conservation laws which are not strictly hyperbolic appear in many physical applications. Generally solution space for such systems are not the usual space of the function of bounded variations. Here solution may be general distributions. Since the product of distributions appears, it is difficult to define a proper notion of solution for this case. Such kind of difficulty arises in the models like large scale structure formation of the universe, zero pressure gas dynamic system, etc. The aim is to define a proper notion of solution and get well-poesedness results of such systems. On the other hand it is important to understand the structure and the large time behavior of the solution.

Dr. Vellat Krishna Kumar, Visiting Professor

Retired from the University of Calicut in 2008 as Professor of Mathematics.

M Sc & Ph D in Mathematics from IIT, Madras in 1969 & 1973 respectively.

Post Doctoral at University of Dundee, Scotland, UK, (1973 - 75) and at Technical University, Darmstadt, Germany, (1980-81).

Dr. Kamal Lochan Patra, Reader-F

Laplacian Spectrum of Graphs: The Laplacian is an important matrix associated with a graph, and the Laplacian spectrum is the spectrum of this matrix. The Laplacian eigenvalues have found numerous applications in various fields. Specially, the second smallest and the largest eigenvalues are used in theoretical chemistry, combinatorial optimization and communication networks. I work on the relationship between the structural properties of a graph and its Laplacian spectrum.

Dr. Sarath Sasi, Assistant Professor

Research Interest:

My primary area of research is nonlinear boundary value problems. Currently my work is focused on two topics in quasilinear elliptic partial differential equations:

- The structure of the second eigenfunctions of the p-Laplacian on a ball,
- Quasilinear elliptic problems in the exterior domain.

Recently we have been looking at an optimization problem on the placement of an obstacle in a ball so as to maximize the first eigenvalue of the p-Lapace operator.

I am also interested in spatial ecology. I have worked on some reaction-diffusion models that have been used to analyze the existence of alternate stable states in ecosystems

Dr. Nabin Kumar Jana, Assistant Professor

Disordered systems pops up quite often in physics (spin glass), biology (artificial neural network), social sciences (matching) and many other places. To analyze, usually these systems are identified with the stochastic models. My main research interest is on the application of probabilistic tools to analyze these stochastic models.

Dr. Sanjay Parui, Reader-F

I work on Harmonic Analysis on Euclidean Spaces and Heisenberg Groups. At present my research interest is Spherical harmonics, Hermite and Laguere expansion and Dunkl Transform.

Dr. Binod Kumar Sahoo, Reader-F

I work on the problem of existence of representations of incidence geometries possibly in nonabelian groups. This helps us to look for the possibility of constructing new geometries and giving new constructions to know geometries. I also work on the study of minimum size blocking sets in projective spaces with respect to varying sets of lines.

Dr. Brundaban Sahu, Reader-F

Supercongruences - The numbers which occur in Apéry's proof of the irrationality of ζ(2) and ζ(3) have many interesting congruence properties. Work started with F. Beukers and D. Zagier, then extended by G. Almkvist, W. Zudilin and S. Cooper recently has complemented the Apéry numbers with set of sequences known as Apéry-like numbers which share many of the remarkable properties of the Apéry numbers. We study supercongruences properties of Apéry-like numbers.

Differential Operators - There are many interesting connections between differential operates and modular forms. Using Rankin-Cohen type differential operators on Jacobi forms/Siegel modular forms, we study certain arithmetic of Fourier coefficients.

Convolution sums and applications - We compute convolution sums of divisor function using the theory of modular forms and quasi modular forms and apply those to find number of representations of an integer by certain quadratic forms.

Dr. Tanusree Khandai, Visiting Professor

I am interested in the representation theory of infinite dimensional Lie algebras. Specifically, I work on the integral representations of the toroidal Lie algebras which are generalizations of the affine Kac-Moody Lie algebras.

In the past I have looked into finite dimensional as well as the graded integrable representations of multiloop Lie algebras. Since toroidal Lie algebras are universal central extensions of multiloop Lie algebras, representations of the graded multiloop Lie algebras can also be thought of as level zero representations of the toroidal Lie algebras. In the case when the centre acts non-trivially, S. Eswara Rao classified the irreducible integrable representations of the toroidal Lie algebra which have finite dimensional weight spaces. It has however been observed that the category of such representations is not completely reducible. Hence it is interesting to look at the homological properties of this category.

Dr. Ashwin S. Pande, Visiting Professor

I am trying to find some more examples on the application of Topological Stacks to Topological T-duality. I am also trying to complete a work on the crossed product by R of a certain class of C*-algebras proposed by Dadarlat and Pennig.

Departmental Seminars

- Dr. Kuntal Banerjee, Harish-Chandra Research Institute, Allahabad: "Circle homeomorphisms, Arnold tongues and Herman rings" on April 2, 2014
- Dr. Shanta Laishram, Indian Statistical Institute, Delhi: "Powers in products of terms of Pell's and Pell-Lucas Sequences" on April 7, 2014
- Mr. Subham Giridhar, SMS, NISER, Bhuaneswar: "Elementary Number Theory" on August 4, 2014
- Prof. Shalabh, Department of Mathematics & Statistics, Indian Institute of Technology, Kanpur: "Measurement Error Models - An Introduction" on August 7, 2014
- Mr. S Bibek Sankar, SMS, NISER, Bhubaneswar: "Exploring Chaos" on August 11, 2014
- Professor S. G. Dani, TIFR-Mumbai and IIT Bombay: "Lattice points in regions of the plane and spaces of higher dimension" on August 22, 2014
- Ms. G. Priyanga, SMS, NISER, Bhubaneswar: "Mathematical Modeling" on August 25, 2014
- Dr. Mahabir Prasad Jhanwar, University of Calgary, Canada: "Cryptographic Accumulators using Lattices" on September 1, 2014
- Mr. Abhash Kumar Jha, SMS, NISER,

Bhubaneswar: "The Stone-Čech Compacti cation" on September 8, 2014

- Dr. Ghurumuruhan Ganesan, EPFL, Lausanne: "Infection Spread and Stability in Random Graphs" on September 9, 2014
- Prof. Parashar Mohanti, Department of Mathematics & Statistics, Indian Institute of Technology, Kanpur: "Compleletely bounded multipliers on L^p" on September 10, 2014
- Dr. Tanusree Khandai, SMS, NISER, Bhubaneswar: "Integrable representations of Multiloop Lie algebras of type A_1" on September 11, 2014
- Dr. Rahul Garg, Israel Institute of Technology, Haifa, Israel: "The lattice point counting problem on the Heisenberg groups" on October 10, 2014
- Dr. Jaban Meher, IISC, Bangalore: "Product of eigen forms" on October 13, 2014
- Dr. Suchismita Das: "How to measure uncertainty in the weighted lifetime distribution" on October 15, 2014
- Ms. Rajula Srivastava, SMS, NISER, Bhubaneswar: "Tree t spanners in 2 connected outerplanar graph" on October 20, 2014
- Mr. Abhash Kumar Jha, SMS, NISER, Bhubaneswar: "Adjoint of some linear maps on the space of Jacobi cusp forms" on October 27, 2014
- Ms. Moni Kumari, SMS, NISER, Bhubaneswar: "Euler's famous prime generating polynomial" on November 3, 2014
- Prof. B. Ramakrishnan, HRI, Allahabad: "Representations of integers as sums of squares" on November 10, 2014
- Prof. Debasis Kundu, Department of Mathematics & Statistics, Indian Institute of Technology, Kanpur: "A Journey Beyond Normality" on November 17, 2014
- Prof. Debasis Kundu, Department of Mathematics & Statistics, Indian Institute of Technology, Kanpur: "Analyzing Periodic Data: Statistical Perspectives" on November 20, 2014
- Dr. Safdar Quddus, SMS, NISER, Bhubaneswar: "Noncommutative Toroidal SL(2,Z) Orbifold" on November 21, 2014
- Prof. Kailash C. Misra, North Carolina State University, Raleigh, North Carolina, USA: "Lie algebras and Combinatorial Identities" on December 1, 2014
- Dr. Pinaki Sarkar: "Key Pre-Distribution Schemes In Wireless Sensor Network Security" on January 2, 2015
- Dr. Sarath Sasi, SMS, NISER, Bhubaneswar: "Weighted Eigenvalue Problem in the Exterior Domain" on January 5, 2015
- Dr. Pritam Ghosh: "Dynamics of outer automorphisms of free groups" on January 12, 2015
- Mr. Gaurish Korpal, SMS, NISER, Bhubaneswar: "Celebrating 110th birthday of D. R. Kaprekar" on January 15, 2015
- Dr. Atish Sahu, Nagaland University SASRD, Medziphema: "Construction of Neighbor Balanced designs" on January 16, 2015
- Ms. Moni Kumari, SMS, NISER, Bhubaneswar: "L-functions" on January 27, 2015
- Prof. A. Sankaranarayanan, TIFR, Mumbai: "Riemann zeta-function and its influence on a problem of Srinivasa Ramanujan" on January 28, 2015
- Mr. Anoop V. P., SMS, NISER, Bhubaneswar: "Hardy-Littlewood Maximal Functions on Sphere" on January 29, 2015
- Dr. Sudeshna Basu, George Washington University, USA: "Stability of ball properties in Banach spaces" on February 2, 2015
- Mr. Anindya Ghatak, SMS, NISER, Bhubaneswar: "Order theoretic properties in C*-algebra and its generalization" on February 3, 2015

- Dr. Gautam Borisagar, Zakir Husain Delhi College: "Iwahori-Hekce model for supersingular representation for GL_2(Q_p)" on February 5, 2015
- Dr. B. G. Manjunath, Dell International Services Pvt. Ltd.: "Gaussian structure of non-Gaussian distributions and contemporary theorems" on February 12, 2015
- Dr. B. Subhas, SMS, NISER, Bhubaneswar: on February 23, 2015
- Dr. Amit Tripathi, Indian Statistical Institute, Bangalore: "Vector Bundles and Geometry of Hypersurfaces" on March 9, 2015
- Dr. Sumit Mohanty, IIT Kanpur: "Maximization of Combinatorial Schrodinger Operator's Smallest Eigenvalue with Dirichlet Boundary Condition" on March 10, 2015
- Dr. Manas Ranjan Sahoo, IIT (BHU), Varanasi: "Vanishing viscosity and weak asymptotic approach to systems of conservation laws admitting δ_∞-waves" on March 12, 2015
- Dr. Vishnu Narayan Mishra, Sardar Vallabhbhai National Institute of Technology: "Approximation of functions by positive linear operators" on March 16, 2015
- Dr. Karam Deo Shankhadhar, Universidad de Chile, Chile: "Converse theorem for Jacobi cusp forms" on March 20, 2015
- Dr. Safdar Quddus, SMS, NISER, Bhubaneswar: "Ultrafilters of N and functionals on D(I_2)" on

Conferences/ Training programmes organized

a. Training Program in Mathematics (TPM-2016)

Duration: May 23, 2016 to June 18, 2016

No. of Participants: 130

Co-ordinator: Prof. V. Muruganandam

Objective: The main objective of TPM is to promote independent learning among students. It aims to provide solid foundation towards mastering the"art of doing Mathematics" on their own by a group of mathematicians drawn from the leading institutes of India, who have a penchant and commitment for teaching mathematics. Beside this programmes identifies young and talented students and motivate them to pursue Mathematics in their career.

b. Summer Outreach Program in Mathematics (SOPM-2016)

Duration: June 20, 2016 to July 2, 2016

No. of Participants: 30

Co-ordinators: Dr. Brundaban Sahu and Dr. Sanjay Parui

Objective: This program is an annual event of the school. The Summer Outreach Program in Mathematics provides training to students who are in Masters Program, in different branches of Mathematics. This program is intended to the students having less exposure to Mathematics. Few special lectures were given by eminent mathematicians.

c. Discussion Meeting on Automorphic Forms-2016

Duration: December 21-27, 2016

No. of Speakers: 15

No. of Participants: 15

Co-ordinator: Dr. Jaban Meher and Dr. Brundaban Sahu

Objective: The main aim is to bring mathematicians working in the area of Automorphic forms, especially on modular forms, Jacobi forms and Siegel modular forms and to share their current research works with others. The discussion meeting benefited research scholars and young mathematicians working in India to know current resaerch done in these areas.

d. School & Workshop on Modular Forms & Black Holes-2017

Duration: January 05 - 14, 2017

No. of participants: 57

No. of Speakers: 17

Co-ordinators: Prof. V. Muruganadam, Prof. Bedangadas Mohanty, Dr. Brundaban Sahu, Dr. Yogesh Srivastava, Dr. Chetan Gowdigere.

Objective: The proposed School and Workshop aim was to foster interactions between Physics and Mathematics in the area of Modular Forms and Black Holes. In recent years there has been lot of interdisciplinary research activity in this area. In counting black hole micro states in string theory, various kinds of modular forms play very important roles. In addition, tantalizing connections between elliptic genus of K3 surfaces, Mathieu group and Mock Modular forms have been an interesting subject of study The School gave pedagogical expositions by leading researchers of international repute on various subjects in Modular Forms and Black Holes to students and young researchers in India. The Workshop provided an opportunity of research interactions between Physicists and Mathematicians.

Awards and Honours received

Dr. Deepak Dalai has received the Best paper Award at the 6th International Conference on Sensor Networks, SENSORNETS 2017 held in Porto-Portugal February 19--21, 2017.

Newly Joined Faculty

a) Dr. Ritwik Mukherjee
Designation: Assistant Professor
Ph.D- Stony Brook University,USA
Research interests - Enumerative Geometry using Topological methods.

b) Dr. Sutanu Roy
Designation: Assistant Professor
Ph.D- Georg-August-Universität Göttingen, Germany
Research Area: Functional Analysis
Research Interest- Topological Quantum Groups, Operator Algebras, Noncommutative Geometry.

c) Dr. Panchugopal Bikram
Designation: Assistant Professor
Ph.D- IM.Sc Chennai
Research Area: Functional Analysis

d) Dr. Dinesh Kumar Keshari
Designation: Assistant Professor
Ph.D-Indian Institute of Science, Bangalore
Research Area: Functional Analysis

e) Dr. K.Senthil Kumar
Designation: Assistant Professor
Ph.D- Harish-Chandra Research Institute, Allahabad
Research Area: Number Theory

f) Dr. Safdar Quddus
Designation: Inspire faculty
Ph.D- Washington University,USA

PUBLICATION

1. Anil K. Karn, Orthogonality in a C*-algebra; Positivity, 20(3) (2016), 607- 620.
2. A. Jena and B. K. Sahoo, Revisiting Eisenstein-type criterion over integers,The Mathematics Student,86 (2017), 77-86.
3. K. L. Patra, B. K. Sahoo and Bikramaditya Sahu, Minimum size blocking sets of certain line sets related to a conic in PG(2,q), Discrete Mathematics339 (2016), 1716-1721.
4. B. K. Sahoo, Existence of non-abelian representations of the near hexagon Q(5,2)\otimes Q(5,2), Proceedings of the Indian Academy of Sciences: Mathematical Sciences126 (2016), 143-151.
5. B. De Bruyn and B. K. Sahoo, Polarized non-abelian representations of slim near-polar spaces, Journal of Algebraic Combinatorics44 (2016), 59-79.
6. B. K. Sahoo and N. S. N. Sastry, Binary codes of the symplectic generalized quadragle of even order, Designs, Codes and Cryptography79 (2016), 163-170.
7. B. Ramakrishnan and B. Sahu, Evaluation of convolution sums and some remarks on cusp forms of weight 4 and level 12, Math. J. Okayama Univ. 59 (2017), 71-79.
8. A. K. Jha and B. Sahu, Rankin-Cohen brackets on Jacobi Forms and the adjoint of some linear maps, The Ramanujan Journal, 39 (2016), 3, 533-544.
9. R. Osburn, B. Sahu and A. Straub, Supercongruences for sporadic sequences,Proc. Edinb. Math. Soc., 59 (2016), 2, 503-518.
10. B. Ramakrishnan and B. Sahu, Identities for the Ramanujan Tau function and certain convolution sum identities for the divisor functions, Number Theory, Lecture Notes Series in Ramanujan Mathematicial Society, No. 23, 2016, 63-75.
11. B. Ramakrishnan and B. Sahu, On the number of representations of ceratin quadratic forms in 20 and 24 variables, Funct. Approx. Comment. Math., 54 (2016), 2, 151-161.
12. Deepak Kumar Dalai and Pinaki Sarkar, Key Predistribution Schemes Using Bent Functions in Distributed Sensor Networks. In Information Security and Cryptology- Inscrypt 2016, number 10143 in Lecture Notes in Computer Science, pages 367–385. Springer Verlag, 2017.
13. Deepak Kumar Dalai and Pinaki Sarkar,Hash Chains Sensornet: A Key Predistribution Scheme for Distributed Sensor Networks Using Nets and Hash Chains, Sensors & Transducers, Vol. 212(5), 2017,pp.39-49.
14. Amit Tripathy, Low rank ACM bundles on hypersurfaces of high dimension are split, Communications in algebra, Volume 44, 3 (2016).
15. Amit Tripathy, Rank 3 arithmetically Cohen-Macaulay bundles on hypersurfaces, Journal of algebra, Volume 478 (2017).
16. Jaban Meher and M. Ram Murty, Oscillations of coefficients of Dirichlet series attached to automorphic forms; Proc. Amer. Math. Soc. 145 (2017), no. 2, 563–575.
17. Arvind Kumar, Jaban Meher On arbitrary products of eigenforms. Acta Arith.173 (2016), no. 3, 283–295.
18. E. satyanarayana, Manas R.Sahoo and Manasa, M; Higher order asymptotic for Burger's equation and adhesion model, Commun. Pure. Appl. Anal. 16(2017), no. 1, 253-272.
19. Manas R. Sahoo, Density Property of certain sets and its application. Elem. Math. 72(2016), no. 1, 9-14.

20. Manas R. Sahoo and Harendra Singh; Weak asymptotic solution for a non-strictly hyperbolic system of conservation laws-II, Electron. J. Diff. Equ., Vol. 2016 (2016), No. 94, pp. 1-14.

21. N. K. Jana and Sumedha, Absence of first order transition in the random crystal field Blume–Capel model on a fully connected graph, (2016) J. Phy. A: Math. and Theo.Vol. 50, No. 1.

22. Shyamal K. De and Shelemyuahu Zacks, Two-stage and Sequential Estimation of Parameter N of Binomial Distribution When p is Known, Sequential Analysis, Volume 35, Issue 4, Pages 440–452 (2016).

23. Bhargab Chattopadhyay and Shyamal K. De, Estimation of Gini Index with Pre-Specified Error Bound, Econometrics, Volume 4, Issue 3, No.30 (2016).

24.Sharon Ramsay and Shyamal K. De, The Definition of Life: The Impact of Physician's Reporting Practices on Neonatal Mortality Rate in New York City, Journal of Neonatal and Clinical Pediatrics, Volume 3, Issue 1, Pages 1–5(2016).

25. P. Kasprzak, R. Meyer and S. Roy, S.L. Woronowicz, Braided quantum SU(2) groups, Journal of Noncommutative Geometry 10 (2016) no. 4 1611-1625.

26. D. Goswami and S. Roy, Faithful actions of locally compact quantum groups on classical spaces, Letters in Mathematical Physics, 107 (2017) no. 7 1375-1390.

27. Meher, N. K. Meher, K. Senthil Kumar and R. Thangadurai, On a theorem of Mahler, Proc. Amer. Math. Soc.145 (2017), no. 11, 4607–4615.

28. T. V. Anoop, P. Drábek and Sarath Sasi, On the structure of the second eigenfunctions of thep-Laplacian on a ball. Proc. Amer. Math. Soc. 144 (2016), no. 6, 2503–2512.

29. T. V. Anoop, P. Drábek, Lakshmi Sankar, Sarath Sasi, Antimaximum principle in exterior domains. Nonlinear Anal. 130 (2016), 241–254.

30.Panchugopal Bikram and Kunal Mukherjee, "Generator masas in q-deformed Araki-Woods von Neumann algebras and factoriality", J. Funct. Anal. 273 (2017) 1443–1478.

31. Safdar Quddus, Cyclic cohomology and Chern-Connes pairing of some crossed product algebras. J. Algebra 481 (2017), 120–157.

32. Safdar Quddus, Hochschild and cyclic homology of the crossed product of algebraic irrational rotational algebra by finite subgroups ofSL(2, $\mathbb{Z}$). J. Algebra 447 (2016), 322–366.

School of Physical Sciences

Dr. Bedangadas Mohanty, Professor

ALICE

The ALICE Collaboration has built a dedicated heavy-ion detector to exploit the unique physics potential of nucleus-nucleus interactions at LHC energies. Our aim is to study the physics of strongly interacting matter at extreme energy densities, where the formation of a new phase of matter, the quark-gluon plasma, is expected. The existence of such a phase and its properties are key issues in QCD for the understanding of confinement and of chiral-symmetry restoration. For this purpose, we are carrying out a comprehensive study of the hadrons, electrons, muons and photons produced in the collision of heavy nuclei. Alice is also studying proton-proton collisions both as a comparison with lead-lead collisions and in physics areas where Alice is competitive with other LHC experiments.

STAR

The primary physics task of STAR is to study the formation and characteristics of the quark-gluon plasma (QGP), a state of matter believed to exist at sufficiently high energy densities. Detecting and understanding the QGP allows us to understand better the universe in the moments after the Big Bang, where the symmetries (and lack of symmetries) of our surroundings were put into motion. Unlike other physics experiments where a theoretical idea can be tested directly by a single measurement, STAR must make use of a variety of simultaneous studies in order to draw strong conclusions about the QGP. This is due both to the complexity of the system formed in the high-energy nuclear collision and the unexplored landscape of the physics we study. STAR therefore consists of several types of detectors, each specializing in detecting certain types of particles or characterizing their motion. These detectors work together in an advanced data acquisition and subsequent physics analysis that allows final statements to be made about the collision.

DINO

Dark matter at INO (DINO) is a proposed experiment which will be looking for the signature of Weakly Interacting Massive Particles (WIMPs), one of the most favoured dark matter candidates. WIMPs are expected to interact with the detector material to produce nuclear recoils. One of the main factors which limit the sensitivity of a dark matter detector is the background. Since neutrons interact with the detector in the same way as WIMPs, it is crucial to understand the flux of neutrons from different sources precisely. Here we study and estimate the flux of neutrons generated in the (α, n) reactions in the rock and the interaction of cosmic ray muons with rock material. The muon flux at the proposed underground site at Jaduguda has been determined using a Monte Carlo code. We have developed a GEANT4 based code which takes muon flux as input and calculated the neutron flux from muon interaction with rock and detector materials. The radiogenic neutron flux has also been calculated. We also study the response of detector material to neutrons using GEANT4.

Super CDMS

NISER is actively involved in direct dark matter search with the Super Cryogenic Dark Matter Search (SuperCDMS) experiment. The experiment involves use of solid state detectors at very low temperatures to detect Weakly Interacting Massive Particles (WIMPs). Over the last one year NISER has been part of an important calibration and backgrounds study. The calibration study involves use of monoenergetic neutrons to better understand the detector response, as neutrons best

mimic WIMPs. NISER is tasked with leading a background study which will improve the limits set on the Si-32 beta decay background seen over the signal region. Apart from dark matter, NISER also has the responsibility of leading a search for Lightly Ionizing Particles (LIPs) using the Super CDMS data from its Soudan run.

Hardware Activity

We are in the process of setting up facilities for performing R & D related to gas and neutron detectors. Studies on gas detectors such as proportional counters, Resistive Plate Chambers (RPC), Gas Electron Multiplier (GEM), and neutron detectors such as liquid scintillators with digitizer based acquisition system will be done. Open ended experiments with these detectors, will be planned for M. Sc students that will increase their knowledge and exposure to state of the art technologies. The R & D efforts could eventually lead in hardware contribution towards large collider experiments such as the CBM and rare event experiments such as INO, DINO, CDMS, etc.

Dr. Sanjay Swain, Associate Professor

The group led by Sanjay Swain, work in CMS experiment at LHC, CERN. The main focus of the group is to perform data analysis using pp collision data. The main areas of interest are

(i) B-physics: Here the group is involved in rare B-decays such as Bs->mumu, B->K*+mumu and B->K+mumu. These are very rare decay modes and are good tool to look for physics beyond standard model. Currently also the group started working in lifetime analysis of Bs ->mumu decay. This has never been done at all so far. This measurement will be the first and can give us hint for NP phenomena.

(ii) Also the group is involved in SUSY analysis, particularly, the susy top-squark production using all hydronic decay mode. This decay is considered to be the most sensitive decay to look for susy top. Although they have not found any SUSY particle at LHC yet, but this measurement can push the limit to exclude the mass of SUSY as they get more and more data.

(iii). Apart from this, the group has taken many important roles in B-physics ad SUSY groups, such a student from NISER-CMS group are leading the triggering validation, data validation, implementing new trigger path which can be used to start new analysis in favorable condition."

Dr. Subhankar Bedanta, Associate Professor

The area of focus for the group led by Dr. Bedanta is nanomagnetism and magnetic domain wall dynamics. The details of their research activities are mentioned below.

