IISER
THIRUVANANTHAPURAM

ANNUAL REPORT
2022 - 2023

Indian Institute of Science Education and Research
Thiruvananthapuram (IISER TVM)

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IISER Thiruvananthapuram
Annual Report 2022–23

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Director's Foreword

It gives me immense happiness to present this 14th Annual Report of the Indian Institute of Science Education and Research Thiruvananthapuram (IISER TVM). In the duration from April 2022 to March 2023, we have made steady and determined progress. The institute has achieved a significant milestone by successfully transitioning out of the project mode, while emerging from the shadows of the unprecedented calamity, the COVID-19 pandemic. I must say that it is a testament to the collective dedication and hard work of the IISER TVM fraternity.

In the year that has gone by, IISER TVM has leapt ahead on several fronts. We have increased our student intake, accelerated faculty recruitment, streamlined academic programs, and improved campus infrastructure. IISER TVM has made commendable strides in moving up in the Nature Index Rankings, now ranking 14th. It is also recognized among the Global 2000 list by the Center for World University Rankings (CWUR). IISER TVM campus presently boasts of well over 1800 enrolled students across various academic programs. It is a matter of pride that over 50% of our current student population is that of girls. In our ongoing commitment to providing high-quality education with a fulfilling learning environment in all programs, be it our flagship BS-MS or revolutionary interdisciplinary i^2 BS-MS or pioneering 2-year MSc or iPhD/PhD programs, curricula and syllabi have been revamped to introduce the students to diverse and frontier areas.

In this period, we established two new research centres, namely, the Centre for Advanced Materials Research with International Engagement (CAMRIE) and the Centre for High-Performance Computing (CHPC), both of which are now fully operational and are admitting PhD students. In addition to actively participating in three Integrated Clean Energy Material Acceleration Platforms (IC-MAP) projects of the Department of Science and Technology (DST), a select group of faculty members is spearheading the IC-MAP consortium on storage by collaborating with multiple institutions working on advancing solid-state battery research. Furthermore, we also launched and inaugurated the newest addition, namely, the School of Earth, Environmental, and Sustainability Sciences, in the current year.

The dedicated faculty members of IISER TVM embody a spirit of intellectual pursuit and cater tirelessly to the evolving needs of our academic ecosystem. By the end of FY 2022-23, IISER TVM increased its tally of talented faculty members to 89 with 13 new additions in this financial year alone. During this period, our faculty published nearly 300 scientific peer-reviewed articles in top-tier international journals, solidifying our position in the global research community. I am pleased to

note that there is a growing trend of collaboration among faculty members, within the faculty of respective Schools and also among faculty members of different Schools of the institute. Our extramural research funding is to the tune of 12 Crores INR in this period with multiple faculty members having secured grants from agencies such as DST, SERB, DRDO, ICAR etc. This funding has enabled us to equip our schools with state-of-the-art research facilities, including advanced instruments like microfocus single-crystal X-ray diffractometers, superconducting quantum interference device (SQUID) magnetometers, electron beam evaporators, and so on. In addition to the existing and ongoing MoUs, the Institute has signed a new agreement with the Kerala University of Digital Sciences, Innovation and Technology, Thiruvananthapuram to further academic cooperation with institutes within the region.

We take immense pride in the achievements and recognitions received by our faculty members at both national and international forums. Some noteworthy accolades include membership in the Indian National Young Academy of Sciences (INYAS), the ACS Rising Star Award in Materials Science by the American Chemical Society and the Excellence in Carbohydrate Research Award. In addition, several of our faculty members have been inducted as members to editorial boards of top-quality journals such as Philosophical Transactions A, Journal of Comparative Physiology, Chemical Society Reviews, JACS Au, Journal of Physical Chemistry A/B/C and Dalton Transactions. These achievements underscore the calibre and expertise of our faculty members in their respective fields. We are equally proud that our students have received many best poster/presentation prizes at national and international conferences, and won competitive international fellowships to carry out part of their research work in labs across the world. A record number of fifteen students – five iPhD and ten PhD students – have received the prestigious Prime Minister's Research Fellowship (PMRF) during this year. Our biology undergraduates bettered their performance in the International Genetic Engineering Machine (iGEM) competition and won a Gold medal in Paris, France for developing 'Duonco' – a dual nanovesicle drug delivery system targeting breast cancer. This team also received a Gold medal at the international synthetic biology-based competition, GOGEC 2023.

To foster engagement with the scientific community and remain abreast with the latest research, a multitude of international and national symposia, seminars, and workshops across disciplines have been organized in the institute. The annual Frontiers Symposium series, which hosts about 80 eminent speakers in all disciplines, has become a significant academic feature of IISER TVM. Other notable symposia and workshops organized on campus include the national Post-Doc Symposium, Chromosome Stability 2022, International Conference on Main Group Synthesis and Catalysis, Fluorescence Correlation Spectroscopy (FCS) XIII workshop, One-Day International Symposium on Functional Nanoscale Materials, 9th Theme Meeting on Ultrafast Sciences, International Workshop on Nano-engineered Materials, Mathematics Training and Talent Search (MTTS) program, NCM Workshop on Numerical Methods for Partial Differential Equations and NCM Workshop on Complex Fluids and Liquid Crystals. During this period, Institute colloquia by distinguished personalities from various domains, for example, Mr. C. Balagopal, Prof. David Cahen, Prof. Sundar Sarukkai, etc., were also conducted.

Insofar as the outreach programs are concerned, the institute has fervently endeavored to promote scientific literacy among the public by engaging in community activities, which include blood donation drives and educational initiatives. Notable among these are uniquely crafted Refresher & Preparative Winter Schools (RPWS) in Chemistry, Biology, and Physics for final year MSc and BS-MS students, the Teachers' Training Program for college and higher secondary school teachers and the Nurturance Program for NCERT National Talent Search Awardees. As a Regional Coordinating Institute (RCI) of Unnat Bharat Abhiyan (UBA), the institute, as an organization with a sense of responsibility to be relevant to the society around, has organized a plethora of programs for students,

women and other communities in nearby tribal villages.

In our commitment to developing and nurturing students with well-rounded personalities, we emphasize on sports, cultural activities, and student well-being. Our students have excelled in various cultural and sports tournaments, showcasing their talents and camaraderie. The IISER TVM contingent finished fourth with 5 gold, 8 silver and 7 bronze medals in the 9th Inter-IISER Sports Meet held at IISER Bhopal. The IISER Thiruvananthapuram debate team won the title of 'overall best speaker' in Altus Disputatio, the flagship debate competition hosted by the National University of Advanced Legal Studies, Cochin. As part of intercollegiate cultural activities, IISER TVM won the first runner-up title at the Inter-IISER cultural meet held at IISER Pune. The institute hosted the very popular annual cultural festival (ISHYA), the annual sports festival (ITSAV) and the annual science festival (Anvesha), which serve as platforms for students to express their talent.

The Institute has been constantly improving the campus infrastructure to enrich the academic ambience. Key upgrades include pedestrian pathways connecting academic blocks to hostels via the central library, a modern tennis court, a children's playing area and a new residential block. The institute embraces the tenets of 'sustainability' and is vigilant with the implementation of measures like energy-efficient LED streetlights, solar streetlights in hostels, restrooms with occupancy sensors to reduce power consumption, etc. These reflect the institute's commitment to providing a modern, eco-friendly, and progressive environment for its community and visitors.

In the forthcoming academic year, plans are afoot to swiftly implement several policies of the New Education Policy (NEP) 2020, some of which include the introduction of multiple exit options in our flagship BS-MS programs, establishment of an academic bank of credits, the choice-based crediting of courses, flexible interdisciplinary courses as part of electives, etc. Finally, I would like to place on record my appreciation and acknowledgement of the guidance and support by the Chairperson, Prof. Arvind A. Natu, and the members of the Board of Governors. I would like to conclude by thanking each and every individual who has contributed to the growth of this institution in his/her own way. I am confident that IISER TVM will rapidly evolve, excel as one of the sought-after institutes for science education and research, and contribute significantly to the academic and research landscape of our country.

J. N. Moorthy

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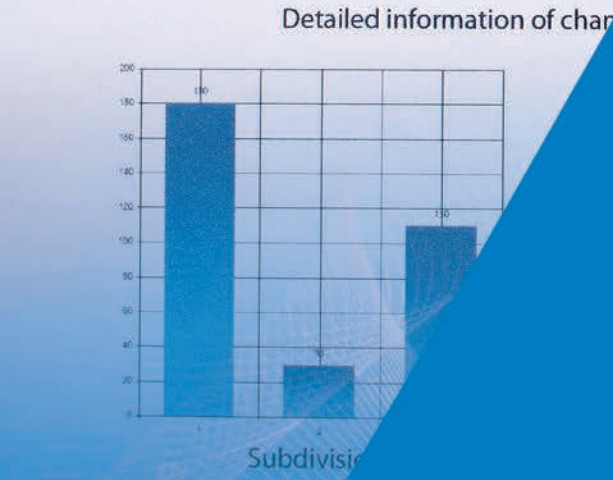

RESEARCH REPORTS

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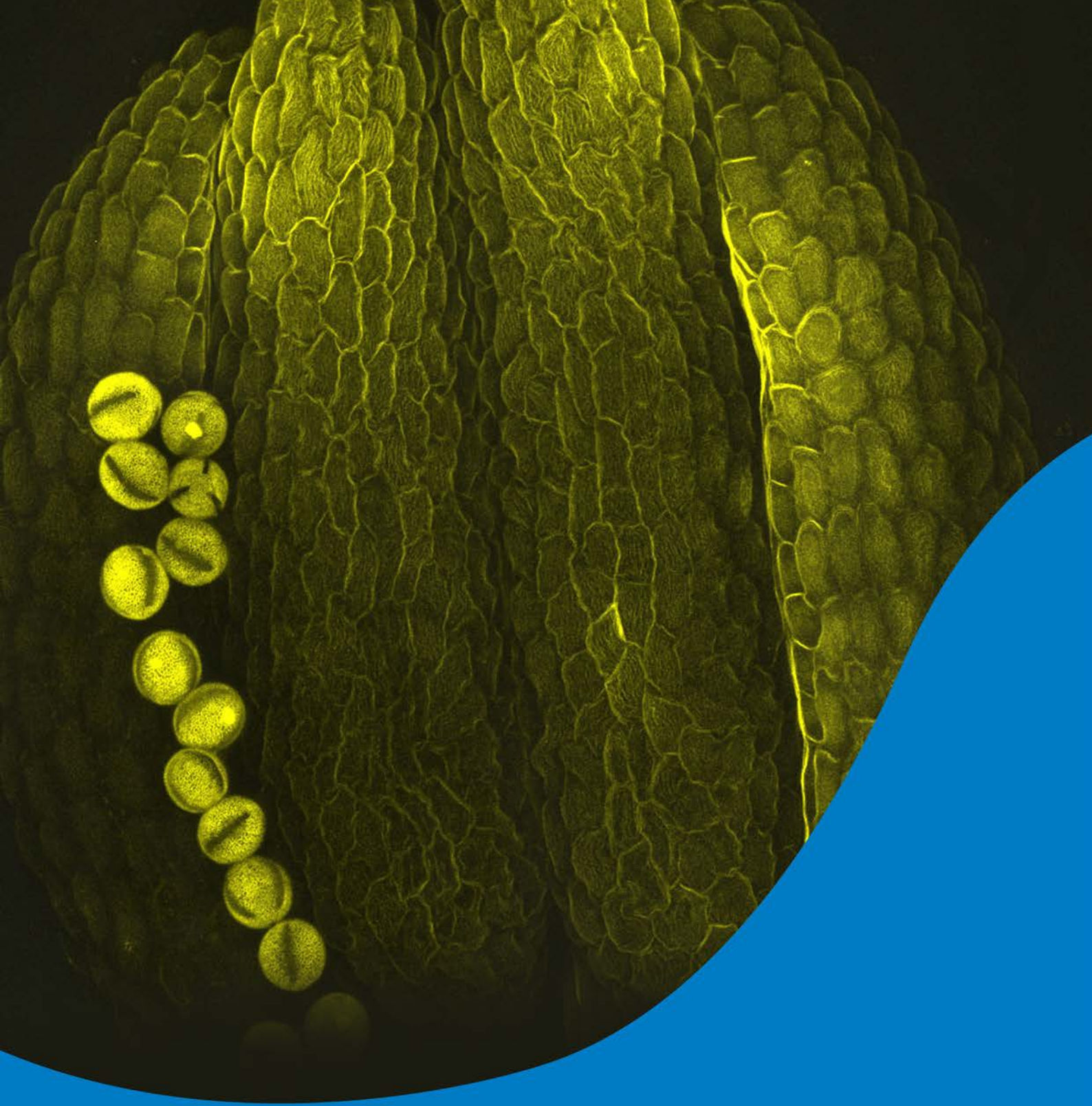
School of Chemistry

School of Physics

School of Mathematics

School of Data Science

Other Faculties

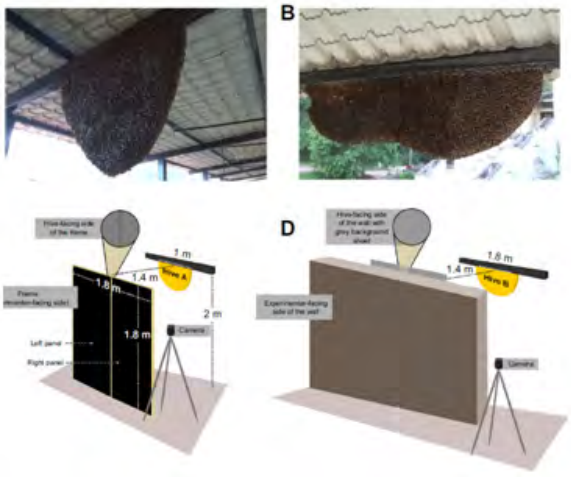


SCHOOL OF BIOLOGY

Fluorescence microscopy image of a dehisced Arabidopsis thaliana anther expressing the phytohormone auxin reporter DR-5 VENUS in the pollen grains (round cells).
Image Credit: Research from Dr Ravi Maruthachalam group (unpublished)

Ecology

Hema Somanathan
Professor & Head of Department



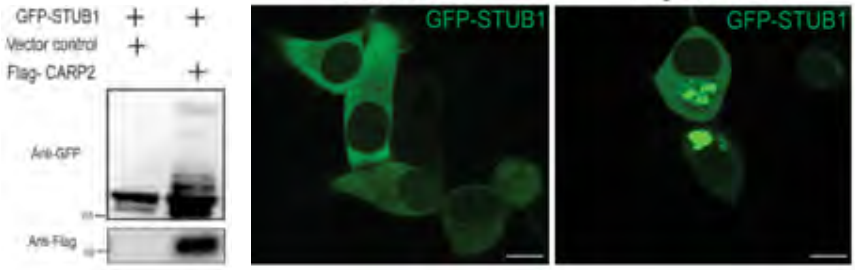
Defensive displays in honey bees [Journal of Experimental Biology 2022, 225 (17), jeb244716]

In my lab, we are interested in questions related to the behavioral ecology and the pollination services provided by bees. We have in the past year, examined the spatial resolution of the eyes of Indian honey bees, fruit bats and stingless bees. This enables us to examine interspecific differences in the visual ecology of bees across various habitats. We have found that honey bees have foraging ranges that are much smaller than the western honey bee, Apismellfiera. These differences may arise from differences in the resource distribution patterns in tropical and temperate habitats. We are currently examining their foraging ecology in varied landscapes to construct forage maps and pollination networks in both forest and in agroecosystems. We are also examining various defensive behaviors in social bees and studying their seasonal migration patterns across Indian landscapes (image above).

Organelle Homeostasis, Ubiquitin Signalling & Host-Pathogen Interactions

S. Murty Srinivasula
Professor

CARPs regulate STUB1 and its pathogenic mutant's aggregation kinetics by mono-ubiquitination. CARP2 expression promotes STUB1 mono-ubiquitination and aggregate formation (left). N2a cells were live imaged after co-expression of GFP-STUB1 with or without FLAG-CARP2 WT (right) [Sharma et al., 2023 FEBS Journal]



Our research primarily focuses on understanding the role of ubiquitin signaling in maintaining the balance of cellular components (organelle homeostasis) and its contribution to the progression of diseases. The development of neurological pathologies is linked to the accumulation of protein aggregates like alpha-synuclein in Parkinson's disease and tau protein in Alzheimer's disease. It has been observed that the attachment of a single or two ubiquitin molecules (mono- or di-ubiquitination) to these proteins can stabilize the aggregates and contribute to the disorders. One protein of interest in our study is STIP1 homology and U-box containing protein 1 (STUB1), which plays multiple roles in maintaining protein quality control and insulin signaling. In

the case of spinocerebellar ataxia 16 (SCAR16), an autosomal recessive neurodegenerative disease, mutations and aggregation of STUB1 have been reported. Although the neuroprotective role of STUB1 is widely accepted, we have limited knowledge about the regulatory mechanisms that control the formation of STUB1 aggregates. In our lab, we discovered a novel regulator of STUB1 called CARP2, which is an ubiquitin ligase. CARP2 interacts with STUB1 and attaches a single ubiquitin molecule to it (mono-ubiquitination). This modification by CARP2 leads to the formation of detergent-insoluble aggregates. Importantly, we found that pathogenic mutants of STUB1 are more susceptible to CARP2-mediated aggregate assembly compared to the wild-type form. Therefore, our findings unveil CARPs (CARP1 and CARP2) as new regulators of STUB1, providing insights into the control of its distribution between the cytosol and aggregate

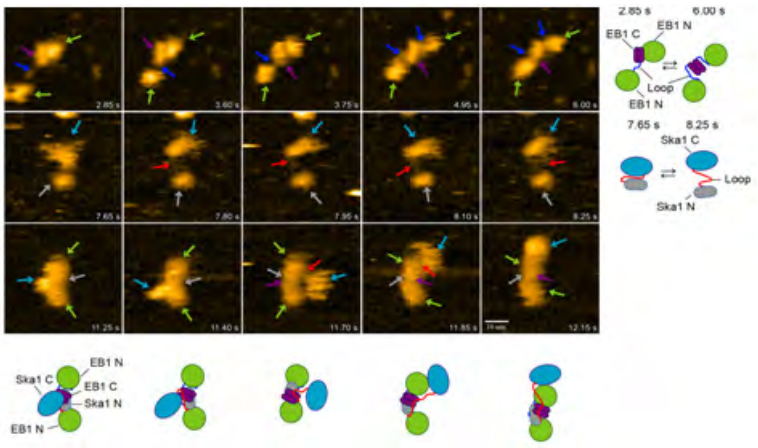
Tapas K. Manna
Professor

Cytoskeleton, Cell Division

Error-free chromosome segregation is crucial for the maintenance of genome integrity in almost all eukaryotic organisms and its deregulation leads to tumorigenesis. Chromosome segregation is orchestrated by kinetochore of the chromosome and centrosome, which assembles the mitotic spindle. Our research focuses on understanding the fundamental aspects of kinetochore and centrosome biology, including their assembly, biogenesis, and the cellular processes associated with their functions.

Our recent work explores a molecular mechanism by which alignment of chromosomes at the metaphase plate during mitotic cell division is stabilized in human cells. We have demonstrated that interaction between the spindle microtubule end-associated protein EB1 and the kinetochore-binding protein Ska1through a flexible region of the protein stabilizes spindle-chromosome interaction during the alignment. We have further shown the direct interaction of the two proteins at the single molecule level by high-speed atomic force microscopy.

In another study, we have demonstrated a key molecular mechanism, which controls optimal level of microtubule assembly in cells. We have shown that interaction between two centrosome proteins, Transforming Acidic Coiled-Coiled (TACC3) and colonic hepatic Tumor Over-expressed Gene (ch-TOG), limits the amount of microtubules to be assembled from the centrosome in human cells.



Molecular dynamics of EB1, Ska1, and EB1–Ska1 complex. High-Speed AFM images and corresponding schematic showing the dynamic changes of the domains of EB1 dimer, Ska1 monomer and EB1–Ska1 complex. The arrowheads colors correspond to the colors of the domains and loops in the schematics [Journal of Biological Chemistry 2023, 299 (2), 102853]

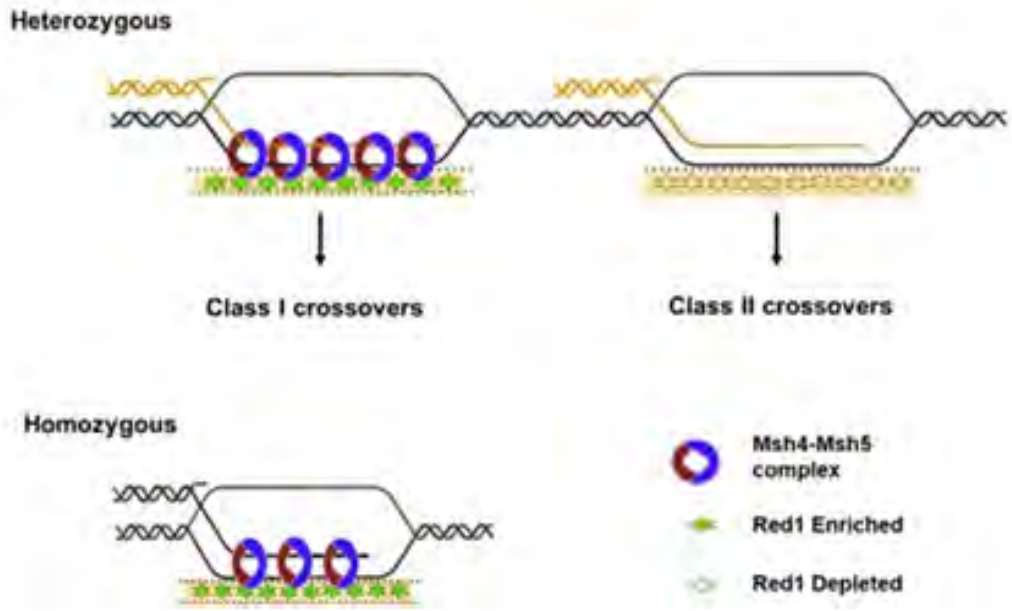
Nishant K.T
Professor

Genome Stability

Our group is interested in understanding mechanisms that maintain genome stability during mitotic and meiotic divisions using the budding yeast Saccharomyces cerevisiae as a model system. Two major research areas in the lab are: 1) Mechanisms of meiotic recombination and chromosome segregation 2) Mechanisms contributing to mutagenesis, loss of heterozygosity and aneuploidy in S. cerevisiae and other eukaryotic models.

Meiotic crossovers are initiated from programmed Double Strand Breaks (DSBs). The Msh4-Msh5 heterodimer is an evolutionarily conserved mismatch repair related protein complex that promotes meiotic crossovers by stabilizing strand invasion intermediates and joint molecule structures such as Holliday junctions. Many organisms have heterozygous genomes that can affect the stability of strand invasion intermediates through heteroduplex rejection of mismatch containing sequences. Our studies in 2022-2023 provided new insights on how the binding of recombination proteins is affected in heterozygous versus homozygous background (See Figure). We show that Msh5 levels were reduced in regions of high heterozygosity, indicating that high mismatch densities reduce levels of recombination intermediates to which Msh4-Msh5 binds. Further, Msh4-Msh5 bound regions are wider in heterozygous backgrounds that maybe necessary for stabilizing recombination intermediates comprising diverged sequences and as a counter mechanism to species barriers among yeast strains.

In recent collaborative work, we have also provided insights into the role of the Exo1 protein in the resolution of Holliday junction intermediates into crossovers [PLoS Biology 2023, 21(4): e3002085].



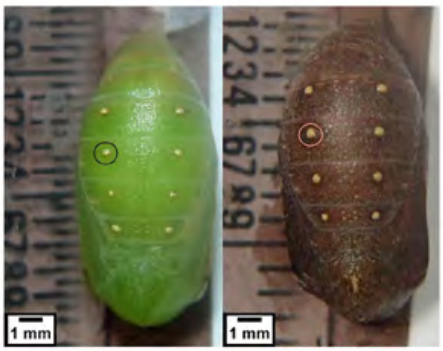
Model for the chromosomal association of the Msh4-Msh5 recombination proteins in homozygous and heterozygous backgrounds.

Evolutionary Ecology

Ullasa Kodandaramaiah
Associate Professor

Our lab works on understanding the diversification of phenotypes in nature. Our recent research has been in the following themes.

1) Using experiments with birds, we have shown that backgrounds with more colours make it more difficult for predators to detect their prey. The study suggests that prey will have higher fitness on backgrounds that are colourful, even if the level of background matching is not extensive.



Many butterflies have pupal colour plasticity, where they produce green or brown pupae depending on the environmental conditions. Research in our lab shows that this plasticity is an effective strategy against desiccation stress.

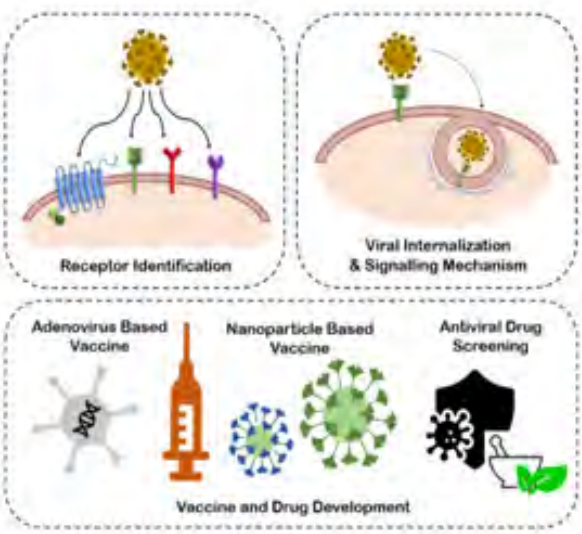
2) Pupal color plasticity is observed in numerous insect species and has traditionally been associated with crypsis. However, our research has presented evidence suggesting that the evolution of pupal color plasticity may primarily serve as a strategy to mitigate desiccation instead.

3) We also reported a novel inter-species hybrid zone in Impatiens species. The hybrid zone is interesting because it is extremely narrow. Our research has illuminated the ecological factors that make the hybrid zone narrow.

Virus-host Interaction, Coronaviruses, Vaccine development

V Stalin Raj
Associate Professor

Coronaviruses (CoVs) infect a wide range of animals, birds, and mammals, including humans. The pandemic severe acute respiratory syndrome coronavirus (SARS-CoV)-2, emerged following the two major outbreaks of SARS-CoV-1 and MERS-CoV, delineates the importance of the development of rapid and effective therapeutic and vaccine strategies. Coronaviruses initiate their life cycle by binding the trimeric spike glycoprotein to its cellular receptors; interfering with the spike-receptor interactions would support the early prevention of the virus infection. Here, we characterized SARS-CoV-1, SARS-CoV-2, and MERS-CoV spike proteins and developed pseudotypedCoVs that specifically bind to their receptors (ACE2 or DPP4) and enter the host cells [Current Pharmaceutical Biotechnology 2022, 23(8), 1118-1129]. The cytoplasmic domain signaling of

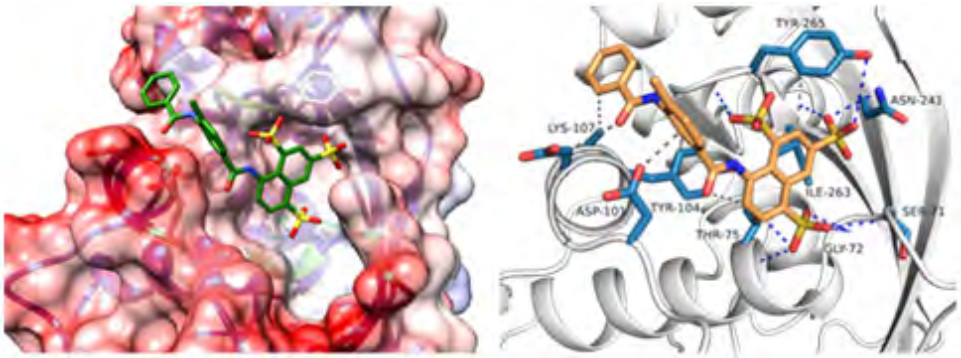


ACE2 is not crucial for the entry of SARS-CoVs, leading to the potential usage of co-receptors for coronavirus cellular entry [Cells 2021, 10(7), 1814]. We also report the structural annotation of SARS-CoV-2 variants and the map of 74 experimentally validated SARS-CoV-2 neutralizing monoclonal antibodies (mAbs) binding epitopes of all major variants, including Delta and Omicron [Joseph J et al., Proteins: Structure, Function, and Bioinformatics 2023]. In addition, we showed that a major catechin in green tea, Epigallocatechin-3-gallate (EGCG) shows antiviral activity against CoVs by blocking spike binding to the host cell receptor [Journal of Global Antimicrobial Resistance 2021, 26, 26-28]. Further, we used the developed Spike proteins for designing self-assembled nanoparticle vaccine candidates presenting the spike on its surface which was validated by TEM, AFM and DLS. Mice were immunized with these vaccine candidates to study the humoral immune response, which showed greater immune response than spike subunit vaccines. In summary, we developed recombinant proteins, pseudotyped viruses and self-assembled protein nanoparticle vaccine candidates for emerging CoVs and demonstrated their diverse applications.

Ramanathan Natesh
Associate Professor

Transcription Regulation, DNA Damage and Repair, Anti-microbial Resistance (AMR), Structural Molecular Biology, Single Particle Cryo EM and Protein Crystallography

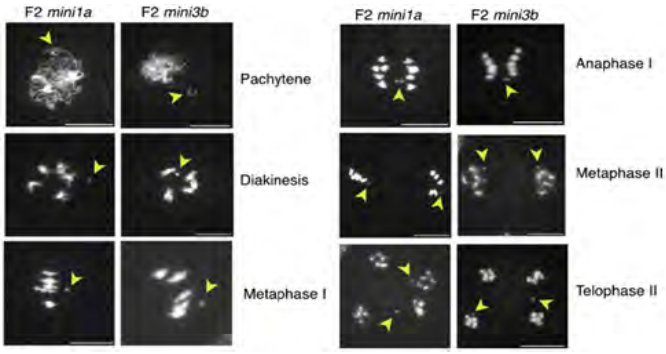
Our research focuses on structural investigation of proteins and its complexes involved in various crucial processes such as transcription regulation, DNA damage repair, topology manipulation, genome stability, chaperones, anti-microbial resistance (AMR) in infectious diseases, and cancer. In our lab, we aim to understand the mechanisms underlying transcription regulation and DNA damage repair by employing two principle techniques namely Cryo Electron Microscopy (CryoEM) and Protein Crystallography along with range of complementary biochemical, biophysical, and bioinformatics methods. Recently, our group in collaboration with Dr Krishna Kurthkoti (RGCB, Thiruvananthapuram), showed that suramin can be used to reduce the conversion of persistors to drug resistors [Antimicrobial Agents Chemotherapy 2022, 66(3), e0177321]. In another research project, we aim to design novel small molecule inhibitors targeting an evolvability factor in Mycobacterium tuberculosis. Through structural, mutational and biochemical/biophysical studies of this factor, we aim to identify the regions that may play an important role in its ATPase activity, and its oligomeric state. Our preliminary cryoEM studies shows promising results for further work in this direction.



Molecular docking of suramin with RecA protein of M. tuberculosis[Antimicrobial Agents Chemotherapy 2022, 66(3), e0177321]

Plant Centromere Biology, Haploid Genetics, Aneuploidy, Genome Stability

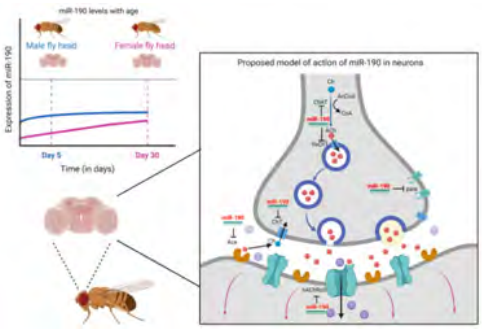
Ravi Maruthachalam
Associate Professor



Meiotic behavior of male meiocytes from Arabidopsis plants harboring a single minichromosome (arrowheads) [Tan et al., 2023, Chromosoma]

Research in our lab is aimed at understanding the mechanistic basis of uniparental genome elimination(UGE) in plants and its exploitation for accelerated plant breeding and genetics. One of the by-products of UGE is the generation of minichromosomes, which have the potential to serve as genetic tools for reliable transfer of desired set of genes as a single unit across a wide range of crop species. To realize this potential, minichromosomes must be reliably generated, easily manipulated, and stably inherited. Towards this end, in collaboration with Prof Luca Comai (UC Davis) and Dr Ek Han Tan (University of Maine), we demonstrate a reliable method of generating a size series of minichromosomes and analyzed its meiotic transmission behavior as shown in the figure. Altogether, we demonstrate the formation of heritable and easy method of minichromosome production in Arabidopsis.