- Effect of random anisotropy: In magnetic thin films in addition to uniaxial and/or cubic anisotropies it is also possible to have the grain disorder induced random anisotropy. The group has shown that the presence of such random anisotropy can lead to the formation of 360^0 domain walls. Further in a model system of Co/Al2O3/Co deposited on Si-substrate they have observed layer-by layer magnetization reversal by LMOKE microscopy. The layer-by-layer magnetization reversal is observed to be different for thicker Al2O3 spacer layer. Using micromagnetic simulations the group has shown that random anisotropy has a major role in stabilizing such layer-by-layer reversal.
- Domain engineering in magnetic antidot lattice (MAL) arrays: The group has systematically working in fabrication and characterization of magnetic antidot lattices (MALs) of Co, CoFeB, L10 ordered FePt and a few Heusler alloy based films. They prepared MALs of Co, CoFeB and Co/Pt by photolithography followed by sputtering deposition. However, MAL arrays in FePt and Heusler alloy films have been prepared by e-

beam lithography. The domain structure and domain wall dynamics in such MAL revealed that domain engineering is possible in MALs. Further the relaxation dynamics in such MALs has been studied as a function of the angle between the easy axis and the magnetic field. The experimental results are reproduced by micromagnetic OOMMF simulations.

- Organic spintronics: The group also focuses on spin transfer across ferromagnetic/organic semiconductor interfaces. The group has successfully demonstrated that non-magnetic Fullerene (C60) can get magnetic moment of ~ 3 mm_b in a Fe/C60 bilayer system. The magnetic interface has been quantitatively evaluated by polarized neutron reflectivity experiments performed at FRM II (Muenich, Germany) and Rutherford Appleton Laboratory (Oxford, UK). These results bring possibilities towards further exploration for future spintronic devices.
- Spin pumping in ferromagnetic/heavy metal heterostructures: The group has recently installed the ferromagnetic resonance spectroscopy and developed in-house for measuring inverse spin Hall effect (ISHE). They investigated the spin pumping and calculated the spin mixing conductance in Co/Pt thin films having different buffer and capping layers.
- Micromagnetic study of skyrmions: By performing micromanetic simulations using the OOMMF package the group has successfully studied the formation and stability of skyrmions for variable anisotropy (K) and Dzyaloshinskii-Moriya interaction (DMI). At present the group is focusing on such skyrmion manipulation by electrical current in various device geometries.

Dr. Subhasis Basak, Reader-F

Presently the group in working on Charmonium spectroscopy with overlap fermions and 2+1+1 highly improved staggered quark (HISQ gauge) configurations.

Dr. Chetan Gowdigere, Reader-F

The group is working in those topics of string theory that address black holes and also the topics of gauge-gravity duality. The next to most recent research is on settling the question of horizon smoothness in the most generic multi-black hole space-time. The most research is on studying various aspects of three dimensional Cherns-Simons-matter superconformal theories primarily monopole operators in these theories.

Dr. Yogesh Srivastava, Reader-F

Dr. Srivastava have been studying gravitational aspects of string theory, in particular issues involving black holes and gauge-gravity duality. Last year, he published (in JHEP) a construction of black hole microstate, along with Amitabh Virmani and Pratik Roy form IOP, Bhubaneswar. He also studied non-vacuum cosmologies in Anti desitter spaces with Sudipta Mukherji, Sudipto Paul Chowdhary and Soumyabrata Chatterjee. Paper was published in Physical Review D. Currently he is working with his Ph.D student Deepali Mishra on generating new geometries in String theory. Also, with his student Swayamsidha Mishra, he is working on BMS transformations in String theory.

Dr. Joydeep Bhattacharjee, Reader-F

The group led by Dr. Bhattacharjee focuses on studies related electronic and optical properties of different class of solids and nano-structures. The activities of his group are described below.

- The structural effects on electron-electron and electron-hole coulomb, exchange and correlation interactions become increasingly important with decreasing system size. At nanoscale they are extremely crucial in determining the optical properties, towards which, we perform extensive ab-initio many-body perturbation theory based calculations for accurate estimation of the ground and excited states. Based on the new

understanding obtained from such calculations we are exploring the possibility of structurally functionalized type-II heterojunctions ideal for photovoltaic applications.

- Another area of focus of this group is the studies related to grapheme and carbon nanotubes. Since their discovery, graphene and carbon nanotubes have been long proposed as ideal building blocks for robust nano-electronic circuitry mainly due to their tunable electron transport property and structural robustness. Inspired by recent advancements in their controllable synthesis, we aim to design novel carbon based simple nano structures which can be used as active elements like inductor, capacitor, diodes and transistors for electronic circuitry and spintronic applications at nanoscale. Research in this direction involves extensive calculation of mesoscopic electron transport using Greens functions and other techniques.

Dr. Prasanjit Samal, Reader-F

Research Areas: Atomic and Molecular Physics, Computational Materials Science, Condensed Matter Physics, Quantum Theory of Solid State and Research Interests: Methodological developments of excited-state Density-functional theory (DFT), both static and time-dependent., Nanostructures and Molecular Electronics.

(1) Development and implementation of density functional for atoms, molecules and solids.

The group is working on new density functional that provide more accurate estimates of molecular properties (structures, energies, chemical shifts etc.) and electronic as well as optical properties of nanoparticles and clusters. Firstly, their aim is to reconstructing the exact exchange-correlation potential or kernel from accurate wave-function based results for model systems. Secondly, they are further improving tuned range separated hybrid density functional encompassing proposed excited-state methods. All the above mentioned developments are aimed at calculating more accurately the charge transfer and double excitations which are now issues in TDDFT.

(2) Investigating nanostructures by DFT & first principles molecular dynamics (MD) method.

They are interested in studying the effect of dimensionality on the electronic, structural and optical properties of hydrogenated silicon nanoclusters. Hydrogenated silicon nanostructures have drawn increasing attention in the past one decade because of the visible luminescence was discovered in porous silicon, and more recently, optical gain was observed in silicon nanocrystals. Optical properties are thus of special interest because of the potential application for making optoelectronic devices. Low dimensionality of silicon nanostructures enlarges the smaller indirect band gap of bulk silicon into larger direct gaps, facilitating reasonably high visible photoluminescence (PL) from the nanostructures compared with the poor photoluminescence from bulk silicon. And now the most important thing which is noticed is the effect of quantum confinement in nanoclusters. As the size of bulk silicon decreases beyond the limit of its free-exciton Bohr radius (43 Å) the quantum confinement effect significantly alters the optical behaviour of the system, resulting in possible excitations in the visible range. A unified DFT and MD approach will be very useful to study nano scale phenomena.

(3) TDDFT research work and excited state dynamics

Their first attempt in this regard is to use novel (orbital-based) density functional in practical TDDFT calculations for real molecules. Secondly, to work on time-dependent DFT in real time, for strong laser-molecule interactions. The ultimate goal of this TDDFT research plan will be the extension of the first principle molecular dynamics studies to include excited states with the help of time-dependent DFT. We are working on methods

that hold the promise to be able to treat linear and nonlinear response and excitation properties of very large and complex systems in which many-body effects are dominating.

Dr. A. V. Anil Kumar, Reader-F

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. Sumedha, Reader-F

Dr. Sumedha's group is interested in understanding and developing mathematical and numerical approaches to study disordered systems. The recent work involves:

1. Effect of quenched disorder on first order transitions. Typically correlation length is finite near the first order transitions and they are more stable than the continuous transitions. It is found though that in two dimensions, even an infinitesimal amount of quenched disorder either destroys transition, or converts it into a continuous transition. What happens in higher dimensions is still not clear. They have looked at three models with random field disorder: Random field Ising Model, p-spin interaction model and random crystal field Blume Capel model. They found that typically there is a threshold of disorder, beyond which the transition is always continuous.

2. Phase transitions in random k-Satisfiability problems. In computer science, it is now believed that computational complexity is connected to phase transitions. k-satisfiability is one of the most fundamental complex optimization problems. The problem is known to undergo phase transitions as a function of the ratio of constraints and variables. While polynomial time algorithms are known to solve the problem for $k = 2$, for $k \geq 3$ the problem is known to be NP-complete. They define the model on a tree and find that the solvability threshold for $k = 2$ matches the exact value of the threshold on regular random graphs. For higher k, the values are very close to those predicted using other techniques. Their method can be extended to many other optimisation problems.

3. Stochastic modelling of cellular processes. They are interested in understanding the role of stochasticity in biological processes. They are working on stochastic modelling of dynamics of FtSz monomers, which result in the formation of Z-ring, which plays a crucial role during cell division in bacteria.

Dr. Colin Benjamin, Reader -F

The research activity of the group concerns two broad fields-

(a) Theoretical Nanoscience- The focus here is on aspects of non-local edge mode transport in the quantum spin Hall state, aspects of edge mode transport in Quantum Hall State of transition metal dichalcogenides and methods for observing quantum spin Hall effects in the adiabatic quantum pumping regime of graphene.

Collaborators: DAAD research stay with Prof. Fabian Hassler in May-July, 2016 (RWTH Aachen Univ. Germany)

(b) Quantum information theory and Game theory- The focus here is on two aspects- one, quantum walks and exploring Parrondo's games in quantum walks and second on equilibrium solutions like Nash equilibrium and Pareto optimality of classical and quantum games.

Dr. Pratap Kumar Sahoo, Reader-F

The group led by Dr. Sahoo carries out experimental investigation of nano-materials and ion matter interaction. The main two research areas are mentioned below.

Tunnel devices are very important for technological application. The basic phenomena can be understood in terms of the physics behind the electron and phonon-tunnel device, which depends on the device geometry. The group is involved to fabricate novel structure with low cost techniques for tunnel devices. Recently they have synthesized crystalline-amorphous-crystalline (c-a-c) stature which can be used as phonon-tunnel junction devices. Similar structures like c-a-c with p-n-p electronics devices also of great interest which can be fabricated using low energy ion beam facility.

Also optical excitation by coupling a foreign atom by ion implantation to propagate surface plasmons and its anisotropic optical response due to the strong transverse and longitudinal plasmons coupling is a hot recent research area. Ion beams are also indispensable tools to dope materials with optically active ions. Ion irradiation can also lead to nanoscale changes in the structure and shape of materials such as colloids, Si nanostructures and lithographic masks. The thermal spike that is generated along the ion track leads to anisotropic deformation, with the material expanding perpendicular to the ion beam. Continuum modeling is used to determine the fundamental mechanisms behind these ion-solid interactions. The first attempt in this regard is to fabricate the nanostructures using various lithographic techniques, thin film deposition and energetic low and swift heavy ion beam implantation and study the strong interaction of light with nano structured materials which lead to the design of plasmonic devices with optimized properties.

Dr. Kartikeswar Senapati, Reader-F

The group led by Dr. Senapati is exploring unconventional superconductivity in hybrid superconductor-ferromagnet systems. In particular, the group is involved in various experiments to generate and tune spin-triplet supercurrent in artificial structures. The large range of this type of super-current is immediately attractive for the field of low temperature spintronics. We are attempting several methods for addressing the issue such as embedding an exchange spring in a Josephson junction and forcing a spin-singlet supercurrent through natural domain walls existing in well known ferromagnets. These experiments are being carried out in collaboration with UGC-DAE CSR, Indore and University of Cambridge UK. This group is also trying to look into aspects of superconductivity in nanoscale superconductor-ferromagnet hetero-structures such as core-shell nano-particles and nanowires with superconducting core and magnetic shell and vice versa.

Dr. Ashok Mohapatra, reader-F

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 is to realize strong photon-

photon interactions using the non-linearity mediated by Rydberg blockade interaction. Rydberg blockade is a phenomenon where more than one atom within the blockade volume can't be excited to the Rydberg state using a monochromatic laser beam due to strong Rydberg-Rydberg interaction. Recently the group has established a technique for all optical detection of Rydberg population which is particularly useful for thermal vapor experiments. Using the same technique the blockade interaction has been studied in thermal vapor. Also the group was involved in studying enhanced Rydberg excitation facilitated by strong Rydberg-Rydberg interaction in a suitable parameter range. The group is also involved in setting up a ultra-cold atom experiment to study blockade interaction as well as enhanced Rydberg excitation.

2. Study of optical non-linearity facilitated by light induced Zeeman coherence of thermal atomic vapor

Light-induced Zeeman coherence of degenerate sub-levels of two-level atomic system can facilitate efficient degenerate four wave mixing (FWM) and cross phase modulation (XPM) which leads to the polarization rotation of an arbitrary elliptically polarised light propagating through the atomic vapor. Recently, the group was involved in theoretical and experimental study of the same system. It has been realized that the system can be used to control the diffraction of a weak probe light in the presence of a strong light field with orthogonal polarization. Also the system can be used to generate various quantum states of light like polarization squeezed light, correlated photon sources and Schrodinger cat states. The study of the system along these directions is now included as the major activity of the group.

3. Study of probe light propagation in all optical waveguides

Strong cross phase modulation is a optical non-linear process which can be used to modulate the refractive index of a medium using a strong pump light field. A probe light filed propagating through such a medium will experience the modulated refractive index. Propagation of a probe field is analogous to the time evolution of a quantum system in a potential and in this case the potential can be easily engineered by using various intensity pattern of the light field. The objective of this project is to study a variety of problems like probe propagation in synthetic magnetic field, random potential, periodic potential etc. Recently the group has successfully guide a probe light through pump light with Laguree-Gaussian intensity profile. Also different spatial modes of a two-dimensional harmonic oscillator potential are observed due to all optical waveguide generated using a pump field in rubidium vapour.

Dr. Ritwick Das, Reader-F

The research group led by Dr. Das focuses on nonlinear photonics, plasmonics and waveguide optics. The main areas of research are described below.

- Optical Parametric Oscillators or OPOs provide an alternative and practical route to reach those spectral regions that are inaccessible to conventional laser technology, by exploiting nonlinear optical properties of non-centro-symmetric crystals. An interesting configuration of OPOs is singly-resonant OPOs or SROs where only one of the generated waves oscillates between a pair of mirrors forming a very stable source of generating coherent radiation. The frequency tunability is achieved by either changing the properties of the crystal such as temperature or angular orientation with respect to the pump beam, or by inserting a frequency selective element in the cavity such as an etalon which manipulates the longitudinal resonance condition. In the present research work, the main idea is to generate high-power, continuous-wave, coherent radiation in the mid-infrared that is tunable from 2-6 μm. This wavelength region is extremely crucial for carrying out absorption spectroscopy of trace-gas molecules such as

methane, formaldehyde, nitrogen, carbon-dioxide and many more.

- The research work essentially comprises study of modal interaction between bandgap-guided modes in a dielectric medium and surface plasmon modes. The dispersive properties of the waveguides, anti-crossing behavior and propagation loss features are being investigated in detail. Another interesting feature that involves the existence and excitation of 'Tamm-plasmon' states is also being investigated. The major goal of this research activity is to provide alternative as well as efficient route for signal processing in the miniaturized photonic integrated circuits and realization of efficient biochemical sensors.

Prolay Kumar Mal, Reader-F

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 and it is believed to be a low-energy limit of a more fundamental theory. For example, it cannot provide appropriate explanation for the dark matter candidate and mass hierarchy problem.

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. In particular, during the current LHC Run II at $\sqrt{s}$=13-14 TeV, he looks for the signatures of dark matter and flavor-changing neutral current (FCNC) decays of the top quark.

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). Furthermore, he pursues the performance studies for the present CMS tracker using the Monte Carlo simulations apart from his participation in CMS detector operations.

Dr. V Ravi Chandra, Reader-F

This year this research group focused on completion of the ongoing analysis of exact diagonalisation data for the spin half antiferromagnet on the breathing pyrochlore lattice. We found on extensive study of data at 36 lattice sites that the system does not show (as indicated in an earlier part of this study on 28 sites) any prominent signs of either dimer or chiral order near the isotropic point where all bonds on the lattice have the same strength. Furthermore, like other spin-1/2 systems with strong frustration we found evidence of multiple number of singlets below the magnetic gap. These results have been presented at a conference and a manuscript is under preparation. A second line of work that had been initiated last year and is currently ongoing is a general study of the ground phases of exchange coupled two dimensional dipolar magnets on geometrically frustrated lattices using the renormalisation group formalism. Earlier work on this area has focused much more on hypercubic lattices and critical exponents for general lattices are not known. We have initiated a program of RG analysis of dipolar coupled 2D hamiltonians using

general Ewald summations of thedipolar interaction terms for any 2D Bravais lattice. Initial work which involved establishing consistency with existing results for the square lattice resulted in Mr. Hardik Routray's Master's thesis. Further work for general geometrically frustrated lattices is currently underway.

Dr. Nishikant Khandai, Reader-F

In the last one year, Dr. Khandai's group have been looking at a couple of problems in large scale structure. Alongwith my Ph.D Student we have been looking at the properties of HI selected galaxies in the local Universe. To this end we have looked at the objects in the ALFALFA survey and have identified optical counterparts in the SDSS survey. We have looked at their abundances and how their clustering depends on their optical properties. This is a crucial input in modeling HI in galaxies based on local observations so as to make more robust predictions on their distribution and signal in the high redshift universe.

With the undergrad project students Sohom Roy and Avinash Anand we have been looking at the the clustering of the Lyman Alpha Forest. We find that most of the clusteringsignal from the forest arises from the regions associated with large flux decrements. We are currently investigating how this property can be exploited to better constrain cosmology.

Dr. Anamitra Mukherjee Reader-F

(a) Dr. Mukherjee completed his project on understanding the effects of disorder on strongly correlated systems and have established that in a 50 year old studied problem of Anderson-Hubbard model, disorder can be used to stabilize and tune new non Fermi liquid behavior. The result is to appear in Physical Review Letters.

(b) He developed (with his Ph.D student Gour Jana) a Determinantal Quantum Monte Carlo (DQMC) code from the scratch that is used for studying interacting Fermi systems at finite temperatures. This was one of the goals from last year to another add cutting edge tool to our repertoire. Using this and our existing expertise in Monte-Carlo+Mean Field (MC+MF) methods we are investigating possibility of spin liquid phases in frustrated 2D systems.

(c) A U(1) gauge theory from spin liquids had been proposed in 2005 whose saddle point leads to the well known slave rotor approximation used to study quantum systems at T=0. We have (along with my Master's thesis student, Sidhartha Shankar Dash) benchmarked the method and applied it to study doped Mott insulator, a state which cannot be reliably studied using above mentioned DQMC as well as MC+MF approaches. We have shown that at T=0 there is a remarkable match of the physics of this state with literature using much more complicated methodologies. We are now extending the method to finite temperature where we hope to clarify the ensuing gauge fluctuations and (fractional) excitations and pairing of spinons and their bearing of spin liquid phases.

(d) He has started a collaborative work with Prof. Tanusri-Saha-Dasgupta at SNBCBS and Prof. Arun Paramekanti at University of Toronto for studying the physics of strongly correlated Nickel oxide systems.

(e) At NISER, he has started regular discussion with Dr. Ravi Chandra and Dr. Joydeep Bhattacharya and his group to set up a Dynamical Mean Field Theory (DMFT) based numerical code with different impurity solvers that can tackle problems in diverse areas of materials to model systems.

Dr. Ajaya Kumar Nayak, Assistant Professor

He is mainly focused on magnetic materials and their applications in spintronics. One of his current research interest is to explore room temperature magnetic skyrmions and the study of their current driven motion for potential applications in racetrack memory devices. An important focus will be synthesis of Mn-based Heusler materials (both in bulk and thin film forms) that host skyrmions at room temperature and their characterization using Lorentz Transmission Electron Microscopy and variable temperature Magnetic Force Microscopy. In addition, Physical Property Measurement System (PPMS) will be used to measure topological Hall Effect in skyrmion phase. In this regard, he has already started synthesis of novel Mn-based Heusler materials using arc-melting technique. Various characterizations will be performed in coming days.

He is also very much interested on study of Anomalous Hall effect (AHE) in non-collinear antiferromagnets that are supposed to exhibit zero AHE due to vanishing magnetic moment. Another important field of research that he is involved in designing of compensated ferrimagnets with zero net magnetic moment and large spin polarization. The reason being, there is a renewed interest in antiferromagnetic spintronics as antiferromagnets do not produce dipole fields that is found in ferromagnts. Compensated ferrimagnets can fulfil the useful properties of ferromagnets (large spin polarization) and antiferromagnet (zero magnetization). In a recent collaborative work, we have designed such a magnet that indeed exhibit zero net magnetic moment with 100% spin polarization [1].

Dr. Victor Roy, Assistant Professor

The present research of our group is focused on the study of large-electromagnetic field produced in the initial state of high-energy heavy ion collisions and its effect on space-time evolution of QCD matter and other experimental observables. In the initial stage of high-energy heavy ion collisions a deconfined phase of quarks and gluons are created over the nuclear volume for a very brief period of time (~10^(-23) seconds). This new phase of matter named Quark-Gluon-Plasma (QGP) enables us to study the Quantum-Chromo-Dynamics (QCD) at high temperature and density. According to QCD prediction gauge field configuration with nonzero winding number (Qw) can separate charge in the presence of a strong magnetic field, this is known as Chiral Magnetic Effect (CME). In order to observe CME in heavy ion collisions one need to experimentally measure the right observable (for example charge dependent anisotropic flow) and subtract all the background contribution. In order to theoretically estimate the presence of CME, one needs to know the correct space-time evolution of the electromagnetic field (produced by the positively charged colliding nucleus) in the QGP and subsequent hadronic phase. This can be achieved by using dynamical models such as relativistic magneto-hydrodynamics, which we are working on at present. In addition to that we are also involved in phenomenological study for estimating transport co-efficient of QGP and hadronic phase.

Publications (Journals)

1. Completely compensated ferrimagnetism and sub lattice spin crossing in the half-metallic Heusler compound Mn1.5FeV0.5Al R. Stinshoff, A. K. Nayak,* G. H. Fecher, B. Balke, S. Ouardi, Y. Skourski, T. Nakamura, and C. Felser, Phys. Rev. B 95, 060410(R) (2017).
2. Effects of composition, thickness and temperature on the magnetic properties of amorphous CoFeB thin films Anabil Gayen, Gobinda Kumar Prasad, Srijani Mallik, Subhankar Bedanta, Alagarsamy Perumal J. Alloys. and Compounds 694, 823 (2017)
3. Effect of the growth conditions on the anisotropy, domain structures and the relaxation in Co thin films Srijani Mallik and Subhankar Bedanta* J. Magn. Magn. Mater. 428, 50 (2017)
4. Study of Magnetization Relaxation in Co Thin Films Prepared by Oblique Deposition and Substrate Rotation Niru Chowdhury, Sougata Mallick, Srijani Mallik and Subhankar Bedanta* Thin Solid Films 616, 328 (2016)
5. Semilocal Exchange Energy Functional for Two-Dimensional Quantum Systems: A Step beyond Generalized Gradient Approximations, Subrata Jana and Prasanjit Samal, J. Phys. Chem. A 121
6. Unusual ferromagnetic behaviour of embedded non-functionalized Au nanoparticles in Bi/Au bilayer films; Sudakshina Prusty, Vantari Siva, Neeraj Shukla, Biswarup Satpati, Kartik Senapati, and Pratap K. Sahoo, RSC Adv 6, 106584 (2016).
7. Role of work function in field emission enhancement of Au island decorated vertically alignesd ZnO nanotaper; Avanendra Singh, Kartik Senapati, Mohit Kumar, T. Som, A. Sinha, and Pratap K Sahoo, Applied Surface Science, 411, 117-123 (2017)
8. Suppression of Nearband Edge Emission in Specially Engineered ZnO Twin Nanorods; Avanendra Singh, Kartik Senapati, Biswarup Satpati, and Pratap K Sahoo, (Accepted for publication in PCCP (2017) DOI: 10.1039/C7CP01880K)
9. Progressive magnetic softening of ferromagnetic layers in multilayer ferromagnet-nonmagnet systems and the role of granularity; Siddharth S Sahoo, Vantari Siva, Paresh C. Pradhan, Maheswar Nayak, Kartik Senapati, and Pratap K. Sahoo (Under review JAP)
10. Mukesh K. Shukla, Partha S. Maji and Ritwick Das , "Yb-fiber laser pumped high-power , broadly tunable , single-frequency red source based on a singly resonant optical parametric oscillator," Optics Letters, vol. 41, no. 13, pp. 3033–3036, (2016).
11. S. Kumar, K.V. Anil Kumar, SM Dharmaprakash, and Ritwick Das, "Phase-dependent ultrafast third-order optical nonlinearities in metallophthalocyanine thin films" J. Applied Physicsvol. 120, pp. 123104 (2016)
12. M. Chhabra & R. Das, "Quantum mechanical wavefunction: Visualization at undergraduate level," European Journal of Physics, vol. 38, pp. 015404 (2016)
13. N. D. Patel, A. Mukherjee, N. Kaushal, A. Moreo, and E. Dagotto "Non Fermi liquid behavior and continuously tunable resistivity exponents in the Anderson-Hubbard model at finite temperature (arXiv: 1702.05612)
14. "A scheme to realize the quantum spin-valley Hall effect in monolayer graphene", Sk Firoz Islam, Colin Benjamin, Carbon 110, 304 (2016)
15. "Topologically induced fractional Hall steps in the integer quantum Hall regime of MoS2", Sk Firoz Islam, Colin Benjamin, Nanotechnology 27, 385203 (2016)

16. "Fragility of non-local edge mode transport in the quantum spin Hall state", Arjun Mani and Colin Benjamin, Phys. Rev. Applied 6, 014003 (2016)

17. "Probing helicity and the topological origins of helicity via non-local Hanbury-Brown and Twiss correlations", Arjun Mani, Colin Benjamin, arXiv:1609.03978; Scientific Reports 7: 6954 (2017)

18. Arup Bhowmick, Sushree S Sahoo and Ashok K Mohapatra, Phys. Rev. A 94, 023839 (2016)

19. Sushree S Sahoo, Arup Bhowmick and Ashok K Mohapatra, J. Phys. B 50, 055501 (2017)

20. Absence of first order transition in random crystal field Blume Capel model on a fully connected graph, J. Phys. A:Math. Theor. vol. 50, 015003(2017), Sumedha and Nabin K Jana

21. K*(892)0 and (1020) meson production at high transverse momentum in pp andPb-Pbcollisions at √sNN=2.76TeV. J. Adam et al. (ALICE Collaboration), Phys. Rev. C 95, 064606 (2017).