Regulation of neurodegeneration and lifespan by microRNA miR-190



miR-190 is a sexually dimorphic microRNA that is expressed at higher level in the male fly head vs female fly head. miR-190 levels in the neurons regulates in male flies modulate the expression of a number of genes involved in controlling neuronal activity.

Jishy Varghese
Associate Professor

Neurodegenerative disorders, an outcome of defective neuronal health and ageing, are a global threat affecting millions. Genetic and environmental factors that contribute to neurodegenerative disorders are not well understood. Studies to unravel such factors would be crucial for identifying preventive strategies and delaying the early onset of neurodegeneration. Recent studies implicate a central role for microRNAs, a class of small non-coding RNAs that regulate gene expression post-transcriptionally in neurodegenerative disorders. However, a comprehensive understanding of the microRNAs and their target genes involved in the maintenance of neuronal integrity is lacking. Our lab uses genetic approaches in Drosophila to identify

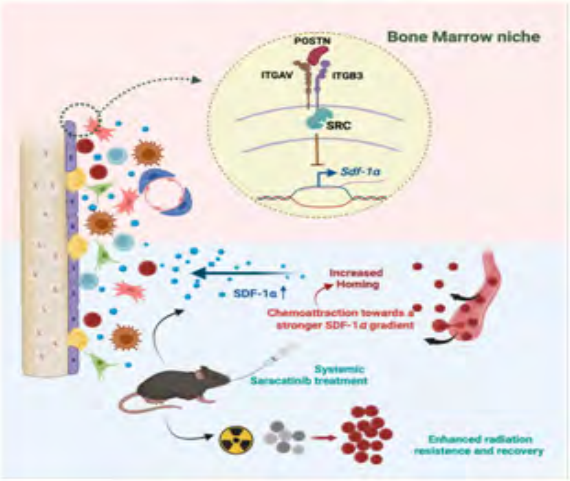
conserved microRNAs that play a role in ageing and age-dependent neuronal deterioration. We aim to identify novel microRNA target genes contributing to neurodegeneration and ageing. Our primary focus would be on conserved microRNAs, which could be relevant to understanding human neurodegenerative disorders.

We recently identified miR-190 in a genetic screen for microRNAs that regulate lifespan and integrity of the nervous system. This study shows that the expression of miR-190 is higher in the male head than in females. In male flies, lack of miR-190 in the neuronal tissues reduced lifespan, leading to early onset of neurodegeneration and age-related climbing defects. Further, we identified target genes responsible for the effects on lifespan and neuronal integrity in miR-190 knockdown flies. Surprisingly, the target genes regulated by miR-190 in the Drosophila nervous system are also conserved in the human genome, including the miR-190 target sites in their 3'UTR. Our results suggest remarkable conservation of the post-transcriptional regulation of miR-190 targets. Thus, our approach has identified a novel microRNA that regulates neuronal integrity and lifespan, which could be relevant to humans[RNA biology, 19(1), 1085-1093].

Stem Cells, Developmental Biology

Satish Khurana
Associate Professor

The bone marrow (BM) niche plays crucial role in the regulation of hematopoietic stem cell (HSC) function in adult mammals. SDF-1α is one of the key factors associated with the functional regulation of HSCs. It interacts with chemokine receptor CXCR4, and plays important role in maintenance, migration, and homing of HSCs. Depletion of Sdf-1α expression leads to cell cycle entry and functional decline in HSCs. Recently published results from our lab provided evidence for transcriptional regulation of Sdf-1α expression through outside-in integrin signalling[iScience 2022, 25(10), 105171]. Our group showed that inhibition of integrin signaling by SRC-phosphorylation inhibitors can lead to increased level of Sdf-1α transcripts in BM stromal cells. Modulation of integrin signalingin vivo, altered cell cycle status of HSCs and provided faster radiation recovery. The report also presented a regulatory role of SRC-mediated integrin signaling in Sdf-1α transcription that remains consistent across stromal cell types, in vitro and in vivo. Pharmacologically induced systemic inhibition of SRC-phosphorylation could alter the chemokine expression and enhance hematopoietic homing and function. Hence, in addition to providing the basis of an improved hematopoietic function and homing, our study presented a direct evidence of less well-known transcriptional regulation by outside-in integrin signaling.

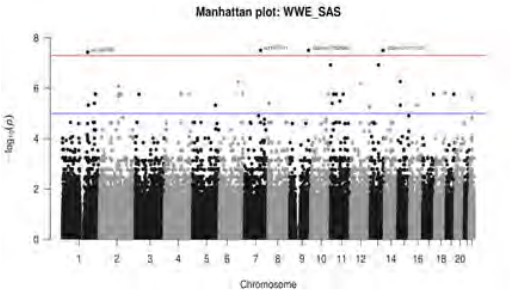


Integrin signaling can be modulated to increase the expression of Sdf-1a. As the master regulator for HSCs maintenance in the BM, it increased the efficiency of homing of transplanted HSC [iScience 2022, 25(10), 105171]

Molecular Biology and Genetics

We are interested in investigating genetic factors, mechanism behind biological systems and genome engineering. We extensively perform genetic, genomic studies using molecular biology tools including genome editing technology and high-throughput genome sequencing technologies. Major thrust areas are:

N Sadananda Singh
Assistant Professor



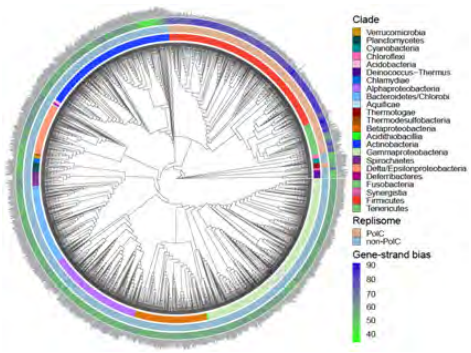
Manhattan plot to show the genetic markers that are associated with anti-seizure medication induced drug toxicity

- Application of genome editing technologies for finding genetic factors underlying drug treatment response and specific biological processes. To accomplish this, we employ human cell lines as model systems and utilize various genome editing techniques such as gene disruption, deletion, or induction of specific genes or regions of interest.
- Development of CRISPR-Cas based genome editing technology to engineer agriculturally important animals particularly bovine. Recently, we have completed the whole genome sequencing and assembly of indigenous Kerala bovine breed and dairy industry related breed used in Kerala. Using these genomic information, we have initiated a bovine genome engineering project to optimize the CRISPR-Cas based genome editing in bovine embryo.
- Investigating and identifying the genetic factors associated with lipid disorders. Molecular genetic analysis for lipid disorder (of particular interest to us is cholesterol disorder) are not commonly conducted, highlighting the need for such studies to differentiate genetic influences from external factors.

Mutagenesis, Gene Expression, Evolution

We aim to understand the mechanisms and consequences of collisions between replication and transcription. Replication and transcription are the two fundamental processes that often use the same DNA template simultaneously, especially in rapidly dividing bacterial cells resulting in collisions between the two machinery. Currently, we are investigating the mechanisms of the mutations generated by replication-transcription collisions, their impact on gene expression and whether they drive antibiotic resistance.

Sabari Sankar Thirupathy
Assistant Professor

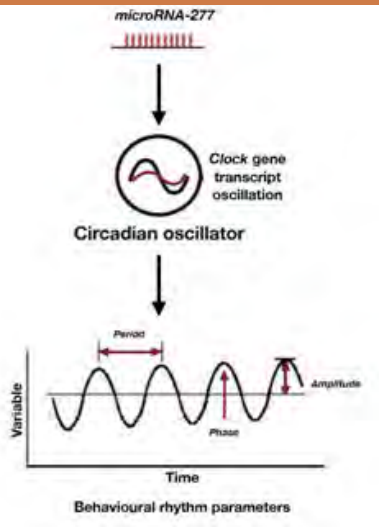


Phylogeny of the bacterial kingdom depicting the evolution of DNA replication machinery and gene distribution and gene inversions

Chronobiology

Nisha N Kannan
Assistant Professor

Our group is interested in understanding the circadian clock at the genetic, neuronal network level and how the circadian clock rhythmically regulates the behavior, physiology and metabolism of an organism. We studied the role of microRNA (miRNA) in posttranscriptional regulation of circadian rhythms, through a genetic screen in which a transgenic library of microRNA-sponges was used to downregulate 23 microRNAs that are abundantly expressed in the circadian clock neurons of Drosophila. We further studied in detail about the role of microRNA-277 (miR-277) in circadian rhythm regulation ofDrosophila. Our results showed that miR-277 plays a critical role in proper phasing of the circadian rhythm, maintenance of free running period and robustness of rhythms. This microRNA is important for the circadian clock to adapt with the environmental day length and light intensity changes. Most importantly, miR-277 expression in the brain clock neurons was found to be important for the diurnal oscillations of the Clock mRNA. Our study points to the possibility of an additional mechanism by which the Clock expression is finetunedto maintain robust circadian rhythm in Drosophila.

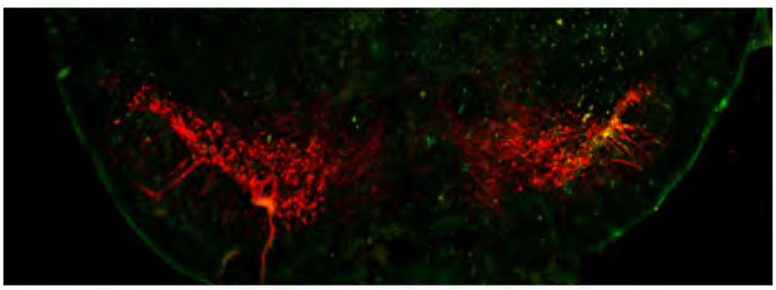


miR-277 expressed in the fly brain circadian clock neurons is important to finetune the circadian Clock gene transcript oscillation and to maintain robust oscillations by governing the phase, period and amplitude of circadian rhythm.

Neurodegeneration, Protein Aggregation, Disease Models

Poonam Thakur
Assistant Professor

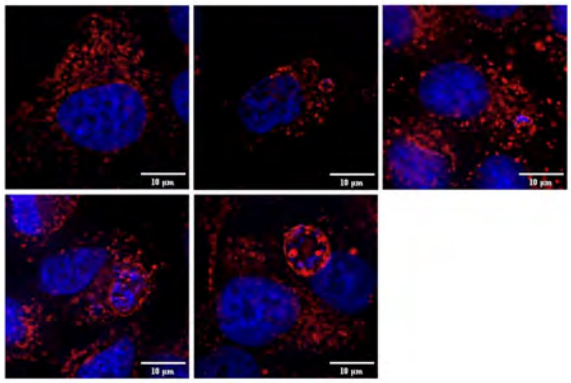
Parkinson's disease (PD) is a prevalent neurodegenerative disorder characterized by progressive deterioration of neurons. Although symptoms and disease progression differ among individuals, PD is histopathologically linked to the accumulation of α-synuclein protein and the gradual but progressive loss of dopaminergic neurons (DA-neurons). Animal models play a crucial role in unraveling the molecular mechanisms underlying the disease and in the development of neuroprotective strategies. One of the major challenges in the field is lack of suitable animal models that can accurately and reliably mimic the disease features. Our lab has recently generated a mouse model that displays the complex pathology of the disease in a progressive manner. Utilizing such mouse model we are exploring various pathways that can be utilized to develop potential therapeutic targets.



A mouse brain section showing dopaminergic neurons (red). Right side of the brain shows appearance of pathological phosphorylated alpha-synuclein aggregates (green) in the PD model

Host-pathogen Interaction

Sandhya Ganesan
Assistant Professor



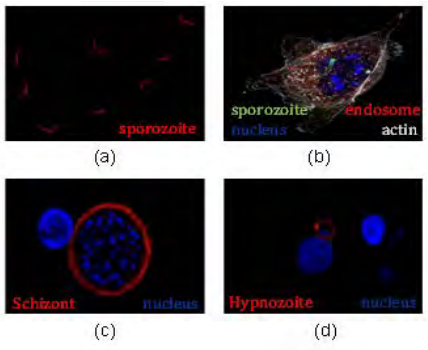
Representative images for infection of HeLa cells with Coxiellaburnetti (100 MOI) showing uninfected, 2, 3, 4 and 5 days post infection (Blue-DAPI; Red-LAMP-2).

Our research broadly focuses on host-pathogen interaction at cellular and molecular level during infection. In particular, we employ intracellular bacterial pathogens that replicate in sub-cellular vacuolar and the mechanisms of host defense and microbial evasion. Recent work has focused on the human SNARE protein Syntaxin 11 (STX11), that mediates vesicle-fusion and inhibits the intracellular replication of the bacterial pathogen Coxiellaburnetii. We are currently investigating the role of lysosomal exocytosis during infection and the relevance of STX11 in this process. Other growing interests of our lab include understanding the regulation of chemokines during infection, characterizing the vacuolar niche of intracellular bacteria and studying the virulence factors produced by pathogens.

Biology of Parasitic Infections, Host-targeted Interventions

Kamalakannan Vijayan
Assistant Professor

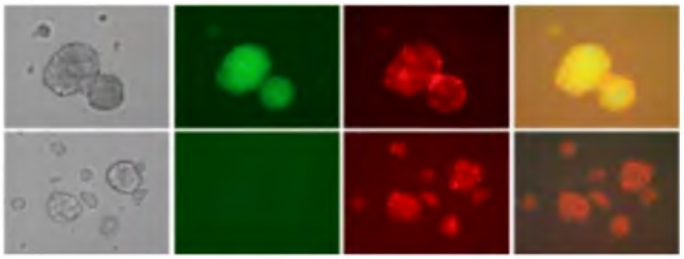
Our research focuses on understanding how the intracellular parasites such as Plasmodium and Toxoplasma rewires the complex host signalling network for its survival. Key to any intracellular survival strategy involves, deriving nutrients from the host while parallelly evading innate sensing. Gaining insight into the nutrient trafficking mechanism at the host-parasite interface would greatly enhance our understanding of the molecular determinants of the infection as well as shed light on the underlying triggers that govern the transition between active and dormant forms of the parasite.Central focus of our lab is to understand the mechanisms by which the intracellular liver-stage parasite 1) evade host innate sensing, 2) acquire nutrients from the host cells.



Multiple facets of liver-stage malaria (a) Liver infective forms of Plasmodium (red) isolated from the mosquito salivary glands. (b) Invasion of Plasmodiumsporozoite into hepatocyte (Green- Parasite; Red- Endosome; White- Actin; Blue- Nucleus). (c) Primary hepatocytes hosting active P.vivax liver forms. (d) Dormant forms of P.vivax developing inside the hepatocytes (Red- Plasmodium UIS4; Blue- Nucleus).

Chromatin Organization

Nishana Mayilaadumveettil
Assistant Professor



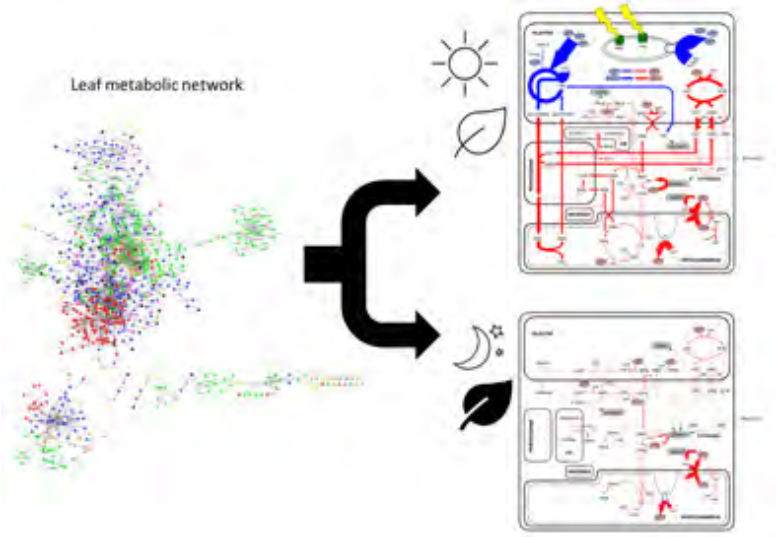
The auxin inducible degron system in mouse embryonic cell lines that we used for studying chromatin organization.

My team explores the multiple ways in which nuclear organization and chromosomal interactions are important for regulation of cellular processes and how their perturbations can lead to diseases. The current projects of the lab include (i) defining how alteration in chromatin organization proteins result in tumorigenesis (ii) the role of non-B DNA structures in genome organization (iii) role of physical proximity in chromosomal translocations (iv) changes in chromatin organization during the process of aging.

Mathematical Modelling, Plant Metabolism, Parasite Metabolism

Sanu Shameer
Assistant Professor

Metabolism is highly complex and interconnected process. My research focusses on using mathematical modelling to tease apart the complexities of metabolism and study why cells do what they do. In the past, I have successfully applied this approach to study metabolism in protozoan parasites, C3 leaves, C4 leaves, CAM leaves and fleshy fruits (tomato). My lab aims to explore metabolism in different metabolic systems with particular focus on(a) Hybrid modelling of plant metabolism (b) Multiscale modelling of growing wheat plants (c) Constraint-based modelling of procyclic form *T. brucei* parasites in tsetse fly gut.

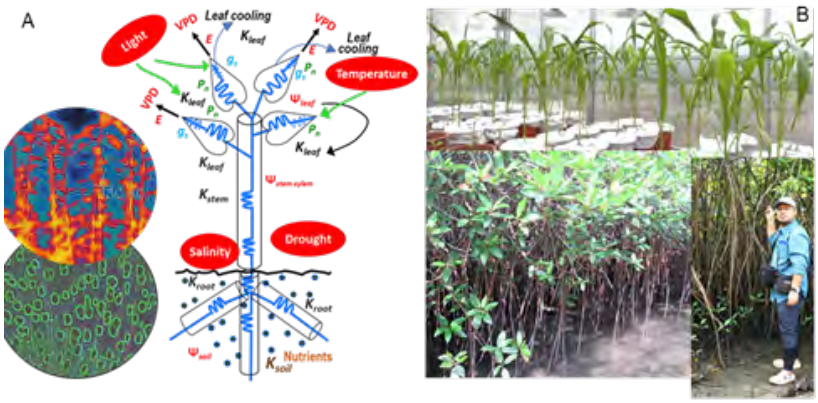


Metabolic networks can be used to study metabolism in biological systems under different environmental conditions

Photoacclimation & Photoprotection, Plant Hydraulics

Anirban Guha
DBT-Ramalingaswami Faculty Fellow

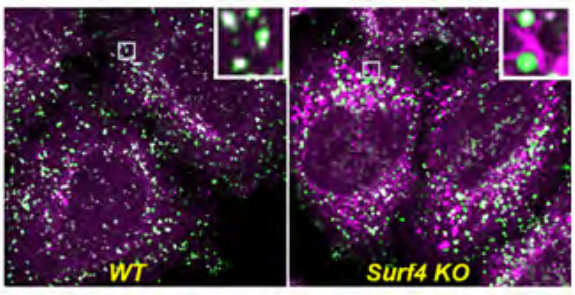
My research focuses on the ecophysiology of plants in relation to adverse environmental conditions and changing climate. I am interested in empirical questions addressing whole-plant physiology, growth, and productivity in natural and managed ecosystems. By integrating ecophysiological, anatomical and modelling approaches, I aim to leverage understanding of plant performance at a whole-plant and ecosystem level. At present, special attention is given to the following themes: (1) effects of changing climate (e.g. warming and drought events) and extreme conditions (e.g. hyper salinity) on plant hydraulic architecture, and (2) ecophysiology of photoacclimation and photoprotection strategies under abiotic stress condition. This research has implications for our crop, forest and wetland productivity, management, and sustainability.



(A)Whole-plant hydraulic network. Axial water transport is shown across xylem where hydraulic conductance (K) may encounter resistances (shown as electrical circuits in blue). Interactions of hydraulic network with leaf CO2& H2O fluxes are shown during abiotic stress and climate change conditions (inset: top - thermal image of young shoot; bottom - traverse section of xylem in tree sapwood). (B) Lab focuses on both monocot (e.g. soghum) and tree (e.g. mangroves) models.

Neurobiology of Lysosomal Storage Disorders

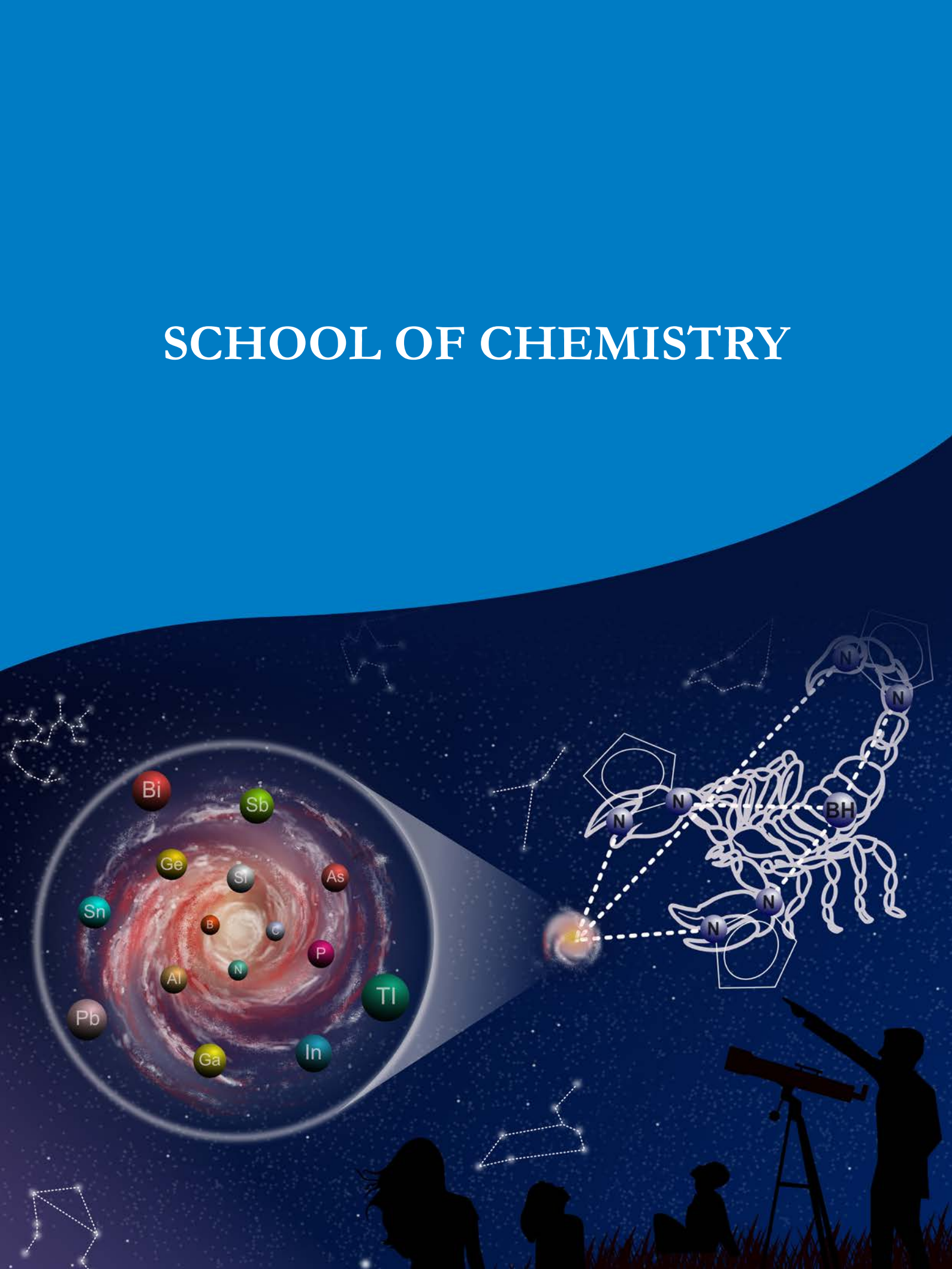
Swathi Devireddy
DBT-Ramalingaswami Faculty Fellow



Surf4 knockout cells showing Progranulin (in magenta) accumulated in ER, leading to a drastic reduction (~50%) in lysosomal levels (in green).

Lysosomes are degradative compartments of a cell. Mutations in over 70 genes cause abnormal lysosomal accumulation of cellular debris including various forms of lipids, polysaccharides, and proteins leading to lysosomal storage disorders (LSDs). The main symptoms of LSDs are neurodegeneration and epilepsy. Previously we found the role of ER sorting receptor, Surf4, in maintaining lysosomal levels of Frontotemporal dementia protein- Progranulin.My lab is studying- 1) mechanisms that maintain the levels of lysosomal proteins, and 2) alterations in cell growth and homeostasis in lysosomal storage disorders.

SCHOOL OF CHEMISTRY



The p-block complexes of the scorpionate ligand, hydrotris (pyrazolyl) borate (Tp*). The scorpion in the starry sky symbolizes the constellation representing the Tp* ligand. It is connected to a galaxy of elements belonging to groups 13–15.

Image Credit: Cover Feature showcasing research from Dr Ajay Venugopal's group

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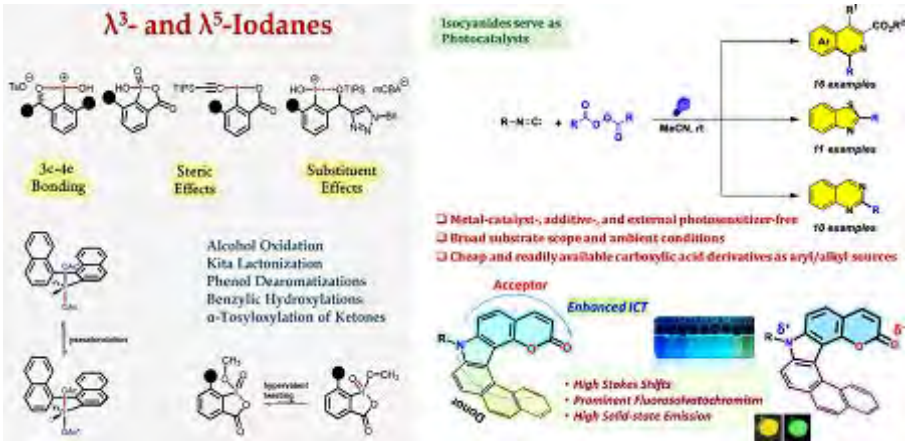
Jarugu Narasimha Moorthy
Professor

Organic Photochemistry, Organic Synthesis, Supramolecular Chemistry

In continuation of our on-going research on organic oxidations mediated by hypervalent iodine compounds, we have consolidated comprehensively overall developments in the development of I(III) and I(V) reagents for oxidation with a particular emphasis on steric effects (*Chem. Eur. J.* **2023**, 29, e20220399). Additionally, our own contributions in the development of I(V)- reagent-based reagents have consolidated as an account (*Synlett,* **2023**, *34*, 495). Further, a metal-free and green iodine-catalyzed protocol has been developed for the synthesis of unsymmetrical thiosulfonates by sulfonylation of thiols using I_2/Oxone(*Asian J. Org. Chem.* **2022**, *11*, e202200554).

Excited-state properties and control of reactivity of photoexcited compounds have been the focus of our investigations. We have shown that donor-acceptor helicenes, designed and synthesized by a de novo design, can exhibit excellent photophysical properties, governed by the structural attributes that facilitate radiative decay mechanisms and packing considerations when dealing with properties in the solid state (*J. org. Chem.* **2023**, *88*, 6611). Insofar as the reactivity is concerned, we have demonstrated the fact that arylisocyanides can serve as triplet sensitizers for decomposition of acyl peroxides and further that they serve as excellent substrates for subsequent reactions, leading to diverse heteroaromatic compounds (*J. Org. Chem.* **2023**, *88*, 5431). In another independent investigation, entropically controlled photochromism has been demonstrated.



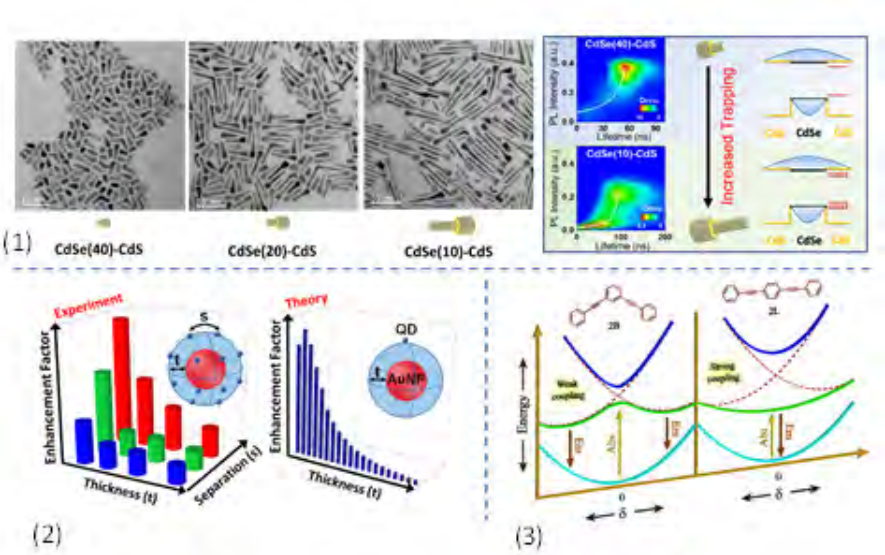
Hypervalent Iodine compounds are cost-effective, environmentally-benign and readily accessible. They have emerged as excellent organic oxidants of immense utility. The developments in recent years on I(III)and I(V) reagents have been comprehensively consolidated, with our contributions.

K George Thomas
Professor and J C Bose National Fellow

Light-Matter Interactions at the Nanoscale

Research activities of our group focus on understanding the photochemistry and photophysics of molecular assemblies, plasmonic systems and semiconductor quantum dots, and chiral nanostructures. Highlights of our activities during April 2022-March 2023 are listed below.

(1) Our group has explored the photophysical properties of one-dimensionally grown CdS on CdSe seeds (CdSe–CdS) as a function of shell length. Single-particle photoluminescence intensity studies revealed an increase in blinking on elongation and established the occurrence of trap-induced



Highlights of our lab activities (Details in text below)

Auger processes. The existence of these trap states in CdSe–CdS is further ascertained using HRTEM, and trap density increases on elongation with a consequent decrease in ensemble φPL and enhanced blinking.

(2) Attempts have been made to enhance the photoluminescence (PL) of quantum dots by placing them in a plasmonic field. Our group has experimentally mapped the landscape of photoluminescence enhancement of emitters in a plasmonic field as a function of the emitter–emitter separation (s) and the emitter–plasmon distance (t) by using Au nanoparticles overcoated with inert spacers as plasmonic systems and CdSe/ZnS quantum dots as an emitter.A seventeen-fold enhancement of PL of CdSe/ZnS in the presence of an Au nanoparticle (diameter ~33 nm) is observed experimentally when t is ~1.35 nm and s is ~18 nm.