22. J/Ψ suppression at forward rapidity in Pb-Pb collisions at √sNN = 5.02 TeV. J. Adam et al. (ALICE Collaboration), Phys. Lett. B 766, 212 (2017).

23. Determination of the event collision time with the ALICE detector at the LHC. J. Adam et al. (ALICE Collaboration), Eur. Phys. J. Plus 132, 99 (2017).

24. -meson production at forward rapidity in p-Pb collisions at √sNN = 5.02 TeV and in pp collisions at √s = 2.76 TeV. J. Adam et al. (ALICE Collaboration), Phys. Lett. B 768, 203 (2017).

25. W and Z boson production in p-Pb collisions at √sNN = 5.02 TeV. J. Adam et al. (ALICE Collaboration), JHEP 02, 077 (2017).

26. Charged-particle multiplicities in proton-proton collisions at √sNN = 0.9, 8 TeV. J. Adam et al. (ALICE Collaboration), Eur. Phys. J. C 77, 33 (2017).

27. Correlated event-by-event fluctuations of flow harmonics in Pb-Pb collisions at √sNN = 2.76 TeV. J. Adam et al. (ALICE Collaboration), Phys. Rev. Lett. 117, 182301 (2016).

28. Jet-like correlations with neutral pion triggers in pp and central Pb-Pb collisions at 2.76 TeV. J. Adam et al. (ALICE Collaboration), PLB 763, 238 (2016).

29. Higher harmonic flow coefficients of identified hadrons in Pb-Pb collisions at √sNN = 2.76 TeV. J. Adam et al. (ALICE Collaboration), JHEP 1609, 164 (2016).

30. Measurement of transverse energy at midrapidity in Pb-Pb collisions at √sNN = 2.76 TeV. J. Adam et al. (ALICE Collaboration), Phys. Rev. C 94, 034903 (2016).

31. Elliptic flow of electrons from heavy-flavour hadron decays at mid rapidity in Pb-Pb collisions at √sNN = 2.76 TeV. J. Adam et al. (ALICE Collaboration), JHEP 09, 028 (2016).

32. Measurement of D-meson production versus multiplicity in p-Pb collisions at √sNN = 5.02 Te J. Adam et al. (ALICE Collaboration), JHEP 8, 1 (2016).

33. Multiplicity dependence of charged pion, kaon, and (anti)proton production at large transverse momentum in p-Pb collisions at √sNN = 5.02 TeV. J. Adam et al. (ALICE Collaboration), Phys. Lett. B 760, 720 (2016).

34. Pseudorapidity dependence of the anisotropic flow of charged particles in Pb-Pb collisions at √sNN = 2.76 TeV. J. Adam et al. (ALICE Collaboration), Phys. Lett. B 762, 376 (2016).

35. Centrality dependence of Ψ(2S) suppression in p-Pb collisions at √sNN = 5.02 TeV. J. Adam et al. (ALICE Collaboration), JHEP 06, 50 (2016).

36. Centrality dependence of the charged-particle multiplicity density at mid-rapidity in Pb-Pb collisions at √sNN = 5.02 TeV. J. Adam et al. (ALICE Collaboration), Phys. Rev. Lett. 116, 222302 (2016).

37. Measurement of an excess in the yield of J/ Ψ at very low pT in Pb-Pb collisions at √sNN = 2.76 TeV. J. Adam et al. (ALICE Collaboration), Phys. Rev. Lett. 116, 222301 (2016).

38. Differential studies of inclusive J/Ψ and Ψ (2S) production at forward rapidity in Pb-Pb collisions at √sNN = 2.76 TeV. J. Adam et al. (ALICE Collaboration), JHEP 05, 179 (2016).

39. Particle identification in ALICE: a Bayesian approach. J. Adam et al. (ALICE Collaboration), Eur. Phys. J. Plus 131, 168 (2016).

40. Centrality dependence of charged jet production in p-Pb collisions at √sNN = 5.02 TeV. J. Adam et al. (ALICE Collaboration), Eur. Phys. J. C76, 271 (2016).

41. Multi-strange baryon production in p-Pb collisions at √sNN = 5.02 TeV. J. Adam et al. (ALICE Collaboration), Phys. Lett. B 758, 389 (2016).

42. Production of K*(892)0 and (1020) in p-Pb collisions at √sNN = 5.02 TeV J. Adam et al. (ALICE Collaboration), Eur. Phys. J. C 76, 245 (2016).

43. Charge-dependent flow and the search for the Chiral Magnetic Wave in Pb-Pb collisions at √sNN = 2.76 TeV. J. Adam et al. (ALICE Collaboration), Phys. Rev. C 93, 044903 (2016).

44. Inclusive quarkonium production at forward rapidity in pp collisions at √sNN = 8 TeV. J. Adam et al. (ALICE Collaboration), Eur. Phys. J. C 76, 184 (2016).

45. Anisotropic flow of charged particles in Pb-Pb collisions at √sNN = 5.02 TeV. J. Adam et al. (ALICE Collaboration), Phys. Rev. Lett. 116, 132302 (2016).

46. Elliptic flow of electrons from heavy-flavor hadron decays in Au + Au collisions at √sNN = 200, 62.4, and 39 GeV. L. Adamczyk et al. (STAR Collaboration) Phys. Rev. C 95, 034907 (2017).

47. Charge-Dependent Directed Flow in Cu+Au Collisions at √sNN = 200 GeV. L. Adamczyk et al. (STAR Collaboration) Phys. Rev. Lett. 118, 012301 (2017).

48. production in U + U collisions at √sNN = 193 GeV measured with the STAR experiment. L. Adamczyk et al. (STAR Collaboration) Phys. Rev. C 94, 064904 (2016).

49. Measurement of elliptic flow of light nuclei at √sNN = 200, 62.4, 39, 27, 19.6, 11.5, and 7.7 GeV at the BNL Relativistic Heavy Ion Collider. L. Adamczyk et al. (STAR Collaboration) Phys. Rev. C 94, 034908 (2016).

50. Beam-energy dependence of charge balance functions from Au + Au collisions at energies available at the BNL Relativistic Heavy Ion Collider. L. Adamczyk et al. (STAR Collaboration) Phys. Rev. C 94, 024909 (2016).

51. Near-side azimuthal and pseudorapidity correlations using neutral strange baryons and mesons in d+Au, Cu + Cu, and Au + Au collisions at √sNN = 200 GeV. B. Abelev et al. (STAR Collaboration) Phys. Rev. C 94, 014910 (2016).

52. Jet-like Correlations with Direct-Photon and Neutral-Pion Triggers at √sNN = 200 GeV. L. Adamczyk et al. (STAR Collaboration) Phys. Lett. B 760, 689 (2016).

53. J/▪ production at low transverse momentum in p+p and d + Au collisions at √sNN = 200 GeV. L. Adamczyk et al. (STAR Collaboration) Phys. Rev. C 93, 064904 (2016).

54. Measurement of the Transverse Single-Spin Asymmetry in p↑ +p→ W±/Z0 at RHIC. L. Adamczyk et al. (STAR Collaboration) Phys. Rev. Lett. 116, 132301(2016).

55. Projected sensitivity of the SuperCDMS SNOLAb experiment. R. Agnese, et al., (SuperCDMS Collaboration) Physical Review D 95, 082002 (2017).

56. Freeze-out conditions in proton-proton collisions at the highest energies available at the BNL Relativistic Heavy Ion Collider and the CERN. Large Hadron Collider. S. Das, D. Mishra, S. Chatterjee, and B. Mohanty, Phys. Rev. C 95, 014912 (2017).

57. Search for new physics with dijet angular distributions in proton-proton collisions at sqrt(s)=13 TeV, CMS Collaboration (Albert M Sirunyan Prolay Mal, Sanjay Swain et al.), arXiv:1703.09986 [hep-ex], JHEP 1707 (2017) 013.

58. Search for a heavy resonance decaying to a top quark and a vector-like top quark at sqrt(s) = 13 TeV, CMS Collaboration (Albert M Sirunyan. Prolay Mal,Sanjay Swain,et al.), arXiv:1703.06352[hep-ex].

59. Measurement of the jet mass in highly boosted ttbar events from pp collisions at sqrt(s)=8 TeV, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain et al.). arXiv:1703.06330 [hep-ex], Eur.Phys.J. C77 (2017) no.7, 467.

60. Search for anomalous couplings in boosted WW/WZ lnu q qbar production in proton-proton collisions at sqrt(s) =8 TeV, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain, et al.), arXiv:1703.06095 [hep-ex], Phys.Lett.B772(2017)21-42.

61. Search for associated production of dark matter with a Higgs boson decaying to b bbar or gamma gamma at sqrt(s) = 13 TeV, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain, et al.), arXiv:1703.05236 [hep-ex].

62. Search for third-generation scalar leptoquarks and heavy right-handed neutrinos in final states with two tau leptons and two jets in proton-proton collisions at sqrt(s)=13 TeV, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain, et al.), arXiv:1703.03995 [hep-ex], JHEP 1707 (2017) 121.

63. Measurement of the top quark mass using single top quark events in proton-proton collisions at sqrt(s)= 8 TeV, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain, et al.), arXiv:1703.02530 [hep-ex], Eur. Phys. J. C77(2017)no.5,354.

64. Search for dark matter produced with an energetic jet or a hadronically decaying W or Z boson at sqrt(s)=13 TeV, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain, et al.), arXiv:1703.01651 [hep-ex], JHEP 1707(2017)014.

65. Measurement of double-differential cross sections for top quark pair production in pp collisions at sqrt(s) = 8 TeV and impact on parton distribution functions, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain, et al.), arXiv:1703.01630 [hep-ex], Eur.Phys.J. C77 (2017) no.7, 459.

66. Search for standard model production of four top quarks in proton-proton collisions at sqrt(s) = 13 TeV, CMS Collaboration (A.M. Sirunyan, Prolay Mal, Sanjay Swain, et al.), arXiv:1702.06164 [hep-ex], Phys. Lett. B772 (2017)336-358.

67. Measurement of the cross section for electroweak production of Zgamma in association with two jets and constraints on anomalous quartic gauge couplings in proton–proton collisions at sqrt(s) = 8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1702.03025 [hep-ex], Phys.ett.B770(2017)380-402.

68. Search for associated production of a Z boson with a single top quark and for tZ flavour-changing interactions in pp collisions at sqrt(s)=8 TeV, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain, et al.), arXiv:1702.01404[hep-ex],JHEP1707(2017)003.

69. Study of jet quenching with Z+jet correlations in PbPb and pp collisions at sqrt(s_NN) = 5.02

TeV, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain, et al.), arXiv:1702.01060 [nucl-ex].

70. Azimuthal anisotropy of charged particles with transverse momentum up to 100 GeV in PbPb collisions at sqrt(s_NN) = 5.02 TeV, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain, et al.), arXiv:1702.00630 [hep-ex].

71. Measurement of the inclusive energy spectrum in the very forward direction in proton-proton collisions at sqrt(s) = 13 TeV, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain, et al.), arXiv:1701.08695 [hep-ex], JHEP1708(2017)046.

72. Search for single production of vector-like quarks decaying into a b quark and a W boson in proton-proton collisions at sqrt(s) = 13 TeV, CMS Collaboration (Albert M Sirunyan, Prolay Mal,. Sanjay Swain, et al.), arXiv:1701.08328 [hep-ex],Phys.Lett.B772(2017)634-656.

73. Search for single production of vector-like quarks decaying to a Z boson and a top or a bottom quark in proton-proton collisions at sqrt(s)=13 TeV, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain, et al.), arXiv:1701.07409[hep-ex],JHEP1705(2017)029.

74. Search for supersymmetry with multiple charged leptons in proton-proton collisions at sqrt(s) = 13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1701.06940 [hep-ex].

75. Measurement of the t t-bar production cross section using events with one lepton and at least one jet in pp collisions at sqrt(s) = 13 TeV, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain, et al.), arXiv:1701.06228[hep-ex].

76. Search for dark matter and unparticles in events with a Z boson and missing transverse momentum in proton-proton collisions at sqrt(s) = 13 TeV, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain, et al.), arXiv:1701.02042[hep-ex],JHEP1703(2017)061.

77. Search for light bosons in decays of the 125 GeV Higgs boson in proton-proton collisions at sqrt(s) = 8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1701.02032 [hep-ex].

78. Search for supersymmetry in the all-hadronic final state using top quark tagging in pp collisions at sqrt(s) = 13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1701.01954 [hep-ex], Phys.Rev.D96(2017)no.1,012004.

79. Search for leptophobic Z' bosons decaying into four-lepton final states in proton-proton collisions at sqrt(s) = 8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1701.01345 [hep-ex].

80. Search for high-mass Z gamma resonances in proton-proton collisions at sqrt(s)= 8 and 13 TeV using jet substructure techniques, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain, et al.), arXiv:1612.09516 [hep-ex],Phys.Lett.B772(2017)363-387.

81. Search for heavy gauge W' boson in events with an energetic lepton and large missing transverse momentum at sqrt(s) = 13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1612.09274 [hep-ex],Phys.Lett.B770(2017)278-301.

82. Measurement of electroweak-induced production of W gamma with two jets in pp collisions at sqrt(s)=8 TeV and constraints on anomalous quartic gauge couplings, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1612.09256 [hep-ex], JHEP 1706 (2017) 106.

83. Search for massive resonances decaying into WW, WZ or ZZ bosons in proton-proton collisions at sqrt(s) = 13 TeV, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain,

et al.), arXiv:1612.09159 [hep-ex], JHEP 1703(2017)162.

84. Measurements of the charm jet cross section and nuclear modification factor in pPb collisions at sqrt(s_NN)= 5.02 TeV, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain, et al.), arXiv:1612.08972 [nucl-ex], Phys.Lett.B772(2017)306-329.

85. Searches for pair production of third-generation squarks in sqrt(s)=13 TeV pp collisions, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain, et al.), arXiv:1612.03877 [hep-ex], Eur. Phys. J. C77 (2017) no.5, 327.

86. Search for heavy neutrinos or third-generation leptoquarks in final states with two hadronically decaying tau leptons and two jets in proton-proton collisions at sqrt(s)=13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay mal, Sanjay Swain, et al.), arXiv:1612.01190 [hep-ex], JHEP 1703 (2017) 077.

87. Search for single production of a heavy vector-like T quark decaying to a Higgs boson and a top quark with a lepton and jets in the final state, CMS Collaboration (Vardan Khachatryan,... Prolay Mal, Sanjay Swain,. et al.), arXiv:1612.00999[hep-ex],Phys.Lett.B771(2017)80-105.

88. Search for CP violation in ttbar production and decay in proton-proton collisions at sqrt(s)=8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1611.08931 [hep-ex], JHEP 1703 (2017) 101.

89. Search for supersymmetry in events with photons and missing transverse energy in pp collisions at 13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1611.06604 [hep-ex], Phys. Lett. B769(2017)391-412.

90. Search for heavy resonances decaying to tau lepton pairs in proton-proton collisions at sqrt(s)=13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1611.06594 [hep-ex], JHEP 1702 (2017) 048.

91. Measurements of the associated production of a Z boson and b jets in pp collisions at sqrt(s) = 8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1611.06507 [hep-ex], Submitted to Eur.Phys.J.C(2016).

92. Measurement of the ttbar production cross section using events in the emu final state in pp collisions at sqrt(s) =13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1611.04040 [hep-ex], Eur.Phys.J.C77(2017)172.

93. Search for dijet resonances in proton–proton collisions at sqrt(s) = 13 TeV and constraints on dark matter and other models, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain, et al.), arXiv:1611.03568 [hep-ex], Phys. Lett.B769(2017)520-542.

94. Suppression of Upsilon(1S), Upsilon(2S) and Upsilon(3S) production in PbPb collisions at sqrt(s_NN) = 2.76 TeV, CMS Collaboration (Vardan Khachatryan,... Prolay Mal, Sanjay Swain, et al.), arXiv:1611.01510 [nucl-ex], Phys.Lett.B770(2017)357-379.

95. A search for new phenomena in pp collisions at sqrt(s) = 13 TeV in final states with missing transverse momentum and at least one jet using the alphaT variable, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1611.00338 [hep-ex], Eur. Phys. J. C77 (2017) no.5, 294.

96. Searches for invisible decays of the Higgs boson in pp collisions at sqrt(s) = 7, 8, and 13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1610.09218 [hep-ex], JHEP 1702 (2017) 135.

97. Search for heavy resonances decaying into a vector boson and a Higgs boson in final states with charged leptons, neutrinos, and b quarks, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1610.08066 [hep-ex], Phys. Lett. B768 (2017) 137-162.

98. Observation of Upsilon (1S) pair production in proton-proton collisions at sqrt(s)=8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1610.07095 [hep-ex], JHEP 1705 (2017) 013.

99. Search for R-parity violating supersymmetry with displaced vertices in proton-proton collisions at sqrt(s) = 8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1610.05133 [hep-ex], Phys.Rev.D95(2017)no.1,012009.

100. Search for top quark decays via Higgs-boson-mediated flavor-changing neutral currents in pp collisions at sqrt(s)=8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1610.04857 [hep-ex], JHEP1702(2017)079.

101. Measurements of differential cross sections for associated production of a W boson and jets in proton-proton collisions at sqrt(s) = 8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1610.04222 [hep-ex], Phys. Rev. D95 (2017) 052002.

102. Measurement of differential cross sections for top quark pair production using the lepton+jets final state in proton-proton collisions at 13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1610.04191 [hep-ex], Phys. Rev. D95 (2017) no.9, 092001.

103. Search for anomalous Wtb couplings and flavour-changing neutral currents in t-channel single top quark production in pp collisions at sqrt(s) = 7 and 8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1610.03545 [hep-ex], JHEP 1702 (2017) 028.

104. Search for high-mass Z gamma resonances in e+e- gamma and mu+mu-gamma final states in proton-proton collisions at sqrt(s) = 8 and 13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1610.02960 [hep-ex], JHEP 1701 (2017) 076.

105. Cross section measurement of t-channel single top quark production in pp collisions at sqrt(s)= 13 TeV, CMS Collaboration (Albert M Sirunyan, Prolay Mal, Sanjay Swain, et al.), arXiv:1610.00678 [hep-ex], Phys. Lett. B772 (2017)752-776.

106. Observation of charge-dependent azimuthal correlations in p-Pb collisions and its implication for the search for the chiral magnetic effect, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, etal.),arXiv:1610.00263 [nucl-ex], Phys. Rev. Lett. 118 (2017) no.12, 122301.

107. Search for supersymmetry in events with one lepton and multiple jets in proton-proton collisions at sqrt(s) = 13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1609.09386 [hep-ex], Phys.Rev.D95(2017)no.1,012011.

108. Search for long-lived charged particles in proton-proton collisions at sqrt (s)= 13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1609.08382 [hep-ex], Phys. Rev. D94 (2016) no.11, 112004.

109. Inclusive search for supersymmetry using razor variables in pp collisions at sqrt(s)= 13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1609.07658 [hep-ex], Phys. Rev. D95 (2017) no.1, 012003.

110. Search for narrow resonances in dilepton mass spectra in proton-proton collisions at sqrt(s) = 13 TeV and combination with 8 TeV data, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.),

arXiv:1609.05391 [hep-ex], Phys. Lett. B768 (2017) 57-80.

111. Measurement of inclusive jet cross sections in pp and PbPb collisions at sqrt(s_NN)= 2.76 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1609.05383 [nucl-ex], Phys. Rev. C96 (2017) no.1,015202.

112. Measurement and QCD analysis of double-differential inclusive jet cross sections in pp collisions at sqrt(s)=8 TeV and cross section ratios to 2.76 and 7 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.),arXiv:1609.05331[hep-ex],JHEP1703(2017)156.

113. Studies of inclusive four-jet production with two b-tagged jets in proton-proton collisions at 7 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1609.03489 [hep-ex], Phys. Rev. D94 (2016) no.11,112005.

114. Decomposing transverse momentum balance contributions for quenched jets in PbPb collisions at sqrt(s_NN)=2.76 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1609.02466 [nucl-ex], JHEP1611(2016)055.

115. The CMS trigger system, CMS Collaboration (Vardan Khachatryan,... Prolay Mal, Sanjay Swain, et al.), arXiv:1609.02366 [physics.ins-det], JINST 12(2017)no.01,P01020.

116. Measurement of the total and differential inclusive B+ hadron cross sections in pp collisions at sqrt(s) = 13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1609.00873 [hep-ex], Phys. Lett. B771(2017)435-456.

117. Measurement of the production cross section of a W boson in association with two b jets in pp collisions at sqrt(s) = 8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1608.07561 [hep-ex], Eur.Phys.J.C77(2017)no.2,92.

118. Measurement of the mass of the top quark in decays with a J/psi meson in pp collisions at 8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1608.03560 [hep-ex], JHEP 1612 (2016) 123.

119. Search for new phenomena in events with high jet multiplicity and low missing transverse momentum in proton–proton collisions at sqrt(s)=8 TeV,
CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.),
arXiv:1608.01224[hep-ex],Phys.Lett.B770(2017)257-267.

120. Measurement of the ZZ production cross section and Z l+l-l'+l'- branching fraction in pp collisions at sqrt(s)=13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1607.08834 [hep-ex],Phys.Lett.B763(2016)280-303.

121. Measurement of electroweak production of a W boson and two forward jets in proton-proton collisions at sqrt(s)=8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1607.06975 [hep-ex], JHEP1611(2016)147.

122. Measurement of the WZ production cross section in pp collisions at sqrt(s) =13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1607.06943 [hep-ex], Phys. Lett. B766 (2017) 268-290.

123. Search for dark matter in proton-proton collisions at 8 TeV with missing transverse momentum and vector boson tagged jets, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1607.05764 [hep-ex],JHEP1612(2016)083.

124. Jet energy scale and resolution in the CMS experiment in pp collisions at 8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain et al.),arXiv:1607.03663[hep-ex],JINST12(2017)no.02,P02014.

125. Search for lepton flavour violating decays of the Higgs boson to e tau and e mu in proton–proton collisions at sqrt(s)= 8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1607.03561 [hep-ex], Phys.Lett.B763(2016)472-500.

126. Observation of the decay B+ psi(2S) phi(1020) K+ in pp collisions at sqrt(s) = 8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1607.02638 [hep-ex], Phys. Lett. B764 (2017) 66-86.

127. Search for new physics in final states with two opposite-sign, same-flavor leptons, jets, and missing transverse momentum in pp collisions at sqrt(s) = 13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.),arXiv:1607.00915[hep-ex],JHEP1612(2016)013.

128. Measurement of the differential cross sections for top quark pair production as a function of kinematic event variables in pp collisions at sqrt(s)=7 and 8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1607.00837 [hep-ex], Phys. Rev. D94 (2016) no.5, 052006.

129. Searches for R-parity-violating supersymmetry in pp collisions at sqrt(s) = 8 TeV in final states with 0-4 leptons, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1606.08076 [hep-ex], Phys. Rev. D94 (2016)no.11,112009.

130. Evidence for collectivity in pp collisions at the LHC, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1606.06198 [nucl-ex],Phys.Lett.B765(2017)193-220.

131. Measurement of the transverse momentum spectra of weak vector bosons produced in proton-proton collisions at sqrt(s)=8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1606.05864 [hep-ex],JHEP1702(2017)096.

132. Search for Resonant Production of High-Mass Photon Pairs in Proton-Proton Collisions at sqrt(s) =8 and 13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1606.04093 [hep-ex], Phys.Rev.Lett.117(2016)no.5,051802.

133. Phenomenological MSSM interpretation of CMS searches in pp collisions at sqrt(s) = 7 and 8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1606.03577 [hep-ex], JHEP 1610 (2016) 129.

134. Measurements of the Higgs boson production and decay rates and constraints on its couplings from a combined ATLAS and CMS analysis of the LHC pp collision data at sqrt(s)=7 and 8 TeV, ATLAS and CMS Collaborations (Georges Aad, Prolay Mal, Sanjay Swain, et al.), arXiv:1606.02266[hep-ex],JHEP1608(2016)045.

135. Measurement of the transverse momentum spectrum of the Higgs boson produced in pp collisions at sqrt(s)=8 TeV using H WW decays, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1606.01522[hep-ex],JHEP1703(2017)032.

136. Search for Dark Matter and Supersymmetry with a Compressed Mass Spectrum in the Vector Boson Fusion Topology in Proton-Proton Collisions at sqrt(s) = 8 TeV, CMS Collaboration (Vardan Khachatryan,. Prolay Mal, Sanjay Swain, et al.), arXiv:1605.09305 [hep-ex], Phys. Rev. Lett. 118 (2017) no.2,021802.

137. Measurement of the W boson helicity fractions in the decays of top quark pairs to lepton + jets final states produced in pp collisions at sqrt(s)=8TeV
By CMS Collaboration (Vardan Khachatryan,... Prolay Mal, Sanjay Swain, et al.), arXiv:1605.09047 [hep-ex], Phys. Lett. B762 (2016) 512-534.

138. Coherent J psi photoproduction in ultra-peripheral PbPb collisions at sqrt (s_NN)= 2.76 TeV with the CMS experiment, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1605.06966 [nucl-ex], Phys. Lett. B772 (2017) 489-511.

139. Multiplicity and rapidity dependence of strange hadron production in pp, pPb, and PbPb collisions at the LHC, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1605.06699 [nucl-ex], Phys.Lett.B768(2017)103-129.

140. Search for supersymmetry in pp collisions at sqrt(s)=13 TeV in the single-lepton final state using the sum of masses of large-radius jets, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1605.04608[hep-ex],JHEP1608(2016)122.

141. Measurement of the double-differential inclusive jet cross section in proton–proton collisions at sqrt(s) = 13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1605.04436 [hep-ex], Eur.Phys.J.C76(2016)no.8,451.

142. Search for new physics in same-sign dilepton events in proton–proton collisions at sqrt(s) = 13 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1605.03171 [hep-ex], Eur. Phys. J. C76(2016)no.8,439.

143. Search for Higgs boson off-shell production in proton-proton collisions at 7 and 8 TeV and derivation of constraints on its total decay width, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1605.02329[hep-ex],JHEP1609(2016)051.

144. Measurement of the integrated and differential ttbar production cross sections for high-pT top quarks in pp collisions at sqrt (s) =8 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1605.00116 [hep-ex], Phys. Rev. D94 (2016) no.7, 072002.

145. Search for narrow resonances in dijet final states at sqrt(s)= 8 TeV with the novel CMS technique of data scouting, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1604.08907 [hep-ex], Phys.Rev.Lett.117(2016)no.3,031802.

146. Pseudorapidity dependence of long-range two-particle correlations in pPb collisions at sqrt (s_NN)=$ 5.02 TeV, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain, et al.), arXiv:1604.05347 [nucl-ex], Phys.Rev.C96(2017)no.1,014915.

147. Search for lepton flavour violating decays of heavy resonances and quantum black holes to an emu pair in proton-proton collisions at sqrt(s) = 8 TeV, CMS Collaboration (Vardan Khachatryan,. Prolay Mal, Sanjay Swain, et al.), arXiv:1604.05239 [hep-ex], Eur.Phys.J. C76 (2016) no.6, 317.

148. Evidence for exclusive gamma gamma W+ W- production and constraints on anomalous quartic gauge couplings in pp collisions at sqrt(s)=7 and 8 TeV, CMS Collaboration (Vardan Khachatryan Prolay Mal, Sanjay Swain, et al.), arXiv:1604.04464 [hep-ex], JHEP 1608 (2016) 119.

149. Measurements of the ttbar production cross section in lepton+jets final states in pp collisions at 8 TeV and ratio of 8 to 7 TeV cross sections, CMS Collaboration (Vardan Khachatryan, Prolay Mal, Sanjay Swain et al.), arXiv:1602.09024 [hep-ex], Eur.Phys.J. C77 (2017) no.1, 15.

150. Photoluminescent Au-Ge composite nanodots formation on SiO2 surface by ion induced dewetting, Debi P. Datta, Vantari Siva, A. Singh, D. Kanjilal, and Pratap K. Sahoo, Nucl. Instrum. Methods Phys. Res. B, 407, 141 (2017).

151. Progressive magnetic softening of

ferromagnetic layers in multilayer ferromagnet-nonmagnet systems and the role of granularity, Siddharth S. Sahu, Vantari Siva, Paresh C. Pradhan, Maheswar Nayak, Kartik Senapati, and Pratap K. Sahoo, Journal of Applied Physics 121, 213905 (2017)

152. Suppression of near band edge emission in specially engineered ZnO twin nanorods, Avanendra Singh, Kartik Senapati, Biswarup Satpati, Pratap K. Sahoo, Phys.Chem. Chem. Phys., 19, 14012 (2017).

153. Synthesis of p-n junctions in ZnO nanorods by O+ ion implantation, Avanendra Singh, K. Senapati, D. P. Datta, R. Singh, S. Bhuniac, D. Kanjilal, Pratap. K. Sahoo, Nucl. Instrum. Methods Phys. Res. B, xxx xxx (2017), DOI: 10.1016/j.nimb.2017.03.048.

154. Interface mediated enhanced mixing of multilayered Ni-Bi thin films by swift heav ion irradiation, V. Siva, A. Chettah, S. Ojha, A. Tripathi, D. Kanjilal, Pratap K. Sahoo, Nucl. Instrum. Methods Phys. Res. B, xxx xxx (2017), DOI:10.1016/j.nimb.2017.03.074.

155. Role of work function in field emission enhancement of Au island decorated vertically aligned ZnO nanotapers, A. Singh, K. Senapati, M. Kumar, T. Som, Anil K. Sinha, and Pratap K. Sahoo, Applied Surface Science, 411, 117-123 (2017).

156. Synthesis of sponge-like hydrophobic NiBi3 surface by 200 keV Ar ion implantation, Vantari Siva, D. P. Datta, S. Chatterjee, S. Varma, D. Kanjilal, Pratap K. Sahoo, Applied Surface Science, 410 519-524 (2017).

157. Synthesis of Cu doped ZnO nanorods for photosensitive UV detection application, S. N. Sarangi, V. Siva, B. K. Padhi, and P. K. Sahoo, Adv. Mat. Lett., 8(4), 524 (2017).

158. Unusual ferromagnetic behaviour of embedded nonfunctionalized Au nanoparticles in Bi/Au bilayer films, Sudakshina Prusty, Vantari Siva, Neeraj Shukla, Biswarup Satpati, K. Senapati, and Pratap K. Sahoo, RSC Adv 6, 106584 (2016).

159. Second harmonic generation of femtosecond pulses using ZnO nanorods grown by chemical bath deposition with drop casted seed layer, R. Panda, S. Bhattacharya, R. Samal, Avanendra Singh, Pratap K. Sahoo, P. K. Datta, S. K. Das, J. Nonlinear Optic. Phys. Mat. 25, 1650029 (2016).

160. Ion induced dewetting of Au-Si on SiO2 surface: composite nanodot evolution and wettability transition, Debi Prasad Datta, Siva Vantari, Shikha Varma, Dinakar Kanjilal and Pratap Kumar Sahoo, Phys. Chem. Chem. Phys., 18, 29955 (2016).

161. Enhanced surface and interface diffusion in Ni-Bi bilayers by swift heavy ion irradiation , Vantari Siva, Abdelhak chettah, Biswarup Satpati , S. Ojha , D. Kanjilal , and Pratap K. Sahooa, RSC Adv 6, 58950 (2016).

162. Facile Sysnthesis of a superhydrophobic and colossal broadband antireflective nanoporous GaSb surface, Debi P. Datta, S. K. Garg, I. Thakur, B. Satpati, Pratap K. Sahoo, D. Kanjilal and Tapobrata Som, RSC Adv 6, 48919 (2016).

Conference/Workshop proceedings

1. ynthesis of p-n junctions in ZnO nanorods by O+ ion implantation; Avanendra Singh, Kartik Senapati, D. P. Dutta, R. Singh, T. Som, S. Bhunia, D. Kanjilal, and P. K. Sahoo, Nucl. Instrum. Meth. Phys. Res. B (http://dx.doi.org/10.1016/j.nimb.2017.03.048)
2. S Kumar and R Das "Quality-Factor Enhancement in Optical Tamm Plasmon Modes" International Conference on Fibre Optics and Photonics, IIT Kanpur 2016. (Oral presentation)
3. S Kumar K V Anil Kumar S M Dhrmapraksh and R Das "Ultrafast Fifth-Order Optical Nonlinearity in 2, 9, 16, 23-Tetra-tert-butyl-29H, 31H-Phthalocyanine Thin Film",IONS Dhanbad 2016 (Oral presentation).
4. S. Kumar, K. V. A. Kumar, S. Dharmaprakash, and R. Das, "Ultrafast Optical Nonlinearities in 2, 9, 16, 23-Tetra-tert-butyl-29H, 31H-Phthalocyanine Thin Films," in Advanced Photonics 2016 (IPR, NOMA, Sensors, Networks, SPPCom, SOF), OSA Technical Digest (online) (Optical Society of America, 2016). (Paper not presented).
5. Dr. N. Khandai, Invited Lecturer for workshop on "Structure Formation inStandard Cosmology" organised by IUCAA and BITS Pilani Hyderabad at BITS Pilani Hyderabad.
6. Dr. N. Khandai, Invited Lecturer for workshop on "High Performance Computing in Astrophysics" at the Astronomical Society Meet in Feb 2017 in Jaipur.
7. Dr. V. Ravi Chandra, Meeting on Low Dimensional Quantum Systems, HRI, February 2017.
8. Dr. A. Mukherjee, "MPG Kick-Off workshop on correlated materials", IOP, Bhubaneswar (May 2017)
9. Dr. A. Mukherjee, "IUMRS-ICYRAM 2016" , IISc, December 2016
10. Dr. Colin Benjamin, International Conference "Games 2016" in Maastricht, Netherlands,July2016.
11. Dr. Colin Benjamin, DAAD Research stay, May-July 2016 on "Mesoscopic Superconductivity", Host: Prof. Fabian Hassler, RWTH Aachen University, Germany, includes funds for travel and fellowship of 2000 Euros per month.
12. Invited Talk on "Multiplicity dependence of identified particle production in pp collisions with ALICE", by Kishora Nayak (for the ALICE Collaboration) at 52nd Rencontres de Moriond QCD and High Energy Interaction, La Thule, Italy, 25th March-1st April, 2017. Proceeding is accepted to publish in http://moriond.in2p3.fr.
13. Talk on "Light hadron production as function of multiplicity in pp collisions at $\sqrt{s}$ = 7 TeV measured with ALICE" by Kishora Nayak (for the ALICE Collaboration) at XXII DAE-BRNS High Energy Physics Symposium, University of Delhi, India, December 12-16, 2016. Proceeding accepted to publish in EPJ Web of Conferences.
14. Talk on "Resonance production in pp collisions at $\sqrt{s}$ = 13 TeV with ALICE at the LHC" by Sourav Kundu (for the ALICE Collaboration) at 61st DAE- BRNS Symposium on Nuclear Physics, SINP, Kolkata, December 05-09, 2016. Proceedings: DAE Symp. Nucl. Phys. 61 (2016) 752-753.
15. Talk on "Identified hadron production in proton-proton collisions at $\sqrt{s}$ = 13 TeV with ALICE at the LHC" by Sourav Kundu (for the ALICE Collaboration) at XXII DAE-BRNS High Energy Physics Symposium, University of Delhi, India, December 12-16, 2016. Proceeding accepted to publish in EPJ Web of Conferences.
16. Talk on "Different freezeout scenarios in large and small systems" by Ajay Kumar Dash et al. at XXII DAE-BRNS High Energy Physics Symposium, University of Delhi, India, December 12-16,2016.

Proceeding accepted to publish in EPJ Web of Conferences.

1. Talk on "Probing heavy-ion collisions through initial state observables" by Vipul Bairathi at 61st DAE-BRNS Symposium on Nuclear Physics, SINP, Kolkata, December 05-09, 2016. Proceedings: DAE Symp. Nucl. Phys. 61 (2016) 734-735.
2. Talk on "Azimuthal anisotropy of strange hadrons in U+U collisions at √sNN = 193 GeV" by Vipul Bairathi (for the STAR Collaboration) at 17th International Conference on Strangeness in Quark Matter: Utrecht, Netherlands,Jul.10-15,2017. Proceeding accepted to publish in EPJ Web of Conferences.
3. Talk on "Freeze-out Conditions in proton-proton Collisions From SPS to LHC Energies" by Debadeepti Mishra et al. at 61st DAE-BRNS Symposium on Nuclear Physics, SINP, Kolkata, December 05-09, 2016.

Proceedings: DAE Symp. Nucl. Phys. 61 (2016) 782-783.

1 Talk on "Identified Particle Production in U+U Collision at √sNN = 193 GeV in STAR" by Debadeepti Mishra (for the STAR Collaboration) at XXII DAE-BRNS High Energy Physics Symposium, University of Delhi, India,December12-16,2016. Proceeding accepted to publish in EPJ Web of Conferences.

2 Talk on "Simulation of response of detector materials to muon induced neutrons for DINO experiment" by Meghna K K at XXII DAE-BRNS High Energy Physics Symposium, University of Delhi, India, December12-16,2016. Proceeding accepted to publish in EPJ Web of Conferences.

3 Poster on "Simulation of neutron background for DINO experiment" by Meghna K K at 61st DAE-BRNS Symposium on Nuclear Physics, SINP, Kolkata, December 05-09, 2016. Proceedings: DAE-BRNS Symp. on Nucl. Phys. 61 (2016) 934-935.

4 Dr. P.K. Sahoo, Ion Beam Lithography with Cu ions for resistive switching application in NiO thin films, Low energy ion beam workshop, IUAC, New Delhi, 8th July 2016.

5 Dr. P.K. Sahoo, Fabrication of Light emitting p-n-p junction in ZnO Nanowires by Oxygen ion implantation, Ion Beam Modofication of Materials (IBMM-2016), Wellingenton, New Zealand, 30th Oct. – 4th Nov 2016.

6 Dr. P.K. Sahoo, Twin ZnO Nanorods for Nano-thermometry and Phonon Tunnel devices, National conference on "Science and Technology for National Development in India" ISCA Bhubaneswar Chapter, 12-13 December-2016, KIIT University Bhubaneswar.

7 Dr. P.K. Sahoo, Fabrication of p-n junctions in ZnO Nanorods influenced by O ion implantation, Low energy ion beam workshop, IUAC, New Delhi, 16th December 2016.

8 Dr. P.K. Sahoo, Nanoscale Interfacial Mixing of Au/Bi LayersUsing MeV ion Irradiations, DAE SSPS-2016, KIIT University Bhubaneswar, Dec 2016

9 Dr. P.K. Sahoo, Chemically Grown ZnO Nanorods for optoelectronic applications, Advanced Materials and Processing (AMP-2017), Department of Physics, National Institute of Technology Durgapur, 8th March 2017.

Conferences /Workshop/Meeting organized:

1. Indo-Japan workshop held at Tohoku University, Japan jointly organized via DST-JSPS project. Dr. Subhankar Bedanta.
2. Conference and Workshop on Modular Forms and Black Holes. Fund:- CFS by Dr. Yogesh Srivastava.
3. A two day workshop on Parallel computing sponsored by Intel in September 2016 at Computer Center, NISER by Dr. V. Ravi Chandra
4. Dr. Ashok Mohapatra:- Member for organisation of International Olympiad on Astronomy and Astrophysics 2016 at NISER.
5. Dr. Sumedha, Member of NOC for "Statphys IX, Kolkata" , December 2016
6. Dr. Chethan N Gowdigere, Modular Forms and Black Holes, Jan 2017 at NISER

Projects from non-DAE schemes:

1. Title:- Ferromagnetic-Semiconductor heterostructures for magnetic field sensing and optoelectronic applications (DST-Nanomission)
   PI: S. Bedanta,
   Financial Support sanctioned: ~Rs 62 lakhs

2. Title:- Indo-Japan workshop on magnetism at nanoscale (IJWMN-2016)
   Project supported by DST, India and JSPS, Japan
   PI- S. Bedanta,
   Financial support sanctioned Rs. 9.4 lakhs

3. Title:- Engineering magnetic domains in Co antidote arrays (DST- SERB)
   PI: S. Bedanta,
   Financial Support sanctioned: ~Rs 49.92 lakhs
   (This project is being continues since 2014)

4. Title:- Electric field induced spin wave spectra in multiferroic antidot lattice arrays (India-Poland bilateral proposal via DST)
   PI: S. Bedanta,
   Financial Support sanctioned: ~Rs 17.2 lakhs
   (This project is being continued since 2015)

5. Title:- Superferromagnetism in magnetic nanoparticle systems (DST- Nanomission)
   PI: S. Bedanta,
   Financial Support sanctioned: ~Rs 50.5 lakhs
   (This project is finished in December 2016)

6. Title: "Spin Seebeck Effect in novel heterostructures"
   Co PI: Dr. Kartik Senapati
   Funding: DST-SERB

7. Title: Ramanujan Research Grant:
   PI- Dr. Ajaya Kumar Nayak
   Amount Sanctioned: 7 lakh/year
   (Total:35 lakh in 5 years, 2017-2021).

8. Max Planck-India partner group:
   PI- Dr. Ajaya Kumar Nayak
   Amount Sanctioned: 20,000/ euro/year
   (Total: 60000/ euro in 3years, 2017- 2019)

9. Early career research award:
   PI- Dr. Ajaya Kumar Nayak
   22 lakh + one JRF for three years (2017-2020)

10. Dr. Colin Benjamin, Funding Agency- DST Nanomission, Project title: Topology, spintronics and quantum computation with Dirac materials, Time: 4 years(Sep. 2013-Sep. 2017), Manpower: One Research Associate and one project fellow, Amount: 27 Lakhs. Host: NISER, Bhubaneswar.

Project was graded "Very good" by DST Nanomission expert committee in its March 2017 review.(Scanned letter attached)

11. Dr. Colin Benjamin, DAAD Research stay, May-July 2016 on "Mesoscopic Superconductivity", Host: RWTH Aachen University, Germany, includes funds for travel and fellowship of 2000 Euros per month

12. Dr. Colin Benjamin, DST SERB Project, July 2016-July 2019: "Non-local correlations in mesoscopic superconducting junctions". PI: Colin Benjamin, Theoretical project with a budget of around 25 Lakhs which includes funds for recruiting a Research Associate.

13. Dr. Victor Roy,
INSPIRE faculty research grant.

14. Prof. Bedangadas Mohanty,
Research Project title: "Beam Energy Scan program with Relativistic Heavy Ion Collisions and development of a Gas based Detector facility at NISER"
Funding Agency: DST-SERB
Sanctioned amount: Rs. 39, 00,000/-
Duration: 2015-2018

15. Dr. Prolay K Mal,
Triggering Techniques in High Energy Physics Experiments.
Funding Agency:-SERB

Talks (Invited and contributory)

1. Dr. S. Bedanta, Presented lecture at International conference on Metallic multilayers (MML 2016) held at Uppsala University, Sweden in June 2016.
2. Dr. S. Bedanta, Invited lecture at department of metallurgical enginnering, IIT Bombay in July 2016
3. Dr. S. Bedanta, Invited lecture at Conference on Emerging materials (CEMAT-2016) held at IISc, Bangalore in July 2016
4. Dr. S. Bedanta, Invited Institute colloquium at Trident Institute of Technology, Bhubaneswar in August 2016
5. Dr. S. Bedanta, Invited lecture at physics department, IISER, Mohali in October 2016
6. Dr. S. Bedanta, Invited lecture at department of physics at IIT Delhi in December 2016
7. Dr. S. Bedanta, Invited lecture at Indo-Japan workshop held at Tohoku University, Japan in December 2016
8. Dr. S. Bedanta, Invited lecture at Indian National Science Academy (INSA) annual meeting held at NISER, Bhubaneswar in December 2016
9. Dr. S. Bedanta, Invited lecture at DAE Solid state physic s symposium (SSPS-2016) held at KIIT University in December 2016
10. Dr. S. Bedanta, Invited lecture at International Union for material research society for young researchers (IUMRS 2016) held at IISc, Bangalore in December 2016
11. Dr. S. Bedanta, Invited lecture at Conference of Emerging trends in physics held at North Odisha University held in March 2017
12. Dr. S. Bedanta, Invited lecture at the Faculty orientation programme held at Utkal University in March 2017
13. Dr. S. Bedanta, Invited lecture at Nano India 2017 conference held at IIT Delhi in March 2017
14. Dr. S. Bedanta, Invited lecture at Defense Metallurgical research laboratory (DMRL), Hyderabad in March 2017
15. Dr. Prasanjit Samal, Lecture Series on Electronic Structure Theory, CET, Bhubaneswar & Biju Pattnaik University of Technology

16. Dr. Prasanjit Samal, (Time-Dependent) Density Functional Theory in Quantum Chemistry, CET, Bhubaneswar & Biju Pattnaik University of Technology

17. Dr. Ritwick Das, "Optical Parametric Oscillators: Devices using Nonlinear Optics" – TEQIP program held at Department of Physics, at College of Engineering and Technology, Bhubaneswar (October 2016)

18. Dr. N. Khandai, Invited Speaker at Dept of Theoretical Physics TIFR.

19. Dr. V. Ravi Chandra, The spin-1/2 Heisenberg antiferromagnet on the Pyrochlore lattice: An exact diagonalisation study delivered at HRI, February 2017.

20. Dr. Anamitra Mukherjee, "Nematic and magnetic order in Iron based superconductors" SNBCBS, Kolkata (June, 2017)

21. Dr. Colin Benjamin, Talk on "Topology, quantum computation and spintronics in Dirac materials" at DST Nanomission Review meeting in IIT Delhi March 2017

22. Dr. Colin Benjamin, Poster on "Do quantum strategies always win?" at Games 2016 in Maastricht, Netherlands, July 2016

23. Dr. Victor Roy, DAE-HEP symposium, December 2016, New Delhi.

24. Dr. Sumedha, Talk at Nobel symposium at NISER: "Strange Phenomenon in Nature's Flatland" , November 2016

25. Dr. Sumedha, Talk at conference `DAE Biologists and Allied Scientists", organized by Bio-Sciences Group, BARC, Mumbai(March 2017) :"Stochastic modelling of dynamical instability in microfilaments"

26. "Multiplicity dependence of identified particle production in pp collisions with ALICE" by Kishora Nayak (for the ALICE Collaboration) in 52nd Rencontres de Moriond QCD and High Energy Interaction held at La Thule, Italy, 25th March-1st April, 2017.

27. "Light hadron production as function of multiplicity in pp collisions at $\sqrt{s}$ = 7 TeV measured with ALICE" by Kishora Nayak (for the ALICE Collaboration) in XXII DAE-BRNS High Energy Physics Symposium held at University of Delhi, India, December 12-16, 2016.

28. "Light flavour hadron production in proton-proton collisions at 13 TeV with ALICE at the LHC" by Sourav Kundu (for the ALICE Collaboration) in 26th International Nuclear Physics Conference (INPC 2016) held at Adelaide Convention Centre, Australia, September 11-16, 2016.

29. "Resonance production in pp collisions at $\sqrt{s}$ = 13 TeV with ALICE at the LHC" by Sourav Kundu (for the ALICE Collaboration) in 61st DAE-BRNS Symposium on Nuclear Physics held at SINP, Kolkata, December 05-09, 2016.

30. "Identified hadron production in proton-proton collisions at $\sqrt{s}$ = 13 TeV with ALICE at the LHC" by Sourav Kundu (for the ALICE Collaboration) in XXII DAE-BRNS High Energy Physics Symposium held at University of Delhi, India, December 12-16, 2016.

31. "Different freezeout scenarios in large and small systems" by Ajay Kumar Dash et al. in XXII DAE-BRNS High Energy Physics Symposium held at University of Delhi, India, December 12-16, 2016.

32. "Hadronic resonances production measurement with ALICE detector at the LHC" by Ranbir Singh (for the ALICE Collaboration) in XXII DAE-BRNS High Energy Physics Symposium held at University of Delhi, India, December 12-16, 2016.

33. "Probing heavy-ion collisions through initial state observables" by Vipul Bairathi in 61st DAE-BRNS Symposium on Nuclear Physics held at SINP, Kolkata, December 05-09, 2016.

34. "Azimuthal anisotropy of strange hadrons in U+U collisions at $\sqrt{s}$NN = 193 GeV" by Vipul Bairathi (for the STAR Collaboration) in 17th International Conference on Strangeness in Quark Matter, held at Utrecht, Netherlands, Jul. 10-15, 2017.

35. "Freeze-out Conditions in proton-proton Collisions from SPS to LHC Energies" by Debadeepti Mishra et al. in in 61st DAE-BRNS Symposium on Nuclear Physics held at SINP, Kolkata, December 05-09, 2016.

36. "Identified Particle Production in U+U Collision at $\sqrt{sNN}$ = 193 GeV in STAR" by Debadeepti Mishra (for the STAR Collaboration) in XXII DAE-BRNS High Energy Physics Symposium held at University of Delhi, India, December 12-16, 2016.

37. "Simulation of response of detector materials to muon induced neutrons for DINO experiment" by Meghna KK in XXII DAE-BRNS High Energy Physics Symposium held at University of Delhi, India, December 12-16, 2016.