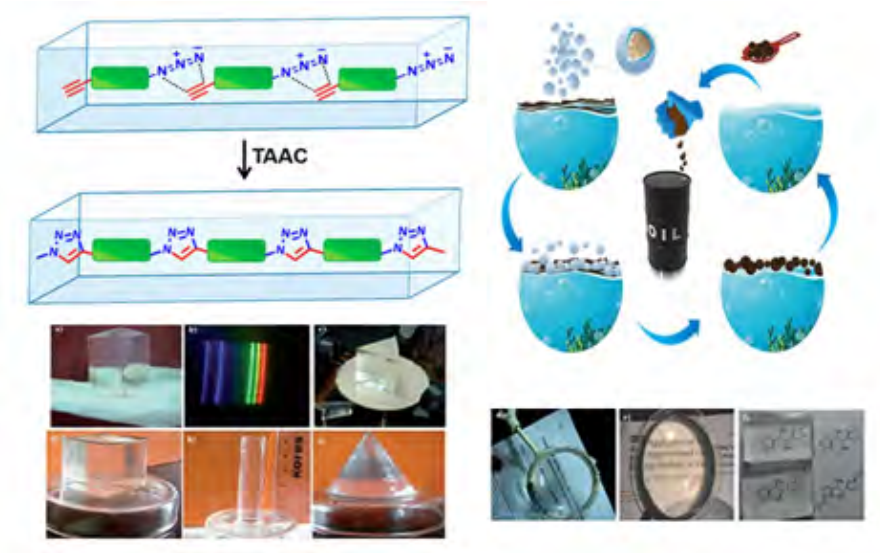
(3) The large Stokes shifts observed for highly symmetric phenyleneethynylenes are explained by the presence of low-lying dark states, as established by two-photon absorption measurements. Despite the presence of low-lying dark states, these systems show an intense fluorescence in striking contrast to Kasha's rule. This intriguing behaviour is explained in terms of a novel phenomenon, dubbed "symmetry swapping" that describes the inversion of the energy order of excited states, i.e., the swapping of excited states occurring as a consequence of symmetry breaking. In short, symmetry swapping is observed in highly symmetric molecules having multiple degenerate or quasi-degenerate excited states that are prone to symmetry breaking.

Kana M. Sureshan
Professor

Supramolecular Chemistry, Topochemical Reactions, Gels

Research in my lab includes design of topochemical reactions, which involves strategic design of molecules making use of supramolecular synthons. These molecules crystallize in a way aligning the complementary reacting motifs proximally so that they can react upon mild activation via heat, light or other stimuli under catalyst-free, solvent-free conditions. We have studied multiple kinds of topochemical reactions. Further, our research also involves synthesis of various organogelators and hydrogelators, and their novel applications in various fields. For instance,

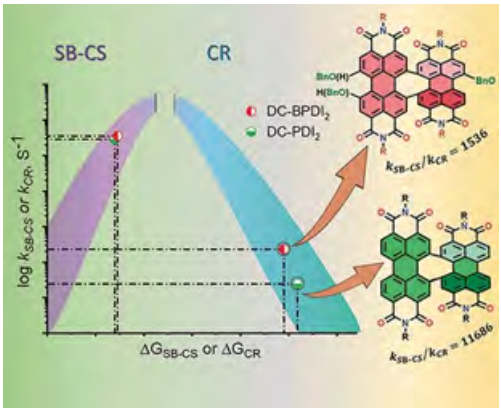
mannitol-based gelators for application in soft and self-healing optics have been developed. A phase-selective gelator having potential in marine oil spill recovery has also been developed.



Physical Organic Chemistry

Mahesh Hariharan
Professor

Our research group focuses on various aspects of Physical Organic Chemistry and Biophysical Chemistry to understand the effect of light on organic small molecules and biomolecules. Synthetic efforts to modulate the rate of charge recombination that is monitored using ultrafast spectroscopic techniques is one of the primary interests in our group. We also look at the strength of weak interactions in novel crystals using theoretical models such as quantum theory of atoms in molecules and exciton migration using cluster model. A combined effort to synthesize novel and diverse architectures, investigate/regulate the ultrafast processes and understand the theoretical reasons behind the events makes our attempt unique.

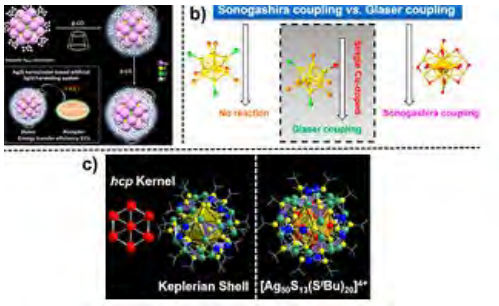


A Symmetry-Broken Charge-Separated State in the Marcus Inverted Region

Sukhendu Mandal
Professor

Metal Nanoclusters, Cluster-assembled Materials, Metal- Organic Frameworks (MOFs), Materials Chemistry

Atom-precise metal nanoclusters are a bridge between the properties of metal complexes and metal nanoparticles. Their ultra-small size (<2 nm) comes up with many unique physical and chemical phenomena with the structure-property relationship. Here in our group, we study cluster-to-cluster transformation at the nanoscale, defect engineering of metal oxide/sulphide using metal nanocluster, synthesis of cluster assembled materials and their various applications, like oxygen reduction reaction (ORR), oxygen evolution reaction (OER), hydrogen evolution reaction (HER) etc. We are also working on defect engineered metal-organic frameworks (MOFs), conductive MOFs and two-dimensional nanosheets and their applications.

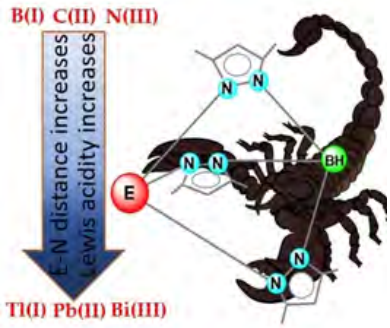


(a) Artificial LHS generation using Ag16 NCs [Chemical Science 2022, 13(28), 8355–8364]. (b) Cu-doped Au11 NC in selective C-C coupling [Chemistry of Materials 2023, 35(4), 1659–1666]. (c) Ag50 NC with unique Keplerian-Shell structure [Nano Letters 2022, 22(9), 3721–3727].

Main Group Chemistry

Ajay Venugopal
Associate Professor

While the primary focus of our lab is on understanding the structure and bonding in reactive main group compounds, stabilization of unusual coordination modes and activation of inert chemical bonds are also investigated. We focus on development of model compounds to understand mechanistic aspects in catalysis involving main group element compounds. Curiosity-driven research in the isolation of reactive main group cations comprising magnesium, zinc, aluminum, antimony, and bismuth has led us to explore their potential as Lewis acids in catalytic hydrosilylation. We have garnered unique expertise to manipulate compounds that are extremely sensitive to air and moisture. Our lab is well-equipped to engage research with highly reactive main group compounds. We have designed several indigenous glassware to handle air- and moisture-sensitive compounds. A stainless steel gas distribution facility to handle CO_2, H_2, and CH_4 at high pressures has been developed. We have expertise in isolating, crystallizing, and elucidating the structures of key reactive intermediates in catalytic cycles. During past year, the research group has computationally explored the concept of periodicity among the p-block elements using tridentate nitrogen donor ligand. This work forms the basis of many future projects that are yet to be experimentally realised. Building upon our expertise in trans-influence, our research group has leveraged this understanding to design Lewis acidic antimony compounds capable of catalyzing carbonyl olefin metathesis. Continuing the exploration of reactive magnesium compounds, the group has reported the first straightforward route to the preparation of cationic magnesium hydride that is obtained by the hydrogenolysis of the corresponding magnesium alkyl.



*A detailed computational analysis of low-valent p-block compounds of hydrotris(3,5-dimethyl-pyrazolyl)borate ligand, [Tp*E]^x, (E=group 13 element, x=0; E=group 14 element, x=1+ ; E=group 15 element, x=2+) shows increasing intrinsic Lewis acidity down the group as E−N bond polarizes.*

Vinesh Vijayan
Associate Professor

NMR spectroscopy, Biochemistry

Tauopathies are a class of neurodegenerative diseases correlated with the presence of pathological Tau fibrils as a diagnostic marker. The microtubule-binding repeat region of Tau protein, which includes R1, R2, R3, and R4 repeats, constitutes the core of these fibrils. Each repeat consists of a semi-conserved C-terminal hexapeptide flanked by KxGS and PGGG motifs. Previous studies have shown the influence of these peptides on protein aggregation, yet their repeat-specific properties are less explored. Using molecular dynamics, we probed the sequence-specific influence of the C-terminal hexapeptide (264ENLKHQ269) in determining the compact local conformation of the R1 repeat of the narrow Pick filament (NPF) with a homologous

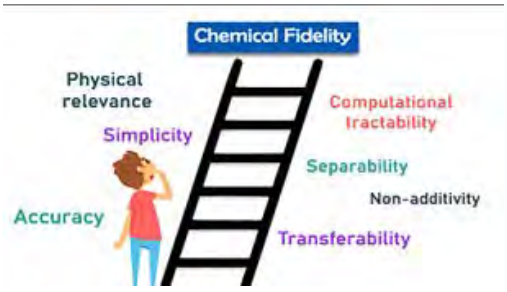
E264G mutation. In addition, we also studied the influence of 262S phosphorylation on this conformation as phosphorylation is proposed to alleviate the pathogenesis of Pick's disease. Interestingly, we determined that E264G mutation induces a conformational shift of 270PGGG273 from a turn to a random coil. This conformational dependence is experimentally verified with the R1R3-E264G mutant construct, which displayed accelerated aggregation compared to the R1R3 wild-type construct. A significant delay in aggregation of the R1R3-G326E mutant further demonstrates the importance of 326G in determining the conformation of the R3 repeat. Thus, we conclude that the conformational properties of the PGGG motif in Tau repeats are strongly dependent on the repeat-specific sequence of the C-terminal hexapeptide.

Mutations in NH6 peptide alters the local conformation of tau protein leading to varied aggregation propensities

R. S. Swathi
Associate Professor

Theoretical Chemistry

Our group focuses on the study of optical excitations in metal nanostructures and their utility as substrates in surface-enhanced spectroscopy using classical electrodynamics. We employ analytical approaches and finite-difference time-domain (FDTD) simulations to probe plasmonic features in metal nanostructures. The FDTD simulations are employed as benchmarks for modeling the plasmonic properties of nanostructure aggregates. Quasi-static approximation and coupled dipole approximation are our favourites for plasmonics modeling.



A journey toward the heaven of chemical fidelity of intermolecular force fields [WIREs Computational Molecular Science 2022, 12(4), e1599]

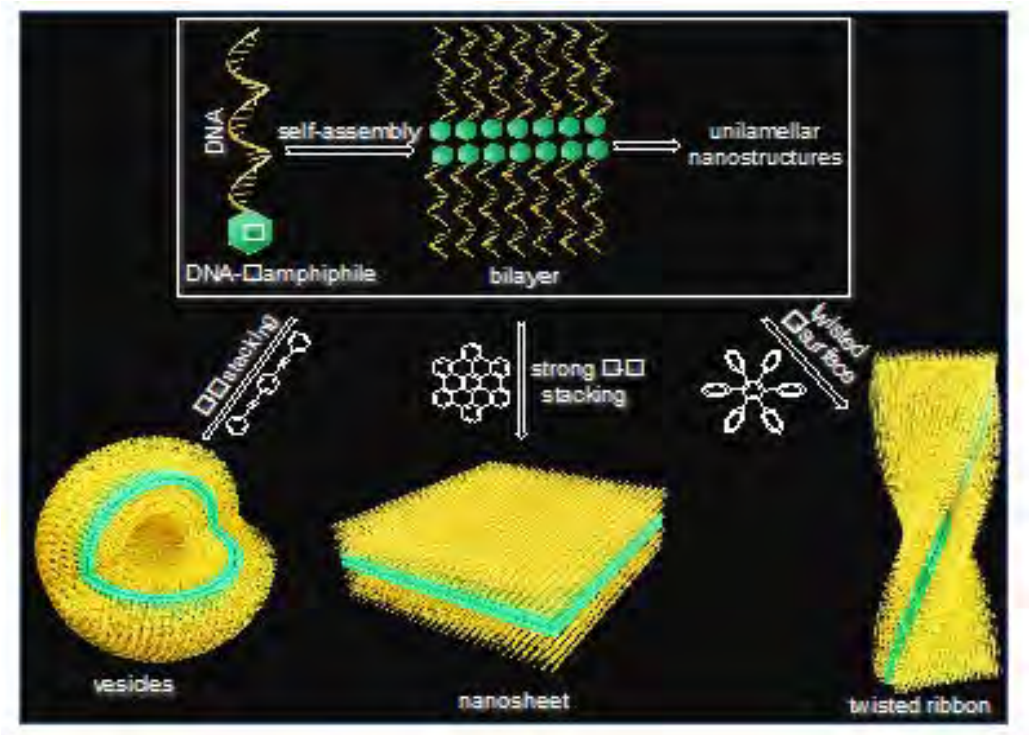
Another major interest of our group is to probe adsorption on carbon-based substrates and encapsulation, into carbon nanotubes and fullerenes, for sensing, separation and storage applications. We employ multiscale modeling approaches for

probing the interactions of atoms, ions, molecules and molecular clusters with the carbon-based materials like graphene, graphynes and carbon nanotubes. We are also interested in developing empirical potential parameters for carbon materials that could yield reasonably accurate results in short computational times. We often employ the electronic structure calculations as benchmarks to develop accurate modeling approaches.

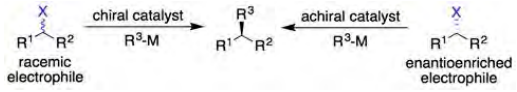
Reji Varghese
Associate Professor

Supramolecular Chemistry, Cancer Therapy, DNA Nanotechnology

Supramolecular chemistry deals with the study of construction of higher order nanostructures using various non-covalent interactions. One of the primary goals of our research group is to design and synthesize DNA-based responsive nanostructures using the principles of supramolecular chemistry. Amphiphilicity-driven self-assembly, a class of supramolecular assembly driven by hydrophobic forces, is a unique class of non-covalent approaches to create large supramolecular structures. We are particularly interested in developing DNA-based amphiphiles and studying their self-assembly into diverse DNA-decorated supramolecular nanostructures. The most unique structural feature of the nanostructures in our design strategy is the DNA-directed surface addressability, which enables the integration of other functional molecules onto the surface of the nanostructures through sequence-specific DNA hybridization. By exploring the surface addressability and excellent biocompatibilityof these nanostructures, we aim to address different challenges in cancer treatment. One such application involves utilizing the nanostructures as carriers for targeted drug delivery. Additionally, we explore the remarkable optical and chiroptical responses of the nanostructures for cancer diagnosis.



Organic Synthesis, Cross-Coupling Reactions



Ramesh Rasappan
AssociateProfessor

Our research focuses in the field of organic chemistry, primarily on enantioselective synthesis, its mechanistic study and its application, to the synthesis of natural and non-natural products. Exploring enantioconvergent and divergent process are of particular interest to our group.

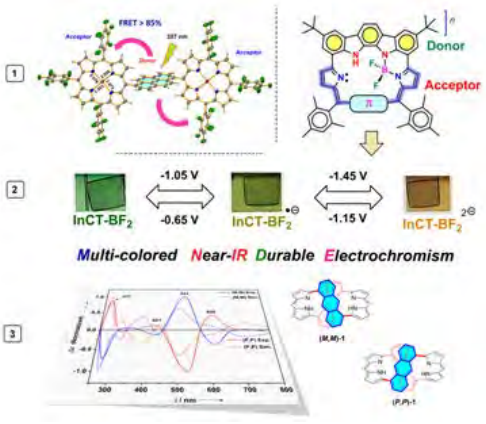
Transition-metal-catalyzed cross-coupling reactions of alkyl substrates are extremely useful for making of C-C bond. Enormous effort has gone into the development of stereoconvergent cross-coupling reactions with alkyl halides as electrophilic coupling partners. Improvements in ligand structure and mechanistic understanding have enabled the cross-coupling between a range of C(sp3) electrophiles bearing a variety of functional groups.

The ability to employ bench-stable and readily available organic halides, without the need to pre-generate a reactive organometallic reagent, endows these cross-coupling reactions with a practical advantage over conventional cross-coupling procedures. Whereas the synthetic potential of secondary alkyl chlorides and ethers is yet to be revealed due to their higher energy barrier to undergo oxidative addition. In addition, the synthesis of enantiopureboronic esters and silanesis yet to be investigated as the existing methodology is limited in scope. The development of highly versatile methods will likely have a substantial impact on organic synthesis, particularly if one can start with relatively cheaper racemic alkyl chlorides or ethers. Recognizing the wide accessibility of alkyl chlorides and ethers, our group aims to overcome the existing limitation by utilizing novel methodologies such as in situ generation of M(0), employing electronically tunable chiral ligands and investigating unprecedented stereoconvergent coupling to enantiopureboronic esters and silanes.

Macrocyclic Chemistry

S. Gokulnath
Associate Professor

We recently constructed a synthetic model exhibiting Förster Resonance Energy Transfer (FRET) from covalently linked porphyrin dimers through apyrene bridge. The models are comprising of two porphyrin arrays (C_6F_5-PyZnDP and Mes-PyZnDP) which differs from their substituents at their meso-positions. The effect of electron accepting and donating meso-substituents results in variation in the ground and excited state properties (see Panel 1).



Next, during our ongoing efforts on macrocyclic chemistry, a new class of redox-active dihydroindolo(2,3a) carbazole-based porphyrin-like macrocycles (InCT and InCB) and corresponding [b]-annulated BODIPY complexes (InCT•BF_2 and InCB•BF_2) exhibiting near-IR electrochromism was identified. The spectroelectrochemical studies displayed intriguing near-IR electrochromic properties with reversible

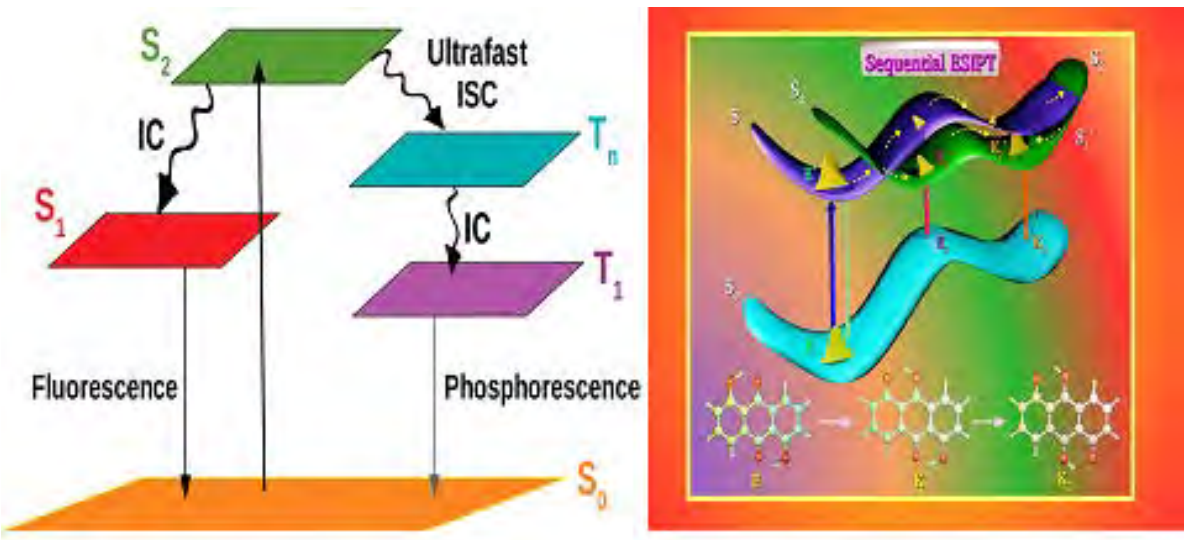
multi-color switching upon cathodic scans. InCT•BF_2 shows high stability with a radical comproportionation constant (Kc) of 1.22 x 106.Such inherent stability with high comproportionation constant and facile reversibility may open-up many opportunities for potential applications (see Panel 2).

Furthermore, we synthesized a conformationally locked Cyclo[2]Dipyrrins linked with Anthracene subunits that adopts a twisted 'figure of eight' conformation and exists as a pair of helical enantiomers such as (P,P) and (M,M) enantiomers. The enantiomersshows moderate chiroptical properties such as absorption dissymmetry factor $|g_{abs}|$ in the order of 10-3, and luminescence dissymmetry factor $|g_{lum}|$ of 3.8 x 10-3 and 2.9 x 10-3 at 702 nm respectively (see Panel 3).

Vennapusa Sivaranjana Reddy
Associate Professor

Theoretical & Computational Chemistry

Our research focuses on investigating ultrafast excited state intramolecular proton transfer (ESIPT) in different organic molecules, specifically those involving 5-membered and 6-membered proton transfer donor-acceptor cycles. Analysis of spectral features associated with ESIPT enol-keto tautomerization is the first step in our study. Since proton transfer (or tautomerization) occurs on vibrational motion timescales, we employ computational techniques to explore potential energy surfaces along each O-H vibrational mode. Subsequently, quantum molecular simulations utilizing the computed potentials enable us to determine the mechanistic pathways and timescales of proton transfer.Furthermore, our research also aims to identify the pathways associated with an indirect intersystem crossing in molecular systems. For this purpose, we are currently investigating naphthalene, perylenediimide, and pyrene derivatives as model systems. These systems allow us to explore the role of near-degenerate higher singlet-triplet excited states.

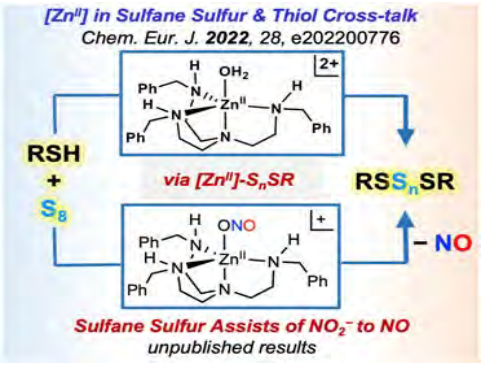


Schematic illustration of ultrafast intersystem crossing of organic molecules (left) & multi state excited-state intramolecular proton transfer process of organic chromophore (right)

Subrata Kundu
Associate Professor

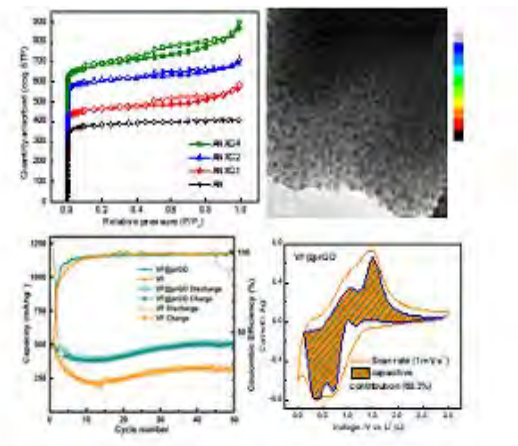
Bioinorganic Chemistry, Reaction Mechanism Investigation

Our group explores the transformations of various reactive sulfur, oxygen, and nitrogen species (RSONs) to decode the intricate signaling processes employed by biological systems at molecular level.The ongoing research work aims to disclose new roles of sulfane sulfur (S0) species in modulating the reactivity of thiol (RSH) towards nitrite (NO_2^-) at a redox-inactive [ZnII] site leading to signaling molecules, such as nitric oxide (NO) and hydrogen sulfide (H_2S). Furthermore, investigations into the reactions of biologically relevant organo-selenium complexes (such as Ebselen and selenophosphates) in assisting the transformations of NOx anions to NO are under progress. In depth studies on the above-mentioned reactive intermediates as well as mechanistic investigations are anticipated to open new avenues of nitrite activation chemistry.



Materials Chemistry: Porous Materials, Gas Separation, Electrochemical Energy Storage

Thirumurugan Alagarsamy
Assistant Professor



Vanadium formate and its graphene composites (bottom).

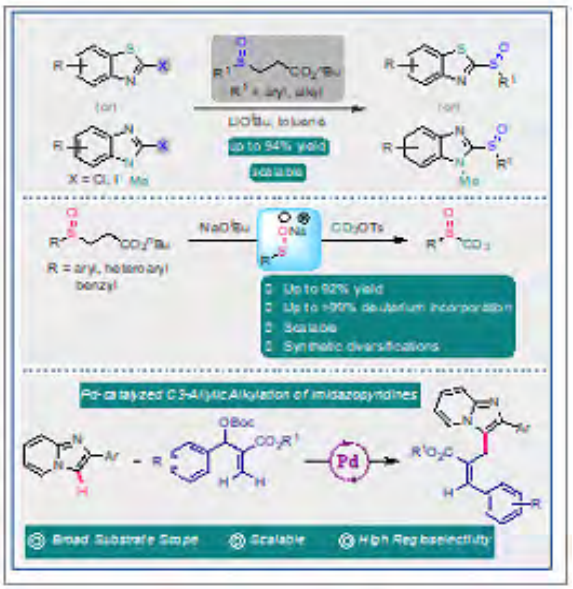
Our research group explores novel materials for energy applications and sustainable development. Specifically, we focus on investigating coordination polymers, metal organic frameworks (MOFs), nanocellulose composites of porous materials, Vanadium oxide clusters and their nanocomposites for molecular (gas) storage - separation, optical and electrochemical energy storage properties. We have employed soft template based mesoassemblies of gemini surfactants to introduce mesopores in well-known MOFs such as HKUST-1 and UiO-66. By inducing variations in the nucleation and crystal growth conditions, we have successfully achieved a diverse range of hierarchical porosity (HP). Such HP materials are used in small molecular gas and dye separation processes.

Furthermore, we have explored the development of mixed matrix membranes using MOF-nanocellulose composites @ cellulose acetate, which has applications for CO_2, alkane and N_2 gas separation.

Development of the materials that provide simultaneously optimal energy density and power density for the next generation electrochemical energy storage (EcES) devices is another important area of research in our lab. We have explored Vanadium based materials, a layered Vanadium formate(VF) coordination polymer and another Vanadium oxide cluster along with their composites of partially reduced graphene oxide (prGO), as anode materials for the Li-ion based EcES systems in the potential range of 0-3 V (vs Li+/Li).

Development of new synthetic methodology for an organic synthesis

Alagiri Kaliyamoorthy
Assistant Professor

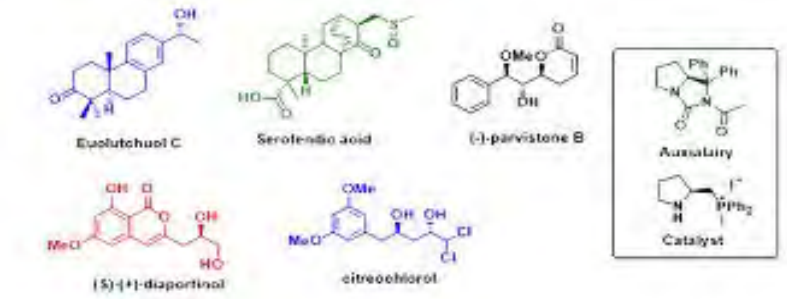


Metal-mediated and metal-free cross-coupling reactions

Our research interests are directed toward an organic synthesis with a focus on developing new synthetic strategies. Our group primarily works on the activation of less reactive pronucleophiles and subsequent C–C bond-forming reactions with various electrophiles. One of the other research interest of my group is the development of metal-mediated and metal-free C–H functionalization and cross-coupling. To this end, we accomplished the palladium-mediated regioselective C3-allylic alkylation of imidazopyridines with MBH carbonates. In addition, we developed a transition-metal-free route for the direct sulfinylation of 2-halobenzothiazoles and 2-halobenzimidazoles using β-sulfinyl esters as the source of sulfenate ion in the presence of a Brønsted base such as LiO^{t}Bu. Furthermore, our group has expanded the scope of sulfenate ion chemistry to synthesize various trideuteromethylated sulfoxide derivatives using CD_3OTS as the electrophilic trideuteromethylating agent in the presence of NaO^{t}Bu base. Moreover, our group has been actively involved in developing copper-catalyzed C–H imidation of various electron-rich heterocycles using NFSI as an oxidant as well as an imidating agent.

Asymmetric Total Synthesis

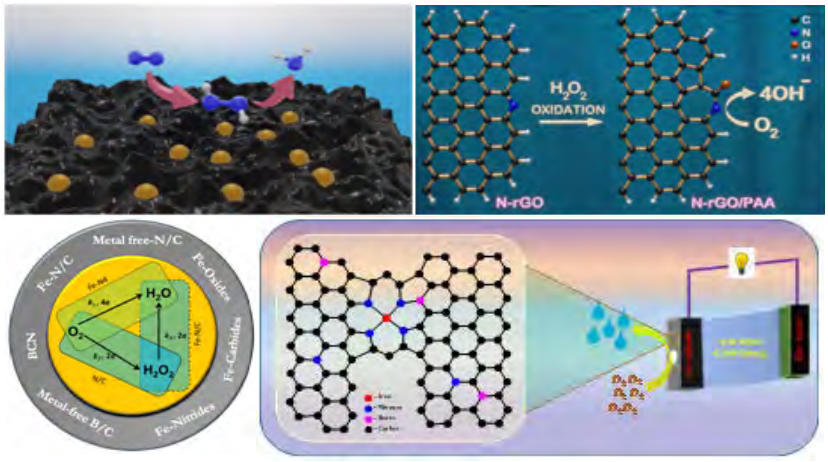
Goreti Rajendar
Assistant Professor



Our group mainly focuses on the total synthesis of bioactive natural products, development of new auxiliaries and organic catalysts, and development of novel synthetic methodologies. We develop novel stereo-selective approaches for the total syntheses of polyketide natural products. New chiral auxiliaries and chiral amino phosphonium ligands developed in our laboratory were used for asymmetric acetate aldol reactions and novel aldol condensation reactions. These methods were applied in total synthesis of citreochlorols, diaportinols, parvistones and macrodiolide tartrolon D etc. The absolute structures of some of these natural products were established using stereo-divergent methods. Our group is also working on non-enzymatic cationic cyclizations, where we developed novel routes for head-to-tail as well as tail-to-head cyclizations. The methods were applied to the total synthesis of terpenoid molecules such as euolutchuols A, B, C, serofendic acids and psuedopterosin analogues. Our group is also engaged in development of novel synthetic methods using in situ oxocarbenium ions such as glycidolacetals rearrangements and cyclic anhydride openings.

Electrocatalysis for the energy conversion and storage devices

A. Muthukrishnan
Assistant Professor



Electrocatalysts for the fuel cells is one of the highly studied area of the materials electrochemistry. Especially, the oxygen reduction reaction (ORR) is studied with various electrocatalysts due to sluggish kinetics on the electrodes. The state-of-the-art platinum-based catalysts are commercially used in the fuel cells but there is a growing interest in developing non-platinum group metal catalysts (NPGM) as viable alternatives for large-scale commercialization. The designing principles of NPGM or metal-free catalysts necessitates the comprehensive understanding of ORR mechanism and the active sites involved.

Our research team is focusing on understanding the fundamentals of ORR and utilizing kinetic analysis to describe the active sites and mechanism of the Fe-N/C and N-doped carbon catalysts. Each component of the heat-treated heteroatom doped Fe-containing catalysts and their potential roles is examined individually by synthesizing it using bottom-up approach. Iron oxides and carbides on porous carbon support are two examples of the various parts of Fe-N/C catalysts that were studied in order to determine their function in the ORR activity. Additionally, the synergistic effect on the two heteroatom-doped (boron and nitrogen) metal-free carbon catalysts and their underlying mechanism was studied. In particular, the BCN materials were investigated, and its kinetic study discloses the mechanism for synergism. The effect of local pH change, role of pore size and higher surface area on ORR was investigated.

Fe-N/C or metal free catalysts were synthesised and studed for the zinc-air battery applications, and the battery performace is improved to 950 $mAhg_{zn}^{-1}$. The defects on the carbon substrates towards ORR activity are analyzed by specially created defects. The selective edge functionalization of heteroatom-doped graphene was employed to create the topological defects, which significantly improves the ORR activity in alkaline medium. Besides, the edge rich defective carbon materials are synthesized using mechanochemical method, i.e, ball milling of the commercial graphite at various conditions and ball sizes.