38. "Photoneutron Calibration of SuperCDMS Soudan Detectors" by Vijay Iyer in APS April Meeting, Washington, USA January 28-31, 2017

39. "Phases of QCD", by Bedangadas Mohanty, IIT Bombay, 9th April 2016

40. "New form of matter – De-confined state of quarks and gluons" by Bedangadas Mohanty, ICTS, Bangalore, 18th April 2016

41. "New form of matter – De-confined state of quarks and gluons" by Bedangadas Mohanty, TCIS, Hyderabad, 28th April 2016

42. "New form of matter – De-confined state of quarks and gluons" by Bedangadas Mohanty, NSF Colloquium, TIFR, Mumbai, 4th May 2016

43. "Freeze-out dynamics in heavy-ion collisions", by Bedangadas Mohanty, Strange Quark Matter Conference, U C Berkeley, USA, June 27 – July 1, 2016

44. "The Phase Diagram of QCD", IIT Madras, by Bedangadas Mohanty, 18th January 2017.

45. Dr. Chethan N Gowdigere gave two lectures on the "Physics of Mirror Symmetry" at the School and Workshop on J-holomorphic curves and Gromov-Witten invariants, held in NISER, July

Recognitions

1. Prof. Bedangadas Mohanty – Got elected as a Fellow of Indian National Science Academy, New Delhi
2. Prof. Bedangadas Mohanty- Got elected as Fellow of Indian Academy of Sciences, Bangalore
3. Dr. Colin Benjamin, The work on Topologically induced fractional Hall steps in the integer quantum Hall regime of MoS2, SK Firoz Islam and Colin Benjamin, Nanotechnology 27, 385203 (2016) was featured in the Nanotechweb.org website, Can fractional steps appear in the integer quantum Hall regime?, Nanotechweb.org LAB TALK Sep. 26, 2016, see http://nanotechweb.org/cws/article/lab/66357
4. Dr. Colin Benjamin, awarded in 2016 from DST SERB, Project title: Non-local correlations in nanoscale systems: Role of decoherence, interactions, disorder and pairing symmetry, Time: 3 years, Amount: 25 Lakhs. Host: NISER.
5. Dr. Colin Benjamin, Awarded DAAD Research stay MAY-JULY 2016, Host: Institute of Quantum Information, Aachen, Germany.
6. Dr. Colin Benjamin, DST Nanomission in it's March 2017 review rated the progress in the project DST Nanomission project(PH1304) "Topology, spintronics and quantum computation with Dirac materials" as "Very Good".

Doctoral degree awarded to Ph.D. Students

1. Dr. Niru Chowdhury has been awarded Ph.D. degree in December 2016 with the thesis title "Effect of Random Anisotropy on Magnetization Reversal in Continuous and Discontinuous Magnetic Thin Films". Supervisor:- Dr. Subhankar Bedanta

Outreach program

1. Dr. Ritwick Das, "Lasers & Nonlinear Optics" at Nayagarh College, Nimapara (Odisha), at Bhadrak College, Bhadrak (Odisha) and P. N. College, Khorda (Odisha) in Optical Society of India's (OSI) Foundation Lecture Series (2016-17).

Major research facilities added in School of Physical Sciences

1. Low-temperature magneto resistance set-up with 7 Tesla magnetic field
2. X-ray diffractometer with X-ray reflectivity, GIXRD options
3. Ferromagnetic resonance spectroscopy (FMR) with 2-17 GHz frequency range
4. UHV sputter-miller system (From DST Nanomission)
5. Ultra cold atom set up and single photon detectors
6. Photoluminescence spectroscopy for studying light emission.
7. PECVD setup for nanostructure growth.

School of Humanities and Social Sciences

Dr. Pranay Swain, Reader-F (Chairperson)

Public Policy and Governance: public policy research aims at facilitating a better understanding of issues related to governance and public affairs and bridging the gap by offering to can analyse the actual implementation of policies by drawing upon comparative and international perspectives in public policy.

Voluntary Sector and Development: with the third sector assuming increasingly significant and creating a huge niche in social development the aim is to enhance our knowledge of the sector through independent and critical research. We also aim to better understand the value of the sector and how this can be maximized in terms of developmental interventions in an array of sectors.

Science Society Interface: Historically science has been steadily contributing in terms of shaping human thinking. As Herbert Spencer puts it Society has evolved through the three stages of evolution, namely theological, metaphysical and positive. Rational thinking and problem solving are two of the major hallmarks of science. However, there is need to continuously study the interactions between science and society that are designed to maintain the balance between scientific quality, political legitimacy and societal relevance.

Contemporary Social Issues: In order to achieve effective solutions to societal problems that involve science and technology, there is a need to understand the changing priorities and the patterns in social life. With technology driven life-style gripping the young generation, the resultant social issues must be addressed with fair amount of details. Our aim is to deep dive into the social transformation due to digital life style and offer valuable insights.

Dr. Debashis Pattanaik, Assistant Professor

Social networks for co-creation of knowledge: My research work is related to the understanding of knowledge diffusion and role of social networks. Social networks provide rich and systematic means of assessing informal networks In addition to mapping information flow; it also helps us in relational characteristics of knowledge, access, and engagement. My research focuses on analysis of the dimensions of relationships that precede or lead to effective knowledge sharing, and an understanding and tools and techniques that improves a network's ability to create and share knowledge.

Dr. Rooplekha Khuntia, Assistant Professor

Business Ethics and Organizational Behaviour: Human behaviour is a result of their individual characteristics as well as the context in which they are placed. My research is about people working in organizations and understanding their behaviour from a person-situation interaction perspective. Exploring people's behaviour within a broader context of work culture, leadership characteristics as well human values and personal belief systems as applied to ethical decision making is the core of my research. Also included in my research is work stress and work life balance - the challenges of a dynamic evolving world like.

Dr Joe Varghese Yeldho, Assistant Professor

Dr Yeldho's research areas focus on Critical History and Narratives of Race, Event Studies, Pedagogy and the Public Sphere, Architecture and Performance, Topology and Affordances

Dr Amarendra Das, Assistant Professor

Dr Das teaches Introduction to Economics and Environmental Economics and Environmental Impact Assessment to the Integrated M.Sc students and Environmental Economics and Ecological Economics, New Institutional Economics and Research Methodology to Ph.D Students. His teaching and research interest lies in Public Economics and Environmental Economics.

Publication

1. Yeldho, Joe Varghese. "Performing the city: Pedestrian Acts and Home to Harlem." Polygraph. 25 (2016): 119-135.

2. Swain, P.K. & Nayak, M. (2016), Attaining the SDGs: A Status Check of Water and Sanitation in Rural Odisha, Proceedings of Odisha Environment Congress-2016, pp. 216-224

3. Bibhunandini Das and Amarendra Das (2017) Technology Adoption in Indian Agriculture after Green Revolution: Changes and Challenges, eds M P Bezbaruah, Binoy Goswami and Raju Mandal. Taylor and Francis Books.

Seminars /Conferences/Invited talks

- Joe Varghese Yeldho, Pedestrianism, Sound and Harlem Dwelling September, 2016, IIT Ropar

- Joe Varghese Yeldho, Sounding Harlem, Futures of American Studies Institute, June 2016, Dartmouth, USA

- Pranay Kumar Swain, Attaining the SDGs: A Status Check of Water and Sanitation in Rural Odisha, Proceedings of Odisha Environment Congress-2016, 20-22 December 2016

- Pranay Kumar Swain, There is no "right" way to do a "wrong" thing : Ethics and Values in Research, CSIR-IMMT, Bhubaneswar, 6 December 2016 (Invited)

- Pranay Kumar Swain, Development Induced Dispossession: Role of key Social Actors, National Conference on Development, Dispossession & Resistance, National Institute of Technology, Rourkela, November 14-15, 2016

- Pranay Kumar Swain, Research 360 Degree: from Information to Insights, Seminar on Research Methodology in Gait Analysis Technology, International Society for Prosthetics and Orthotics, CIRS, Bhubaneswar, 6-7 August, 2016 (invited)

- Amarendra Das, Education of Adivasis in India: Relooking the Language Barrier National Conference on Health, Public Policy and Human Development: A Way Forward to Address SDGs (HPPH.D2017) March 30 - 31, 2017, NIT Rourkela (invited).

- Education of Adivasis in Odisha in the national seminar on Odisha Economy: Problems and Prospects organized in the Department of Economics, Ravenshaw University, Cuttack on 25 March 2017 (invited)

Conference Organized

53rd Annual Conference of The Indian Econometric Society (TIES), December 22-24, 2016

The school of Humanities and Social Sciences, NISER in collaboration with Nabakrusha Choudhury Centre for Development Studies (NCDS), Bhubaneswar organised the 53rd annual conference of TIES during December 22-24, 2016.

Around 350 participants from all over India and 5 from other countries participated in the conference. Prof Arvind Panagaraiya, Vice-Chairman of NITI Ayog was the chief guest of the conference in the inaugural session. Prof V Chandrasekhar, Director of NISER chaired the inaugural session. Dr R B Barman, Chairman of National Statistical Commission was the chief guest in the valedictory session of the conference. A number of past president of TIES were present in the conference. Prof M Govinda Rao, Member of the Finance Commission –XIV also delivered talk in the conference. Apart from the 310 paper presenters, there were 30 special invitees for the conference from all over the country. About 50 faculty and research scholars from the leading university and colleges of Odisha were invited to participate in the conference. A special panel discussion was organized to deliberate on the issues relating to Odisha. The panelists were: Prof Santosh Panda, Vice President, South Asian University, Prof Sudhakar Panda, Ex Chairman, Third State Finance Commission, Govt of Odisha and Prof Kishore Samala, Retired Prof NCDS. This was chaired by Prof Padmaja Mishra, Vice Chancellor Ramadevi University, Bhubaneswar.

Dr Amarendra Das, organisng secretary of the conference has been nominated as the Joint Secretary of TIES in the general body meeting of TIES held at NISER.

Colloquium/Seminar Organized

- Relationship between Market Access and Livelihood Choice., Professor P V Viswanath, Pace University, Lubin School of Business, New York. 28 February, 2017
- Examining Women's Status and Understanding Gender, Prof Madhumita Ray of KSRM deliver a talk at NISER on International Women's day, 08 March 2017
- Making Comparisons of Demographic Aggregates: A case of Life Expectancy, Prof Udaya Shankar Mishra from Centre for Development Studies, Thiruvananthapuram, Kerala, March 29, 2017
- Science Technology and Society: Ideological Construal of Relationships, Dr Sambit Mallick, Associate Professor, Indian Institute of Technology, Guwahati, 19 December 2016
- Intellectual Property Rights in Science in India, Dr Sambit Mallick, Associate Professor, Indian Institute of Technology, Guwahati, 19 December 2016

Outreach Programme

Special Lectures on Econometric Theory and Application, by Dr Vijay Mohan Pillai Associate Professor, Centre for Development Studies, Trivandrumduring 06-11 March, 2017 for Post Graduate and Doctoral students of NISER, Utkal University and Ramadevi University, Bhubaneswar

RESEARCH AND DEVELOPMENT PROJECTS: EXTRAURAL FUNDING

Project Sanctioned During 1st April 2016 to 31st March 2017					
Sl No.	Project Title	Source of Funding	Name of the P.I	School	Amount sanctioned
1	Role of Clusterin in the pathogenesis of Pseudoexfoliation Glaucoma	CSIR	Dr. Dabasmita P Alone	SBS	₹. 25,74,000.00
2	Non-local correlations in nanoscale system: Role of decoherence, interactions, disorder and pairing symmetry	SERB	Dr. Colin Benjamin	SPS	₹ 24,45,520.00
3	Immune regulatory role of TRPV in T Cell activation and supressive response	CSIR	Dr. Subhasis Chattopadhyay	SBS	₹ 21,24,000.00
4	Understanding the photophysics of molecular (Organic)Aggregates in near vicinity of metal and semiconductor (inoprganic) nano particles:Towards finding new hybrid nanoscale materials for optoelectronic applications	SERB	Dr. Moloy Sarkar	SCS	₹ 62,15,000.00
5	Metallo-Corroles:Unusual Oxidation States, Near-Infrared Dyes and (Electro) catalytic Bond Formation Reaction	DST	Dr. Sanjib Kar	SCS	₹ 20,13,500.00
6	Odisha Prospective Plan	IEG	Dr. Amarendra Das	SHSS	₹ 2,00,000.00
7	Circadian Clock mediated regulation of migratory physiology in long distant migratory birds	SERB	Dr. Devraj Singh	SBS	₹ 39,93,000.00
8	Total Synthesis of Lycorine Alkaloids	CSIR	Dr. P C Ravikumar	SCS	₹ 21,24,000.00
9	Degeneration of tissue structure and loss of function in respiratory system with age:Analysis in a Drosophila model	SERB	Dr. Ranjith Mathew	SBS	₹ 45,34,056.00
10	J.C BOSE FELLOWSHIP	SERB	Prof. R Ramesh	SEPS	₹ 84,00,000.00
11	Ramanujam fellowship	SERB	Dr. Ajaya Kumar Nayak	SPS	₹ 38,00,000.00
12	Inspire Faculty Award	DST	Dr. Safdar Quddus	SMS	₹ 83,00,000.00
13	Inspire Faculty Award	DST	Dr. Victor Roy	SPS	₹ 35,00,000.00
14	Inspire Faculty Award	DST	Dr. Sutanu Roy	SMS	₹ 35,00,000.00
15	Assembly and Constriction of the Bacterial Cytokinetic Ring formed by the Tubulin homologue,FtsZ	DBT	Dr. Ramanujam Srinivasan	SBS	₹ 71,78,000.00
16	A Drosophila model to study senile tissue degeneration of the respiratory system	DBT	Dr. Renjith Mathew	SBS	₹ 71,92,000.00

17	Assembly of Bacterial cell division protein, FtsZ into Ringh-like Structures: Cell Biological, Biochemical, Biophysical and Ultra-Structural Characterization of Novel Mutants trapped in a Helical Intermediate Stage of Z-ring Assembly.	SERB	Dr. Ramanujam Srinivasan	SBS	₹ 78,14,600.00
18	Genetic and mechnistic analysis of the pathomechanism of fuchs endothelial comeal dystrophy	ICMR	Dr. Debasmita P. Alone	SBS	₹ 66,72,764.00
19	Ferromagnetic semiconductor hererostructures for magnetic field sensing and optoelectronics application	DST	Dr. Subhankar Bedanta	SPS	₹ 62,41,600.00
20	Mechanistic insights into functioning of polysaccharide lyases (Pls) beloning toclass 5 (PL-5) from pathogenic bacteria such as Ralstonia pickettli, Pseudomonas aeruginosa.	DBT	Dr.Rudresh Acharya	SBS	₹ 59,97,000.00
21	Triggering techniques in High Energy Physics	SERB	Dr. Prolay Kumar Mal	SPS	₹ 35,32,565.00
22	National Post Doctoral Fellowship	SERB	Dr. Muthuchamy Murugavel	SCS	₹ 19,20,000.00
23	National Post Doctoral Fellowship	SERB	Dr. Joseph Ponniah S	SCS	₹ 19,20,000.00
				Total Cost	₹ 1021,91,605.00

Projects Sanctioned During 1st April 2016 to 31st March 2017

School	DST	DBT	SERB	CSIR	ICMR	IEG	Total	Fund Sanctioned
SPS	2	-	3	-	-	-	5	₹ 195,19,685.00
SMS	2	-	-	-	-	-	2	₹ 118,00,000.00
SBS	-	3	3	2	1	-	9	₹ 480,79,420.00
SCS	1	-	3	1	-	-	5	₹ 141,92,500.00
SHSS	-	-	-	-	-	-	1	₹ 2,00,000.00
SEPS	-	-	1	-	-	-	1	₹ 84,00,000.00
						TOTAL	23	₹ 1021,91,605.00

FIFTH GRADUATION CEREMONY

The 5th graduation ceremony was held on 10th June, 2016. Honourable Chief Guest Prof. Goverdhan Mehta, FNA,FRS, Jubilant–Bhartiya Professor, School of Chemistry, University of Hyderabad, Padmabhusan Prof S. K. Joshi, Chairman Board of Governors, NISER, graced the occasion and awarded the degrees to the Graduated students.

One Ph.D scholar and 56 Integrated M.Sc students graduated in the 5th convocation ceremony.

The students who own various awards in the 5th Graduation Ceremony are mentioned below;

Gold Medal for Best All Round Performances

Mr. Sanket Samal (School of Chemical Sciences)

Silver Medal for Best Academic Performance in each discipline of the graduating class

Mr. Jaydeep Paul (School of Biological Sciences)

Mr. Sanket Samal (School of Chemical Sciences)

Mr. Sagar Srivastava (School of Mathematical Sciences)

Mr. Himangshu Neog (School of Physical Sciences)

Best M.Sc Thesis Award-2016

Mr. Nilabh Ghosh (School of Biological Sciences)

Mr. Vineet Kumar Jakhar (School of Chemical Sciences)

Mr. Sagar Srivastava (School of Mathematical Sciences)

Mr. Himangshu Neog (School of Physical Sciences)

Memorial Awards-2016

Winner of Sarat Chandra Annapurna Award-2016

Mr. Himangshu Neog (School of Physical Sciences)

Winner of Smt. Jayalaxamma Award-2016

Mr. Sanket Samal (School of Chemical Sciences)

Winner of Prof.Tribikram Pati Memorial Award-2016

Mr. Sagar Srivastava (School of Mathematical Sciences)

Winner of Dr Sumitra Moharana Memorial Award-2016

Mr. Jaydeep Paul (School Biological Sciences)

Admission Statistics in the 5yr Integrated M.Sc programme, 2016

Approved intake for 5 year integrated M.Sc programme is 200. Total admitted into the 5 year integrated M.Sc programme in the year 2016 is 122. Total students on roll in 5 year integrated M.Sc programme is 103.

INFRASTRUCTURE

NISER Project at Jatni has been completed by M/s L&T and supervised by DCSEM, Mumbai along with the help of NISER, Institute Works Department (IWD). NISER Project was given Construction Industry Development Council (CIDC) Vishwakarma Award for the year 2017 which is a prestigious award. NISER is thankful to all the stakeholders of the Project. It covers an area of 300 acres and is located at Jatni along Jatni-Khurda road, Odisha at a distance of about 6 km from NH-5. The campus comprises an academic township, sports complex and residential township consist of 127 Nos of Buildings having plinth area 175937.92 sqm.

NISER, Jatni Project comprises Academic buildings, Amenities buildings, Service buildings, Residential, Hostels a total of 127 buildings. Academic complex consists of Schools of Chemical Science, School of Biological Science, Library & Lecture hall complex, School of Physical Science, School of Mathematical Science, School of 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, Local control substations, Gas bank, Water works and Gate house. Residential Complex consist of Flats of A, B, C, D and individual duplex houses like E type, Dean Bungalows and Director Bungalow. Hostels consist of four numbers of double occupancy and five numbers of Single Occupancy.

Some of the salient features of this project are:

Water harvesting is fully ensured by recharging of ponds in the campus by rain water and Ground water recharging pits. STP and ETP are provided to make use of waste water. Separate flushing tank is provided, so that STP treated water can be used in flushing. To ensure minimum water utilisation dual flushing system is provided.

Proper utilisation of day light to conserve electricity by providing glass window and Polycarbonate sheets in the top truss enabling proper lighting. The orientation of building was done in such a way that proper lighting and ventilation is ensured. To ensure heat transfer thermal insulation to the top floor is provided in academic complex.

The water tank catering to the entire campus water demand is placed at the top most location of the campus enabling proper conservation of pumping charges and allied expenses. The water is able to reach the high rise buildings through gravity as a result of this arrangement. A separate irrigation tank is provided for arboriculture.

Smoke proof doors around the corridors to confine the smoke in local area so that rescue can be done. Fire proof doors (2hrs resistivity) at exit point of staircase in every floor during fire emergency.

Source of Electricity and water in campus

The electricity supply for NISER campus is arranged from Aurugul Grid (5km) near IIT Bhubaneswar which was successfully energized on 28th April 2015. The interim water supply with the electrification of the pump panel room was successfully done in the month of March 2015 by Government of Odisha.

In order to make the campus the greenest campus various plantation programmes taken up by in-house faculties and staff. Various saplings were prepared and based on the advice of garden management committee the activities were taken up. In the campus, already a large number of trees around 6000 have been planted in various spreads across the campus. In STP area the plants have been planted and well maintained by Forest Deptt, Odisha.

The works section is always actively monitoring the maintenance works and landscaping. New works were also taken up like 4th floor in SPS which was taken over from L&T. Later on based on inputs and suggestions of faculties, deans and Directors the work was taken up and finishing done to the satisfaction of the end users.




In summer in order to mitigate the water crisis, water from STP are planning to be used for which already the pipeline work is in progress and for small portion around the STP the pipeline is already been laid. In rainy season the rain water harvesting ponds are seen flooded with water which seems have solved their purpose.

The shopping complex is also taken over. Various shops have been allotted.

The community centre is already in place which is being regularly used by staff and faculty for family functions and various departmental functions. This is being maintained in co-ordination with FIC (EMW). In construction of various things proper value engineering is taken care and accordingly the scarps taken over from fencing materials are used as guard rails saving huge amount of money etc.
In this year various all hostels were taken over from DCSEM and L&T and students are staying in those hostels.

The solid waste disposal is being maintained by Jatni Municipality. Jatni Municipality is picking the solid waste daily and dumping in their designated dumpyards

Permanent Campus at Jatni

The academic complex at permanent campus comprises of a total built up area of 72,700 square metres spread in 11 buildings. The residential township has a built up area of 102,000 square metres comprising nine buildings for hostels, adequate number of faculty and staff quarters and one Directors' Bungalow. The sports complex is going to have a student activity centre, aquatic sports complex and playground.

NISER Project at Jatni comprises a total of 127 buildings. The building comprises of various types like Academic buildings, Amenities buildings, Service buildings, Residential buildings, Hostels etc.

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 substations (LCS), Gas bank, water works and gate house.

Residential Buildings consist 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

As the peak demand water supply from Naraj Barrage is likely to take 2-3 years, temporary arrangement to the tune of 5 MLD (Million Litre per day) is being made by Government of Odisha by constructing the bore well at Bhimpur near Jatni. The interim water supply with the electrification of the pump panel room was successfully done.

Rain water harvesting structures like ground water recharging pits and ponds have been come up in the Jatni campus of NISER.

The water to the campus is to be filled in the water tank placed at the hill top from where the water is filled to the respective water tanks at the multi storied buildings through gravity which is economical as far as the expenditure with regards to keeping a pump and its operation and consumption of diesel etc.

The sewage treatment plant is in place. The treated water from the plant can be used for arboriculture and other useful purposes etc.








Outreach and Summer Programmes

NISER has been conscious of its responsibility to reach out to society. As part of our outreach activity we conduct regular workshops and training programmes, particularly in the discipline of mathematics. Our colleagues from this school have been doing a commendable job in this regard catering to students and teachers from Odisha and other parts of the country.

NISER has conducted a highly successful science day celebration which involved lectures and practical demonstrations to school children. We hope to be able to kindle the interest of society in general and young students in particular in science and technology and to be able to attract students to pursue a career in science.

We also accept students from other reputed Institutes of the country such as IISERs, NITs, etc. who express their interest to do summer projects under the supervision of our faculty members. NISER has been more than happy to allow such interested students to leverage its facilities for initiating new or furthering ongoing research activities. Similarly our students also embark for some of the best places during summers to learn new things as well as to expand and fine-tune their existing knowledge.

MISCELLANEOUS

International Day of Yoga

International Day of Yoga was celebrated by the institute on 21.06.2016. NISER conducted various yoga sessions, pranayama etc in which the faculty members, staff and students of the institute participated with all enthusiasm.

Sadbhavana Diwas

The Sadbhavana Diwas was observed 19th August 2016, 20th August, 2016 being a Saturday. All the officers and employees took the Sadbhavana Pledge for maintaining communal harmony.

Rastriya Ekta Diwas (National Unity Day)

The Rastriya Ekta Diwas was observed 31st October, 2016. Director, NISER administered Rastriya Ekta Pledge to all the officers and employees of the institute.

Vigilance Awareness Week

The vigilance awareness week was observed during 31 October 2016- 05 November 2016. All the employees of NISER took the oath of official secrecy and pledged on 02nd November, 2016, for maintenance of honesty and transparency while delivering their work.

Constitution Day observation

The day was observed on 25.11.2016 instead of 26.11.2016 as 26th Nov was a Saturday. The day was marked with address by Director, Registrar and reading of preamble. As a part of awareness drive, essay and debate competition was organized and prizes distributed for essay and debate.