Sustainable Organic Synthesis and Catalysis Catalysis

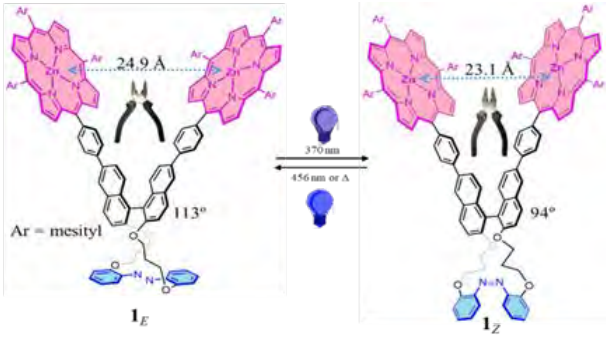
Basudev Sahoo
Assistant Professor

Our group is pursuing research in the area of organic synthesis and catalysis, with an emphasis on sustainability. Recently, we have contributed to the development of organic synthetic methods, where we have demonstrated the successful implementation of readily available unactivated aliphatic ketone feedstock as a non-trivial Csp3 alkyl synthon via formidable inert C-C bond cleavage, aiding to construct complex molecular architectures of interests, relying on transition metal and/or visible light-mediated photocatalysis. In this realm, we have reported two different catalytic techniques for mild C-H alkylation of distinctly functionalized N-heteroarenes, utilizing ketone-derived dihydroquinazolinones, that remain applicable for the late-stage functionalization of Active Pharmaceutical Ingredients (APIs) [Chemical Communications 2022, 58, 13202-13205; Mondal et al. Synlett 2023]. We have described a visible light photocatalyzeddicarbofunctionalization of N-arylsulfonyl-modified acrylamides with ketone-based dihydroquinazolinones for the construction of two different types of vicinal C-C bonds with the concurrent generation of all carbon quaternary stereocenter, to effectively enhance structural complexity and the survival of distinct functionalities [Organic Letters 2023, 25, 1441-1446].

Supramolecular Chemistry

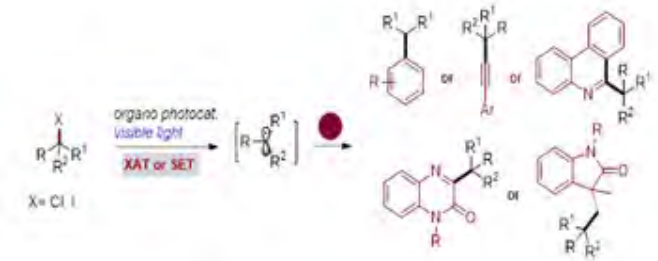
Soumen De
Assistant Professor

Our group is primarily working on the cutting edge inter-disciplinary area of dynamic supramolecular chemistry, including molecular switches and machines, abiotic foldamers and their host-guest properties, and stimuli-responsive dynamic materials. Specifically, we employ flexible and tunable BINOL-based building blocks to develop chiral switches, hosts and adaptive architectures that can be used in selective sequestering of guests, catalysis, and sensing. In our lab, we extensively use synthetic and physical organic chemistry to make and understand the properties of our target molecule that can be self-assembled using various non-covalent interactions and dynamic covalent chemistry. We also utilize advanced spectroscopic techniques and DFT calculations to explain the emergent properties.



Operation of a photoresponsive chiral molecular plier

Catalysis



Photocatalytic activation of inert haloalkanes

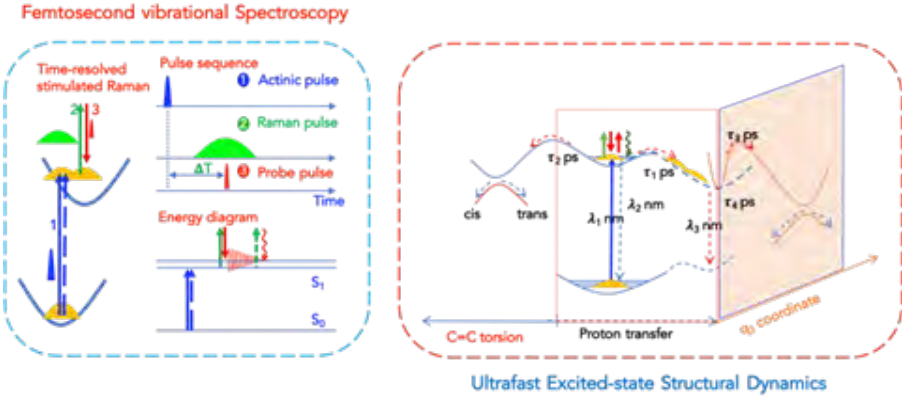
Veera Reddy Yatham
Assistant Professor

Alkyl radicals are powerful synthetic intermediates in organic chemistry for the construction of carbon−carbon and carbon-heteroatom bonds. The generation of alkyl radicals through homolytic cleavage of alkyl C−X (X = Cl, Br, I) bonds is the first and most apparent way, due to alkyl halides being ubiquitous starting materials for the synthesis of functionalized molecules. In the early days, metal-based reagents (Sn, Mn) were employed for the generation of alkyl radicals from alkyl halides through halogen atom transfer (XAT). Significant efforts have been made in replacing toxic metals with other compounds such as silicon reagents, trialkyl borane-O2 system, and cyanoborohydride anion. Photo-induced electron transfer is the alternative method to generate alkyl radicals from activated alkyl halides. However, direct reduction of unactivated alkyl halides by an excited-state photocatalyst is difficult due to their high reduction potentials (Ered~−2.0 V vs SCE), which necessitate the use of a strongly reducing photocatalyst. Another method to generate alkyl radicals from alkyl halides is the visible-light induced halogen atom transfer (XAT) process, as the energy of C−X bonds is low (bond dissociation energies range from 50−70 kcal mol−1).

In this direction, our group uses the halogen-atom transfer (XAT) process withphotoredox catalysis to generate a variety of carbon radicals from inert iodoalkanes, which are further integrated into to a number of cross-coupling reactions (See figure). Further, visible light induced photocatalytic activation of inert chloroalkanes was demonstrated and applied in radical cross-coupling reactions. All these chemical reactions operate under mild reaction conditions, work under metal-free photocatalyst and tolerate a variety of unactivatedhaloalkanes containing different functional groups. Our preliminary mechanistic studies suggest that the canonical photoredox catalytic cycle may be operative.

Ultrafast Structural Dynamics, Proton-Coupled Electron Transfer, Excited-State Chiro-Optical Properties, Development of Multi Photon, Non-Linear Coherent Spectroscopic Methods

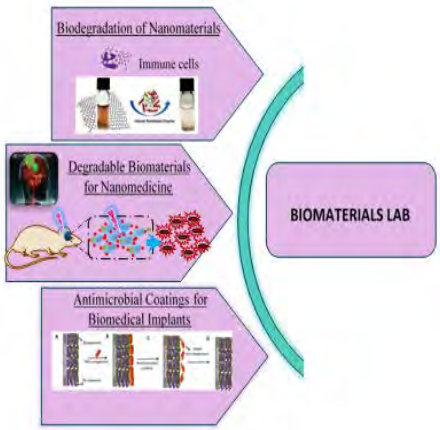
Y. Adithya Lakshmanna
Assistant Professor



Our research interests are broadly in understanding the excited-state reaction dynamics that are mediated by fundamental processes such as electron transfer, proton transfer and proton-coupled electron transfer reactions. Such excited-state dynamics are typically described by employing femtosecond transient absorption and emission spectroscopic techniques. However, we focus on a structural perspective, essentially with an aim to unravel the intricate structural dynamics associated with excited-state electron and proton transfer processes by employing the ultrafast coherent Raman and IR spectroscopic methodologies.

Biomaterials, Materials Science

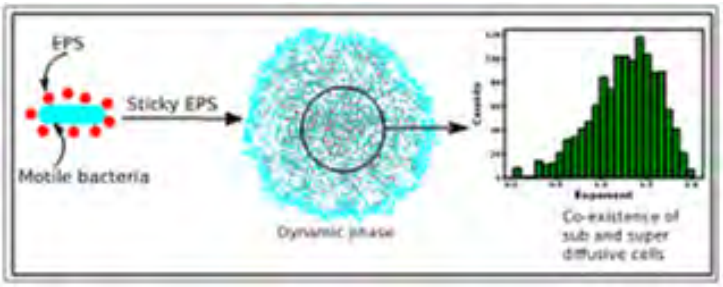
Rajendra Kurapati
Assistant Professor



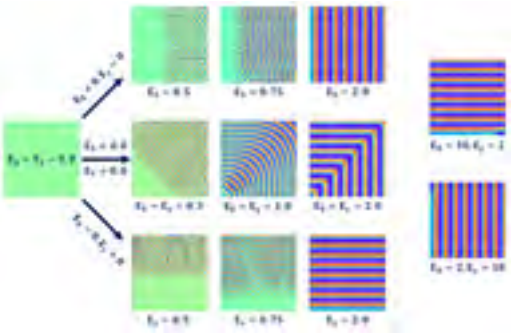
Our research interests lie at the interface of Materials Science, Biology and Bioengineering. In particular, we aim to develop 'Functional Biodegradable Materials for Biomedical Applications' to address the long-term adverse effects associated with non-degradable nanomaterials and enhance the clinical translation of biomaterials, such as gold (Au), silver (Ag), and carbon nanotubes (CNTs), which can accumulate in organs like the liver and spleen. Further, we areinvestigating the ability of peroxidases secreted by immune cells to oxidize or degrade the emerging 2D materials such as black phosphorus, MXenesetc, and study intracellular (macrophages) stability of 2D materials and their cytotoxicity. We employ 2D materials such as graphene oxide, black phosphorus etc in combination with biopolymers or biominerals ($CaCO_3$) for developing degradable biomaterials for drug/gene delivery, nano-theranostics, biomimetic systems, and to tackle multidrug resistance bacteria throughantimicrobial coating.

Theoretical & Computation Chemistry, Soft-Matter Biophysics

Pushpita Ghosh
Assistant Professor

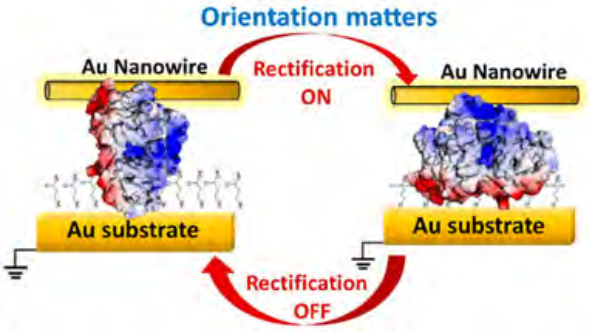


Research in our group is aimed towards understanding self-organized patterns and order formation in complex systems. The two major directions in this regard include spatially extended autocatalytic chemical systems and biological soft matter. Our research is comprehensively engaged towards examining and understanding the underlying mechanism of spatiotemporal self-organization leading to the formation of diverse nature patterns like stripes, spots, spirals, target waves, and propagating waves in multicomponent reaction-diffusion systems. We also examine the dynamics of various chemical and biological systems based on analytics and numerical simulation. In this regard, we have explored mobility-induced stationary and moving spatial patterns in two prototypical reaction-diffusion systems involving ionic intremediates. On the otherhand, we have deciphered the mechanistic understanding of coexistence of mobile and sessile aggregates during biofilm morphogenesis. Using a particle-based model of motile bacterial cells and self-produced extracellular polymeric substances (EPS), we have found that the interplay between cell-motility, heterogeneous production of EPS and its mechanical property is the key factor to regulate the coexistence of mobile and sessile units in a growing colony.



Microcolony morphogenesis - coexistence of mobile and sessile aggregates (top) and Mobility-induced spatial patterns in chemical reaction-diffusion systems (bottom)

Bio-Molecular Electronics



Proteins as Rectifiers. The direction of current rectification via one of nature's most efficient light-harvesting systems, the photosystem 1 complex (PS1), can be controlled by its orientation on Au substrates

Jerry Alfred Fereiro
Assistant Professor

Our principal research interests lie in the field of bio/molecular-electronics and interfacial charge transport. Other areas of interest also include surface functionalization, nano-fabrication, low temperature electronic measurements, surface analysis and electrochemistry.

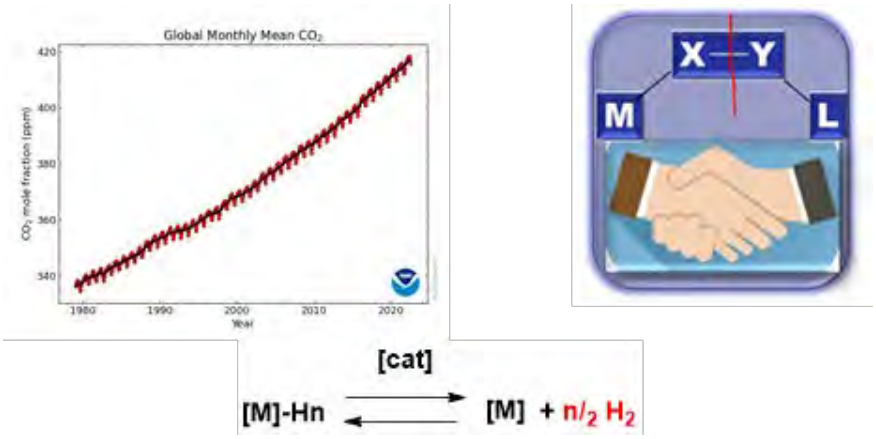
Integrating (bio)molecules into electronic junctions is a challenging research area, which combines nano-science and -technology, biophysics, and bio-electrochemistry. While our primary research focus centers on studying electron transport through (bio)molecules, there is an exciting potential for practical applications in the future. We would aim to use molecules/proteins as building blocks to develop multi-functional electronic devices for applications such as biomedical, biofuel cells, and biosensing devices. As part of the effort to achieve our goal, we want to understand how the mechanism of electron transfer (ET) in the natural liquid surroundings of a protein compares to that of electron transport (ETp) in the dry proteins (dry in the sense that they keep only the structural water).

It is generally recognized that the details of contact geometry and conformation are critical to the electronic behavior of the junction, and these may vary significantly for each molecule studied. Except for the special cases of Inelastic Electron Tunneling Spectroscopy (IETS) and tip-enhanced SERS, single-molecule devices and ensembles are not amenable to the spectroscopic characterization of working junctions, so it is difficult to determine the precise conformation and contact geometry.

Ramaraj Ayyappan
Assistant Professor

Organometallic Chemistry

My research group is working on the development of phosphine and carbene based multifunctional ligands (L_n). Ligand design is essential to control the metal electronic and steric properties in catalytic applications such as hydrogenation, coupling reactions, polymerization.By utilizing these ligands, we can create transition-metal complexes [L_nM] with a variety of metals including Ti, Mn, Fe, Co, Ni, Cu, Ru, Ir, and Rh. It is worth noting that working with first row 3d-metal complexes is far more challenging than their heavier counterparts. This is primarily due to their tendency to form less stable metal-ligand bonds and their susceptibility to one-electron oxidation, leading to the formation of paramagnetic complexes. So successful synthesis of [L_nM] becomesconsiderably difficult. There are significant incentives in terms of cost, as first row 3d-elements are abundant in the Earth's crust and exhibit non-toxic properties. Using the [L_nM] complexes, bond activations in carbon dioxide (O=C=O) and dinitrogen (N_2) and relevant catalytic transformations will be studied.

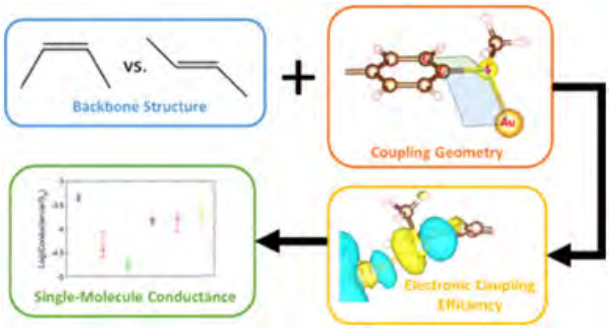


CO2 level increase in the atmosphere (https://keelingcurve.ucsd.edu/) (top left); Pictorial representation of metal-ligand cooperative strategy to break strong bonds (top right); Development of catalysts for hydrogen release (above equation)

Organic Chemistry

Keshaba Nanda Parida
CSIR Pool Scientist

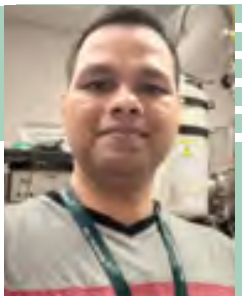
The exploration of umpolung chemistry - a non-classical/polarity reversal approach - has gained remarkable momentum due to easy accessibility, catalytic and eco-friendly attributes. It offers new connection(s) between species of similar charges; unlike the classical approach which is only limited to opposite charges. We are focused on developing methods using hypervalent iodine-, phosphine-, and carbene-mediated umpolung protocols to construct novel C–C and C–heteroatom bonds.



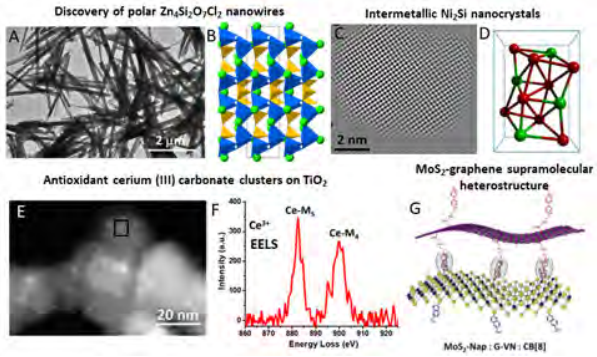
Single Molecule Conductance [J. Phy. Chem. C 2022, 126, 6653–6661]

Miniaturization of tools has a remarkable effect on human civilization.For electronics, it has achieved astonishing development in the last two decades. The first transistor reported has a length of 1/2' whereas the recent intel core-i11 contains more than 5 billion transistors. Similarly, IBM developed chips in 2015 and 2021, with source to drain distance of 7 nm and 2 nm, respectively. Our research is also focused on a similar gap between source and drain (metal electrodes) where the properties of conducting organic molecules are studied under an applied bias. At this metal-molecule-metal (M-m-M) junction, the behavior of conducting molecules is analyzed using either mechanically controlled break junctions (MCBJs) or Scanning Tunneling Microscope Break Junctions (STM-BJs) techniques. The study will unravel how to improvise charge transport at M-m-M, and to develop future electronics with superior efficiencies.

Inorganic & Solid-State Chemistry and Advanced TEM Techniques



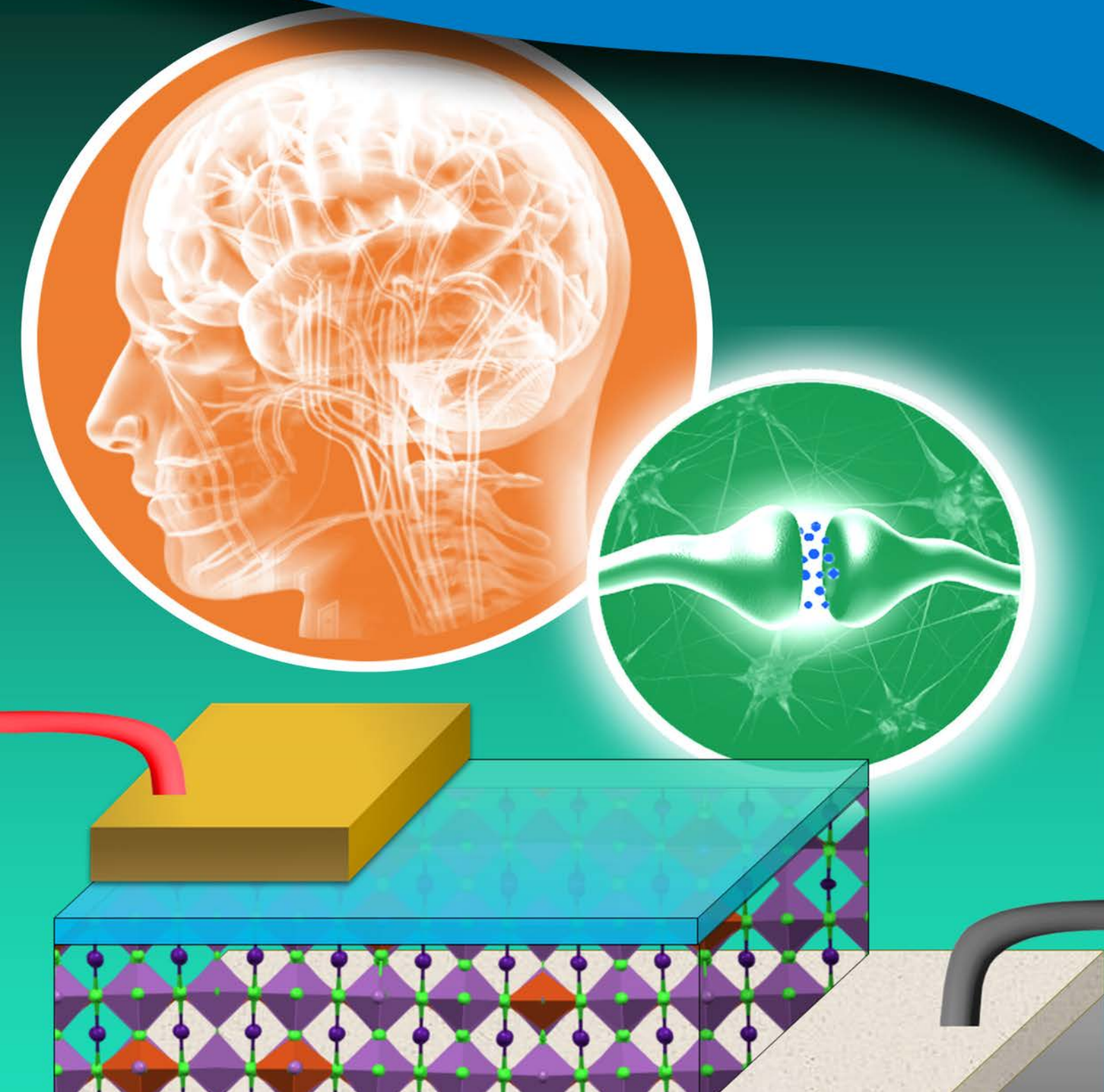
Ram Kumar
Ramanujan Faculty Fellow



Synthesis methodologies development in inorganic & solid-state chemistry

My research primarily focuses on development of synthesis methodologies in inorganic and solid state-chemistry, and advanced TEM techniques. I work on both core synthesis methodologies development and exploratory synthesis to discover new solid-state materials as well as process technologies development for commercialization. The other focus is to achieve kinetically controlled metastable phases in the phase space. To achieve synthesis targets, I use a variety of synthesis techniques such as standard colloidal, molten salts, solvothermal, microwave, gas phase solid-state routes, arc discharge etc. The synthesized materials are vital for core technologies such as energy storage and conversion, and efficient heterogeneous catalysis processes.

SCHOOL OF PHYSICS



Thin-film of lead-free caesium copper antimony chloride ($Cs_4CuSb_2Cl_{12}$) layered double perovskite nanocrystals is utilized to demonstrate robust electroforming free analog resistive switching with synaptic functionalities and neural activities.

Image Credit: Front Cover showcasing research from Dr Bikas C Das group

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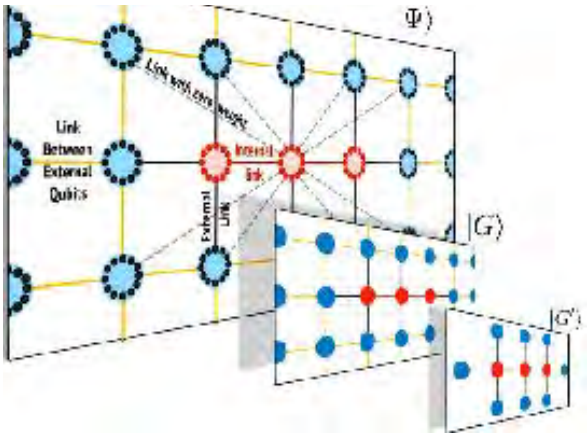
Quantum Computing, Information Theory and Quantum Technologies,Open Quantum Dynamics, Quantum Biology, Simulation of Molecular Systems on Quantum Computers

Anil Shaji
Professor

Identifying the resources that make mixed state quantum computing possible was one of the main lines of research taken up by our group during the past year. We found that in many structured quantum systems made of many qubits, the global entanglement in the states of these systems is connected to the non-classical correlations present in small subsystems made of one or two qubits. This indicated that the mixed states in quantum information processors may be able to harness the computational power of the larger pure state that it is part of in some cases to provide computational advantage.



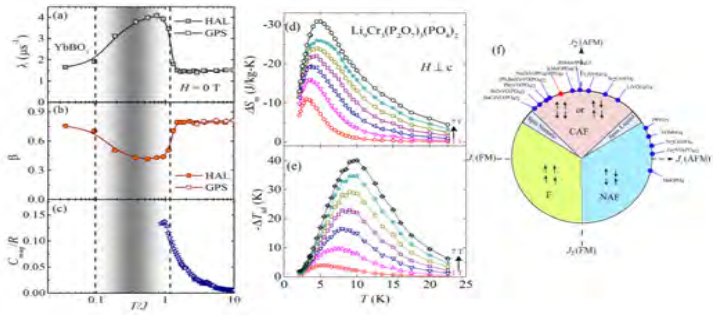
A schematic representation of the Projected Entangled Pair State construction that shows the entanglement structure of quantum states defined on a lattice. These states can be used for running quantum algorithms in the measurement-based quantum computing model and helps reveal the flow of non-Classical correlations during such computations.

Another area of research that we focused on was the modeling of coherent energy transfer between molecular systems. A detailed analysis on how the immediate environment of an exciton in a complex molecule can affect the coherent transfer of the exciton between adjacent sites was done and conditions under which the coherence may be preserved for a long time was identified. This can lead to creation of such systems with engineered environments that allow it to retain quantum coherence for longer durations.

Other areas of research pursued by our group included simulation of complex molecular systems on the small-scale quantum information processors that are available over the cloud. Extension of this to effectively handle molecular dynamics is also an active area of research. Our group is continuing research into the theory of non-Markovian open quantum dynamics and generating a simple catalog of the consequences of various simplifying assumptions that are necessarily made when mathematically describing such dynamics. As support to the ongoing project in IISER TVM on building a few-qubit quantum computer using silicon quantum dot-based qubits, theoretical support in terms of materials and device modeling is also done in our group. One-sided device-independent quantum key distribution, non-classical correlations in three party scenarios, machine learning for improving quantum gates in specific architectures etc. are other related projects taken up the group members. An interesting project on modeling neuronal network behavior was also taken up during the last year.

Ramesh Chandra Nath
Professor

Experimental Condensed Matter Physics



(a) μSR depolarization rate λ, (b) stretching parameter β, and (c) magnetic heat capacity of $YbBO_3$. The shaded portion highlights the fluctuating regime. (d) Entropy change and (e) adiabatic temperature change for $Li_9Cr_3(P_2O_7)_3(PO_4)_2$. (f) Location of $NaZnVOPO_4(HPO_4)$ in the $J_1 - J_2$ phase diagram.

Our group focuses on discovery of new materials based on transition metal and rare-earth ions and investigate their structural, electronic, magnetic, thermal, and dynamical properties using various experimental tools under extreme conditions i.e. at ultrahigh/ultralow temperatures, high magnetic fields, and high pressure. Ourresearchaims at the fundamental understanding of the complex and emergent electronic and magnetic phenomena in strongly correlated electron systems and frustrated quantum magnets. In these materials, the charge, orbital, spin, and lattice degrees of freedom are often intertwined with each other leading to a variety of macroscopic properties, which are having both fundamental and applied importance such as in high temperature superconductors, spin liquids etc. Some of the research highlights are:

- Absence of magnetic order and emergence of unconventional fluctuations in the Jeff=1/2 triangular-lattice antiferromagnet $YbBO_3$
- Large magnetocaloriceffect in the Kagome ferromagnet $Li_9Cr_3(P_2O_7)_3(PO_4)_2$.
- Static magnetic and spectroscopic properties of the dimer-chain antiferromagnet $BiCoPO_5$
- Structural and magnetic properties of deformed spin-1/2 square lattice in antiferromagnetic $NaZnVOPO_4(HPO_4)$
- Manipulation of Anti-skyrmionphase in $Mn_{2+x}Ni_{1-x}Ga$ Tetragonal Heuslersystem

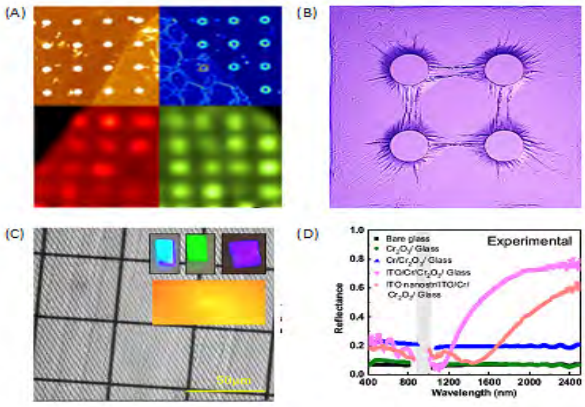
Experimental Condensed Matter Physics

Joy Mitra
Professor

Our research group focuses on studying fundamental physical phenomena occurring at surfaces and interfaces, with the aim of harnessing them for novel applications. Multi-physics investigation of strain induced spectroscopic and electrical properties in 2D quantum materials like WS2 flakes via spatially resolved spectroscopic maps correlated with electrical, electronic and mechanical properties. These investigations provide comprehensive understanding of the effects of local strain in inducing spatial heterogeneity in optoelectronic properties of 2D layered materials. This understanding is crucial for device fabrication and the development of potential applications. Another area of our research involves engineering the optical properties of opaque and transparent surfaces using ultrathin, low loss,

epsilon-near-zero films. This induces direction and spectrally selective reflective, emission and absorption properties. Results in figure C & D show that ultra-thin film coatings (~100 nm) imparts structural colour and emissivity properties.

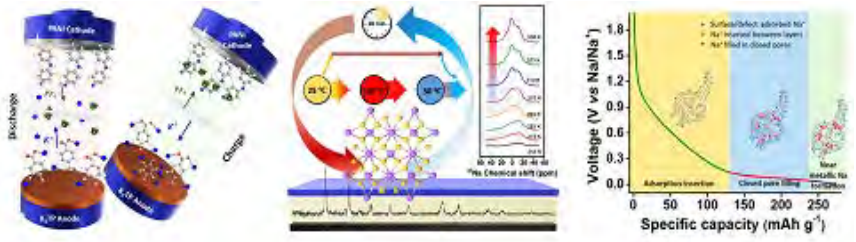
Additionally, our group collaborates with scientists from the Institute of Electronic Materials Technology in Poland to investigate eutectics of Ni-TiO_2 for optoelectronic applications. Samples with Ni nanoparticles decorating the TiO_2 backbone presents a novel platform to explore optoelectronics, catalysis, thermoelectrics and the complex plasmon-exciton landscape in these hybrid systems.



(A) Monolayer MoS_2 on SiO_2 substrate decorated with periodic gold pillars (clockwise from top left: topography, strain, Raman and photoluminescence maps). (B) Simulated wrinkles in monolayer MoS_2 atop cylindrical structures. (C) SEM image of indium tin oxide nanostructures on glass. Insets show structural colour and thermal emissivity induced by nanostructures on glass. (D) Reflectance of glass + nanostructures

M M Shaijumon
Professor

Energy Storage and Conversion, Rechargeable Batteries, 2-D Materials

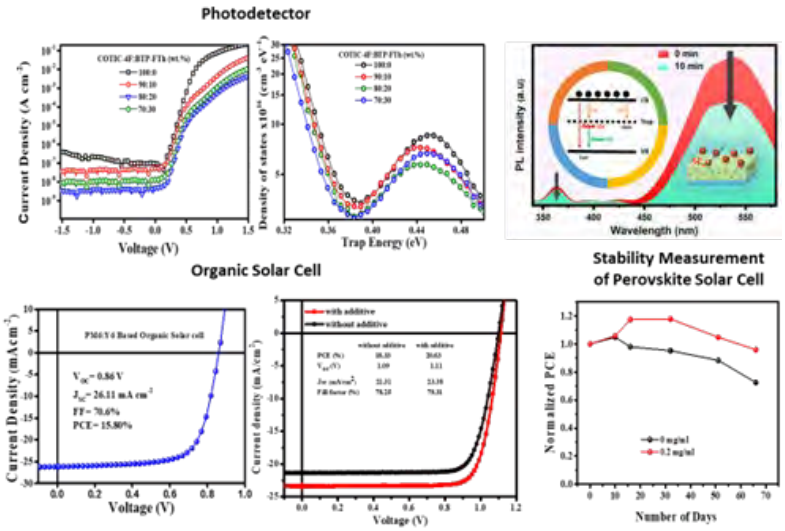


Schematic of an all-organic K-ion hybrid capacitor device (Left panel), scheme highlighting the accelerated microwave-assisted synthesis and characterization of Na-based solid-state electrolyte (Middle Panel) and illustration of Na-ion charge storage mechanism in hard carbon (Right Panel).

Our group is involved in research on materials science and physics of various energy storage and conversion systems with the goal of making a significant impact on society. Ourfocus mainly lies on two key areas: (i) 2-Dimensional layered nanomaterials and (ii) High performance energy generation and storage systems. Over thepast year, we have focused on both energy conversion and storage studies. In one of the recent study, we demonstrated a simple, accelerated, and energy-efficient method for the synthesis of highly crystalline cubic sodium thiophosphate solid electrolyte (Na_3PS_4) using microwave-assisted irradiation technique. This energy-efficient approach for sodium-ion solid electrolyte synthesis presented in our work will provide a meaningful advancement to the accelerated synthesis of sulfide electrolyte-based all-solid-state batteries. In another study, we developed an all-organic potassium ion hybrid capacitor device, which exhibited excellent electrochemical properties. In yet another interesting study, we attempted to unravel the Na-ion storage mechanism associated with hard carbon electrodes. Our findings confirm the adsorption-intercalation pore-filling model and highlight the significance of closed microporesin generating plateau discharge curves. We have also been actively collaborating with several other labs in different areas such as optoelectronics devices and organic electrode materials.

Semiconductors, Photodetectors, Solar Cells, LEDs, Materials Research

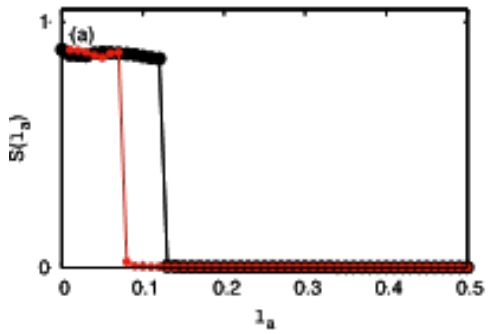
Manoj A.G. Namboothiry
Professor

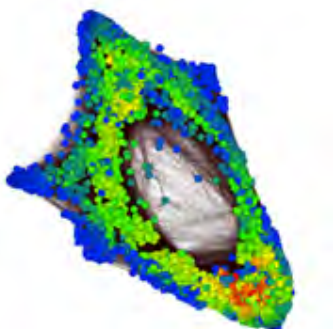


Our research work is primarily directed towards the photo induced free carrier generation, recombination and optoelectronic properties of devices made using organic, organic-inorganic hybrid, 2D, nano and quantum materials. Recently, we have achieved an efficiency of 15.8% in organic solar cell and 20.5% in perovskite solar cell. To study the electron-trapping dynamics in slow photoresponse materials, we have developed a novel technique using photoluminescence spectroscopy with ZnO thin film as a model system. A new parameter called 'capture time' was introduced to quantify the electron persistence in the Conduction Band. Capture time is evaluated from the PL spectra and we have successfully demonstrated that it can be used for simulating optoelectronic behaviors.Further, we have used hydrophobic poly-TPD to modify the PEDOT: PSS surface in order to control the crystal growth of the methylammonium lead iodide perovskite layer. The controlled crystal growth resulted in improved perovskite film leading to enhancements in power conversion efficiency and stability of the solar cells.

The simultaneous realization of organic near-infrared photodetectors with low dark current density and good performance metrics is quite difficult. In order to reduce the dark current in OPDs, we have suppressed the trap density in the active layer using the ternary strategy approach. The optimized device exhibits low dark current and improved photoresponse beyond λ~1000 nm.

Nonlinear Dynamics & Complex Systems





G. Ambika
Emeritus Professor

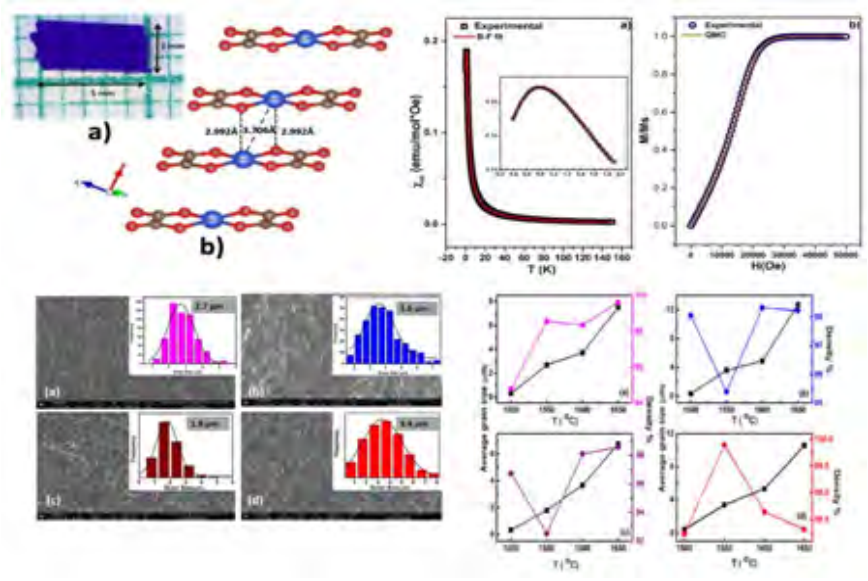
(Left) Transition to Explosive synchronization in multiplex networks [Physics Letters A2022, 450, 128391]. (Right) Recurrence network generated om Stock market data [Physica A: Statistical Mechanics and its Applications 2022,608, 128240].

Our research focuses on understanding complex systems through the theory of nonlinear dynamics and complex networks. We study the dynamics and transitions that occur within complex networks, as well as the emergent spatio-temporal dynamics such as explosive synchronization and chimera states. Further, we compute measure of complexity from observational data and seek out 'early warning signals' for tipping or regime shifts in complex systems. Recently, we reported the emergence of explosive synchronization in a multiplex network where oscillators on the first layer are coupled with attractive coupling and those on the second layer are coupled with repulsive coupling. Our group have also studied the complex dynamics underlying stock markets and their transitions. We employed measures based on recurrence plots and recurrence networks, and have shown that the transition in the dynamics prior to the Global Financial Crisis is due to increasing stochasticity.

Deepshikha Jaiswal-Nagar
Associate Professor

High Temperature Superconductivity, Quantum Phase Transitions, Charge Transport at Nano-Scale

Our research group explores a broad range of phenomena, including strongly correlated electron systems, vortex physics, quantum criticality, quantum information theory, superconductivity and physics at nanoscale. We have a particular interest in areas such as quantum phase transitions, entanglement in low-dimensional spin systems, high-temperature superconductivity, charge transport at nanoscales, nanocluster physics, hydrogen sensing, and hydrogen storage. In our lab, we also focus on materials discovery, in-house laboratory-based measurements like thermal expansion as well as scattering and spectroscopy experiments at large scale neutron and synchrotron facilities.

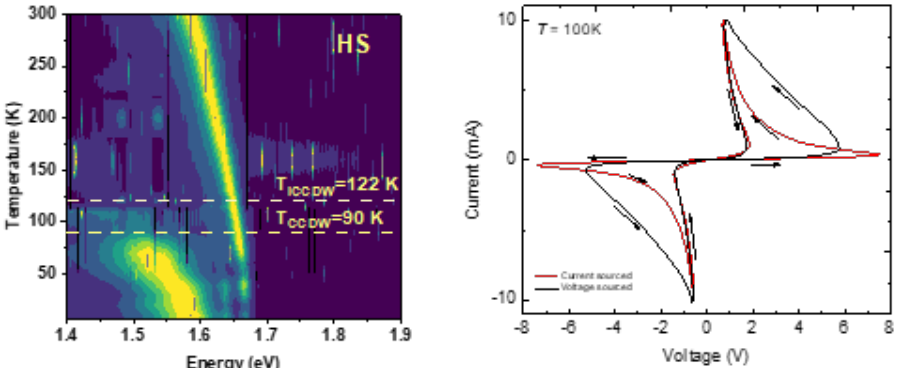


One of our main focuses is the synthesis of single crystals of low dimensional quantum materials that exhibit exotic ground state. In this regard, our group discovered a new spin ½ antiferromagnetic Heisenberg chain system with a chemical formula $(C_5H_7N_2)_2[Cu(C_2O_4)_2]\bullet 2H_2O$. This compound serves as an excellent representation of a spin ½ antiferromagnetic Heisenberg chain characterized by a low exchange coupling

constant J/kB = 1.27 K and a low saturation value of 1.72 T. Large sized single crystals of this compound will be utilized to measure the spinon excitation spectra and characterize the excited state of this material. In our efforts to grow single crystal of high temperature superconductor $YBa_2Cu_3O_{6+x}$, we have synthesized nanosized, uniform and highly dense $BaZrO_3$ powders to help make crucible of $BaZrO_3$. These are an inert crucible in which single crystals of $YBa_2Cu_3O_{6+x}$ can be grown with excellent purity. $BaZrO_3$ powders were produced using a sol-gel technique that resulted in the highest ever measured relative density of 99.8% in $BaZrO_3$. Our lab also specializes in state-of-the-art home-built set-ups like nanocluster deposition system, feedback based gas sensing setup, capacitive dilatometry based thermal expansion measurement setup in closed cycle refrigerators, detwinner-cum-annealing assembly etc.

Rajeev N Kini
Associate Professor

Ultrafast and Terahertz spectroscopy



Temperature dependence of the photoluminescence in a $TaSe_2/MoSe_2$ van der Waals heterostructure (Left Panel). Highly nonlinear conduction with negative differential conductance in a CDW crystal $Sr_{14}Cu_{24}O_{41}$ (Right Panel)

Van der Waals heterostructures (vdWH) are the new playground of emergent physics, including proximity effects, high-temperature superconductivity and Bose-Einstein condensation.The lattice mismatch between the layers of two-dimensional materials in the vdWH holds great promise to study interfacial effects like orbital hybridization, charge density wave (CDW) proximity and magnetic interactions. We have investigated the optical signatures of the interlayer coupling in the semiconducting 2H-$MoSe_2$ with the layered CDW material 2H-$TaSe_2$, which exhibits Incommensurate CDW transition at 122 K and transition to Commensurate CDW at 90 K. The Raman measurements on the individual layers and the heterostructure confirms strong coupling between the layers. The photoluminescence (PL) spectra from vdWH exhibits an enhancement of about six times higher and a blue shift compared to that of the monolayer $MoSe_2$ at room temperature. The temperature-dependent measurements and the band structure calculations can provide more insight into the role of CDW transitions in the excitonic landscape of the heterostructure.

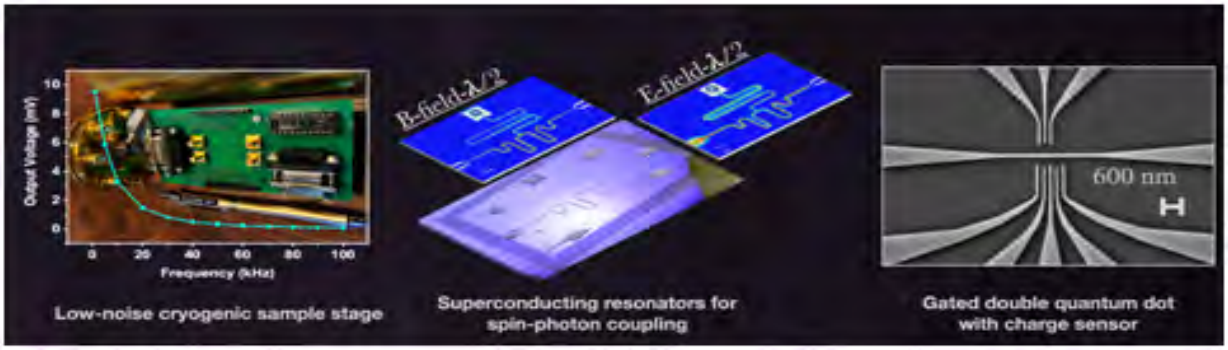
Additionally, we demonstrated dynamic control of the lattice by terahertz (THz) radiation through the manipulation of phonon modes. The low-energy sliding phonon modes in the spin-ladder system, $Sr_{14}Cu_{24}O_{41}$, are excited using THz radiation with high electric fields. Due to the non-linearity induced by the THz electric fields, the low-energy phonon mode couple to the high-energy silent optical phonon modes at ≈1.17 THz. This indirect excitation of the silent phonon mode is reflected as an enhancement of the THz transmission near 1.17 THz. Our findings demonstrate the possibility of indirectly controlling otherwise inaccessible phonon modes by utilizing THz electromagnetic radiation and it provides opportunities for dynamically altering the electronic and magnetic properties of such material systems using THz radiation.

Madhu Thalakulam
Associate Professor

Quantum Transport

Our major research directions include two-dimensional (2D) superconductivity and quantum electrical amplifiers.In the disorder-free regime, 2D superconductivity exists only in the limit B → 0 and I → 0. Under weak external fields, the system transforms to a dissipative state of Bosons, the Bose metal state, owing to quantum fluctuations. A metallic ground state in 2D is beyond the consensus of both Bosonic and Fermionic systems, and its origin and nature warrant a detailed investigation. Disruption of the order parameter caused by the dynamics of vortices makes the system dissipative and transient. We investigate the transient nature and noise characteristics of the magnetoresistance and confirm that quantum fluctuations are solely responsible for the nature and fate of the BM state, and the fragility of the superconducting state.

We also explore the effect of quantum noise due to the electron tunnelling process in a quantum point contact (QPC) electrical amplifier onto the macroscopic host crystal. The electrical amplifier consists of a semiconducting QPC galvanically coupled to a superconducting transmission-line resonator operating around ~2.16 GHz with a conductance sensitivity of ~11 pS/Hzˆ(1/2). The electron tunnelling events exert a back-action noise onto the host GaAs crystal, exciting vibrational modes via the piezoelectric effect. This electromechanical coupling induces characteristic peaks on the noise spectrum corresponding to the piezoelectrically active vibrational modes. From the power spectrum analysis, we are able to detect displacements corresponding to these vibrations with a sensitivity ~pm/Hzˆ(1/2). In addition to demonstrating the macroscopic manifestation and microscopic back-action of an ultra-sensitive sensor, this technique allows us to detect mechanical motion with pico-metre level sensitivity at faster timescales.



Bindusar Sahoo
Associate Professor

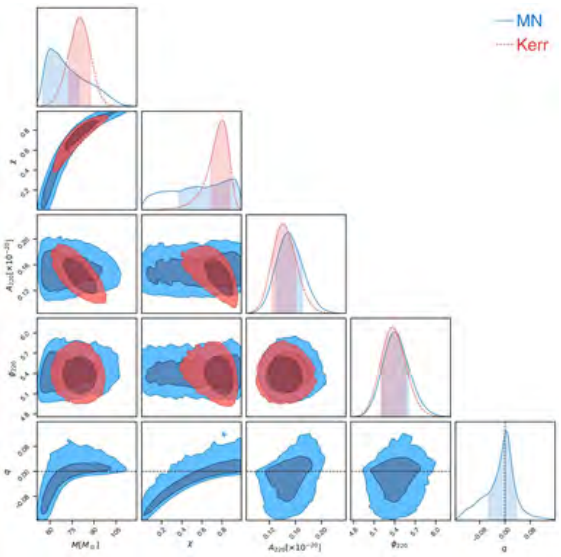
Conformal Supergravity

The research of our group is focused on conformal supergravity, which is a theory of supergravity with additional symmetries. It is mainly used as a tool to construct the physical Poincare supergravity theories that realizes only the super-Poincare group of symmetries. Overthe last year, we focused on the construction of N=3 supergravity theories in four dimensions using the framework of conformal supergravity. In order to do that, we first constructed the action of N=3 conformal supergravity in four dimensions using the method of covariant superformsthat we had developed earlier. Thereafter we coupled N=3 vector multiplets to conformal supergravity and used three of them as a compensator to obtain pure N=3 Poincare supergravity with higher derivative corrections.

Cosmology and Gravitational Wave Astronomy

Soumen Basak
Associate Professor

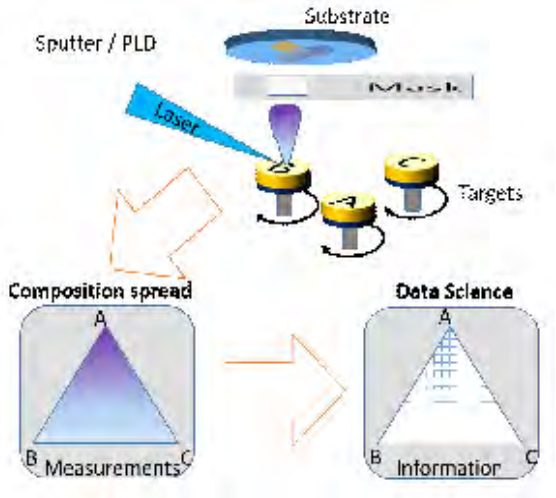
Our research work is primarily focused on the observation of the CMB, the afterglow of the Big Bang, and the analysis of cosmological and astrophysical data sets. Recent research work from our group is devoted to investigating the best options for detecting signatures of Gravitational waves in the CMB polarization from the multi-frequency observations of the sky. We are primarily interested in the scientific content of the B-modes of CMB polarization, the level of primordial power in cosmological Gravitational waves as well as the Gravitational Lensing of the CMB in particular. Our group is also involved in the activities "Foreground Working Group" of the CMB-Bharat (http://cmb-bharat.in) satellite mission to forecast the potential of this mission. We have an ongoing collaboration with Laser Interferometer Satellite Antenna (LISA) and have access to the considerable resources of the consortium. The objective of LISA (https://lisa.nasa.gov) is to detect Gravitational waves from astrophysical sources (such as supermassive black holes, extreme mass ratio inspiral) unseen by the preceding ground-based mission (LIGO-Virgo https://www.ligo.org). Additionally, our group participates in the activities of the "Artefact Working Group" of LISA. The primary objective of this working group is to investigate the impact of scheduled and unscheduled gaps in the data on the analysis of the Massive Black Hole Binary (MBHB) signal.



Posterior distributions for the parameters obtained from the GW150914 data, assuming Manko-Novikov (MN) and Kerr as background space times.

Wide Bandgap Materials and Devices

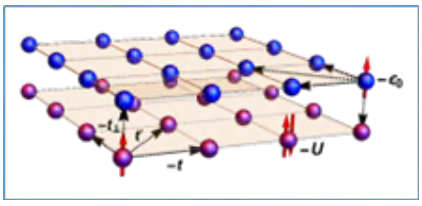
Kumaragurubaran Somu
Associate Professor



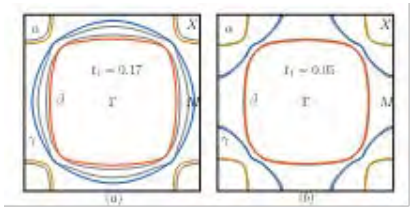
High throughput combinatorial synthesis method

Our collaborative research with National Institute for Materials Science (Japan) aims to control the physical properties of Ga_2O_3, a promising power semiconductor material. To tailor the physical properties, we employed the technique of alloying Ga_2O_3 with another oxide namely, In_2O_3. Typically, this is a multi-step process involving preparation ofseveral samples with varying compositions and evaluating their relevant properties individually. In contrast, in this collaborative research, we synthesized the alloy in a single step process by making a thin-film composition spread of individual oxides and investigated their physical properties. This synthesis process, known as combinatorial synthesis, was developed by our Japanese collaborators. As a result of our collaboration, this advanced combinatorial synthesis equipment is now being developed at IISER-TVM. Towards the property control of Ga_2O_3, we received thin-films of Ga_2O_3 and In_2O_3, and evaluated the optical, surface and electronic properties. The Japanese team provided the materials preparation technical details while the Indian team shared the property measurement data. The exchange of data between both teams is vital not only for controlling the properties of Ga_2O_3, but also for developing machine learning based accelerated materials discovery and development in the near future.

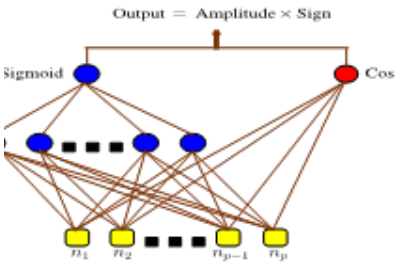
Condensed Matter Physics (Theory)



A superconductor-metal bilayer system



Electronic correlation effect on Fermi surface



An artificial neural network

Amal Medhi
Associate Professor

Our research primarily focuses on investigating the physics of strongly correlated electrons in condensed matter systems. Strong electronic correlations in materials give rise to a hosts of novel phenomena, which are fascinating yet very challenging for theoretical studies. Our efforts have been to understand the physics of such systems using various computational techniques such as quantum Monte Carlo and slave-particle theory. Particularly, we studied the effects of Hund's exchange coupling and spin-orbit interaction on the ground state electronic properties of multi-band Hubbard model, within the slave-spin mean field theory. Machine learning (ML) and its application to condensed matter physics have seen explosive developments in recent years. We investigate the feasibility of employing artificial neural networks and ML techniques to learn the ground state wave function of a fermionic many-body lattice Hamiltonians like the Hubbard model, which is at the heart of condensed matter theory.

We also studied the superconducting properties of a superconductor-metal bilayer using quantum Monte Carlo method. Our investigations demonstrate how the properties of the superconductor can be tuned by proximity to a metallic band. In a separate line of work,in quest for high efficiency thermoelectric (TE) materials, we studied the thermoelectric transport properties of a few interesting TE materials within the Boltzmann transport formalism in conjunction with first principles calculations.

Nonlinear Optics, Photonics

Ravi Pant
Associate Professor

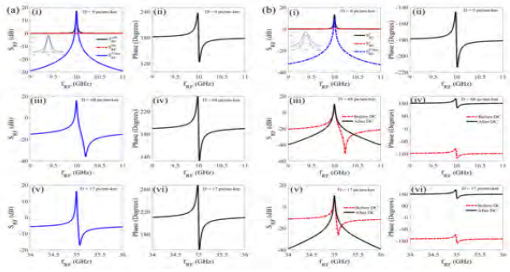


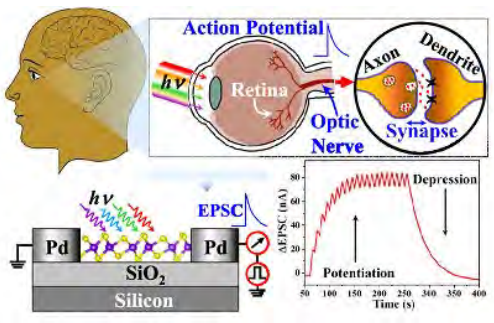
Fig. (a)(i)-(vi) Simulation results showing the effect of dispersion on the filter profile different frequencies for a phase modulated signal (b) (i)-(vi) Dispersion compensation using z-cut intensity modulation showing recovery of filter profiles at different frequencies

Our research is geared towards understanding of nonlinear optical phenomena in nanoscale waveguides, microresonators and exotic material platforms. Over the last one year, we demonstrated mitigation of dispersion induced impairment of microwave photonic bandpass filters using voltage-controlled phase of a z-cut Mach-Zehnder modulator [Varun et al, Journal of Lightwave Technology, 2023]. The work compares the performance of dispersion induced impairments for the following two bandpass filter configurations (i) Phase modulation based double sideband configuration, which has a fixed inherent phase difference of 180 degrees between the interfering RF beat signals and (ii) intensity modulation based double sideband configuration, where a bias voltage controlled phase shift allows compensation of dispersion induced phase shift.

Semiconductor Physics and Devices

Bikas C Das
Associate Professor

Over the past year, our research group has focused to study perovskite memristor devices with neuromorphic functionality, molecular memristor devices, organic pH sensors, 2D ReS_2 photodetectors with photoreceptor-cum-optic nerve synaptic plasticity, and the effect of electrode buffer layers on the performance of organic thin-film solar cell. In the initial stages of each project, we emphasized materials growth and characterizations, which serves as crucial foundations for our work. For instance, we successfully synthesized lead-free layered cesium copper antimony chloride ($Cs_4CuSb_2Cl_{12}$; CCAC) double perovskite nanocrystals using a hydrothermal technique in solution. Furthermore, we achieved the growth of large-area 2D ReS_2 monolayer having a direct band gap of 1.5 eV and Peierls distorted 1T crystalline phase, by facilitating with an organic seeding promoter called perylene-3,4,9,10-tetracarboxylic dianhydride (PTCDA), during chemical vapor deposition. Subsequently, we proceeded with thin-film device fabrication, followed by comprehensive electrical and optoelectronic characterizations for demonstrating the potential applications with various control experiments. We had also explored photoconductive atomic force microscopy (pc-AFM) to probe the dynamics of photo-generated charge carrier based on the nature of electrode buffer layer of organic solar cells. Overall, our research efforts encompassed a multidimensional approach, combining advanced materials, innovative techniques, and robust device applications.

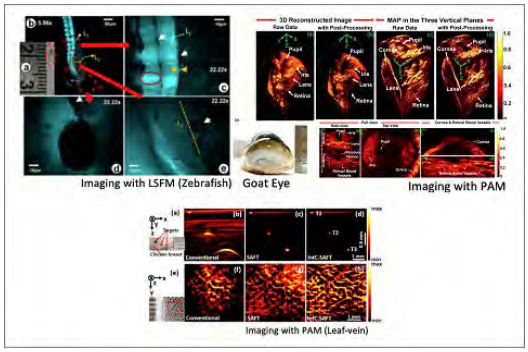


The schematics and results represents the correlation between visual nervous system and ReS_2 photodetector device with synaptic weight modulation

Biomedical and Nano-Bioscience Engineering

Mayanglambam Suheshkumar Singh
Associate Professor

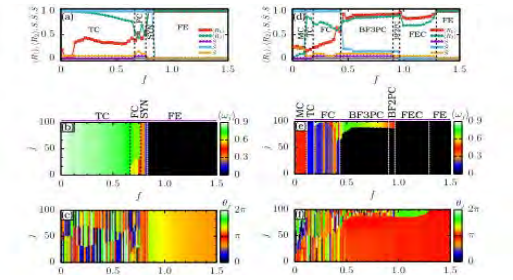
Our research group, Biomedical and Nano-bioscience Engineering Lab (BnBEng. LAB), focuses on study of interaction of light and/or sound with soft matter and its exploitation for development of novel imaging modalities suitable for imaging of sample at wider range of size from biological specimens (of the order of μm-mm) to clinical tissue sample (~cms). More specifically, wework on design and development of non-destructive and non-invasive (multi-dimensional) imaging system for diverse applications including biological, clinical diagnosis, and therapeutic treatments.In last year, our group successfully developed and reported a unique imaging technology called as SAFT-based photoacoustic microscopy (SAFT-PAM) imaging system that enables us to unprecedentedly image entire eye (diameter of ~3cm) at microscopic resolution in one scanning time. In addition, we reported development of light sheet fluorescence microscopy (LSFM) or selective plane illumination microscope (SPIM) – more specifically, sMx-SPIM – that enables us to image live biological specimen (larger ~1-2mm) non-destructively and can image multiple frames simultaneously in real-time to provide 3D images of the specimen. This technical feature can help to record spatio-temporal dynamics of biological specimens at different levels of resolution/magnification.



Nonlinear Dynamics & Complex Systems

D V Senthilkumar
Associate Professor

Our group focusses on developing various strategies to increase the dynamical robustness of coupled oscillator networks. Recently, we have introduced a new model consisting of globally coupled high-dimensional generalized limit-cycle oscillators, which explicitly incorporates the role of amplitude dynamics of individual units in the collective dynamics. In the limit of weak coupling, our model reduces to the D-dimensional Kuramoto phase model, akin to a similar classic construction of the well-known Kuramoto phase model. The proposed model puts the recent studies of the D-dimensional Kuramoto phase model on a stronger footing by providing a more general framework for D-dimensional limit-cycle oscillators. We have investigated the interplay of an external forcing and an adaptive network, whose connection weights coevolve with the dynamical states of the phase oscillators in accordance with the spike-time dependent plasticity, Hebbian and anti-Hebbian adaptation rule. We have also extended our investigations to higher-order interactions in networks of dynamical systems by constructing simplicial complexes. We have reported the emergence of a generalized form of synchronization among the metacommunity, which precedes complete synchronization thereby serving as an early warning signature for possible extinction of the species of the metacommunity.



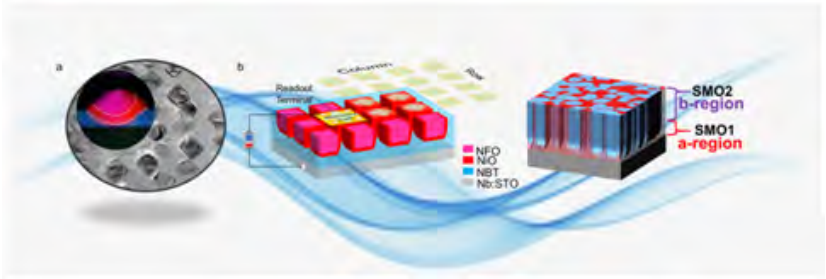
Dynamical transitions as a function of the external forcing strength. (a) & (d) The time averaged order parameters and the three distinct measures of the strength of incoherence corroborating the dynamical transition; (b) & (e) time-averaged mean frequency of all the oscillators, and (c) & (f) instantaneous phase of the oscillators.

Nonequilibrium Physics

Sreedhar B Dutta
Assistant Professor

The main emphasis of our research group is on Nonequilibrium Physics and Effective Field Theories. One of the primary activity currently pursued by our group is towards establishing appropriate framework to describe periodically driven macroscopic systems and investigating their thermodynamic properties. In pursuit of comprehending the asymptotic behavior of periodically driven thermodynamic systems, our group has studied the prototypical example of underdamped Brownian particle, in harmonic and anharmonic potentials, subjected to periodic driving. In particular, we have developed a perturbative scheme that is well-suited for analyzing driven Langevin systems under large viscous drives [Physical Review E2022, 106, 064116].

Functional Materials & Devices



Vertically aligned nanocomposite (VAN) for energy efficient electronics

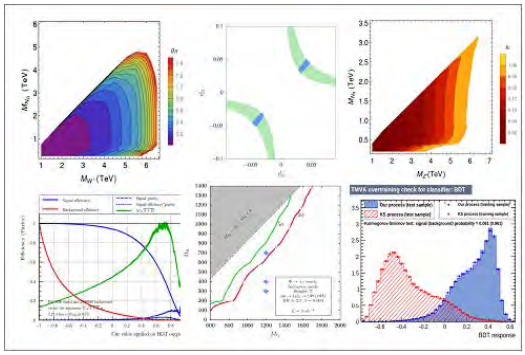
Tuhin Maity
Assistant Professor

In our lab, we engineer nanoscale functional materials (with at least one dimension below 100 nm) for use in energy-efficient electronic and magnetic devices. We focus on manipulating metallic alloy and strongly correlated oxide materials, and their spin-ion-charge interactions at the nanoscale. The materials are prepared by various state-of-the-art deposition facilities such as DC/RF sputtering, Pulsed Laser Depositionand thermal evaporation, and chemical synthesis techniques such as hydrothermal and solid state reaction. We also use different computational techniques such as micromagnetic simulations and Density Functional Theoryto design and understand materials systems.We have observed exchange bias in a ferromagnetic-ferroelectric bi-layer system without an antiferromagnetic material. Further, we investigate different ways to control functionalities of magneto-caloric materials for solid state refrigeration.