Implementation of Official Language in NISER

During the year 2016-17 all four quarterly meetings of the institute Official Language Implementation Committee (OLIC) have been conducted. One Special meeting of OLIC was also conducted on 24.08.2016 on the occasion of Inspection of Implementation of Official Language in NISER by Dr. Ajay Mallik, Dy. Director, Official Language (Implementation), Ministry of Home, Government of India. Various decisions with respect to implementation of Official Language have


been taken. Besides this, the major events / activities which were conducted during the year are as follows:

1. Hindi fortnight was observed during September 1st to 15th, 2016. On this occasion following events / activities were conducted:

Hindi Film Quiz Competition

This event was conducted on September 9, 2016 and coordinated by Dr. Pranay Swain. Amongst the participants, groups of two people were formed. Winner groups of this event were:

i. First Prize (Cash award of Rs.2000):
   Ms. Bishnupriya Das & Ms. Sandipa Sahoo
ii. Second Prize (Cash award of Rs.1500):
   Mr. Vijay Singh & Mr. Sukant Kumar Das
iii. Third Prize (Cash award of Rs.1000):
   Mr. Srikant Sethi & Mr. Prem Prakash Pandey

Hindi Essay writing competition

This event was conducted in two categories viz. Students & Employees on September 12, 2016 on the topic of "Digital India". Winners of this competition were:

Students Category

I. First Prize (Cash award of Rs. 2000):
   Mr. Deepanshu Kumar
ii. Second Prize (Cash award of Rs.1500):
   Mr. Pankaj Kumar
iii. Third Prize (Cash award of Rs.1000):
   Ms. Rashmita Das & Mr. Sourish Biswas

Employees Categories:

i. First Prize (Cash award of Rs.2000):
   Mr. Souvagya Mahapatra
ii. Second Prize (Cash award of Rs.1500):
   Mr. Dileep Jha
iii. Third Prize (Cash award of Rs.1000):
   Ms. Sandeepa Sahoo & Mrs. Apolina Lakra

Short – Lecture in Hindi organized on HINDI – DIWAS:

This event was conducted on the occasion of the Hindi – Diwas (i.e. on September 14, 2016). The winners of this event were:

i. First Prize (Cash award of Rs.2000):
   Dr. Sourabh Chawla
ii. Second Prize (Cash award of Rs.1500):
   Mr. Sunny M. Gautam
iii. Third Prize (Cash award of Rs.1000):
   Mr. Dileep Jha

Some of the Photographs of Hindi-Diwas celebration, & prize distribution to the winners of different events conducted during the Hindi fortnight are furnished below:






1. Workshop on "Official Language Policy and Digital Tools" was jointly organized by NISER, IOP & HWB Talcher on December 16th, 2016 at Institute of Physics Campus. There were 10 participants from NISER who have attended this workshop. Contribution by each institution to this event was of Rs.3535.

2. Competition on "Noting and Drafting" in Official Language was jointly organized by the Town Official Language Implementation Committee (TOLIC) & Regional office of C&AG Bhubaneswar on December 22, 2016. Two participants Ms. Sandeepa Sahoo and Mrs. Lopamudra Sahoo were nominated from NISER to participate in this competition.

3. A Hindi Seminar on "Role of Scientific and Technical Institutions in Economic Self-Reliance" was jointly organized by the NISER, IOP, SIFA, ILS, SIWA, and AIIMS Bhubaneswar on February 27th, 2017. There were 20 participants from NISER who have attended this Seminar. NISER has contributed Rs.20000/- towards organization of this seminar.

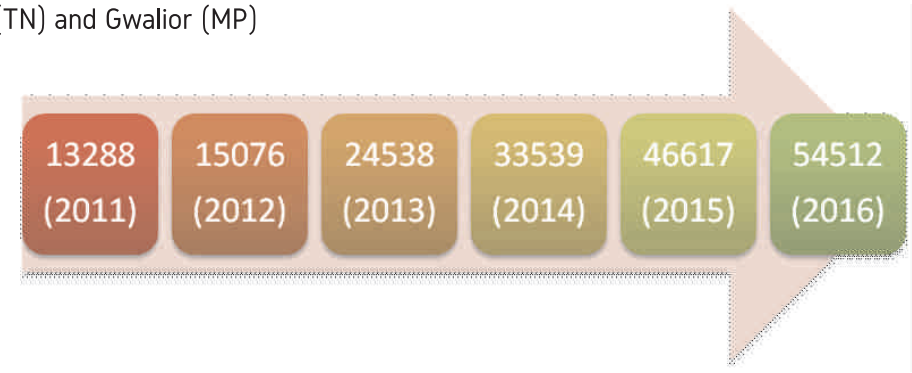
Intake to the Flagship programme - NEST

National Entrance Screening Test (NEST), the nation-wide test that NISER conducts to select the most deserving candidates for admission into its flagship programme, has been extremely popular and effective. NEST is conductedfor admission to 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 CBS), Mumbai was successfully conducted at 102 venues in 59 cities across the country on 28th May 2016. The response to this year's advertisement was very satisfying.

For NEST-2016, 8 new centres were added. Those are Imphal (MN), Durgapur (WB), Dhanbad (JH), Koraput (OD), Vijayawada (TS), Coimbatore (TN), Tiruchirapally (TN) and Gwalior (MP)

As against 33503 in 2014 and 46617 in 2015, this time 54511 applications were received. The number reinforces the growing popularity of science education in general and NISER in particular. Out of the 54511 applied, 37665 candidates wrote the test.

The results were declared on the NEST website on 17th June, 2016 and admission counseling were held in the first fortnight of July. A new batch of 130 students were admitted on 25th July 2016 and the classes for the academic session 2016-17 started from 27th July 2016. In next couple of years, once NISER settles down completely here in the new campus, it will increase the intake to the approved strength of 200. Number of applications received over the years is depicted below.



Brief summary of the gender and category wise applicants is as follows:

Gender	GEN	OBC	SC	ST	PD	Total
Male	17579	9046	2937	1011	201	30774
Female	14538	6791	1692	643	73	23737
					TOTAL	54511

The state wise distribution of the applications received is shown in the following table.

State of Domicile	Number	Percentage
Odisha (OD)	14966	27.455
Kerala (KL)	8235	15.107
Uttar Pradesh (UP)	5110	9.374
West Bengal (WB)	3810	6.989
Bihar (BR)	2840	5.21
Rajasthan (RJ)	2500	4.586
Maharashtra (MH)	1910	3.504
Haryana (HR)	1821	3.341
Andhra Pradesh (AP)	1693	3.106
Madhya Pradesh (MP)	1593	2.922
Tamil Nadu (TN)	1366	2.506
Telangana (TS)	1186	2.176
Jharkhand (JH)	1173	2.152
Delhi NCR (DL)	1053	1.932
Himachal Pradesh (HP)	975	1.789
Chhattisgarh (CG)	833	1.528
Punjab (PB)	737	1.352
Uttarakhand (UK)	646	1.185
Karnataka (KA)	551	1.011
Assam (AS)	503	0.923
Gujarat (GJ)	306	0.561
Tripura (TR)	212	0.389
Jammu & Kashmir (JK)	152	0.279
Chandigarh (CH)	117	0.215
Puducherry (PY)	93	0.171
Meghalaya (ML)	34	0.062
Manipur (MN)	29	0.053
Arunachal Pradesh (AR)	18	0.033
Goa (GA)	13	0.024
Andaman & Nicobar (AN)	11	0.02
Sikkim (SK)	7	0.013
Lakshadweep (LD)	6	0.011
Dadra & Nagar Haveli (DN)	5	0.009
Nagaland (NL)	4	0.007
Mizoram (MZ)	2	0.004
Daman & Diu (DD)	1	0.002
TOTAL	54511	100

The admissions to the Ph.D programmes were conducted through an even more rigorous process that included short-listing of eligible applicants followed by in-house written tests and interviews.

The selection process for the Ph.D programmes in various schools were completed in the month of June 2016. Close to one thousand applications were received for the Ph.D programme this time and the school wise break up is as follows.

Physics:435	Biology: 283	Chemistry: 164	Mathematics: 67	Humanities and Social Sciences: 32

STUDENTS ACTIVITIES

Placement

Talking of placement, the 5th batch of Integrated M. Sc graduating students graduated in June 2016, have bagged offers for Ph.D. positions from various universities in India and abroad. In India, they have secured positions at TIFR, NCBS and IITs. From abroad, students have received offers from various universities including 13 universities under top 50 global rankings in respective subjects, some of them are University of Oxford, ETH Zürich, University of Illinois at Urbana-Champaign, University of Wisconsin-Madison, Texas A&M University, University of Michigan, RWTH Aachen University, University of British Columbia, Rice University.

Sports

Sports and games constitute a major part of campus life for our students. It is not just a coincidence than the words like "students", "science" and "sports" start with the same letter. Sports wise also, our students have quite a busy annual calendar. Apart from the regular sporting activities, the students organize their NISER Premier League and NISER Football League twice a year and the Annual Sports Meet.

Going forward, NISER will have better sports infrastructure when our Sports Complex with the Students Activity Centre, Gym, aquatic complex, etc. are ready.

The IISM is the only sporting event in which NISER participates every year along with the other IISERs and a few other national science Institutes. The event was organised during 07 December 2016 to 15 December 2016 at IISER, Kolkata. Even with a hectic academic schedule our students would find time at some hour of the day and practice for the meet. And it paid off in the form of two silver medals, two bronze medals and a couple of heart warming performances.

Mimamsa 2017

One of the NISER teams (team BHW 101) comprising Mitradip Das, Tanmay Pani, Debadutta Patra and Rudrarup Bose emerged as the centre toppers at the recently concluded Annual Inter-college Science Challenge- Mimamsa held at IISER, Pune.
The other team (BHW105) comprising Indranil Ghosh, Renu Raman Sahu, Pritam Laskar and Salil Javed VP went even further by reaching the finals along with 3 others teams: IIT Bombay, IISc Bangalore and IIT Madras, where they finished runner up. Mimamsa is a two stage event in which team of 4 compete to showcase their understanding

of core concepts in fundamental disciplines of science. Over 250 teams from across the country participated in this edition of Mimamsa. The top four teams from the qualifying rounds made it to the national final held during 18-19 March 2017.

Cultural Activities

Dandiya Night

On the 15th of October, 2016 the students organised a Dandiya Raas. Dandiya is a traditional folk dance form, primarily, of Gujurat and is generally performed during Navaratri. The lights, music and the colourful choli, ghagra and bandhani dupattas added a different flavour to the evening.

Cultural Night:

The inaugural event in the Amphitheatre was held on 2nd November 2016. The Drama and Music Club coordinated the event and staged our very own talents. Vocalists and instrumentalists along with poets and stand-up comedians were the major attractions of the evening.

The Weekly:

The Quizone Club conducts a weekly e-quiz for the members NISER. Interesting and intriguing might be the only words which could describe it.

Film Club :

The film club organizes weekly film show for NISER students. The club organised screening of movies from different genres, languages and countries. The literary club and the arts club are gradually getting into the act.

Spic-Macay NISER Chapter

It is heartening to note that now we have a formal Spic Macay, NISER chapter. The student volunteers, in spite of their tight academic schedule, organize various events round the year. On 10 December 2016, the SPICMACAY NISER chapter organized a concert of the renowned Odishi exponent Vidushi Aruna Mohanty. Another concert of Ustad Shahid Pervez, the renowned Sitar exponent was organized on 18 December 2016.

Cleanliness Drive

The youngest members of our NISER family, the first-year Integrated M.Sc. Students, have continuously made efforts towards keeping our campus clean. In order to create awareness amongst the students they even performed a street play (Nukkad). And after that we all wore safety gloves and cleaned our hostel premises. The first years continue to pursue their goal till date. They have taken the initiative to put up dustbins on the sidewalks leading to our hostels.

Four in One:

Being a national institute we house students from various corners of our country, all with different cultural backgrounds. However, we never realized the diversity that is present in our institute. So, we decided to change things around by celebrating Makar Sankranti, Pongal, Lohri and Bihu, all on the same day.

All of these festivals mark the onset of Uttarayan apart from being harvest festivals. The first-year students organised various events to celebrate the occasion. The following events were held: 1. Kite flying 2. Bonfire 3. Folk Dance 4. Matka Fod

Halloween Night:

We have a kind of ritual here, wherein the first-year M.Sc. guys organize a Halloween night every year. The guys did put in a lot of effort to prepare the Students Activities Centre for the night.

Drama and Music Club

NISER students have a very vibrant drama and music club. The students showcase their artistic creativity through activities on various festive occasions. To name a few, they put up cultural activities during Holi, Diwali, Eid and Chirstmas. Koffee with Kishore is another event that the students organize every year on a grand scale to commemorate the birthday of the legendary singer Kishore Kumar.

Social Initiative: ZARIYA:

The social service club of NISER has been actively taking measures to address some major societal issues which include education of children residing in the slums, donation of clothes to the needy and cleanliness drives. Our students at NISER have given an expression of their compassionate minds by forming an organization named "Zariya" to serve as a medium for translating their concern and feeling for their fellow beings. It's primary objective is to stimulate social responsibility amongst NISER students and promote processes which are sustainable, socially inclusive and gender equitable, enabling marginalized communities to achieve a dignified quality of life. Since its inception, it has taken quite a few initiatives to help underprivileged kids in attaining primary education by providing them financial aid as well as moral support.

As a part of fund raiser, they organised a food fest on 30th October 2016 for the two children Tehasin and Sukriya that the zariya team has rehabilitaed.That evening the entire NISER family came together with smiles and a lot of excitement for the cause.

They also hold personal reading and story-telling sessions to create a habit of readings among the children in Bhubaneswar slums and villages nearby. Please join me in giving a heart-felt round of applause to these initiatives of our students.

Food Fest 2016

Blood Donation Camp

Plantation

10th International Olympiad on Astronomy & Astrophysics (IOAA), 2016

The 10th International Olympiad on Astronomy & Astrophysics (IOAA), 2016, was held during December 9 – 19, 2016, and IOAA-2016 Outreach Programme during December 17 – 20, 2016, at NISER. A total of 47 teams from 41 countries (from 5 continents) participated in this 10 day event. There were 243 contestants and all were high school students. About 20 school students from Jatni and Bhubaneswar visited and participated in the outreach programmes.

The Olympiad consisted of the following rounds – Planetarium problem, Sky Map test, Night sky observation test, a 5 hour Theoretical exam, Data analysis round and team competition. The Planetarium round was held at Pathani Samanta Planetarium, Night Sky observation test was carried out at Oneness International School (Khurda) and the rest of the tests took place in the Lecture Hall complex of NISER.

The top three teams in the medal tally were Russia (3G, 2S, 4B), India (2G, 4S, 2B) and Iran (2G, 2S, 1B). The Opening and Closing ceremonies were held in NISER campus and Honb'l Governor of Odisha was the chief guest in the closing ceremony and distributed the gold medals to the winners. The cultural programme in both the ceremonies was organized with the help of Spic Macay.
Regarding the organizational aspect, the students and staff of NISER played an outstanding role in making the IOAA a great success. Particularly, our Director extended all possible help that we needed to organize the event. All the student participants were housed in D3 and A1 apartments, which were converted to fully furnished dormitories for the event. Each country team was assisted by our student volunteers. The kitchen was set up in front of the Library building and the hall inside was used for dining. Our student volunteers were also responsible for telescope handling during the Night sky observation round and bringing out extremely high quality Newsletter every morning during the event. The contestants and their leaders were taken to Nandankanan, Konark and Dhauli- Mukteswar for excursions.

INSA – Annual meet 2016

The INSA annual meeting was held in our campus between 28th and 30th December 2016. The council members, Fellows, New Fellows, Fellows for Induction, Young INSA scientists and teacher awardees were part of this program and altogether 150 delegates attended this meeting. The program was inaugurated by our Director and followed byremarks by INSA presidentProf. R. Gadagkar.

A series of lectures were delivered during the annual meeting which included; a) introduction of the symposium on food security in a changing world, where the lecture was delivered by INYAS members; b) mini-symposium organized by NISER colleagues; c) the golden jubilee commemoration medal lecture by our Director; d) Shanti SwarupBhatanagar medal (2013 and 2016) lecture by Prof. Indira Nath and Prof. V. Ravindranath; e) CV Raman medal lecture by Prof. N. Sathyamurthy; f) Sunder Lal Hora Medal lecture by Prof. BK Thelma; g) INSA VainuBappu Memorial award lecture by Dr. Anil Bhardwaj and h) Jawaharlal Nehru Birth Centenary lecture (2014) by Prof. SudhirSopory. On the last day, the session started with display of

INSA App by Prof. LS Shashidhara followed by Anniversary address by the President, INSA.
Finally the annual meeting ended with Felicitation functions, where, 24 new fellows, 9 fellows for induction, 13 teacher awardees and 18 young scientist awardees and 1 Historian awardee were felicitated. As a newly elected fellow, Prof. BedangadasMohanty, Chairperson of the School of Physical Stciences at NISER, was felicitated during this occasion.

53rd The Indian Econometric Society (TIES) Annual Conference

The School of Humanities and Social Sciences, NISER in collaboration with Nabakrusha Choudhury Centre for Development Studies (NCDS), Bhubaneswar organised the 53rd annual conference of TIES during December 22-24, 2016.

Around 350 participants from all over India and 5 from other countries participated in the conference. Prof Arvind Panagariya, Vice-Chairman of NITI Ayog was the chief guest of the conference in the inaugural session. Prof V Chandrasekhar, Director of NISER chaired the inaugural session. Dr R B Barman, Chairman of National Statistical Commission was the chief guest in the valedictory session of the conference. A number of past presidents of TIES were present in the conference. Prof M Govinda Rao, Member of the Finance Commission –XIV also delivered a talk in the conference. Apart from the 310 paper presenters, there were 30 special invitees for the conference from all over the country. About 50 faculty and research scholars from leading universities and colleges of Odisha were invited to participate in the conference. A special panel discussion was organized to deliberate on the issues relating to Odisha. The panelists were: Prof Santosh Panda, Vice President, South Asian University, Prof Sudhakar Panda, Ex Chairman, Third State Finance Commission, Govt of Odisha and Prof Kishore Samala, Retired Prof NCDS. This was chaired by Prof Padmaja Mishra, Vice Chancellor Ramadevi University, Bhubaneswar.Dr Amarendra Das, organisng secretary of the conference,was nominated as the Joint Secretary of TIES in the general body meeting of TIES held at NISER.

School and Workshop on Modular Forms and Black Holes

Date/Time: January 5 - 14, 2017

The School and Workshop fostered interactions between Physics and Mathematics in the area of Modular Formsand Black Holes. In recent years there has been a lot of interdisciplinary research activity in this area. In counting black hole microstates in string theory, various kinds of modular forms play very important roles. In addition, tantalizing connections between elliptic genus of K3 surfaces, Mathieu group and Mock Modular forms have been an interesting subject of study.

The School gave pedagogical expositions by leading researchers of international repute on various subjects in Modular Forms and Black Holes to students and young researchers in India. The Workshop provided an opportunity for research interaction between Physicists and Mathematicians.

Outreach Programme

NISER Open Day

NISER Open Day was held on April 23rd 2016 as part of the Institute's outreach activity. Around 225 students from classes VIII to XII and accompanying teachers from various schools in and around Jatni participated in the program. The program was divided into two parts with engaging talks on contemporary topics of "Gravitational Waves" and "Zika Virus" delivered by NISER faculty in the first half, followed by laboratory visits in the second half. The laboratory sessions were primarily coordinated by the NISER Integrated M.Sc and Ph.D students.

Outstanding Performers Award

Our Administrative and Technical staff play an invaluable role in ensuring the smooth functioning of all Institute activities. This year (2017)on Republic Day the Institute acknowledged the contributions made by them and felicitated several members of the NISER family for their devotion to duty. The Institute has also decided to make the excellence awards an annual component of our Republic Day celebrations.

Dr. Arun Kumar, SO-E,
School of Chemical Sciences

Mr. Ram Prasad Panigrahi, Technician,
School of Physical Sciences

Fire Safety group at NISER

Mr. G. K. Rath, Assistance Personnel Officer,
Accounts and R&D section

List of NISER Administrative Staff

SL No	Name of the Employee	Designation
1	Dr. A. K. Naik	Registrar
2	Shri Y. K. Srinath	Finance Officer
3	Shri Deepak Srivastava	Stores & Purchase Officer
4	Mrs. Shabnam Khanum	Assistant Personnel Officer
5	Shri Dinesh Bahadur Singh	Assistant Personnel Officer
6	Shri Rajeev Kumar Singh	Assistant Personnel Officer
7	Shri Bibhupada Tripathy	Administrative Officer-III
8	Shri Ramakant Kar	Administrative Officer-III
9	Smt. A B Rosy	Office Assistant (Multi Skill)
10	Shri D. Lingaraj	Office Assistant (MS)
11	Shri Sujit Kumar Bastia	Office Assistant (MS)
12	Smt.Smruti Kanungo	Office Assistant (MS)
13	Ms. Monalisa Baliarsingh	Office Assistant (MS)
14	Shri Vijay Singh	Office Assistant (MS)
15	Shri Madhusudan Padhy	Office Assistant (MS)
16	Smt. Lipsa Das	Office Assistant (MS)
17	Smt. Lopamudra Sahoo	Office Assistant (MS)
18	Shri Nabin Kumar Sahoo	Office Assistant (MS)
19	Smt. Banita Pradhan	Office Assistant (MS)
20	Smt. Elina Das	Office Assistant (MS)
21	Shri Amarendra Kumar Behera	Office Assistant (MS)
22	Shri Ranjan Kumar Das	Office Assistant (MS)
23	Shri Abhaya Kumar Mohanty	Assistant Personnel Officer
24	Shri Hiralal Das	Assistant Personnel Officer
25	Smt. Apolina Lakra	Office Assistant (MS)
26	Shri Susanta Kumar Sethi	Operator (General Function)
27	Smt. Sasmita Sahoo	Operator (General Function)
28	Ms. Sandeepa Sahoo	Operator (General Function)
29	Shri Subrat Ranjan Hota	Operator (General Function)
30	Shri Jogendra Jena	Operator (General Function)
31	Shri Tusar Kanta Sahoo	Operator (General Function)
32	Shri Pradeep Kumar Mishra	Assistant Personnel Officer
33	Shri Chandra Sekhar Mahapatra	Assistant Personnel Officer

34	Shri Gopal Krishna Rath	Assistant Personnel Officer
35	Shri Purna Chandra Sahu	Assistant Personnel Officer
36	Ms. Bishnupriya Das	Operator (General Function)
37	Shri Dolananda Pradhan	Assistant Personnel Officer
38	Shri Dhaneswar Nayak	Assistant Personnel Officer
39	Shri Sanjay Kumar Patro	Assistant Personnel Officer
40	Shri Chitta Ranjan Nayak	Clerk - A
41	Ms. Babita Pradhan	Clerk - A
42	Shri M Siba Prasad Rao	Clerk-A
43	Shri Biplab Kanungo	Clerk - A
44	Shri Bijay Kumar Behera	Clerk - A
45	Shri Trailokyanath Sahoo	Deputy Controller of Accounts

Scientific and Technical Staff

SL. No.	NAME OF EMPLOYEES	DESIGNATION
1	Shri Ranjan Kumar Rana	Scientifc Assistant 'D' Electrical
2	Shri Jitendra Narayan Dash	Scientifc Assistant 'D' Library
3	Shri Dipak Kumar Rout	System Administrator
4	Shri Deepankar Dash	System Manager
5	Shri Susanta Kumar Parida	Technician-C
6	Shri Bikash Chandra Behera	Technician-C
7	Shri Ramprasad Panigrahi	Technician-C
8	Dr. Shyamasree Basu	Scientific Officer 'F'
9	SK Safatulla	Technician-B (Library)
10	Dr. Sudakshina Prusty	Scientific Officer 'F'
11	Ms. Anuradha Das	Technician-C
12	Shri Sanjaya Kumar Mishra	Technician-C
13	Shri Alok Kumar Jena	Technician-C
14	Shri Deepak Kumar Behera	Technician-C
15	Shri Rudranarayan Mohanty	Technician-C
16	Shri Pravakar Mallick	Technician-C
17	Shri V.A. Sakthivel	Technician-C
18	Ms. Suchismita Dash	Technician-D(Library)
19	Shri Rabindra Kumar Maharana	Technician-D(Library)
20	Dr. Gunda Santosh Babu	Scientific Officer 'D'
21	Shri Subhransu Sekhar Panda	Operator (Lab. Function)

22	Shri Mukesh Kumar Meena	Operator (Lab. Function)
23	Dr. Arun Kumar	Scientific Officer 'F'
24	Shri Amit Sankar Sahu	Technician-C
25	Dr. Saurabh Chawla	Scientific Officer 'D'
26	Shri Souvagya Mahapatra	Scientific Officer 'D' Civil
27	Shri Dilip Jha	Scientific Officer 'D' Electrical
28	Shri Saikat Hira	Scientific Officer 'E'
29	Shri Amit Kumar Panigrahi	Scientific Assistant 'C'
30	Shri Bhagaban Dhal	Scientific Assistant 'C'
31	Shri Pramod Kumar Nath	Scientific Assistant 'C'
32	Shri Binod Bhagat	Scientific Assistant'C'
33	Dr. Ranbir Singh	Scientific Officer 'D'
34	Shri Ajit Kumar Raut	Scientific Assistant 'B'
35	Shri Ajit Kumar Mohanty	Scientific Assistant 'B'
36	Shri Srikrushna Sahu	Technician –B
37	Shri Debasis Das	Technician –B
38	Ms. V Shiny Jerusha Joseph	Technician –B
39	Mrs. Ashwini Babrubahan Sethi	Technician-B
40	Dr. Saralasrita Mohanty	Scientific Officer 'D'
41	Mr. Prakash Chandra Behera	Technician-B
42	Mr. Prafulla Kumar Sethi	Technician-C
43	Mr. Rakesh Kumar Behera	Technician-B
44	Mr. Kuna Mahara	Technician-B
45	Mr. Sandeep Kumar Behera	Technician-B
46	Mr. Ananda Raman	Scientific Officer 'D'
47	Dr. Priyanka Pandey	Scientific Officer 'C'
48	Mr. Balaji Venkatesan	Technician-C
49	Mr. Mriganka Sadhukhan	Technician-C
50	Dr. Biswajit Mishra	Scientific Officer 'D' Medical
51	Mr. Bidyut Siba Sankar Mohanty	Scientific Assistant 'B'
52	Mr. Alok Sahoo	Scientific Assistant 'B'
53	Mr. Tapan Kumar Panigrahi	Technician-C
54	Dr. Varchaswi K S Kashyap	Scientific Officer 'D’

Audited Statement of Accounts
&
Statutory Auditor's Report
Financial Year 2016-17

National Institute of Science Education
and Research, Bhubaneswar

Auditor

P K NAYAK & CO.
CHARTERED ACCCOUNTANTS
446, Sahid Nagar, Bhubaneswar-751007, Odisha
Tel.: 0674-2547560, Email: pknayakco@yahoo.com

P K NAYAK & CO.
Chartered Accountants

446 – SAHID NAGAR, Bhubaneswar-751007
Tel.: 0674-2547560 / 2545560
Fax : 0674 - 2545491
Email: pknayakco@yahoo.com

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 ('The Institute'), which comprise the Balance Sheet as at 31 March 2017, the Income and Expenditure account and the cash Receipt & Payment account for the year then ended, and a summary of significant accounting policies and other explanatory information.