Particle Physics, Collider Analysis

Tanumoy Mandal
Assistant Professor

Our group worked on leptophobic U(1) framework where we evade the stringent bounds on Z' parameter space from the dilepton resonance searches. We considered two theoretically well-motivated examples of leptophobic U(1) extensions in which the Z' decays to right-handed neutrinos (RHNs) with substantial branchings. Interestingly, we found large parameter regions beyond the reach of future dijet-resonance searches can be probed exclusively through our channel [Physical Review D 2022, 106, 095035]. In another study, we considered the left-right symmetric models where a heavy charged gauge boson W' can decay to a lepton and a RHN. We found that a sequential W' with mass up to 6 TeV along with a TeV-scale RHN can be discovered at the HL-LHC. In addition to the long-standing anomalies seen in the muon g − 2, $R_{K^{(*)}}$, and $R_{D^{(*)}}$ observables by various independent experiments,

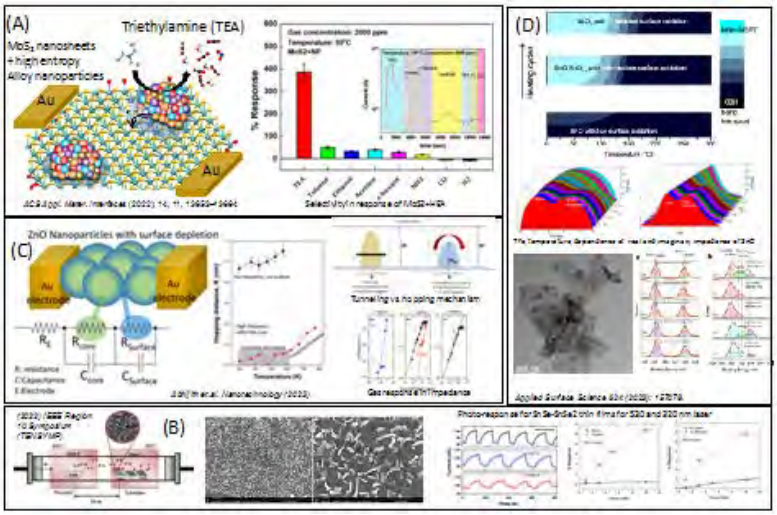


the CDF Collaboration has found another significant one in the W-boson mass. These anomalies might be intertwined at a fundamental level and have a single new physics explanation [Physical Review D 2022, 105, 115007]. In yet another study, we presented a simultaneous solution to these anomalies with two scalar leptoquarks of roughly equal mass - one a weak-singlet S1 and the other a weak-triplet S3 - which mix through a Higgs portal [Physical Review D 2022, 106, 115009].

SMART Materials and Devices

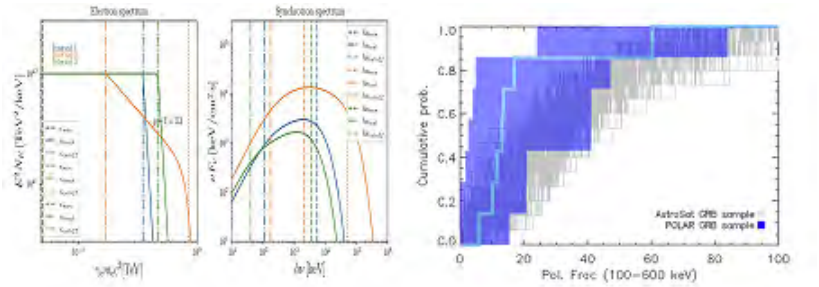
Vinayak Kamble
Assistant Professor

SMaRT lab stands for Sensors, Microsystems and Renewable Technologies. In this year,SMaRT lab had its first PhD student graduated and reported several new exciting works. (A) We worked on the high entropy alloys (Ni-V-Ti-Zr-Cr) functionalized MoS_2 nanosheets that shows strong fermi level pinning and hence a Schottky barrier with 3D metal electrodes. Compared to bare MoS_2, it shows a large enhancement and selectivity in the response towards Triethylamine vapors [ACS Applied Materials and Interfaces, 2022, 14 (11), 13653-13664]. (B) AnotherSnSe based photodetector research work published in IEEE proceedings, shows enhanced response to almost entire visible spectrum due to inherent SnSe/$SnSe_2$ heterojunctions formed vis-à-vis low response in bare SnSe thin films grown by CVD. Our collaborative work on optical detection using atomically precise silver clusters was also revered and published in Nano Letters. Subsequently, in the beginning of 2023, we reported AC conductivity studies on nanocrystalline ZnOchemoresistive sensor devices as well as SnO microcrystal that are susceptible to surface oxidation. (C) The frequency-based sensor studied explored the partial selectivity and type of transport in ZnO nanocrystalline materials separating the bulk as well as surface contributions. (D) Similarly, the transport in SnO changes in subsequent heating cycles due to progressive heating during high temperature measurement changing the nature of transport from nearest neighbor hopping to band transport. Polaron hopping transport mechanism and its role in sensing mechanism of V_2O_5 nanowires is investigated via suppressing the polaron formation by Mo doping in V_2O_5 nanowires [Journal of Applied Physics 2023,133, 194505].



Astronomy and Astrophysics

Shabnam Iyyani Syamsunder
Assistant Professor



The upper left plot shows the synchrotron spectrum along with the electron distribution. The peak time bin (in orange) exhibits an onset of particle acceleration into a power law distribution. The upper right plot shows the cumulative probability distribution of the PF detected by AstroSat GRBs (blue) along with that detected by POLAR mission (grey).

Our research has been primarily focused on understanding the radiation process and the microphysics of synchrotron emission in gamma-ray bursts (GRBs). In addition, we have alsoinvestigated the polarization properties of GRBs detected by the AstroSat CZTI (Cadmium Zinc Telluride Imager).

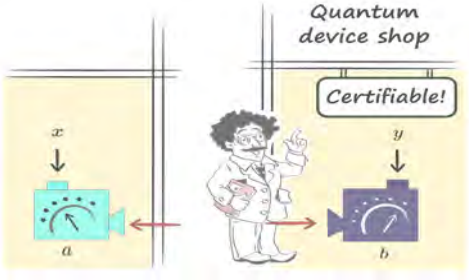
The physical processes of gamma-ray emission and particle acceleration during the prompt phase in GRBs remain unresolved. In order to perform unambiguous physical modeling of these observations, it is crucial to clearly identify the emission mechanisms involved. In one notable instance, we have successfully identified synchrotron emission during a particularly intense flare in GRB 160821A, which occurred at 135 seconds into the prompt phase. We show that the distribution of the radiating electrons in this flare initially exhibits very narrow profile but later develops a power-law tail of accelerated electrons. Thus, we identify for the first time the onset of particle acceleration in a GRB jet. The CZTIonboard AstroSat, since its launch in 2015, has been consistently detecting GRBs. Its sensitivity to polarization measurements at energies above 100 keVenablesit to undertakespectropolarimetric studies of GRBs. The first catalog of GRB polarization measurements based on CZTI data collected over the first five years of its operation was released. Our analysis reveals that the majority of GRBs in the sample exhibit low or null polarization throughout the duration of the bursts. However, a small fraction of five GRBs exhibit high polarization. Further, CZTI, compared to the POLAR instrument, has detected a larger number of cases with high polarization.

Quantum Information Theory, Foundations of Quantum Mechanics

Debashis Saha
Assistant Professor

To realize quantum technology and its wide-ranging applications in information processing, it is of primary importance to certify that a quantum device operates in a non-classical way. To address this, we have developed innovative certification schemes for various quantum multipartite-entangled states and incompatible quantum measurements. These certification schemes rely only on the input-output statistics or the empirical probabilities generated by the devices, making them practical to implement with off-the-shelf technology. Furthermore, we have demonstrated that these certification methods can be utilized for quantum information processing tasks such as the generation of random numbers.

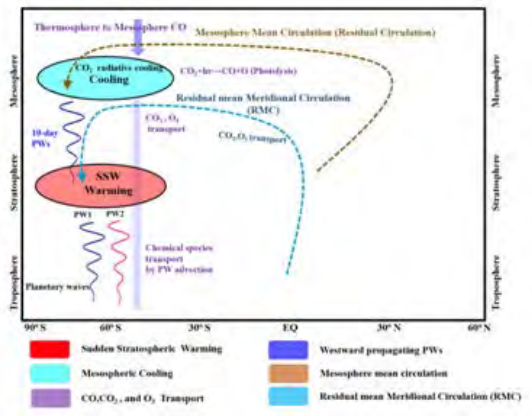
Quantum contextuality, a counter-intuitive feature of quantum theory, states that the physical properties of subatomic particles cannot pre-exist until they are observed. While the conceptual significance of contextuality in quantum theory has long been recognized, its direct applications remained unknown. Through the application of graph theory, we have discovered that quantum contextuality offers significant advantages



in distributed computation and various communication protocols, without the need for entanglement. In addition, we explored the measurement problem of quantum theory in an operational approach and proposed thought experiments to test quantum correlations that are incompatible with the notion that measurement outcomes are objective.

Atmospheric Science

Pramitha M
Assistant Professor



Schematic illustration (not to scale) of Sudden Stratospheric Warming (SSW) effects on the polar mesospheric cooling by planetary wave propagation and chemical species during the 2019 Southern Hemisphere minor SSW [Atmosphere 2022, 13(9), 1475]

Our research group focuses on understanding the dynamics and chemical composition of the middle atmosphere (10-100 km in altitude). Our primary aim is to study different wave modes in the tropics and extratropics and how these wave modes influence the strength of the stratospheric Brewer Dobson Circulation and Quasi Biennial Oscillation. To acheive this, we use ground based observations, satellite observations, re-analyses of datasets and climate model simulations.

Computational Solar Physics

Nitin Yadav
Assistant Professor

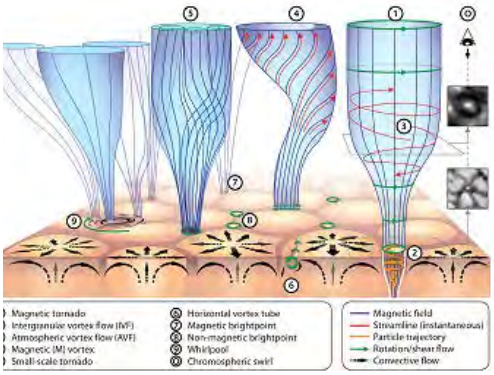
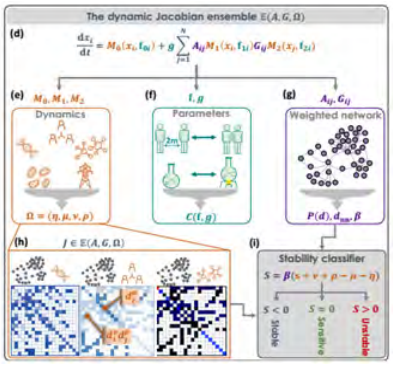


Illustration of different types of vortex flows and related phenomena in the solar atmosphere (Space Science Reviews2023, 219, 1)

Our research hopes to contribute to a deeper understanding of the complex dynamics and processes occurring in the Sun.We focus on investigating the propagation of magnetohydrodynamic (MHD) waves in the solar atmosphere and exploring wave-related phenomena in the solar atmosphere. To achieve this, we perform realistic numerical simulations of various regions of the Sun including the quiet sun, active regions, and sunspots. We employ advanced data analysis techniques to detect wave signatures and their association with observables.

Nonlinear Dynamics, Complex Networks, Stability Analysis, Machine Learning Algorithms

Chandrakala Meena
Assistant Professor



Emergent stability in complex network dynamics
[Meena et al., Nature Physics, 2023]

Research in our lab aims to understand and predict complex systems' behavior using simulations of networked models and data analysis. Currently, we have also been using machine learning algorithms to gain further insights into real-world phenomena of the complex systems. This year, in collaboration with Prof Baruch Barzel (Bar-Ilan University, Israel), we have shown that the actual behavior of the complex system is strongly intertwined with the network structure and dynamics. We developed a mathematical theory that allows us to directly predict the stability of large-scale real and human-engineered systems based on the information of their network structure and dynamics.In addition, we have also found that the heterogeneity of network structure enhances the stability of complex systems. Our finding has resolved a longstanding paradox in ecology known as the 'Diversity Vs. Stability' dilemma, which has puzzled researchers for over 50 years. We believe that our developed theory will help in incorporating the effect of network structure and dynamics to solve numerous existing problems in various real-life scenarios.

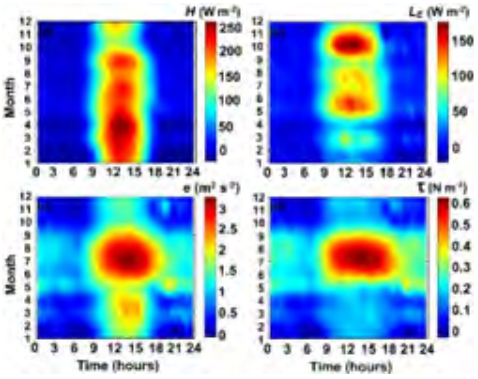
Materials Science using Density Functional Theory

Souvik Paul
Assistant Professor

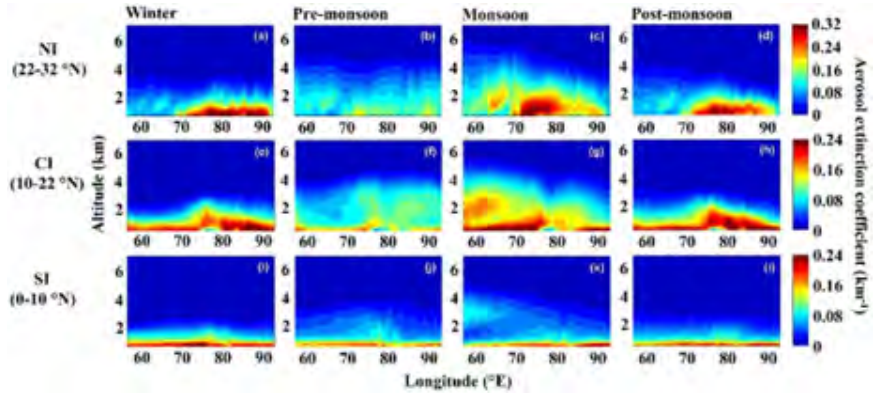
Our research endeavors focus on employing state-of-the-art Density Functional Theory to uncover the microscopic mechanisms underlying various materials. Our research interests include multifunctional materials, strongly correlated systems, and magnetism in bulk and 2D materials. Currently, we are investigating nontrivial topological magnetic structures known asskyrmions, particularly those that are observed in 2D magnets. They are envisioned as the building block of the next-generation logic devices, transistors, magnetic tunnel junctions, nano-oscillators, microwave devices, magnonic devices, probabilistic, neuromorphic, reservoir and quantum computer. We have been working with two world's leading groups (Prof Wiesendanger from the University of Hamburg and Prof Heinze from the University of Kiel) from Germany. Our collaborative efforts are focused on gaining a deeper understanding of the underlying physics behind skyrmions and working towards the realization of skyrmion-based devices.

Atmospheric Optics, Free-Space Optical Communication, Aerosols, Optical Turbulence, Boundary-Layer Meteorology

Anand N
DST INSPIRE Faculty



Diurnal variations of sensible flux (H), latent flux (LE), turbulent kinetic energy (e) and momentum flux (τ) [Atmospheric Chemistry and Physics 2022, 22 (9), 6067-6085].

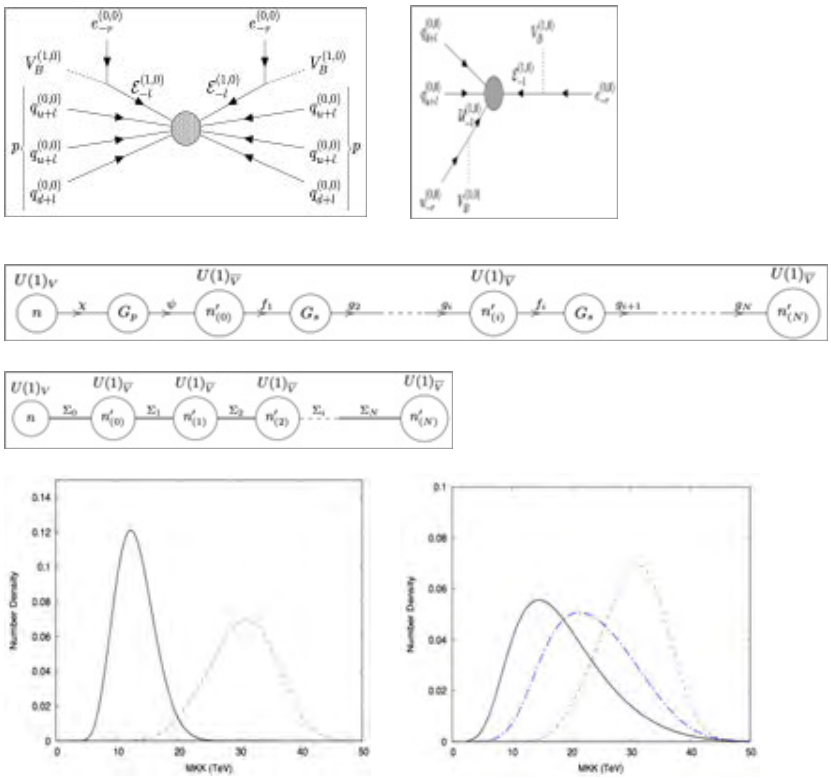


Longitudinal variations in the vertical distribution of aerosols over north (NI; top rows), central (CI; middle rows), and south (SI; bottom rows) India. Each column corresponds to a particular season, as marked above them [Journal of Geophysical Research Atmospheres 2022, 127 (21), e2022JD037211].

My research focusses on atmospheric optical propagation. In situ, balloon-borne, and satellite observations of lower atmosphere, along with radiative transfer modelling are used to study the effects of atmospheric turbulence and aerosols on terrestrial and satellite-to-Earth Free-Space Optical (FSO) communication links. The 3D distribution of atmospheric aerosols and its variation with respect to longitudes over the Indian mainland and the surrounding oceans are studied using multi-satellite observations. The consequent climate impacts of aerosols are estimated using radiative transfer calculations. These findings will likely have strong implications for aerosol–radiation interactions in regional climate simulations [Atmospheric Chemistry and Physics 2022, 22 (9), 6067-6085]. The exchange of energy, mass, and momentum fluxes between the atmosphere and the surface decides the regional weather and climate. Long-term measurements at a semi-arid region in India revealed large differences between the measurements and a reanalysis data set in the rainfall duration and intensity, its feedback to soil moisture, and the surface energy partitioning. These results will be useful in improving the representation of land-atmosphere interactions in climate model simulations over the tropics [Journal of Geophysical Research Atmospheres 2022, 127 (21), e2022JD037211].

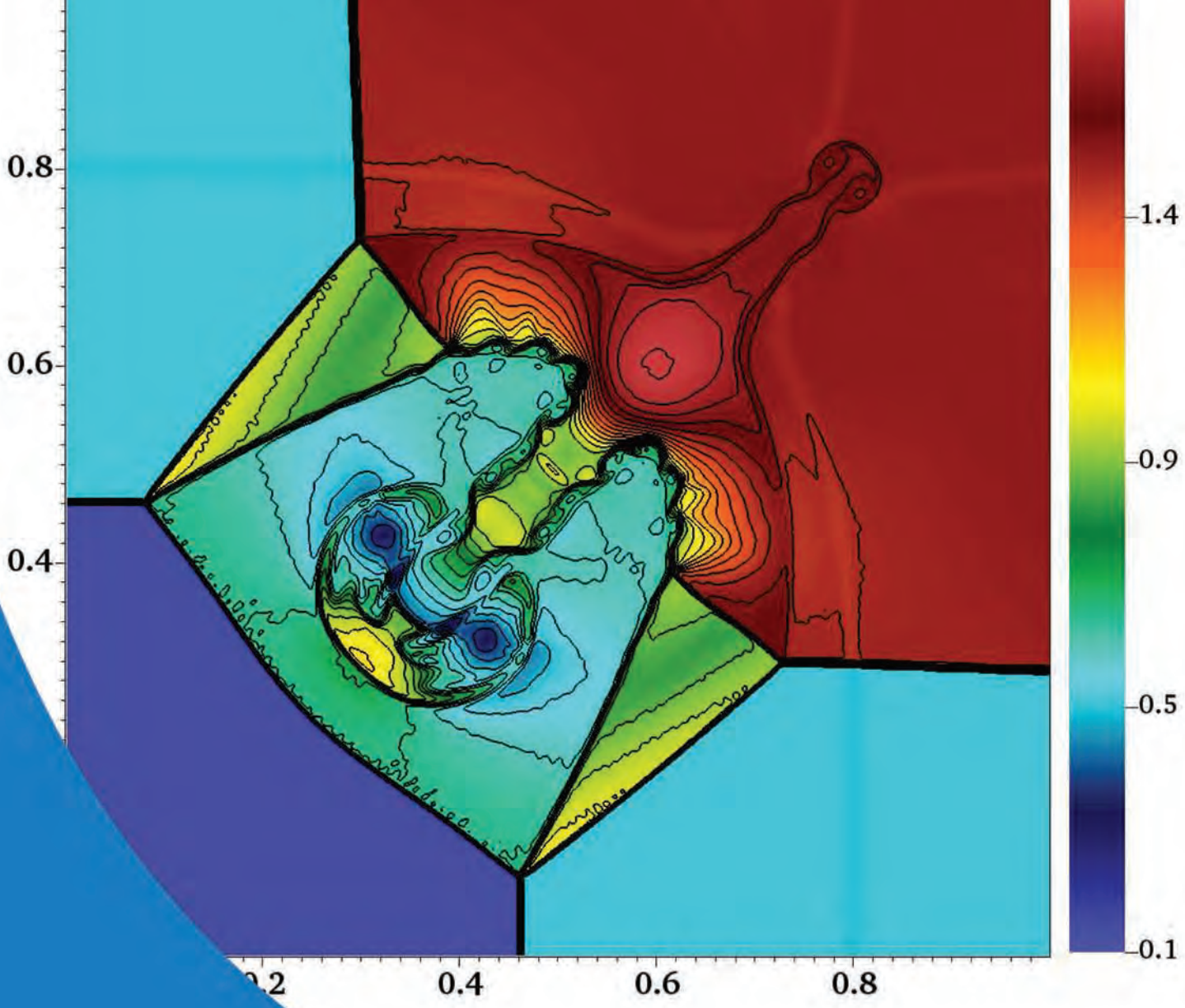
Extra-Dimension Models, Ads/QCD , Baryon Number Violation, Flavour Physics, Clockwork Fermions

Mathew Arun Thomas
DST INSPIRE Faculty



(A) Dark Matter assisted Hydrogen-antihydrogen oscillation and proton decay in 4-dimensions arising from orbifolded 4k+2 dimensions. (B) Low energy confining New Physics leading to Baryon number violation (especially neutron-antineutron oscillations). (C) Scale of 4+1-dimensional Little Randall Sundrum Model from muon to electro conversion processes- (Left) Dependence on brane localised kinetic terms (BLKT); Red curve indicates without BLKT while Black one for maximal BLKT. (Right) Dependence of the same process on brane thickness; Red curve is for thin brane while the Blue and the Black curves are for brane thickness 0.1 and 0.2 times that of bulk respectively.

The study of effective field theory operators in 4k+2 dimensions revealed interesting Baryon number violation (BNV) processes, where Dark Matter (DM) acts as a catalyst. This predicts new phenomena like DM-assisted Hydrogen-antihydrogen oscillation and DM-assisted Proton decay, which could lead to observable effects at the centers of galaxies. If detected, it would not only mark a significant milestone but also provide an explanation for the lack of BNV events observed in terrestrial experiments. Further, we showed that a six-dimensional orbifolded torus geometry offers an effective explanation for the observation of 11 neutron-antineutron oscillation events at Super-Kamiokande while naturally suppressing proton decay. Direct detection of confining New Physics is extremely difficult. We showed that in certain models, the effect can be observed in BNV processes that are studied at Super-Kamiokande and upcoming Hyper-Kamiokande. Additionally, we showed that embedding our universe in 4+1 dimensional Little Randall Sundrum model is heavily constrained by charge lepton flavour violations, and its safety requires either brane localized kinetic terms or brane oscillations. Studying Kalb-Ramond field within Teleparallel framework, we showed that the possible matter-bounce scenario in the evolution of the universe plays a crucial role in the lack of rank-2 fields in present day cosmological observations.

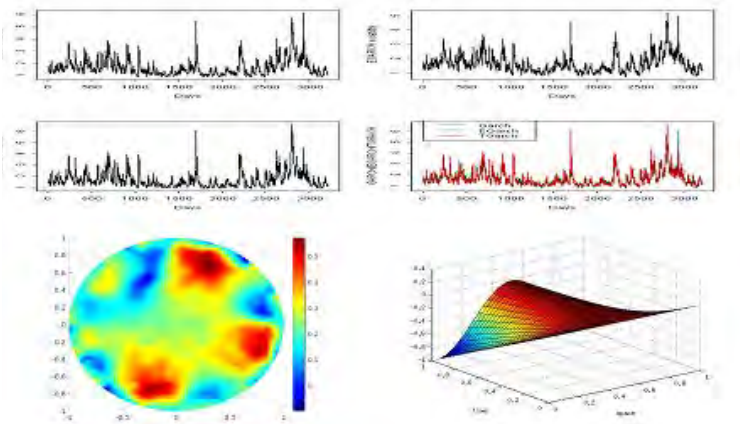


SCHOOL OF MATHEMATICS

Density contours of a two-dimensional Riemann problem computed using a seventh order hybrid WENO scheme.
Image Credit: Research from Dr K. R. Arun and Dr Asha Dond's group
©Int. J. Number. Meth. Fluids, 2023

Cancer Research (Mathematical Biology); Financial Engineering; Inverse Problems; Data Science and Machine Learning; Numerical Functional Analysis

Rajan M.P.
Professor



Our research focuses on inverse problems, numerical functional analysis, financial engineering, mathematical finance, statistical and econometric modeling, data science research, machine learning, mathematical biology (cancer research), parameter identification problems in PDE, singular perturbation problems in PDE, image processing and tomography. We also offer consultancy work in the financial domain/financial engineering, data science research and machine learning.

Stochastic Partial Differential Equations, Analysis and Control of Fluid Flow Problems, Liquid Crystals and Ferromagnetism

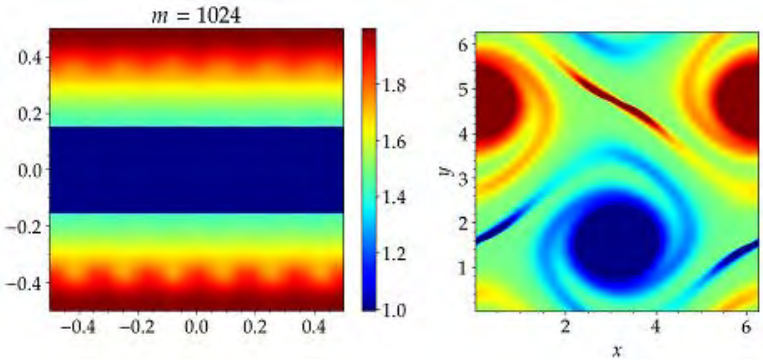
Utpal Manna
Professor

Our work in stochastic partial differential equations arises mostly from fluid dynamics, magnetisation and other physical problems (e.g. Navier-Stokes equations, magneto-hydrodynamic systems, Landau-Lifshitz-Gilbert equations in ferromagnetism, nematic liquid crystal model, Schrodinger equation, viscoelastic fluids etc.) driven by Wiener or Levy processes. We study existence, uniqueness, regularity, large deviation, control and other statistical properties of these kind of problems using tools from stochastic analysis, harmonic analysis, non-linear functional analysis, differential geometry and PDE theory. In recent times, our team is working on understanding the phase transition phenomena in the ferromagnetic materials below the critical temperature.

Nonlinear Hyperbolic Conservation Laws, Finite Volume

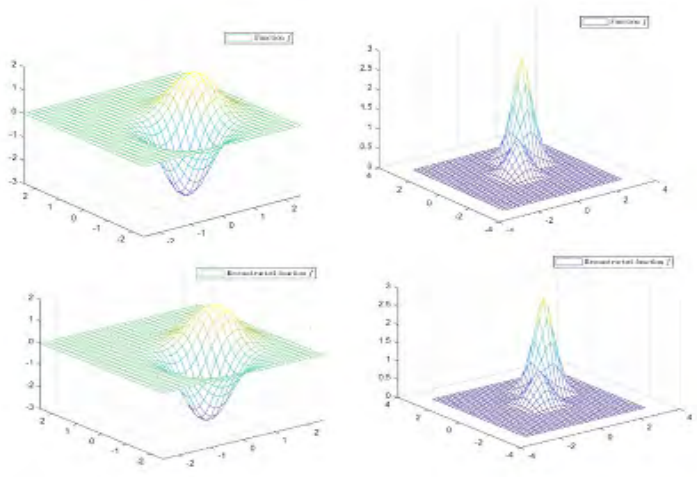
K. R. Arun
Associate Professor

Our research is focused on the theory and numerical aspects of weak and dissipative measure-valued (DMV) solutions to the compressible Euler system. Measure-valued solutions are introduced using the concept of Young measures, which arise by taking weak limits of sequences of weak solutions or consistent numerical approximations. DMV solutions involves some defect measures to account for the lack of compactness of weak solutions. We use the notion of the so called K-convergence to visualize the limits weakly converging sequences of numerical solutions by replacing them with their Cesaro averages that converge strongly to the corresponding limit. We design and analyze finite volume scheme for the numerical approximation. The scheme enjoys the key physical attributes such as positivity of density, entropy stability and the weak consistency with the Euler system. The results of case studies substantiate the claims made by the proposed scheme.



Harmonic Analysis

P. Devaraj
Associate Professor



Our research deals with the analysis of certain convolution operators on locally compact groups. For a given compactly supported measure on a locally compact group, the convolution of a continuous function with a measure gives the local moving averages of the function considered. The primary objective of our analysis comprises two components:analysing the range of such operators and developing suitable methods for reconstruction of continuous functions from their local moving averages.Another aspect of our research focuses on the reconstruction of analog signals from their digitized versions called samples (or local weighted average samples) over various signal classes like shift invariant spaces and spline spaces.

Linear Algebra, Matrix Analysis

Our main research focus is in linear algebra and matrix analysis. Our current interests include (1) structure and linear preservers of certain positivity classes of matrices (2) perturbation results for matrix polynomials and rational matrices and (3) linear algebra & dynamical systems.

Sachindranath Jayaraman
Associate Professor

Complex Dynamics and Ergodic

Holomorphic, non-invertible dynamical systems of the Riemann sphere are surprisingly intricate and very captivating. Our research interests focus mainly on such complex dynamical systems. We have contributed towards various aspects in finer analysis of Julia sets of maps: polynomials, rational functions etc, both open and closed. We also work on systems of holomorphic correspondences, correspondences generated by a finite rational semigroup, ergodic theory and other related areas.

Shrihari Sridharan
Associate Professor

Commutative Algebra, Homological Algebra, Group Theory

In the past few years, we have been working on Schur's exponent conjecture, which states that for a finite group G, the exponent of the second homology of G with integer coefficients divides the exponent of G. We have proved Schur's exponent conjecture in several cases. We have also given bounds on the size of Schur multiplier of special p groups improving all previously known bounds for this class and thereby addressing a question of Berkovich.

Viji Z Thomas
Associate Professor

Algebraic Geometry

Our lab focus is mainly on moduli space related problems on higher dimensional variety and questions on endomorphisms of Fano varieties.

Sarbeswar Pal
Associate Professor

Control Theory, Partial Differential Equations, Fluid Flow Models

Sheetal Dharmatti
Assistant Professor

Our research group is looking at optimal control problems for fluid flow equations. In particular, we are looking at coupled systems where the Cahn Hilliard equation is coupled with dynamics equations like Navier Stokes' equation (CHNS), Brinkman (CHB) equations etc. The main theme of our work is to prove the existence of optimal control for a suitable control problem subjected to given equations. Currently, we are exploring boundary control problems where the well posedness of the equation needs to be addressed before considering control problems. We have recently studied the existence, uniqueness and regularity of one such system, namely the local CHNS system with regular potential. Similar questions for the CHB system are being analysed. Controllability for these equations is a completely open question and we are also investigating these problems.

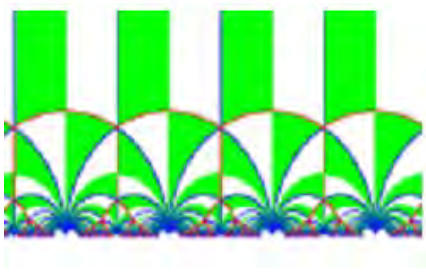
Geometry over Lie Groupoids and Stacks

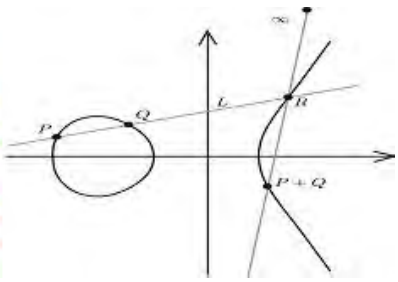
Saikat Chatterjee
Assistant Professor

After the development of gauge theory and Yang-Mills theory in physics, the bundles and connections were introduced to provide a precise mathematical framework, which subsequently became one of the main themes of modern differential geometry. On the other hand, mainly due to Grothendieck, the language of category theory became pivotal in expressing many abstract structures in geometry and topology. Our main focus is the study of bundles and connection structures over some specific type of categories, such as Lie groupoids and stacks.

Number Theory, Graph Theory and Combinatorics

Srilakshmi K
Assistant Professor





Our primary areas of interests are arithmetic geometry (elliptic curves, modular forms & Galois representations), analytic, algebraic and additive number theory. Secondary areas of interests are Graph theory and combinatorics.

Representation Theory

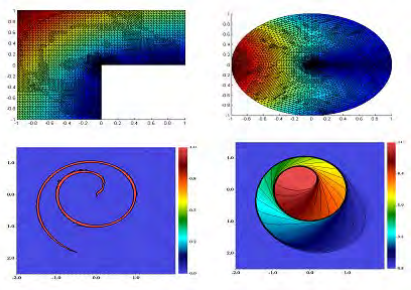
Our lab focus includes:

- Representation Theory of Finite groups and finite dimensional algebras
- Cellular Algebras
- Combinatorics

Geetha Thangavelu
Assistant Professor

Numerical Analysis, Finite Element Methods

Our research interest includes studying the finite element methods (FEM), adaptive FEM, stabilized FEM, and convergence analysis of these methods for the second-order elliptic partial differential equations. Finite element methods are elegant and powerful techniques used to compute the numerical solution of initial and boundary value problems. Furthermore, adaptive FEM is a well-known algorithm for computing numerical solutions with minimal computational effort. The main aim of my research work is to establish a priori and a posteriori finite element analysis for various elliptic equations and validate it with numerical simulations.



Dond Asha Kisan
Assistant Professor

Elliptic Partial Differential Equations

Recently, we have developed a keen interest in studying elliptic problems that involve double-phase operators, specifically the p-q Laplacian and fractional p-q Laplacian. Our focus lies in establishing the qualitative properties of solutions to these problems. This encompasses investigating the existence, uniqueness, and multiplicity of solutions for nonlinear problems that incorporate double-phase operators. Furthermore, we are actively exploring parameter estimates, regularity results, and other related aspects.

Dhanya Rajendran
Assistant Professor

Hyperbolic Conservation Laws, High-Order Schemes, Conservation Laws with Discontinuous Flux, Flow in Porous Media

Sudarshan Kumar K.
Assistant Professor

The Lax-Wendroff method is a single step method for evolving time dependent solutions governed by partial differential equations, in contrast to Runge-Kutta methods that need multiple stages per time step. We develop a flux reconstruction version of the method in combination with a Jacobian-free Lax-Wendroff procedure that is applicable to general hyperbolic conservation laws. The method is of collocation type, is quadrature free and can be cast in terms of matrix and vector operations. Special attention is paid to the construction of numerical flux, including for non-linear problems, resulting in higher CFL numbers than existing methods, which is shown through Fourier analysis and yielding uniform performance at all orders. Numerical results up to fifth order of accuracy for linear and non-linear problems are given to demonstrate the performance and accuracy of the method.

Numerical Analysis, Scientific computing, Optimal Control of PDEs, Computational Biology, High-Performance Computing, Computational Fluid Dynamics, Modeling and Simulation of Multiscale Problems, Scientific Machine Learning

Nagaiah Chamakuri
Assistant Professor

Our group explores numerical tractability of bidomain equations,modeling and optimal control of electrical activity of heart, finite element methods , multiscale modeling and simulation of biological problems, various linear and non-linear models, and the development of computing technology for large scale problems.

Operator Theory and Functional Analysis

Md. Ramiz Reza
Assistant Professor

Our research focuses on the field of Operator Theory, with a particular emphasis on Hilbert spaces composed of analytic functions. This area of investigation involves utilizing tools and techniques that intersect with various disciplines, including functional analysis, harmonic analysis, and complex analysis. Currently, we are interested in studying higher order weighted Dirichlet integrals and its various properties in order to understand the structure of the analytic m-isometric operators on Hilbert spaces and the structure of its invariant subspaces.

SCHOOL OF DATA SCIENCE

Priyanka Majumder
Assistant Professor

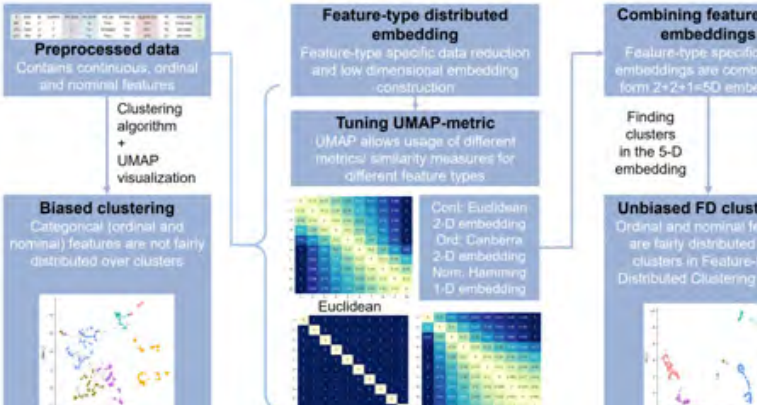
Statistical Inference, Design of Experiment, Clinical Trials, Survival Analysis, Reliability Theory

Our research area broadly lies in the field of Design of Experiments and Mathematical Theory of Reliability and Life Testing. In particular, we are interested in cluster randomised trials, longitudinal data analysis, analysis of hierarchical data, survival analysis, theory of majorization and stochastic orderings.

This year we have published research dealing with optimal sample size requirements for a four-level longitudinal cluster randomised trials design. In another research paper, we have developed a testing procedure designed specifically for assessing decreasing mean time to failure distribution via deriving a moment inequality. Additionally, we have further enhanced our test procedure to accommodate situations involving random censored data.

Patient stratification, Personalized medicine

Saptarshi Bej
Assistant Professor



Our patient-stratification workflow, called feature-type-distributed clustering that accounts for diverse feature-types in clinical data, produces more informative clusters compared to UMAP and is very effective in stratifying patients in a unsupervised manner from clinical routine data.

Studies on Type-2 Diabetes Mellitus (T2DM) have revealed heterogeneous sub-populations in terms of underlying pathologies. However, the identification of sub-populations in epidemiological datasets remains unexplored. We focused on the detection of T2DM clusters in epidemiological data, specifically analyzing the National Family Health Survey-4 (NFHS-4) dataset from India containing a wide spectrum of features, including medical history, dietary and addiction habits, socio-economic and lifestyle patterns of 10,125 T2DM patients.

From a methodological perspective, we show that for diverse data types, frequent in epidemiological datasets,

feature-type-distributed clustering using UMAP is effective as opposed to the conventional use of the UMAP algorithm. The application of UMAP-based clustering workflow for clinical routine data with diverse feature-types is novel in itself. Our findings demonstrate the presence of heterogeneity among Indian T2DM patients with regard to socio-demography and dietary patterns. From our analysis, we conclude that the existence of significant non-obese T2DM sub-populations characterized by younger age groups and economic disadvantage raises the need for different screening criteria for T2DM among rural Indian residents.

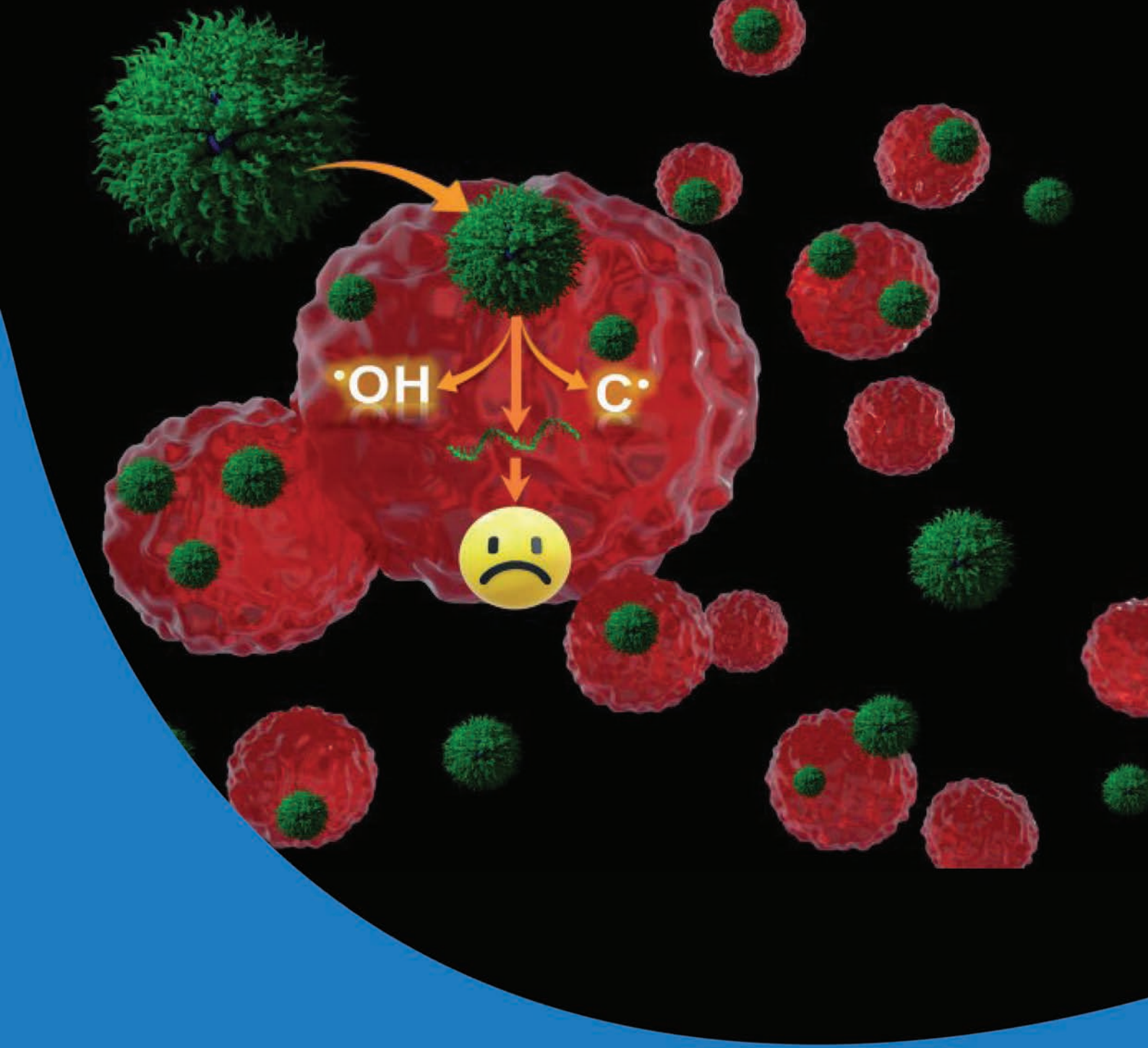
Localization, Human Activity Recognition, Facial Emotion Recognition, Intelligent Systems

Alwin Poulose
Assistant Professor

Our system gathers data from wearable sensors and predicts human behavior/intention that enhances ambient assisted living. The most common sensors used in the prediction system are smartphone IMU sensors, camera sensors, smartwatches, and Wi-Fi access points.

Our research focusses on developing an intention prediction system that can assist humans in intelligent and healthy living, healthcare, indoor navigation, ambient assisted living and abnormal activity detection. Our approach begins with an advanced indoor localization system where our research focuses on achieving a localization error as low as 10 cm. This research addresses crucial challenges such as mitigating cumulative errors from IMU sensors, accounting for the effects of refraction and attenuation on RSSI signals, enabling localization in complex environments, and facilitating multi-user localization. In addition, we work on human activity recognition (HAR), with a primary focus on sensor and camera-based approaches. Our HAR research tackles challenges such as handling age diversity, capturing accurate postural transitions, addressing missing values or labeling errors in datasets, and selecting suitable sensors.

Emotion recognition also plays a significant role in our human intention prediction system. In this regard, our research focuses on analyzing facial expressions from a smartphone camera and emotion recognition from physiological signals such as ECG and speech. Overcoming challenges such as data augmentation, dealing with face occlusion and lighting variations, addressing racial differences, and accurately identifying children's emotions are key objectives of our emotion recognition research. Furthermore, we explore the use of videos to study human pose and employ eye-tracking systems for human intention prediction. Our research involve the implementation of advanced deep learning models to identify human location, activity, expression, posture, and eye movements.



OTHER FACULTIES

A supramolecular strategy for the design of multifunctional tumor microenvironment sensitive nanoparticles composed of artemisinin, ferrocene and antisense DNA via a single-step assembly process is demonstrated.

Image Credit: Inside Back Cover showcasing research from Dr Reji Varghese's group

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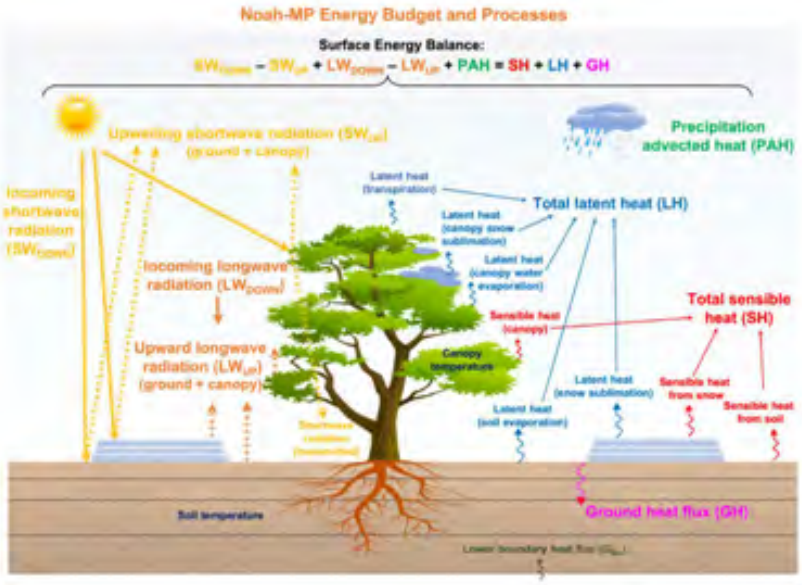
Harilal Madhavan
Ad-hoc Faculty

Health Systems and Frugal Innovations

My research focuses on health systems and frugal innovations. As part of the collaborative work with French and European researchers, we analyze the implications of COVID-19 on health systems and their resilience. The low-tech frugal innovations in health sector are identified in the low and middle income countries as part of the broader disaster management strategies. Currently, I am working on two main themes. Firstly, I am examining the dynamics of health spending and conducting a fiscal space analysis of the healthcare sector in the state of Kerala during the post-COVID period.Secondly, I am documenting the experience of primary health care (PHC) in Kerala, whichemerged and persisted over half a century by virtue of social activism and coalitions of local institutions in the context of decentralization.

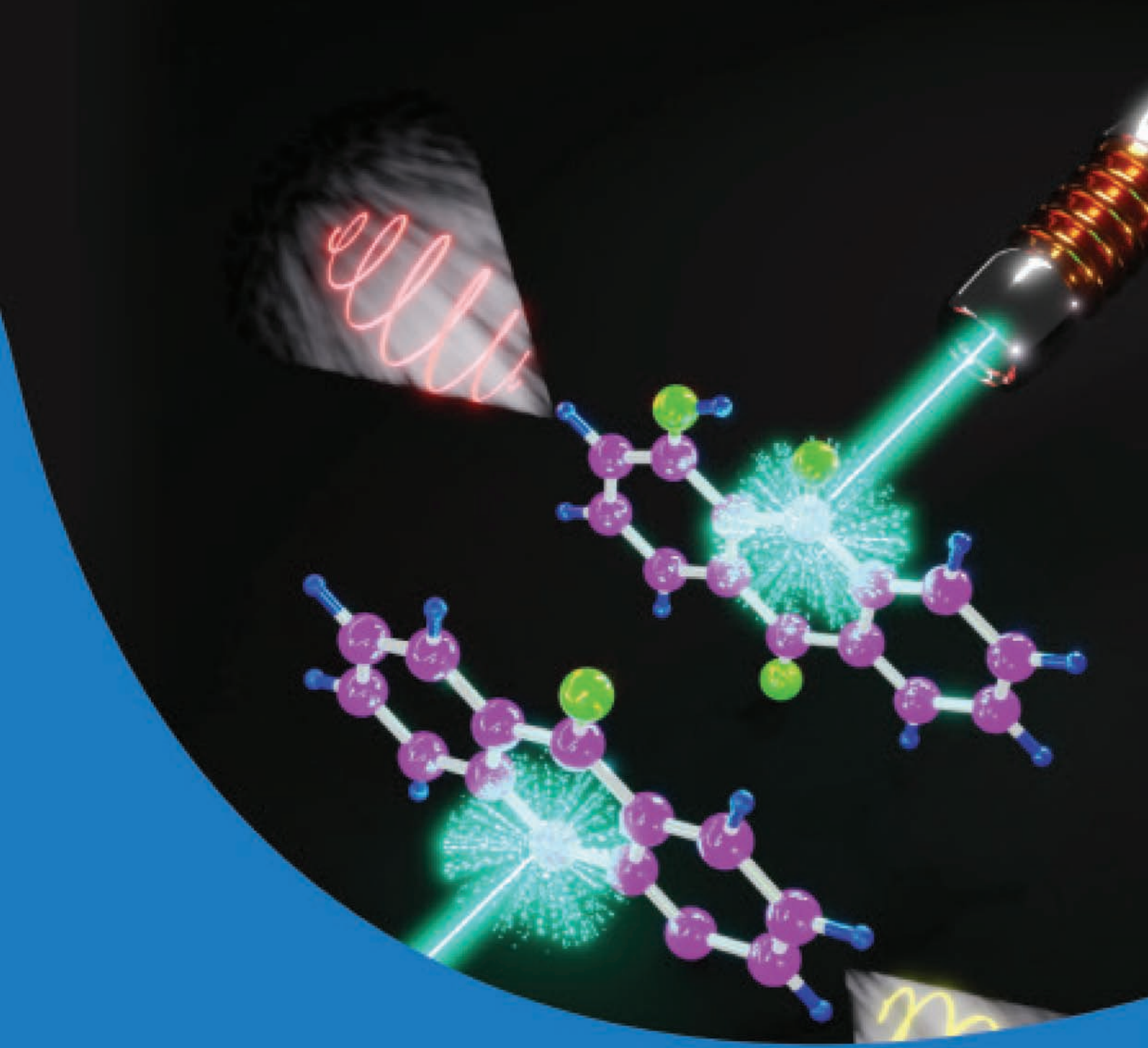
Land-Atmosphere Interaction and Climate Modeling, Hydrology and Agriculture

Prasanth Valayamkunnath
Assistant Professor



Schematic diagram of energy budget and processes represented in Noah-MP Land Surface Model

Our research aims to advance our understanding of how the Earth's ecosystems interact with the atmosphere and how human-induced changes and climate variability affect regional-scale weather patterns and water resources. By refining the physics within Earth system models and utilizing convection-permitting Earth system models, our work contributes to improving the accuracy and reliability of climate projections and predictions at the regional scale.



LIST OF PUBLICATIONS

The rapid intersystem crossing via higher triplets in anthraquinone is quenched by the ultrafast excited-state intramolecular proton transfer dynamics in hydroxyanthraquinone.
Image Credit: Supplementary Cover Art showcasing research from Dr Sivaranjana Reddy's group
©J. Phys. Chem. A, 2022, 126, 3680–3687

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76. Zou, W.; He, S.J.; Senthilkumar, D.V.; Kurths, J. Solvable dynamics of coupled high-dimensional generalized limit-cycle oscillators. *Physical Review Letters* **2023**, *130* (10), 107202. DOI:10.1103/PhysRevLett.130.107202

Student Publications:

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20. Rajan, M.P.*; Jose, J. An efficient discrete Landweber iteration for nonlinear problems. *International Journal of Applied and Computational Mathematics* **2022**, *8* (4), 189. DOI:10.1007/s40819-022-01390-6
21. Rajan, M.P.*; Nanditha, C.K. A multi-drug pharmacokinectic optimal control approach in cancer chemotherapy. *Journal of Optimization Theory and Applications* **2022**, *195* (1), 314-333. DOI:10.1007/s10957-022-02085-0
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Student Publications:

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28. Bhattacharya, D. Geometry of certain Brill-Noether locus on a very general sextic surface and Ulrich bundles. *Proceedings of the Indian Academy of Sciences-Mathematical Sciences* **2022**, *132* (1), 22. DOI:10.1007/s12044-021-00652-5
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31. Dey, P., Mukherjee, M. Generalized Halmos conjectures and constrained unitary dilations. *Advances in Operator Theory* **2022**, *7*, 56. DOI:10.1007/s43036-022-00217-x
32. Dey, P.; Mukherjee, M. Higher rank numerical ranges of normal operators and unitary dilations. *Journal of Mathematical Analysis and Applications* **2023**, *524* (2), 127077. DOI:10.1016/j.jmaa.2023.127077

SCHOOL OF DATA SCIENCE

1. Bej, S.*; Sarkar, J.*; Biswas, S.; Mitra, P.; Chakrabarti, P.; Wolkenhauer, O.* Identification and epidemiological characterization of Type-2 diabetes sub-population using an unsupervised machine learning approach. *Nutrition & Diabetes* **2022**, *12*, 27. DOI:10.1038/s41387-022-00206-2
2. Colaco, S.J.; Kim, J.H.; Poulose, A.; Neethirajan, S.; Han, D.S. DISubNet: Depthwise separable inception subnetwork for pig treatment classification using thermal data. *Animals* **2023**, *13*, 1184. DOI:10.3390/ani13071184
3. Ghosh, S.; Mukhopadhyay, S.; Majumder, P.; Wang, B. Statistical power and sample size requirements to detect an intervention by time interaction in four level longitudinal cluster randomized trials. *Statistics in Medicine* **2022**, *41* (14), 2542-2556. DOI:10.1002/sim.9369
4. Hahn, W.; Schütte, K.; Schultz, K.; Wolkenhauer, O.; Sedlmayr, M.; Schuler, U.; Eichler, M.; Bej, S.; Wolfien, M. Contribution of synthetic data generation towards an improved patient stratification in palliative care. *Journal of Personalized Medicine* **2022**, *12* (8), 1278. DOI:10.3390/jpm12081278

OTHER FACULTIES

1. He, C.; Valayamkunnath, P.; Barlage, M.; Chen, F.; Gochis, D.; Cabell, R.; Schneider, T.; Rasmussen, R.; Niu, G.-Y.; Yang, Z.-L.; Niyogi, D.; Ek M. The community Noah-MP land surface modeling system technical description Version 5.0. *NCAR Technical Note* **2023**, *NCAR/TN-575+STR*. DOI:10.5065/ew8g-yr95
2. Madhavan, H.* Integration of a heterogeneous medical tradition: Some reflections from Sowa Rigpa in India. *Traditional medicine Review* **2022**, *2* (2), 29-40

Collaborative Publications between School of Biology and School of Chemistry

1. Raj, G.; Vasudev, D.S.; Narendradev, N.D.; Dommeti, V.K. K.; Shriwas, S.; Sekhar, P.M. A.; Jacob, L.S.; Srinivasula, S.M.; Varghese, R*. Tumor microenvironment responsive nanocarriers for efficient antisense DNA delivery and enhanced chemodynamic therapy. *Materials Chemistry Frontiers* **2023**, *7* (9), 1821-1830. DOI: 10.1039/d3qm00073g.
2. Radhakrishnan, R.M.; Kizhakkeduth, S.T.; Nair, V.M.; Ayyappan, S.; Lakshmi, R.B.; Babu, N.; Prasannajith, A.; Umeda, K.; Vijayan, V.; Kodera, N.; Manna, T.K.* Kinetochore-microtubule attachment in human cells is regulated by the interaction of a conserved motif of Ska1 with EB1. *Journal of Biological Chemistry* **2023,***299* (2), 102853. DOI:10.1016/j.jbc.2022.102853

Collaborative Publications between School of Biology and School of Physics

1. Aiswarya K.S.; Rinsa S.R.; Sharma, R.; Srinivasula, S.M.; Singh M.S.* Multi-spectral imaging in mammalian cells using a home-built LSFM system. *Proc. SPIE12383, Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues XXI, 123830L* **2023**. DOI:10.1117/12.2649890.

Collaborative Publications between School of Chemistry and School of Physics

1. Aparna, R.K.; Surendran, V.; Roy, D.; Pathak, B.; Shaijumon, M.M.*; Mandal, S.* Silver nanoparticle-decorated defective Zr-based metal-organic frameworks for efficient electrocatalytic carbon dioxide reduction with ultrahigh mass activity. *ACS Applied Energy Materials* **2023**, *6* (7), 4072-4078. DOI:10.1021/acsaem.3c00299
2. Aswathy, P.; Suriyakumar, S.; Kumar, S.A.; Hassan, M.S.O.; Vijayan, V.; Shaijumon, M.M.* Microwave-Assisted Synthesis of Sulfide Solid Electrolytes for All-Solid-State Sodium Batteries. *ACS Applied Energy Materials* **2022**, *5* (10), 12592-12601. DOI:10.1021/acsaem.2c02224
3. Babu, A.; Tirumalarao, D.; Das, S.; Dixit, V.; Sruthy, S.; Vijayan, V.; Jaiswal-Nagar, D.* Effect of pH variation on citrate nitrate sol-gels obtained from auto-combustion method: Synthesis, calculations and characterisations of extremely dense $BaZrO_3$ ceramic. *Open Ceramics* **2022,** *12*, 100303. DOI:10.1016/j.oceram.2022.100303
4. Biswas, S.; Das, A.K.; Reber, A.C.; Bhandary, S.; Kamble, V.B.; Khanna, S.N.*; Mandal, S.* The new Ag-S cluster $[Ag_{50}S_{13}(S^tBu)_{20}][CF_3COO]_4$ with a unique hcp Ag_{14} kernel and Ag_{36} keplerian-shell-based structural architecture and its photoresponsivity. *Nano Letters* **2022**, *22* (9), 3721-3727. DOI:10.1021/acs.nanolett.2c00609

5. Kumar, C.S.; Sebastian, A.; Athira, S.; Singh, R.; Kakarlamudi, A. C.; Alex, A.P.; Reddy, S.; Jaiswal-Nagar, D.* One-dimensional magnetism in a facile spin 1/2 Heisenberg antiferromagnet with a low saturation field. *CrystEngComm* **2022**, *24* (27), 4910-4920. DOI:10.1039/d2ce00331g.

6. Sidhardh, G.L.; Ajith, A.; Sebastian, E.; Hariharan, M.; Shaji, A. Local phonon environment as a design element for long-lived excitonic coherence: Dithia-anthracenophane revisited. *Journal of Physical Chemistry A* **2022**, *126* (23), 3765-3773. DOI:10.1021/acs.jpca.2c00507

7. Surendran, V.; Hema, R.K.; Hassan, M.S.O.; Vijayan, V.; Shaijumon, M.M.* Open or closed? Elucidating the correlation between micropore nature and sodium storage mechanisms in hard carbon. *Batteries & Supercaps* **2022**, *5* (11), e202200316. DOI:10.1002/batt.202200316

AWARDS AND RECOGNITIONS

FACULTY AWARDS & RECOGNITION

Selected faculty awards and recognitions during 2022-23		
School of Biology		
S No	**Name of Faculty**	**Award/Recognition**
1	**Dr. V. Stalin Raj**	Committee member to review the annual progress of the Prime Minister's Research Fellows (PMRF) (December 2022) Member of search and selection committee of the SERB POWER grant. The committee will review and recommend the proposal for funding (Jan 2023) Taskforce expert and chairperson of the committee ofthe ICMR PM-ABHIM Scheme (March 2023) Expert committee member to review the applications of the Prime Minister's Research Fellowships (PMRF) (March 2023)
2	**Dr. Hema Somanathan**	Member of the advisory board of Journal of Comparative Physiology (April 2022 onwards)
3	**Dr. Nishant K.T**	Chairperson of the jury panel for the Inspiring Science Award (Cell Press) given to the best published scientific paper in the Life Sciences from India (Aug 2022)
4	**Dr. Ullasa Kodandaramaiah**	Received a commendation as one of the best performing Associate Editors of Proceedings of Royal Society B: Biological Sciences (Dec 2022) Editor of Journal of Bioscience (Nov 2022)
School of Chemistry		
S No	**Name of Faculty**	**Award/Recognition**
1	**Dr. Subrata Kundu**	Member of the Early Career Advisory Board of JACS Aupublished by the American Chemical Society (May 2022)
2	**Dr. R. S. Swathi**	Associate Editor of the Bulletin of Materials Science published by Indian Academy of Sciences (Jan 2023) Section Editor for the section on Clusters and Nanostructures, of Comprehensive Computational Chemistry (ongoing since Sep 2021)
3	**Dr. Ajay Venugopal**	Invited by the Royal Society of Chemistry to join the Editorial Advisory Board of Dalton Transactions for his significant contributions to the area of main group chemistry (March 2023)
4	**Dr. Soumen De**	Associate Editor of Supramolecular Chemistry of Frontiers in Chemistry (June 2022)
5	**Dr. Mahesh Hariharan**	Member of the Editorial Advisory Board of theJournal of Physical Chemistry A/B/C (Jan 2023) Member of the Editorial Advisory Board of ACS Applied Optical Materials journal published by the American Chemical Society(June 2022)
6	**Dr Kana M. Sureshan**	Received 'Excellence in Carbohydrate Research Award 2022' from the Association of Carbohydrate Chemists and Technologists, India (ACCTI)for his outstanding contribution in the area of carbohydrate chemistry and the development of sugar-based functional and advanced materials (Dec 2022) Member of the Advisory Board of the Chemical Society Reviews(Jan 2023)

FACULTY AWARDS & RECOGNITION

School of Physics		
S No	**Name of Faculty**	**Award/Recognition**
1	**Dr. Vinayak Kamble**	Membership of the Indian National Young Academy of Sciences (INYAS) by INSA (Jan 2023) Received ACS Rising star in Materials Science by American Chemical Society. It is a recognition to early career material scientists (Jan 2023)
2	**Dr S. Kumaragurubaran**	International Advisory Board Member for 15th International conference on New Diamond and Nano Carbons 2022, Kanazawa, Japan (June 2022)
3	**Dr G. Ambika**	Member of the editorial board of Philosophical Transactions A, published by the Royal Society, London (Jan 2023) Associate editor of the European Physical Journal ST (Special Topics) (renewed in Feb 2023)

School of Mathematics		
S No	**Name of Faculty**	**Award/Recognition**
1	**Dr. Utpal Manna**	Member of the editorial board of Stochastic Analysis and Applications (ongoing since Feb 2020) Member of the editorial board of Proceedings - Mathematical Sciences by Indian Academy of Sciences, Bengaluru (ongoing since Jan 2022)