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.

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.

P. K. NAYAK & CO. Bhubaneswar Chartered Accountants

Contd...P/2

P. K. NAYAK & CO.

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, 2017.

   AND

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

For **P. K. NAYAK & CO.**
Chartered Accountants
FRN - 318155E

P. K. NAYAK & CO. Bhubaneswar Chartered Accountants

(CA. Anipta Kumar Jena)
Partner
M. No. 304980

Place : Bhubaneswar
Date: 27.07.2017

BALANCE SHEET AS AT 31ST MARCH, 2017

Amount In Rs.

Particulars	Schedule	As at 31st March, 2017	As at 31st March, 2016
CORPUS/CAPITAL FUND AND LIABILITIES			
CORPUS/CAPITAL FUND	1	7,96,43,15,009	6,79,67,73,950
RESERVES AND SURPLUS	2	-	-
EARMARKED/ENDOWMENT FUNDS	3	-	-
SECURED LOANS AND BORROWINGS	4	-	-
UNSECURED LOANS AND BORROWINGS	5	-	-
DEFERRED CREDIT LIABILITIES	6	-	-
CURRENT LIABILITIES AND PROVISIONS	7	9,14,01,538	4,93,53,528
TOTAL Rs.		**8,05,57,16,547**	**6,84,61,27,478**
ASSETS			
FIXED ASSETS	8	1,37,34,95,978	1,11,02,44,248
INVESTMENTS - FROM EARMARKED/ENDOWMENT FUNDS	9	-	-
INVESTMENTS-OTHERS	10	14,24,04,232	8,71,08,571
CURRENT ASSETS, LOANS, ADVANCES ETC.	11	6,53,98,16,338	5,64,87,74,659
MISCELLANEOUS EXPENDITURE (to the extent not written off or adjusted)		-	-
TOTAL Rs.		**8,05,57,16,547**	**6,84,61,27,478**
SIGNIFICANT ACCOUNTING POLICIES	24		
CONTIGENT LIABILITIES AND NOTES ON ACCOUNTS	25		

As per our report of even date attached

For P. K. NAYAK & CO.
Chartered Accountants
FRN - 318155E

(CA. Anipta Kumar Sena)
Partner
M. No. 304980

(T. N. Sahoo)
Dy.Controller of Accounts

(CMA. Y.K.Srinath)
Finance Officer

(Prof. Sudhakar Panda)
Director

Date: 27.07.2017
Place: Bhubaneswar

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 2017

Amount in Rs.

Particulars	Schedule	For the Year Ended 31st March, 2017	For the Year Ended 31st March, 2016
INCOME			
Income from Sales/ Services	12	-	-
Grant / Subsidies	13	90,55,89,923	45,54,68,868
Fees / Subscriptions	14	1,18,73,514	1,01,95,556
Income from Investment	15	-	-
Income from Royalty, Publication etc.	16		-
Interest Earned	17	2,74,07,176	2,93,95,099
Other Income	18	-	-
Increase/(decrease) in stock of Finished goods and work-in-progress	19	-	-
TOTAL(A)		**94,48,70,613**	**49,50,59,523**
EXPENDITURE			
Establishment Expenses	20	34,51,88,163	24,41,19,229
Other Administrative Expenses etc.	21	20,51,97,058	15,68,79,211
Expenditure on Grants, Subsidies etc.	22	-	-
Interest	23	-	-
Depreciation(Net total at the year-end-corresponding to Schedule 8)		17,76,08,403	15,60,27,681
TOTAL(B)		**72,79,93,625**	**55,70,26,121**
Balance being excess of Income over Expenditure(B-A)		(21,68,76,988)	6,19,66,598
Add: Depreciation Adjustment		-	-
Add: Prior Period Expenditure		1,63,000	(6,04,269)
Less: Prior Period Income		83,994	1,90,160
BALANCE BEING SURPLUS/(DEFICIT) CARRIED TO CORPUS/CAPITAL FUND		**21,67,97,982**	**(6,11,72,169)**
SIGNIFICANT ACCOUNTING POLICIES	24		
CONTIGENT LIABILITES AND NOTES ON ACCOUNTS	25		

As per our report of even date attached

For **P. K. NAYAK & CO.**
Chartered Accountants
FRN - 318155E

(CA. Anipta Kumar Jena)
Partner
M. No. 304980

(T. N. Sahoo)
Dy.Controller of Accounts

(CMA. Y.K.Srinath)
Finance Officer

(Prof. Sudhakar Panda)
Director

Date:27.07.2017
Place: Bhubaneswar

RECEIPTS AND PAYMENTS ACCOUNT FOR THE PERIOD FROM 1ST APRIL,2016 TO 31ST MARCH, 2017

Amount in Rs.

RECEIPTS	For the Year Ended 31st March, 2017	For the Year Ended 31st March, 2016	PAYMENTS	For the Year Ended 31st March, 2017	For the Year Ended 31st March, 2016
I.Opening Balances			**I. Expenses**		
			a) Establishment Expenses		
a) Cash in Hand	32,375	8,682	**(corresponding to Schedule 20)**		
b) Bank Balances:			i. Pay and Allownaces	28,65,98,387	19,80,92,585
i) In current accounts	34,49,16,783	16,39,31,706	ii. Manpower (Outsourced)		
ii) In deposit accounts	-	-	iii. Staff Welfare Expenses		
iii) In Savings accounts	8,59,88,234	46,96,95,665	iv. Other Expenditure		
			v. New Pension Contribution		
			b) Administrative Expenses		
II. Grants Received			**(corresponding to Schedule 21)**		
a) From Government of India	1,85,63,33,000	71,00,00,000	i. Laboratory Consumable		
b) From State Government	-	-	ii.Computer Consumables		
c) From other sources	-	-	iii. Rent, Rates & Taxes		
			iv. Duties & Taxes		
III. Income on Investments	-	-	v. Other Expenditure	14,58,78,237	12,64,59,645
			vi. Prior Period Expenses		
IV. Interest Received			vii. Niser XII plan	4,85,54,385	21,36,21,965
On Bank Deposits	2,69,97,066	2,93,95,099			
			II. Payments made against funds for various proiects		
V. Other Income					
a) Registration Fee (Msc & Phd)	84,13,508	4,66,136			
b) Job Application Fee	1,52,000	7,20,500	**III. Investments and deposits made**		
c) Summer course fee	28,000	-			
			IV. Expenditure on Fixed Assets & Capital Work- in- progress		
d) Application fees	1,500	-			
e) Receipts of CIF, SCS	-	16,800	a) Purchase of Fixed Assets	41,96,91,376	23,16,80,879
f) RTI Application Fees	636	110	b) Expenditure on Capital WIP	1,01,21,507	59,53,568
g) Sale of Tender paper	4,66,925	2,25,550			
h) Guest House Rent	3,91,399	21,940	**V. Refund of Surplus money/loans**		
i) License Fees	6,66,410	2,45,935			
j) Misc. Receipt	6,153	4,317	**VI.Finance Charges(Interest)**		
k) Transcript Fees	31,400	31,100			
l) Identity Card/Health Card(Deplicate) Fee	1,525	7,025	**VII. Other Payments**		
			a) Sundry Creditors	1,61,061	14,396
			b) Summer course fee	-	1,000
			c) Advance to Staff & Suppliers and Other	-	3,04,59,971
			d) Fellowship	-	6,71,500
			e) Scholarship	-	2,90,65,310
VI. Amount Borrowed			f) NISER R&D	3,22,758	1,51,332
			g) IOAA - 2016	2,24,41,576	-
VII. Any other receipts (Loans, Advances & Expenses Recovered)			h) DCSEM-Medical Expenses	43,143	1,36,930
a) Security Deposit	15,67,448	96,65,067	i) IGCAR	-	30,402
b) E.M.D	5,80,680	9,70,687	j) Deposit (Asset) (LC)	22,48,03,043	19,19,44,499
c) IOAA - 2016	2,98,78,792	-	k) Deans Allowance Receivable	52,200	48,000
d)Lab Equipments	6,60,282	-	l) Prepaid Expenses	84,84,700	49,05,749
e) Establishment Expenses	1,04,971	-	m) Newspaper & Magazine	58,938	-
f) Prior Period Income	69,669	1,11,190	n)Security Deposit (Refundable)	7,90,032	96,840
g) Duties & Taxes	2,71,28,570	1,99,57,652	o) Duties & Taxes	2,67,09,824	1,98,78,745
h)CBS, MUMBAI - (Msc Program Registration Fees)	-	70,000	p) EMD	26,11,799	57,29,731
i)DCSEM-Medical Expenses-Receivable	-	393	q) NPS Receive SERB Delhi	-	3,46,560
j) Statutory Recoveries	1,60,91,395	1,28,88,639	r) Scholarship Ashutosh Payable	2,83,060	2,70,900
k) Student Dues	32,91,334	93,05,143	s) Statutory Recoveries	1,55,92,015	1,28,82,384
l) Scholarship Ashutosh Payable	2,87,120	5,56,840	t) Student Dues	11,52,595	4,82,474
m) NPS Receive SERB Delhi	-	3,48,480	u) Conference/ Seminar	-	2,10,066
n) NISER R& D Payable	-	1,16,332	v) Loans & Advance (Asset)	40,81,07,646	11,42,47,479
o) LSPC of Prof T. K. Chandrasekhar	-	2,41,413	vi) Abhash Jha NBHM TA Claim	39,766	-
p) Ghuru Murughan Ganeshan	-	94,390	vii) Mr. Vanatri Siva TA Bill (SERB)	1,35,504	-
q) Deans Allowance Receivable	-	78,000	vii) Liabilities for Expenses	2,59,52,312	-
r) Deposit (Asset) (LC)	16,95,07,382	16,65,30,033	vii) Scholarship Receivable	86,82,539	-
s) Loans & Advance (Asset)	55,83,514	66,28,526	viii) Guest House Rent	17,852	-
t) Fellowship Receiveable	-	7,56,500	ix) Fright & Forwarding Expenses	12,31,882	-
u) Scholarship Payable	-	1,39,57,169	x) Registration Fee (Msc & Phd)	6,93,974	-
v) Sundry Creditors	1,61,061	2,20,253	xi) prior period expenses	93,000	-
w) Liabilities for expenses	-	14,325	xii) Dean Allowance	-	-
x) NISER R& D Receivable	575	10,38,705			
xi) shop rent	7,76,062	-			
xii) NISER XII PLAN	37,964	-			
xiii) Water Charges	1,15,332	-	**VIII. Closing Balances**		
xiv) Electricity Charges	5,38,119	-	a) Cash in hand	27	32,375
xv) Travelling & Conveyance	6,37,502	-	b) Bank Balances:		
xvi) Supplies & Materials	5,43,513	-	i) In current accounts	61,78,53,298	34,49,16,783
xvii) Other Expenses	2,57,694	-	ii) in deposit accounts	-	-
xviii) Abhash Jha NBHM TA Claim	1,60,420	-	iii) In savings accounts	33,85,24,600	8,59,88,234
xix) DAE Fund	6,28,000	-			
xx) Mr. Vanatri Siva TA Bill (SERB)	1,35,504	-			
xxi) NISER XIITH Plan (Asset)	1,15,944	-			
xxii) Scholarship Receivable	3,23,97,275	-			
		-			
TOTAL Rs.	**2,61,56,83,036**	**1,61,83,20,302**	**TOTAL Rs.**	**2,61,56,83,036**	**1,61,83,20,302**

For **P. K. NAYAK & CO.**
Chartered Accountants
FRN - 318155E

(CA. Anipta Kumar Jena)
Partner
M. No. 304980

(T. N. Sahoo)
Dy.Controller of Accounts

(CMA. Y.K.Srinath)
Finance Officer

(Prof. Sudhakar Panda)
Director

Date:27.07.2017
Place: Bhubaneswar

Schedule -1 : Corpus / Capital Fund
(Schedule forming part of Balance Sheet as at 31.03.2017)

Amount in Rs.

Particulars	Current Year(2016-17)		Previous Year(2015-16)	
Balance as at the beginning of the year	7,55,07,00,000		7,55,00,00,000	
Add: Contribution towards Corpus/Capital Fund	46,00,00,000		7,00,000	
Add: XII Plan New Project	**1,02,83,46,000**		**48,83,46,000**	
Advance Materials for Different applications Grant	14,36,00,000		7,14,00,000	
Basic Research in Cellular and Moducular Grant	11,75,00,000		5,00,00,000	
Centre for Fundamental Studies Grant	3,52,96,000		1,73,96,000	
Centre for inter Disciplinary Sciences Grant	16,09,00,000		-	
Experimental Condensed Matter Ultra Cold Atom Grant	25,05,00,000		11,41,00,000	
Experimental High Energy Physics Programme Grant	3,12,00,000		2,51,00,000	
Microbes Immunity and Rearch Biology Grant	11,19,00,000		5,69,00,000	
Novel Organic Compounds for Boimedical Grant	13,67,00,000		12,34,00,000	
Outreach Programmes in Maths and Systems Biology Grant	24,50,000		10,50,000	
Theoretical High Energy and Condensed Matter Grant	3,83,00,000		2,90,00,000	
Less: Grant Transferred to Revenue	12,10,05,961		7,17,49,038	
		8,91,80,40,039		7,96,72,96,962
Add/(Deduct): Balance of net income/ (expenditure) transferred from the Income and Expenditure Account	-	(95,37,25,030)	-	(1,17,05,23,012)
Balance as at the year end Total Rs.		**7,96,43,15,009**		**6,79,67,73,950**

Schedule -2 : Reserves & Surplus
(Schedule forming part of Balance Sheet as at 31.03.2017)

Particulars	Current Year(2016-17)		Previous Year(2015-16)	
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 Rs.		-		-

For **P. K. NAYAK & CO.**
Chartered Accountants
FRN - 318155E

P. K. NAYAK & CO. Bhubaneswar Chartered Accountants

(CA. Anipta Kumar Jena)
Partner
M. No. 304980

(T. N. Sahoo)
Dy.Controller of Accounts

(CMA. Y. K. Srinath)
Finance Officer

(Prof. Sudhakar Panda)
Director

Schedule -3 : Earmarked/Endowment Fund

(Schedule forming part of Balance Sheet as at 31.03.2017)

Particulars	Fund-wise break up								Totals			
	Fund WW		Fund XX		Fund YY		Fund ZZ		Current Year(2016-17)		Previous Year(2015-16)	
a) Opening balance of the funds		-		-		-		-		-		-
b) Additions to the funds:												
i. Donations/grants	-		-		-		-		-		-	
ii. Income from Investments made on account of funds	-		-		-		-		-		-	
iii. Other additions	-		-		-		-	-	-	-	-	-
TOTAL Rs. (a + b)		-		-		-		-		-		-
c) Utilisation/Expenditure towards objectives of funds												
i. Capital Expenditure												
Fixed Assets	-		-		-		-		-		-	
Others	-		-		-		-		-		-	
Total		-		-		-		-		-		-
ii. Revenue Expenditure												
Salaries, Wages and allowances	-		-		-		-		-		-	
Rent	-		-		-		-		-		-	
Other Administrative expenses	-		-		-		-		-		-	
Total		-		-		-		-		-		-
TOTAL Rs. (c)		-		-		-		-		-		-
Net Balance at the year end (a+b-c)		-		-		-		-		-		-

For **P. K. NAYAK & CO.**
Chartered Accountants
FRN - 318155E

(CA. Anipta Kumar Jena)
Partner
M. No. 304980

(T. N. Sahoo)
Dy.Controller of Accounts

(CMA Y.K.Srinath)
Finance Officer

(Prof. Sudhakar Panda)
Director

Schedule -4 : Secured Loans and Borrowings
(Schedule forming part of Balance Sheet as at 31.03.2017)

Amount in Rs.

Particulars	Current Year(2016-17)		Previous Year(2015-16)	
1. Central Government		-		-
2. State Government (Specify)		-		-
3. Financial Institutions				
a) Term Loans	-		-	
b) Interest accured and due	-	-	-	-
4. Banks:				
a) Term Loans	-		-	
Interest accured and due	-		-	
b) Other Loans (specify)	-		-	
Interest accured and due	-	-	-	-
5. Other Institutions and Agencies		-		-
6. Debenture and Bonds		-		-
7. Others(specify)		-		-
TOTAL Rs.		-		-

For **P. K. NAYAK & CO.**
Chartered Accountants
FRN - 318155E

(CA. Anipta Kumar Jena)
Partner
M. No. 304980

(T. N. Sahoo)
Dy.Controller of Accounts

(CMA. Y.K.Srinath)
Finance Officer

(Prof. Sudhakar Panda)
Director

Schedule -5 : Unsecured Loans and Borrowings
(Schedule forming part of Balance Sheet as at 31.03.2017)

Amount in Rs.

Particulars	Current Year(2016-17)		Previous Year(2015-16)	
1. Central Government		-		-
2. State Government (Specify)		-		-
3. Financial Institutions		-		-
4. Banks:				
a) Term Loans	-		-	
b) Other Loans (specify)	-	-	-	-
5. Other Institutions and Agencies		-		-
6. Debenture and Bonds		-		-
7. Fixed Deposits				
8. Others(specify)		-		-
TOTAL Rs.		-		-

Schedule -6 : Deferred Credit Liabilities
(Schedule forming part of Balance Sheet as at 31.03.2017)

Amount in Rs.

Particulars	Current Year(2016-17)	Previous Year(2015-16)
a) Acceptances secured by hypothecation of capital equipment and other assets	-	-
b) Others	-	-
TOTAL Rs.	-	-

For **P. K. NAYAK & CO.**
Chartered Accountants
FRN - 318155E

(CA. Anipta Kumar Jena)
Partner
M. No. 304980

(T. N. Sahoo)
Dy.Controller of Accounts

(CMA. Y.K.Srinath)
Finance Officer

(Prof. Sudhakar Panda)
Director

Schedule -7 : Current Liabilities and Provisions
(Schedule forming part of Balance Sheet as at 31.03.2017)

Amount in Rs.

Particulars	Current Year(2016-17)		Previous Year(2015-16)	
A. CURRENT LIABILITIES				
1. Acceptances		-		-
2. Sundry Creditors:				
a) For Goods	2,87,653		2,87,653	
b) Others - EMD	47,39,297		67,70,416	
		50,26,950		70,58,069
3. Advances Received		-		-
4. Interest accured but not due on:				
a) Secured loans/borrowings		-		-
b) Unsecured Loans/borrowings		-		-
5. Statutory Liabilities				
a) Overdue		-		-
b) Others				
TDS (Non Salary)	6,00,701		72,774	
TDS (Salary)	5,046		5,110	
Work Contract Tax	53,175		1,62,265	
c) Other Recoveries Payables				
Statutory Deposit	-		-	
		6,58,922		2,40,149
6. Other Current Liabilities				
a) Student Dues				
Internal amenitie S.D.	1,92,000		1,94,000	
Excess Prog. Regd. Fees	52,589		5,200	
Caution Money (Hostel)	-		13,000	
Caution Money (Labrotary)	13,000		13,000	
Caution Money (Library)	12,41,000		10,30,000	
Caution Money (Institute)	21,54,150		18,95,000	
DAE Fund	6,28,000			
Programme Registration	76,550		2,33,950	
Student Welfare Fund	1,61,640		1,21,440	
IOAA -2016	71,62,115		-	
TA Claim (Abhash jha)	1,20,654			
Scholarship (Asutosh)	2,90,000		2,85,940	
Earned Leave	12,713		12,713	
		1,21,04,411		38,04,243
b) Security Deposit				
Thames Consultant Pvt. Ltd.	22,722		22,722	
Jena Travels	1,01,000		1,01,000	
Airway Bhubaneswar	28,000		-	
Ashok Kumar Nayak	5,000		-	
Anirudha Mohapatra	4,864		-	
Amarendra Ojha	31,385		-	
4S Interiors	25,39,832		25,39,832	
Bigyan Kumar Pradhan	24,369		-	
Bijay Kumar Behera	32,500		-	
Bhagarathi Sahoo	30,553		5,504	
B K Giri	13,133		13,133	
CEETAK	70,794		33,743	
Cleen "N" Cleen	9,60,320		9,60,320	
Damodar Engineers Pvt. Ltd.	76,947		1,69,062	
Deepak Kumar Mishra	51,841		18,954	
Geeken Seating Collection Pvt. Ltd.	55,36,542		55,36,542	
Orissa Engineering Udyog Pvt. Ltd.	30,020		30,020	
HAK Electrical & Engineering Works	50,018		-	
H Electrical Engg. Works	16,439		-	
Jagannath Refrigeration Services	3,200		-	
Shri Rabindra Kumar Mallick	2,14,006		1,28,501	
Subhashree Engineering	4,890		4,890	
Pest Control India Pvt. Ltd.	360		360	
Biswajit Mishra	1,26,694		1,26,694	
Nirmal Chandra Sar	3,34,046		78,411	
Larsen & Turbo Ltd.	-		4,45,000	
Numeric Power Systems Ltd.	14,343		14,343	
Deepak Ku Das	1,04,345		34,285	
Laser Science Services (I) Pvt Ltd	4,50,900		4,50,900	
Laxman Senapati	81,631		-	
Maa Dakhilachandi Catering Services	1,00,000		-	
Nihar Ranjan Parida	1,96,981		-	
Sai Aircon	9,509		-	
Sanjeeb Kumar Das	5,000		-	
Sridhar Routray	5,000		-	
Sritam Computers	1,05,836		-	
Sujit Kumar Nahak	33,394		-	
Tathagata Engineering	1,40,267		65,049	
		1,15,56,681		1,07,79,265

Schedule -7 : Current Liabilities and Provisions
(Schedule forming part of Balance Sheet as at 31.03.2017)

Amount in Rs.

Particulars	Current Year(2016-17)		Previous Year(2015-16)	
c) Other Payables				
NPS Recovery	21,595		8,580	
Professional Tax	540		(2,325)	
		6,17,16,851		2,71,34,079
TOTAL Rs. (A)		**9,10,63,815**		**4,90,15,805**
B. PROVISIONS				
1. For Taxation	-		-	
2. Gratuity	-		-	
3. Superannuation / Pension	-		-	
4. Accumulated Leave Encashment	-		-	
5. Trade Warranties / Claims	-		-	
6. For Expenses Payable	-		-	
Audit Fees	50,740		49,450	
Admission Fee Payable	-		14,325	
Fellowship	61,92,165		14,53,042	
Hire Charges Vehicle	10,57,288		-	
Staipend to Trainee Payable	59,080		-	
Fuel Charges Payable	20,857		-	
House Keeping Expenses	-		8,55,311	
Honorarim/Remuneration	1,74,537		3,45,000	
Outsourced Manpower	28,70,253		12,34,491	
Outsourced Security	20,00,162		16,93,033	
Medical Expenses	4,13,586		-	
Electricity charges	-		37,29,517	
Repair & Maintainance Expenses Payable	19,750		7,62,000	
Professional update allowance	29,80,000		26,16,250	
Pay and Allowances	1,75,25,066		1,31,23,588	
Telephone & Telex	1,34,217		1,80,919	
PRIS	2,66,85,421		-	
Water Charges	17,796		22,986	
NPS Employers contribution	14,93,998		10,47,912	
Ghuru Murughan Ganeshan	94,390		94,390	
LSPC of Prof.T.K.Chandrasekhar	2,41,413		2,41,413	
NPS-Receive SERB Delhi	1,920		1,920	
Sub-total Rs. (B)		**6,20,32,439**		**2,74,65,547**
Total Rs. (A+B)		**15,30,96,254**		**7,64,81,352**

For **P. K. NAYAK & CO.**
Chartered Accountants
FRN - 318155E

P. K. NAYAK & CO. Bhubaneswar Chartered Accountants

(CA. Anipta Kumar Jena)
Partner

M. No. 304980

(T. N. Sahoo)
Dy. Controller of Accounts

(CMA Y.K.Srinath)
Finance Officer

(Prof. Sudhakar Panda)
Director

Schedule -8 : Fixed Assets
(Schedule forming part of Balance Sheet as at 31.03.2017)

Amount in Rs.

			GROSS BLOCK					DEPRECIATION			NET BLOCK	
				Addition during the year								
Sl. No.	Particular of Assets	Rate	WDV as on 01.04.2016	more than 180 days	less than 180 days	Deductions { / (Sale / Adjustt.} during the year	Cost/valuation at the year-end	Depreciation for the year	Deductions during the year	Total upto the year-end	As at the current year-end on 31.03.2017	As at the Previous year-end on 31.03.2016
1	Land	-	2,76,17,405	-	-	-	2,76,17,405	-	-	-	2,76,17,405	2,76,17,405
2	Furniture & Fixtures	10%	29,62,51,867	1,83,41,913	2,55,36,590	-	34,01,30,370	3,27,36,208	-	3,27,36,208	30,73,94,163	29,62,51,867
3	Computers	60%	96,21,727	4,96,876	3,52,181	-	1,04,70,784	61,76,816	-	61,76,816	42,93,969	96,21,727
4	Software	60%	4,68,298			-	4,68,298	2,80,979	-	2,80,979	1,87,319	4,68,298
5	Lab Equipments	15%	28,21,83,383	1,58,82,247	4,03,79,220	6,60,282	33,77,84,568	4,76,39,244	-	4,76,39,244	29,01,45,324	28,21,83,383
6	Tools Equipments	15%	1,49,035			-	1,49,035	22,355	-	22,355	1,26,680	1,49,035
7	Books	60%	55,60,841	8,71,453	35,74,026	-	1,00,06,320	49,31,584	-	49,31,584	50,74,736	55,60,841
8	Journals	100%	2,29,50,461	2,15,52,822	5,17,12,672	-	9,62,15,955	7,03,59,619	-	7,03,59,619	2,58,56,336	2,29,50,461
9	Air Conditioners	15%	22,38,648			-	22,38,648	3,35,797	-	3,35,797	19,02,851	22,38,648
10	Vehicles	15%	4,78,984			-	4,78,984	71,848	-	71,848	4,07,136	4,78,984
11	Bicycle	15%	3,622			-	3,622	543	-	543	3,079	3,622
12	Machinery & Equipments	15%	8,67,43,786	70,44,251	25,47,404	-	9,63,35,441	1,42,59,261	-	1,42,59,261	8,20,76,181	8,67,43,786
13	EPABX	15%	11,332			-	11,332	1,700	-	1,700	9,632	11,332
14	Kitchen Equipments	15%	52,67,507	9,955		-	52,77,462	7,91,619	-	7,91,619	44,85,843	52,67,507
15	Telephones	10%	8,305			-	8,305	831	-	831	7,475	8,305
16	Capital Assets(WIP)	-	19,70,96,571	88,40,409	1,19,18,280	-	21,78,55,260	-	-	-	21,78,55,260	19,70,96,571
17	NISER XII Plan Asset	-	17,35,92,477	4,58,37,047	18,67,39,012	1,15,944	40,60,52,592	-	-	-	40,60,52,591	17,35,92,477
	TOTAL Rs.		1,11,02,44,248	11,88,76,973	32,27,59,385	7,76,226	1,55,11,04,380	17,76,08,403	-	17,76,08,403	1,37,34,95,978	1,11,02,44,248

For **P. K. NAYAK & CO.**
Chartered Accountants
FRN - 318155E

(CA. Anipta Kumar Jena)
Partner
M. No. 304980

P. K. NAYAK & CO. Bhubaneswar Chartered Accountants

(T. N. Sahoo)
Dy.Controller of Accounts

(CMA Y.K.Srinath)
Finance Officer

(Prof. Sudhakar Panda)
Director

Schedule -9 : Investments from Earmarked/Endowment Funds

(Schedule forming part of Balance Sheet as at 31.03.2017)

Amount in Rs.

Particulars	Current Year(2016-17)	Previous Year(2015-16)
1. In Government Securities	-	-
2. Other approved Securities	-	-
3. Shares	-	-
4. Debentures and Bonds	-	-
5. Subsidiaries and Joint Ventures	-	-
6. Others (to be specified)	-	-
TOTAL	**-**	**-**

Schedule -10 : Investments-Others

(Schedule forming part of Balance Sheet as at 31.03.2017)

Amount in Rs.

Particulars	Current Year(2016-17)	Previous Year(2015-16)
1. In Government Securities	-	-
2. Other approved Securities	-	-
3. Shares	-	-
4. Debentures and Bonds	-	-
5. Subsidiaries and Joint Ventures	-	-
6. FD against LC's	14,24,04,232	8,71,08,571
TOTAL Rs.	**14,24,04,232**	**8,71,08,571**

For **P. K. NAYAK & CO.**
Chartered Accountants
FRN - 318155E

(CA. Anipta Kumar Jena)
Partner
M. No. 304980

(T. N. Sahoo)
Dy. Controller
of Accounts

(CMA. Y.K.Srinath)
Finance Officer

(Prof. Sudhakar Panda)
Director

Schedule -11 : Current Assets, Loans, Advances etc.
(Schedule forming part of Balance Sheet as at 31.03.2017)

Amount in Rs.

Particulars	Current Year(2016-17)		Previous Year(2015-16)	
A. CURRENT ASSETS:				
1. Inventories:				
a) Stores and Spares	-		-	
b) Loose Tools			-	
c) Stock-in-trade				
Finished goods	-		-	
Work-in-progress	-		-	
Raw Materials	-	-	-	-
2. Sundry Debtors:	-			
a) Debts Outstanding for a period exceeding six months	-		-	
b) Others		-		-
3. Cash balances in hand	-	27	-	32,375
4. Bank Balances				
a) SBI A/C - 30755200010	61,78,53,208		34,45,16,752	
b) UBI A/C - 460502050000215	1,76,52,381		1,66,50,137	
c) ICB A/C - 37070100000001	20,47,70,065		4,04,52,368	
c) ICB A/C 37370100000858	30,94,453		-	
e) CB A/C - 1476010000310610	3,22,02,701	85,63,77,090	2,38,88,734	43,09,05,017
5. Post office Savings Accounts		-		-
Total(A)		85,63,77,575		43,09,37,392
B. LOANS, ADVANCES AND OTHER ASSETS:				
1. a) Staffs				
Anil K. Kar			78,442	
Abhay Kumar Mohanty	2,000		20,000	
Ajit Kumar Mohanty	-		10,805	
Amarendra Kumar Behera	167		167	
Apollina Lakra	-		4,721	
Arup Bhowmick	-		60,000	
Awanendra Singh,Ph.D. Student , SPS	16,200		1,60,200	
A V Anil Kumar (SPS)	62,282			
Bhagaban Dhal	9,711		9,711	
Binod Bhagat	2,582		320	
Bishnupriya Das	-		4,727	
Brundaban Sahu	70,000		95,000	
Chandra Shekar Purohit	20,000		30,000	
Debashis Mallick	2,84,210		-	
Deepak Kumar Dalai	-		46,370	
Dhaneswar Nayak	-		9,414	
Dr. Ranjith Mathew	15,000		-	
D Lagaraj	-		5,150	
Jacob Mohar	70,233		96,000	
Jogendra Jena	212		212	
Joydeep Bhattacharya	-		2,77,000	
Kishora Nayak			3,60,000	
P C Ravikumar	-		65,000	
Pradeep Kumar Verma	17,404		20,000	
Prasanjit Samal	20,325		20,325	
Pratap Kumar Sahoo	-		60,000	
Praloy Kumar Mal	1,50,000		4,55,286	
Sanjay Kumar Swain	-		1,00,000	
Ranbir Singh	5,06,260		-	
Sandeep Bhowmik	5,00,000			
Sanjay Kumar Patra	6,220		-	
Sanjay Parul	-		75,550	
Sudhansu Sekhar Panda	311		311	
Tusar Kanta Sahoo			1,152	
V Muruganandum	-		6,000	
Deepak Srivastav	3,369		3,369	
Vijay Singh	28,000		10,906	
Vinay Bharath	2,64,210		-	
Niladri Bihari Sahu	-		5,06,998	
Prafulla Singru	1,000		61,000	
Debasmita P. Alone	-		68,704	
Susanta Ku Sethi	-		11,721	
V Chandrasekhar	-		16,240	
Saurabh Chawla	81,253		1,283	
Subashis Dasak	90,000		2,40,000	
Shabnam Khanum	10,000			
Sourav Kundu SPS	3,55,140		-	
Koushik Mandal	-		3,00,000	
Pranaya Ku Swain	4,760		4,960	
Sanjay Kumar Patro(Imprest)	-		5,000	
Shabnam Khanum(Imprest)	20,000		10,000	
Subhragya Mohapatra, SO, Civil (Imprest)			25,000	
Suchakshina Prusty, SO (Imprest)			10,000	
Harilal Das(Imprest)	1,845			
Pulak Aich (Imprest)	4,986		-	
Ritwik Das (Imprest)	10,000			
Rabingdra Mohanty (Imprest)	-		826	
J.Lourdaraj (Imprest)			13,000	
V. Muruganandam(Imprest)	-		10,000	
Festival Advance to Staff	64,600		57,752	
		27,09,020		35,41,297

P. K. NAYAK & CO.
Bhubaneswar
Chartered Accountants

Schedule -11 : Current Assets, Loans, Advances etc.
(Schedule forming part of Balance Sheet as at 31.03.2017)

Amount in Rs.

Particulars	Current Year(2016-17)		Previous Year(2015-16)	
b) Other Entities engaged in activities similar to that		-		-
c) Others				
NBHM Support DHA	1,67,174		1,67,174	
Deans Atowance Receivable	1,00,199		42,000	
Advances to Suppliers :				
Balmer Lawrie & Co. Ltd.	-		5,59,442	
Blue Star Ltd.	-		1,05,175	
Cheap Tubes, USA	-		39,080	
Exim Logistics Pvt Ltd	-		40,568	
National Centre for Cell Sc.	-		5,000	
Carl Zeiss Microimaging GmbH, Germany	-		30,778	
HCL Infosystem Ltd.	-		19,828	
MTI Corporation USA	1,430		87,762	
Bruker Biospin AG, Switzerland	-		3,42,019	
Centre for Cellular & Molecular Bio.,Bang.	-		10,594	
Deltronic Crystal Industries, Usa	-		3,98,803	
India International Centre	-		3,00,000	
Oerlikon Leybold Vacuum GmbH, Germany	-		3,60,672	
Perkin Elmer (India) Pvt Ltd	-		56,180	
Pfeiffer Vacuum GmbH	-		7,54,216	
Praveraka Infotech LLP, Bangalore	27,000		27,000	
Shree Mahabir Service Station	-		51,958	
Sisro Medicare, Coimbator	36,397		36,397	
Thermo Fisher Scientific (Asheville),LLC	-		1,49,032	
M/s A One Hospitality	96,603		96,603	
Scholarship -ICMR	50,345		50,345	
Scholarship -UGC	35,68,332		18,63,648	
Scholarship-INSPIRE	15,11,425		2,83,25,812	
CBS Mumbai	-		-	
DCS & EM, Mumbai	5,30,00,00,000		4,90,00,00,000	
Scholarship -CSIR	1,34,77,830		1,17,81,063	
IGCAR	30,402		30,402	
NEST -2016	28,620		-	
DCS & M,VECC,Kolkata	24,62,10,423		24,62,10,423	
		5,56,53,06,180		5,19,19,41,975
Security Deposit		63,17,910		1,69,55,092
2. Advances and other amounts recoverable in cash or in kind or for value to be received:				
a) on Capital Account		-		-
b) Prepayments		-		-
c) Others				
JEST-2010	-		7,038	
DCSEM-Medical Expenses Receivable	2,50,666		2,07,523	
R&D Receivable	3,78,937		56,754	
IOAA 2016	-		2,10,066	
KYPY 2013	-		11,833	
Prepaid Expenses	84,84,700		49,05,749	
		91,14,303		53,98,963
3. Income Accured:				
a) On Investments from Earmarked/Endowment Fund	-		-	
b) On Investment Others	-		-	
c) On Loans and Advances	-		-	
d) Others	-	-	-	-
4. Claims Receivables		-		-
Total (B)		5,58,34,38,413		5,21,78,37,267
TOTAL Rs.(A+B)		6,53,98,16,338		5,64,87,74,659

For P. K. NAYAK & CO.
Chartered Accountants
FRN - 31[illegible]

(CA. Arupta Kumar Jena)
Partner

M. No. 304980

(T. N. Sahoo)
Dy. Cont. of Accounts

(CMA. T.K.Srinath)
Finance Officer

(Prof. Sudhakar Panda)
Director

Schedule -12 : Income from Sales/Services

(Schedule forming part of Income & Expenditure for the year ended on 31.03.2017)

Amount in Rs.

Particulars	Current Year(2016-17)	Previous Year(2015-16)
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 Rs.	-	-

Schedule -13 : Grants/Subsidies

(Schedule forming part of Income & Expenditure for the year ended on 31.03.2017)

Amount in Rs.

Particulars	Current Year(2016-17)	Previous Year(2015-16)
(irrevocable Grants & Subsidies Received)		
1) Central Government	-	-
i)Non-Plan (Revenue)	85,63,33,000	41,00,00,000
ii)Plan (Capital)	4,92,56,923	4,54,68,868
2) State Government(s)	-	-
3) Government Agencies	-	-
4) Institutions/Welfare Bodies	-	-
5) International Organisations	-	-
6) Others (Specify)	-	-
TOTAL Rs.	**90,55,89,923**	**45,54,68,868**

For **P. K. NAYAK & CO.**
Chartered Accountants
FRN - 318155E

(CA. Anipta Kumar Jena)
Partner
M. No. 304980

(T. N. Sahoo)
Dy. Controller
of Accounts

(CMA. Y.K.Srinath)
Finance Officer

(Prof. Sudhakar Panda)
Director

Schedule -14 : Fees/Subscriptions

(Schedule forming part of Income & Expenditure for the year ended on 31.03.2017)

Amount in Rs.

Particulars	Current Year(2016-17)	Previous Year(2015-16)
1. Registration Fees (Msc & Phd)	94,72,934	89,17,779
2. Application Fees	1,500	
3. License Fees	5,62,718	2,45,935
4. Sale of Tender Paper	4,66,925	2,25,550
5. CIF, SCS Receipt	-	16,800
6. RTI Application Fees	636	110
9.Transcript Fees	31,400	31,100
10.Identity card/Health Card fee	1,525	7,025
11.Income from ICCAR	-	-
12.Summer course fees	28,000	4,500
13. Miscellaneous Receipts	6,267	4,317
14. Guest House Rent	3,73,547	21,940
15. Job Application Fees	1,92,000	7,20,500
16. Rent for shop	7,76,062	-
TOTAL Rs.	**1,18,73,514**	**1,01,95,556**

Schedule -15 : Income from Investments

(Schedule forming part of Income & Expenditure for the year ended on 31.03.2017)

Amount in Rs.

Particulars	Investment from Earmark Fund		Investment Others	
	Current Year(2016-17)	Previous Year(2015-16)	Current Year(2016-17)	Previous Year(2015-16)
(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 P. K. NAYAK & CO.
Chartered Accountants
FRN - 316155E

(CA. Anipta Kumar Jena)
Partner

M. No. 304980

(T. N. Sahoo)
Dy. Controller of Accounts

(CMA Y.K.Srinath)
Finance Officer

(Prof. Sudhakar Panda)
Director

Schedule -16 : Income from Royalty, Publication etc.

(Schedule forming part of Income & Expenditure for the year ended on 31.03.2017)

Amount in Rs.

Particulars	Current Year(2016-17)	Previous Year(2015-16)
1) Income from Royalty	-	-
2) Income from Publications	-	-
3) Others (specify)	-	-
TOTAL	**-**	-

Schedule -17 : Interest Earned

(Schedule forming part of Income & Expenditure for the year ended on 31.03.2017)

Amount in Rs.

Particulars	Current Year(2016-17)	Previous Year(2015-16)
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	2,74,07,176	2,93,95,099
b) With Non-Scheduled Banks	-	-
c) With Institutions	-	-
d) Others	-	-
3) On Loans:		
a) Employees/ Staff	-	-
b) Others	-	-
	-	-
4) Interest on Debtors and Other Receivables		
TOTAL Rs.	**2,74,07,176**	**2,93,95,099**

For **P. K. NAYAK & CO.**
Chartered Accountants
FRN - 318155E

(CA. Anipta Kumar Sahoo)
Partner
M. No. 304980

(T. N. Sahoo)
Dy. Controller
of Accounts

(CMA. Y.K.Srinath)
Finance Officer

(Prof. Sudhakar Panda)
Director

Schedule -18 : Other Income

(Schedule forming part of Income & Expenditure for the year ended on 31.03.2017)

Amount In Rs.

Particulars	Current Year(2016-17)	Previous Year(2015-16)
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 Income & Expenditure for the year ended on 31.03.2017)

Amount In Rs.

Particulars	Current Year(2016-17)	Previous Year(2015-16)
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 Income & Expenditure for the year ended on 31.03.2017)

Amount in Rs.

Particulars	Current Year(2016-17)	Previous Year(2015-16)
a) Pay and Allowances	16,74,80,426	13,67,21,449
b) Manpower (Outsourced)	4,13,32,566	2,55,70,009
c) Stipend to Trainee	5,30,561	3,50,201
d) Contribution to NPS	1,47,36,116	1,18,62,866
e) Leave Travel Concession	31,45,902	22,79,398
f) Fellowship to Phd Scholars	5,80,14,745	3,76,22,061
g) Fellowship to Post Doctoral Scholars	52,21,223	72,39,530
h) Contigency to PHD Students	33,92,951	37,97,878
i) Honorarium & Scholarship	56,84,033	56,65,942
j) PRIS	3,72,45,523	50,30,012
k) Medical Expenses	34,30,362	34,18,437
l)Children Education Allowance	12,05,327	10,82,807
m) Leave Encashment	5,18,164	4,41,519
n) Leave Salary Contribution	1,14,400	4,20,870
o) Professional Update Allowance	28,99,654	26,16,250
p) Pension Contribution	2,36,210	
TOTAL Rs.	34,51,88,163	24,41,19,229

For **P. K. NAYAK & CO.**
Chartered Accountants
FRN - 318156E

(CA. Anipta Kumar Jena)
Partner
M. No. 304980

(T. N. Sahoo)
Dy. Controller
of Accounts

(CMA. Y.K.Srinath)
Finance Officer

(Prof. Sudhakar Panda)
Director

Schedule -21 : Other Administrative Expenses

(Schedule forming part of Income & Expenditure for the year ended on 31.03.2017)

Amount in Rs.

Particulars	Current Year(2016-17)	Previous Year(2015-16)
Graduation Ceremony Expenses	2,55,910	2,38,751
Freight & Forwarding Expenses	12,36,732	6,74,325
Foundation Day Expenses	83,800	1,00,614
Purchases (Consumables)	3,19,04,297	1,58,44,662
Office Maintenance	13,884	11,51,203
Repair & Maintenance	87,69,337	79,27,753
Electrical Maintenance	29,14,031	-
Civil Maintenance	56,45,016	-
Advertisement	13,59,999	15,22,821
Audit Fees	50,740	50,106
Bank Charges & Commission	58,675	27,928
CRA Service Charges	46,546	41,974
Electricity Charges	4,64,84,454	2,66,27,061
NISER Inaguration Day Expenses	-	77,54,545
Fuel for DG set	64,290	4,49,824
Hospitality Expenses	22,25,627	25,45,145
Housekeeping Expenses	88,24,053	59,74,483
Legal Fees	1,69,535	28,437
Meeting Expenses	9,60,333	1,88,186
News Papers and Periodicals	65,522	57,878
Other Academic Expenses	-	2,09,645
Postage & Courier	5,06,469	2,98,485
Printing & Stationery	10,96,240	33,93,606
Rent, Rates & Taxes	10,28,506	29,51,457
Seminar/Workshop Expenses	16,02,211	10,43,468
Telephone & Internet charges	83,13,976	1,17,86,143
Travelling & Conveyance - Domestic	87,35,971	66,26,694
Travelling & Conveyance - Foreign	93,32,713	45,11,044
Vehicle Maintenance Expenses	1,40,87,473	90,81,869
Water Charges	1,03,796	3,02,236
	-	-
NISER XII PLAN		
	-	-
Domestic Travel	4,32,846	8,06,547
Fellowships	14,05,455	8,24,745
Foreign Travels	22,55,654	24,29,555
Office Expenses	33,46,989	20,03,079
Other Expense	4,71,086	13,67,959
Supplies & Materials	4,13,18,893	3,80,35,483
Honorarium	26,000	1,500
TOTAL Rs.	**20,51,97,058**	**15,68,79,211**

For P. K. NAYAK & CO.
Chartered Accountants
FRN- 312135E

(CA. Anipta Kumar Jena)
Partner
M. No. 304980

(T. N. Sahoo)
Dy. Controller
of Accounts

(CMA Y.K.Srinath)
Finance Officer

(Prof. Sudhakar Panda)
Director

Schedule -22 : Expenditure on Grants, Subsidies etc.

(Schedule forming part of Income & Expenditure for the year ended on 31.03.2017)

Amount in Rs.

Particulars	Current Year(2016-17)	Previous Year(2015-16)
a) Grant given to Institutions/Organisation	-	-
b) Subsidies given to Institutions/Organisation	-	-
TOTAL	-	-

Schedule -23 : Interest

(Schedule forming part of Income & Expenditure for the year ended on 31.03.2017)

Amount in Rs.

Particulars	Current Year(2016-17)	Previous Year(2015-16)
a) On Fixed Loans	-	-
b) On Other Loans (including Bank Charges)	-	-
c) Others (specify)	-	-
TOTAL	-	-

For P. **K. NAYAK & CO.**
Chartered Accountants
FRN - 318155E

(CA. Anipta Kumar Jena)
Partner
M. No. 304980

(T. N. Sahoo)
Dy. Controller
of Accounts

(CMA Y.K.Srinath)
Finance Officer

(Prof. Sudhakar Panda)
Director

SCHEDULE 24 – SIGNIFICANT ACCOUNTING POLICIES

(Schedule forming part of the accounts for the period ended on 31.03.2017)

About the organisation :

The National Institute of Science Education and Research (NISER) set up at Bhubaneswar by the Department of Atomic Energy was registered as a Society with the Registrar of Societies, Cuttack, Orissa vide registration no:22426/16 dt. 10.07.2007 with a capital outlay of Rs 857.27 crores .

NISER conducts the following programmes in science education 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 higer secondary schooling.
b) Integrated M.SC +PHD programmes after 10+2 from other universities.
c) PHD programme after MSC from other Universities.
d) Computer Science and Earth& Planetary Science

Presently NISER has 521 students admitted in 5 year M.SC programme in the various streams of Basic Sciences .

1. Basis of Preparation of Financial Statements

The Financial Statements have been prepared on accrual 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.

P. K. NAYAK & CO. Bhubaneswar Chartered Accountants

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 is at project stage. Hence Capital Expenditure incurred on construction activities including Electrical Furnishing, Electrical installation, Electrical Transformer & Office Automation ware etc are being shown as capital work in progress in the FY 2016-17.

5. Recognition of income & Expenditure

Income & expenditure are generally recognised on accrual basis & provision made for all known liabilities.

Lab consumables and stores consumables purchased during 2016-17 is treated as recurring expenditure and the consumables are transferred to respective schools of study. Necessary records are maintained at the school concerned.

6. Foreign Exchange Transactions

Transactions involving foreign currency are accounted at the exchange rate prevailing on the date of the transaction.

7. Accounting for Registration Fees

Registration fee of students are being accounted for on receipt basis.

8. Accounting of interest earned on FD

Interest earned against lien of FD are being accounted for on accrual basis.

9. 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 as the project is under progress.

c) Government grants/ subsidy is accounted on realisation basis.

10. Lease

Lease rentals are expensed with reference to lease terms.

P. K. NAYAK & CO. Bhubaneswar Chartered Accountants

11. Retirement Benefits

Liability towards gratuity payable on death/ retirement and provision for accumulated leave encashment benefit to employees is not applicable at present.

12. TAXATION

Since the Institute is a research oriented organization wholly funded by Government of India, Department of Atomic Energy there being no taxable income under Income-tax Act 1961, no provision for Income tax has been made during the year.

For **P. K. NAYAK & CO.**
Chartered Accountants
FRN - 318155E

(CA. Anipta Kumar Jena)
Partner
M. No. 304980

(T. N. Sahoo)
Dy. Controller of Accounts

(CMA. Y.K.Srinath)
Finance Officer

(Prof. Sudhakar Panda)
Director

NOTES

NATIONAL INSTITUTE OF SCIENCE EDUCATION AND RESEARCH BHUBANESWAR

An Autonomous Institute under Department of Atomic Energy, Government of India

P.O.- Jatni, District - Khurda, Pin - 752050, Odisha, India

Printed at: AD GRAPHIX @ 9438028690