Selected student awards and recognitions during 2022-23		
School of Biology		
S No	**Name of Student**	**Award/Recognition**
1	Ushma Anand	PhD student of Dr. Tapas K. Manna received Best Poster Award in Frontier Symposium in Biology held at IISER Thiruvananthapuram (March 2023)
2	Renjith M. R.	PhD student of Dr. Tapas K. Manna received Best Poster Award in Chromosome Stability Meeting 2022 held at IISER Thiruvananthapuram in association with JNCASR (Dec 2022)
3	Swetha Gopalakrishnan	PhD student of Dr. Nisha N Kannan received Best Poster Award in Frontier Symposium in Biology held at IISER Thiruvananthapuram (March 2023)
4	Malhar Atre	iPhD student of Dr Sabari Sankar Thirupathy received Nature Microbiology Poster Prize in EMBO Workshop held at Goa (Feb 2023)
5	Sohela Sarkar	PhD student of Dr. Jishy Varghese received Best Poster Award in Frontier Symposium in Biology held at IISER Thiruvananthapuram (March 2023)
6	Reshma Menon	PhD student of Dr. Jishy Varghese received Best platform presentation award in Frontier Symposium in Biology held at IISER Thiruvananthapuram (March 2023)
7	Jervis Fernandes	PhD student of Dr. Jishy Varghese received Best platform presentation award in Frontier Symposium in Biology held at IISER Thiruvananthapuram (April 2022) Received Best platform presentation at Indian Neurobehaviour Conference 2022 held at KMC, Manipal (Dec 2022)
8	Amrutha Sahoo	BS-MS student of Dr. Ravi Maruthachalamreceived internship at Max Planck Institute for Plant Breeding Research in Cologne (MPIPZ) for carrying out master's thesis research project (Aug 2022)
9	Archisha Ganguly	MSc student of Dr. Satish Khurana received IASc-INSA-NASI Summer Research Fellowship 2022 to pursue internship in the Single Molecule Biophysics Lab at Saha Institute of Nuclear Physics, Kolkata(July 2022)
10	Arunima Mathew	Application of BS-MS student of Dr. Satish Khurana was selected by the Science Gallery Bangalore (a total of only 20 participants across country) as part of their CARBON Exhibition Season (June 2022)
11	Nikhil Dev N	PhD student of Dr. S. Murty Srinivasula received Fulbright Nehru Doctoral Research Fellowship to carry out research project at The Scripps Research Institute, USA for a period of nine months (March 2023)
12	Anushree Bhatnagar	PhD student of Dr. S. Murty Srinivasula received Carl Storm International Diversity Fellowship from Gordon Research Conferences and DBT CTEP Travel Grant by DBT for attending GRC Immunoengineering 2022 (July 2022) Received Best poster award at the 2nd International Conference on Biological Transactions: From Molecules to Organisms (BTMO 2023) held at IISc Bengaluru (Jan 2023) Received Carl Storm International Diversity Fellowshipfrom Gordon Research Conferencesfor attending GRC Phagocytes 2023 (March 2023)
13	Rahul Sharma	iPhD student of Dr. S. Murty Srinivasula received EMBO Travel Grantfor attending the workshop on "Timing mechanisms linking development and evolution" in Spain (June 2022)

14	Rishith Ravindran	PhD student of Dr. S. Murty Srinivasula received EMBO Scientific Exchange Grants (EMBO Short-Term Fellowship) to work at University of Bristol, UK for a period of three months(April 2022)
15	Sajesh Vijayan	PhD student of Dr. Hema Somanathan received European Society for Evolutionary Biology (ESEB) Travel grant to attend its annual meeting (May 2022) Received Flash talk award in Frontier Symposium in Biology held at IISER Thiruvananthapuram (May 2022) Received Developing Neuroethology Awardfrom the International Society for Neuroethology to attendInternational Congress on Neuroethology (May 2022) Selected to be a part of the American Society of Naturalists' Graduate Council for the period of 2022-2025 (Sep 2022)
16	Asmi Jezeera	PhD student of Dr. Hema Somanathan received second prize for poster presentation in Frontier Symposium in Biology held at IISER Thiruvananthapuram (March 2023)
17	Baheerathan Murugavel	PhD student of Dr. Hema Somanathan receivedFiretail Fellowship from Schauffelhut Berger GmbH, Germany (March 2023)
18	Sachin Bhaskar	PhD student of Dr. Hema Somanathan selected to be a part of the American Society of Naturalists' press release team (Feb 2023)
19	Shreshth Shekhar	BS-MS student of Dr. Poonam Thakur received second place for poster presentation with a cash prize inthe International Conference on Schizophrenia held at NIMHANS, Bengaluru (Aug 2022)
20	Tarunkishwor Yumnam	PhD student of Dr. Ullasa Kodadaramaiah received British Ecological Society (BES) Training and Travel Grant to attend the BES Conference (Dec 2022)
21	Amith B	BS-MS student of Dr. N. Sadananda Singh qualified for CSIR-JRF (Nov 2022)
22	Gopakumar VV	BS-MS student of Dr. N. Sadananda Singh qualified for CSIR-JRF (Nov 2022)
23	Manish R	PhD student of Dr. Hema Somanathan qualified for Prime Minister's Research Fellowship (Nov 2022)
24	Kavya N. Mohan	PhD student of Dr. Hema Somanathan received Student grant from the Animal Behaviour Society (May 2022)
25	Amrutha Krishnakumar	PhD student of Dr. Ramanathan Natesh qualified for UGC-JRF (June 2022)
26	Kavitha M S	PhD student of Dr. V. Stalin Raj qualified for Prime Minister's Research Fellowship (Apr 2022)
27	iGEM Team	A team of biology student participated in the International Genetically Engineered Machine (iGEM) competition and won a Gold Medal at the grand jamboree held at Paris, France for developing Duonco, a novel drug delivery system for breast cancer (Oct 2022)

School of Chemistry

S No	**Name of Student**	**Award/Recognition**
1	Ajaykumar M P	PhD student of Dr. K. George Thomas received Best Poster Award in 16th JNCASR Conference on Chemistry of Materials (Oct 2022)
2	Merin Varghese	PhD student of Dr. K. George Thomas received Best Poster Award in Ultrafast Sciences 2022 conference (Nov 2022)

3	Vishnu E K	PhD student of Dr. K. George Thomas won Mihir Chowdhury student fellowship(One lakh rupees travel grant for presenting work in an international conference) and Best Poster Award in National Workshop on Fluorescence And Raman Spectroscopy(FCS XIII meeting) held at IISER Thiruvananthapuram (Jan 2023)
4	Shourya Gupta	PhD student of Dr. Subrata Kundu received Best Poster Award in 27th ISCB International Conference held at Birla Institute of Technology, Mesra (Nov 2022)
5	Gayathri K	PhD student of Dr. Subrata Kundu received Best flash talk award in Frontier Symposium in Chemistry held at IISER Thiruvananthapuram (Jan 2023)
6	Anjana Prasad Nambiar	iPhD student of Dr. S. Gokulnath received Best Poster Award inInternational Conference on Frontiers in Chemical Sciences (FICS - 2022) held at IIT Guwahati (Dec 2022)
7	Sankeerthana P. A.	BS-MS student of Dr. S. Gokulnath received Internship for Foreign Student tostay for 2 months to pursue internship at Tokyo Metropolitan University (March 2023)
8	Rishika Roy	PhD student of Dr. K. M. Sureshan received Best PhD Gold Medal award fromthe Society for Polymer Science, India (Thiruvananthapuram chapter)(March 2023)
9	Arthi Ravi	PhD student of Dr. K. M. Sureshan received Best Poster Award in International Conference on Chemistry and Applications of Soft Materials (July 2022)
10	Aniruddha Mazumder	PhD student of Dr. Mahesh Hariharan receivedBest Poster award in Frontier Symposium in Chemistry held at IISER Thiruvananthapuram (Jan 2023)
11	Lijina M. P.	PhD student of Dr. Mahesh Hariharan received Best Oral Presentation award in Frontier Symposium in Chemistry held at IISER Thiruvananthapuram (Jan 2023) Received Best flash talk prize in 3rd International Conference on Crystal Engineering: From Molecule to Crystal (CE:FMC2022) held at University of Kashmir (Sep 2022)
12	Swathi Krishna	PhD student of Dr. Mahesh Hariharan received Best Poster award in Crystal Engineering and Solid-State Chemistry conference held at IISER Thiruvananthapuram (Feb 2023)
13	Jibin Sivanarayanan	PhD student of Dr. Mahesh Hariharan received Best Poster award in the 9th Theme meeting onUltrafast Sciences (UFS 2022)held at IISERTVM (Nov 2022)
14	Timi Titus	PhD student (CAMRIE) of Dr. K. George Thomas qualified for Prime Minister's Research Fellowship (Oct 2022)
15	Akanksha Sharma	PhD student of Dr. Soumen De qualified for Prime Minister's Research Fellowship (Oct 2022)
16	Anshuman Bera	PhD student of Dr. V. Sivaranjana Reddy qualified for Prime Minister's Research Fellowship (Nov 2022)
17	Tarpan Maiti	PhD student of Dr. Puhspita Ghosh qualified for Prime Minister's Research Fellowship (Jan 2023)
18	Avishek Kumar Jha	PhD student of Dr. Veera Reddy Yatham qualified for Prime Minister's Research Fellowship (Nov 2022)
19	Akash Bisoyi	PhD student of Dr. Veera Reddy Yatham qualified for Prime Minister's Research Fellowship (Nov 2022)

STUDENTS AWARDS & RECOGNITION

School of Physics		
S No	**Name of Student**	**Award/Recognition**
1	Sebin Joseph Sebastian	iPhD student of Dr. Ramesh C. Nath received Best Prime Minister's Research Fellowship (PMRF) award in Physics at the PMRF Symposium held at IIT Madras (Feb 2023)
2	Sandip Guchhait	iPhD student of Dr. Ramesh Nath received Best Poster Award in EESTER conference held at IIT Madras (Jan 2023)
3	Navaneeth Krishnan K	PhD student of Dr. Bikas C. Das received Best Poster Award in 66th DAE Solid State Physics Symposium held at Birla Institute of Technology, Mesra (Dec 2022)
4	Manisha Bansal	PhD student of Dr. Tuhin Maity received Students Travel Grantto attend International Workshop on Advance Materials in RAK-UAE(Feb 2023) ReceivedBest Poster award in Frontier Symposium in Physics held at IISER Thiruvananthapuram (Feb 2023)
5	Wasim Akram	PhD student of Dr. Tuhin Maity received Students Travel Grantto attend International Workshop on Advance Materials in RAK-UAE(Feb 2023)
School of Mathematics		
S No	**Name of Student**	**Award/Recognition**
1	S. Shreenidhi	BS-MS student of Dr. K. R. Arun received Future Research Talent (FRT) Awardinstituted by Australian National University (Dec 2022)
2	Rahuldev Ghorai	iPhD student of Dr. K. R. Arun qualified for Prime Minister's Research Fellowship (Nov 2022)
3	Sathasivam	iPhD student of Dr. Viji Z. Thomas qualified for Prime Minister's Research Fellowship (Nov 2022)
4	Sarbani Pramanik	iPhD student of Dr. Dhanya Rajendran qualified for Prime Minister's Research Fellowship (Jan 2023)
5	Gopika P B	PhD student of Dr. Nagaiah Chamakuri qualified for Prime Minister's Research Fellowship (March 2023)

GRANTS & PARTNERSHIPS

NEW EXTRAMURAL GRANTS

New Extramural Grants 2022-23					
S No	Name of the Project & Project Code	Name of PI	Funding Agency	Period	Funds Received in 2022-23 (in Lakhs INR)
1	Investigations of Structure-Reactivity Patterns of First-Row Late Transition Metal-Boryl/Silyl Complexes CSIR-01(3025)/21/EMR-II	Dr. Subrata Kundu	CSIR	20.10.2021 to 19.10.2024	6.33 (1st Instalment)
2	DST-Bioenergy & H2 MAP DST/TMD/IC-MAP/2K20/02 [C]	Dr. Deepshikha Jaiswal Nagar	DST	16.03.2022 to 15.03.2025	36.09 (1st Instalment)
3	DST-Materials MAP DST/TMD/IC-MAP/2K20/03 [C]	Dr. Manoj A G Namboothiry	DST	16.03.2022 to 15.03.2025	90.43 (1st Instalment)
4	Growth of Nuclear Radiation Sensitive Single Crystals through Bridgman Technique DRDO-DLJ/TC/1025/I/73	Dr. Ramesh Chandra Nath	DRDO	29.04.2022 to 28.09.2023	11.72
5	BEEscape: Investigating landscape level pesticide use and health of native, social bees SERB-SPR/2021/000510	Dr. Hema Somanathan	SERB	30.05.2022 to 29.05.2025	37.3
6	On the central idempotents of algebras arising from Schur-Weyl Duality and the invariant theory of certain groups SERB-SPG/2021/004200	Dr. Geetha T	SERB	10.06.2022 to 09.06.2025	7.51
7	Studies on the feasibility of electrochemical oxidation of 5-hydroxymethylfurfural to furan dicarboxylic acid TREEMERA GmbH, Germany	Dr. A Muthukrishnan	OTHERS	08.06.2022 to 07.12.2022	9.84
8	Chief Minister's Navakerala Postdoctoral Fellowship (CMNPF) KSHEC-A1/144(C)/CMNPF	Dr. Neema P M	KSHEC	20.06.2022 to 19.06.2024	2.0
9	Chief Minister's Navakerala Postdoctoral Fellowship (CMNPF) KSHEC-A1/144(C)/CMNPF	Dr. Hijas K M	KSHEC	14.07.2022 to 13.07.2024	0.25
10	Chief Minister's Navakerala Postdoctoral Fellowship (CMNPF) KSHEC-A1/144(C)/CMNPF	Dr. Aswathi K	KSHEC	04.07.2022 to 03.07.2024	0.25
11	CRISPR Crop Network: Targeted improvement of stress tolerance, nutritional quality and yield of crops by using genome editing ICAR-NASF/BGAM-9021/22-23	Dr. Ravi Maruthachalam	ICAR	16.08.2022 to 15.08.2025	9.86

12	Neutrophils Mediated Enzymatic Biodegradability of Two-Dimensional MXenes Nanosheets: Effect of Surface Functionalization and BloodSerum Protein Coating SERB-SRG/2022/000291	Dr. Rajendra Kurapati	SERB	27.09.2022 to 26.09.2024	26.74
13	Collective spatiotemporal dynamics of biological soft matter using theory and computation SERB-SRG/2022/000043	Dr. Pushpita Ghosh	SERB	27.09.2022 to 26.09.2024	25.97
14	INSPIRE Faculty Fellowship DST/INSPIRE/04/2020/001105	Dr. Pramitha M	DST	09.09.2021 to 08.09.2026	10.29
15	Chromosomal features governing crossover pathway choice DBT-BT/PR41371/BRB/10/1958/2020	Dr. Nishant K T	DBT	14.09.2022 to 13.09.2025	0 (1st Instalment yet to be received)
16	IKS Interships Program 2022 IKS Internships program 2022 (BGS-2)	Dr. Sandhya Ganesan	OTHERS	01.10.2022 to 31.03.2023	1.88
17	Biomass-Derived Carbon Dots for High-Performance Supercapacitor SERB-TAR/2022/000226	Dr. Sam John	SERB	28.10.2022 to 27.10.2025	3.35
18	Hydraulic targets for better crop growth and productivity under climate change like conditions DBT-RAMALINGASWAMI-BT/RLF/Re-entry/08/2021	Dr. Anirban Guha	DBT	01.11.2022 to 31.10.2027	24.72
19	Defining lysosomal mechanisms of defense against intracellular pathogens SERB-SRG/2022/002157	Dr. Sandhya Ganesan	SERB	04.11.2022 to 03.11.2024	21.90
20	Physiology and metabolism of Iysosomal dysfunction in a Iysosomal storage disorder causing prosaposin mutation DBT-RAMALINGASWAMY-BT/RLF/Re-entry/54/2021	Dr. Swathi Devireddy	DBT	22.09.2022 to 21.09.2027	24.72
21	INSPIRE Faculty Fellowship DST/INSPIRE FACULTY/BATCH 18/2022	Dr. Nitin Yadav	DST	08.12.2022 to 07.12.2027	7.0
22	INSPIRE Faculty Fellowship DST/INSPIRE FACULTY/BATCH-18/2022	Dr. Prasanth Valayalamkunnath	DST	08.12.2022 to 07.12.2027	22.0
23	Copper-Mediated Nucleophilic and Electrophilic Propargylation Reactions: Asymmetric Synthesis of Various Propargylic Compounds SERB-CRG/2022/002516	Dr. Alagiri Kaliyamoorthy	SERB	09.01.2023 to 08.01.2026	11.96

NEW EXTRAMURAL GRANTS

24	Atom-Precise Metal Nanocluster and Two-Dimensional Cluster-Assembled Materials for Efficient Electrochemical Nitrogen Reduction Reaction SERB-CRG/2022/000984	Dr. Sukhendu Mandal	SERB	12.01.2023 to 11.01.2026	24.50
25	Thorough investigation of the mechanism of the origin of Gamma-ray burst through first principles, observational interpretation and simulation studies SERB-SRG/2022/000211	Dr. Shabnam Iyyani	SERB	13.01.2023 to 12.01.2025	16.90
26	Synthesis of mimics of collagen, elastin and fibroin via isosteric replacement of amide with triazole SERB-CRG/2022/000568	Dr. K M Sureshan	SERB	13.01.2023 to 12.01.2026	39.87
27	Hybrid numerical schemes for system of hyperbolic conservation laws SERB-MTR/2022/000265	Dr. Asha Kisan Dond	SERB	13.01.2023 to 12.01.2026	2.20
28	Nanofabricated Single Protein Assemblies for Solid-State Bioelectronic Devices SERB-CRG/2022/000584	Dr. Jerry Alfred Fereiro	SERB	18.01.2023 to 17.01.2026	59.05
29	Cyclodextrin tethered polymeric materials for the capture of plant essential oils: Evaluation of its in vitro efficacy as an antimicrobial and cytotoxic agent for biomedical applications SERB-TAR/2022/000048	Dr. Sonia Mol Joseph	SERB	13.10.2022 to 12.10.2025	3.35
30	An Improved Lennard-Jones Formulation for Modeling Adsorption on Graphynes SERB-CRG/2022/006873	Dr. R S Swathi	SERB	31.01.2023 to 30.01.2026	10.83
31	Cancer environment stimuli-responsive DNA nanoparticles: A unique drug delivery vehicle for combination cancer therapy SERB-CRG/2022/002612	Dr. Reji Varghese	SERB	06.02.2023 to 05.02.2026	41.37
32	Existence and qualitative properties of solutions of quasilinear and nonlocal elliptic partial differential equations SERB-MTR/2022/000780	Dr. Dhanya Rajendran	SERB	09.02.2023 to 08.02.2026	2.20
33	Understanding the mutational landscape in different Candida auris clades using a multiprogned approach ICMR-Myco/Adhoc/1/2022-ECD-II	Dr. Nishant K T	ICMR	20.02.2023 to 19.02.2026	21.33

34	Understanding the effect of stabilizing selection for the timing of adult emergence on circadian clock of Drosophila melanogaster SERB-EEQ/2022/001034	Dr. Nisha N Kannan	SERB	22.02.2023 to 21.02.2026	20.64
35	Interface Engineering of Bi-Sb-Ge Tellurite Superlattices using Atomic Layer Deposition SERB-EEQ/2022/001016	Dr. Vinayak B Kamble	SERB	23.02.2023 to 22.02.2026	43.65
36	Development of AI assisted Versatile Chemical Sensor Array for On-demand End Use SERB-CRG/2022/006973	Dr. Vinayak B Kamble	SERB	02.03.2023 to 01.03.2026	22.20
37	2D Materials/Biopolymer based Broad-Spectrum Antimicrobial Multilayer Coatings: Synergistic Approach to Thwart the Biofilm Formation on the Medical Implants SERB-EEQ/2022/000614	Dr. Rajendra Kurapati	SERB	17.03.2023 to 16.03.2026	29.42
38	Stabilization by sparse controls for system of reaction-diffusion equations with mixed state and control constraints SERB-CRG/2022/006421	Dr. Nagaiah Chamakuri	SERB	17.03.2023 to 16.03.2026	11.66
39	Understanding the role of energy producing metabolic pathways on hematopoietic emergence in mouse BT/PR30459/MED/31/449/2021	Dr. Satish Khurana	DBT	28.03.2023 to 27.03.2026	0 (1st Instalment yet to be received)
40	Biomass-Derived Carbon Dots for High-Performance Supercapacitor SERB-CRG/2022/006421	Dr. Ram Kumar	SERB	20.02.2023 to 19.02.2028	0 (1st Instalment yet to be received)
41	National Post-Doctoral Fellowship 75/202/KSCSTE	Dr. Arun Kumar G	KSCSTE	13.03.2023 to 12.04.2024	0 (1st Instalment yet to be received)

ON-GOING EXTRAMURAL GRANTS

On-Going Extramural Grants					
Sl. No	Name of the Project & Project Code	Name of PI	Funding Agency	Period	Funds Received in 2022-23 (in Lakhs INR)
1	Elucidating post-transcriptional regulation of circadian behavior in Drosphila WELLCOME TRUST-IA/I/15/2/502329	Dr. Nisha N Kannan	DBT	01.01.2017 to 30.06.2023	17.24
2	Al(I)/Al(III) Lewis Pairs for the Activation of Inert Chemical Bonds CRG/2019/005040	Dr. Ajay Venugopal	SERB	01.01.2020 to 30.06.2023	1.5
3	Devising practically implementable enhanced means of communication with the aid of quantum resources Chanakya Post-Doctoral Fellowship	Dr. Manik Banik (Mentor)	DST	01.04.2022 to 31.03.2023	0 (Relieved from the Institute on 10.06.2022)
4	NBHM Postdoctoral Fellowship	Dr. Arati Shashi	DAE	01.05.2021 to 30.04.2023	5.49
5	JC Bose Fellowship SB/S2/JCB-64/2013	Dr. K George Thomas	SERB	01.06.2019 to 31.05.2024	22.89
6	Application-development of genome editing tools for gene target discovery and understanding regulation of cholesterol metabolism genes RAMALINGASWAMY-BT/RLF/Re-entry17/2015	Dr. N Sadananda Singh	DBT	01.08.2017 to 31.03.2023	4.99
7	Identifying the effect of a-synuclein induced alterations on electrophysiological homeostasis of dopaminergic neurons in Parkinson's disease progression WELLCOME TRUST-IA/E/17/1/503664	Dr. Poonam Thakur	DBT	01.09.2019 to 31.08.2024	12.09
8	Conflict between Replication and Transcription accelerates Mutagenesis and drives Antibiotic Resistance WELLCOME TRUST-IA/I/18/2/504037	Dr. Sabari Sankar Thirupathi	DBT	01.10.2019 to 30.09.2024	20.17
9	INSPIRE Faculty Fellowship DST/INSPIRE/04/2019/00540	Dr. Shabnam Iyyani	DST	01.10.2020 to 30.09.2025	6.77
10	Targeted Editing of Potato Genome to Develop Variety Specific True Potato Seed (TPS) ICAR-NASF/GT-7024/2018-19	Dr. Ravi Maruthachalam	ICAR	01.11.2018 to 31.10.2022	1.46

ON-GOING EXTRAMURAL GRANTS

11	Understanding the role of Periostin-Itgav interactions in adult and fetal hematopoiesis WELLCOME TRUST-IA/I/15/2/502061	Dr. Satish Khurana	DBT	01.12.2016 to 31.05.2023	31.76
12	Bheja Fry NCBS-INDIABIOSCIENCE OUTREACH GRANTS	Dr. Poonam Thakur	OTHERS	01.12.2021 to 30.11.2022	0
13	Exploring 2D Atomic Crystals for Resistive Switching Based Emerging Artificial Neuromorphic Devices CRG/2021/000567	Dr. Bikas C Das	SERB	02.03.2022 to 01.03.2025	1.5
14	Control and Finite Element Analysis of Cahn-Hilliard-Navier-Stokes system CRG/2021/008278	Dr. Sheetal Dharmatti	SERB	02.03.2022 to 01.03.2025	0
15	NBHM Postdoctoral Fellowship	Dr. Prasanta Kumar Barik	DAE	02.08.2021 to 31.07.2022	0 (Relieved from the Institute on 27.06.2022)
16	Nickel mediated cross-coupling reactions of a - SILYLOXYALKYL - Zinc reagents CSIR-02(0409)/21/EMR-II	Dr. Ramesh Rasappan	CSIR	03.06.2021 to 02.06.2024	0
17	Olfactory cues used in stingless bee foraging-recruitment behavior:behavioral and neuronal perspectives PDF/2020/000943	Dr. Reshma Basak	SERB	04.02.2021 to 03.02.2023	9.63
18	Investigating post-transcriptional regulation of steroidogenic genes during development SR/WOS-A/LS-457/2017 [G]	Dr. Smitha Vishnu	DST	04.03.2019 to 04.09.2022	0.03
19	Design and Synthesis of Pie Extended and Ring- Extended Bis- Macrocycle and Investigating their Photophysical Properties for Optoelectronic Applications CRG/2019/006303	Dr. Gokulnath Sabapathi	SERB	05.02.2020 to 04.02.2023	0
20	Structural and thermodynamic study of the phase separation of TIA1 in the presence of Tau protien and the influence of the phase separation on protien aggregation CRG/2019/004880	Dr. Vinesh Vijayan	SERB	05.02.2020 to 04.02.2023	2.5

ON-GOING EXTRAMURAL GRANTS

21	Multifunctional Biodegradable Hybrid Black phosphorous-CaCO3 Nanoparticles as a Synergistic Targeted Chemo-photothermal Therapy for Glioblastoma Multiforme DBT-BT/RLF/Re-entry/24/2020	Dr. Rajendra Kurapati	DBT	05.04.2021 to 04.04.2026	0
22	Unravelling the interplay of reorganization energy, driving force and electronic coupling on the rate of electron transfer CRG/2019/002119	Dr. Mahesh Hariharan	SERB	06.02.2020 to 05.02.2023	2.0
23	Plasmonic Chromatography for Multiresidue Pesticide Detection in Spices DST/WOS-B/AFE-20/2021[G]	Dr. T Shyamala	DST	07.01.2022 to 06.01.2025	12.85
24	Infrared Plasmonics of Nanostructured Conducting Oxides for communication and spectroscopic applications CRG/2019/004965	Dr. Joy Mitra	SERB	07.02.2020 to 06.02.2023	0
25	Ramanujan Fellowship RJF/2020/000103	Dr. Joydeb Mandal	SERB	08.03.2021 to 07.03.2026	21.51 (Relieved from the Institute on 23.08.2022)
26	Decoding Neuronal States using Chimera Patterns CRG/2021/000816	Dr. D V Senthil Kumar	SERB	08.03.2022 to 07.03.2025	1.0
27	Schurs Exponent Conjecture MTR/2020/000483	Dr. Viji Z Thomas	SERB	10.02.2021 to 09.02.2024	0
28	Characterization of network structure and homogeneity of N-Doped Graphene activated Natural Rubber Sulfur Vulcanizate TAR/2021/000384	Dr. Rani Alphonsa Jose	SERB	10.12.2021 to 09.12.2024	0
29	High fluorine content DNA micelle: A Universal "OFF/ON" 19F-NMR-based probe for the detection of miRNA and Telomerase for cancer diagnosis BT/PR30172/NNT/28/1593/2018	Dr. Reji Varghese	DBT	11.02.2019 to 10.08.2022	1.53
30	Understanding the regulation of kinetochore protein phosphorylation for the activation of spindle assembly check-point CRG/2020/002452	Dr. Tapas Kumar Manna	SERB	11.03.2021 to 10.03.2024	20.0
31	Development of next generation all-solid-state sodium-sulfur batteries for lighting and consumer electronic applications PDF/2020/000209	Dr. Shruti Suriyakumar	SERB	12.01.2021 to 11.01.2023	0

32	Multi-wavelenth Selective Plane Illumination Microscope - with simultaneous magnification at mutiple levels: A promising imaging technology for molecular and cellular biology BT/PR30005/MED/32/657/2018	Dr. M Suhesh Kumar Singh	DBT	13.09.2019 to 12.09.2022	0.43
33	INSPIRE Faculty Fellowship DST/INSPIRE/04/2019/001843	Dr. Sooraj K	DST	13.10.2020 to 12.10.2025	0 (Relieved from the Institute on 30.06.2022)
34	Blockade of CXCL-3—CXCR-2 axis normalises tumor vasculature and enhances immune surveillance in triple negative breast cancer TAR/2021/000147	Dr. Suboj Babykutty	SERB	13.12.2021 to 12.12.2024	0
35	DST-Storage MAP DST/TMD/IC-MAP/2K20/01	Dr. M M Shaijumon	DST	14.02.2022 to 13.02.2025	0
36	Energy-Efficient Synaptic Transistors of Two-Dimensional Layered Material EEQ/2021/000810	Dr. Bikas C Das	SERB	14.03.2022 to 13.03.2025	0
37	Thermal Expansion Measurements in a spin ½ Heisenberg antiferromagnet $C_{12}H_{14}CuN_4O_5$ CRG/2021/001262	Dr. Deepshikha Jaiswal Nagar	SERB	14.03.2022 to 13.03.2025	0
38	Microresonator frequency combs in visible: A path to ultrashort pulse generation and spectroscopy CRG/2019/000993	Dr. Ravi Pant	SERB	15.01.2020 to 14.01.2023	3.0
39	Scheme for Promotion of Academic and Research Collaboration (SPARC) SPARC/2018-2019/58/SL [IN]	Dr. Nishant K T	MoE	15.03.2019 to 30.09.2022	0
40	Structure, function and molecular mechanism of transcription regulators in Mycobacterium spp STARS/APR2019/BS/729/FS	Dr. Ramanathan Natesh	MoE	15.05.2020 to 14.05.2024	7.51
41	Photochemical and Electrochemical Processes in Assembled Molecules and Nanomaterials: Implications Field and Coherence in Photovoltaics DST/NM/TUE/EE-01/2019	Dr. K George Thomas	DST	15.11.2021 to 14.11.2025	15.82

ON-GOING EXTRAMURAL GRANTS

42	Functionality Shuttling via Catalytic Isodesmic Reaction and Its Application in Organic Synthesis SRG/2021/000572	Dr. Basudev Sahoo	SERB	15.12.2021 to 14.12.2023	0
43	Activation of Alkyl Chlorides Driven by Visible Light Titanium Photoredox Catalysis SRG/2021/000834	Dr. Veera Reddy Yatham	SERB	15.12.2021 to 14.12.2023	0
44	Chemistry of Reactive Sulfur and Selenium Speicies: Elucidating the Routes in Bio(in) organic Signalling and Toxicology CRG/2021/001174	Dr. Subrata Kundu	SERB	15.12.2021 to 14.12.2024	8.0
45	Lithium Battery Testing Momentive Performance Materails (India) Pvt Ltd	Dr. M M Shaijumon	OTHERS	15.12.2021 to	0
46	Non-volatile resistance switching memory on SiC for harsh environment applications CRG/2021/000935	Dr. Kumaragurubaran Somu	SERB	16.03.2022 to 15.03.2025	0
47	Development of porous titania supported Lithium Hydroxide for efficient capture of carbon-di-oxide ISRO/RES/3/861/20-21	Dr. K M Sureshan	ISRO	16.11.2020 to 31.12.2023	0
48	Conductive inorganic-organic hybrid materials for electrochemical applications CSIR-01(3024)/21/EMR	Dr. Sukhendu Mandal	CSIR	17.08.2021 to 16.08.2024	0
49	Palladium and Magnesium based hybrid nanocluster structures for high gravimetric capacity hydrogen storage DST/TMD/HFC/2K18/37 [C] & [G]	Dr. Deepshikha Jaiswal Nagar	DST	17.09.2019 to 16.09.2022	12.0
50	Exploring the active sites of nitrogen and boron containing/doped materials:N2-C-B type active sites for electrocatalytic 4-electron oxygen reduction reaction DST/TMD/HFC/2K18/24[C] & [G]	Dr. A Muthukrishnan	DST	17.09.2019 to 16.09.2023	5.0
51	Terahertz spectroscopic studies of layered 2-D materials CRG/2019/004865	Dr. Rajeev N Kini	SERB	18.01.2020 to 17.07.2023	2.5
52	INSPIRE Faculty Award INSPIRE FACULTY AWARD/ BATCH-13/2017	Dr. Manik Banik	DST	18.04.2018 to 17.04.2023	0 (Relieved from the Institute on 10.06.2022)

53	Stereoselective Total Synthesis of Atisan Based Diterpenoids Antiquorpenes CRG/2020/003737	Dr. Rajendar Goreti	SERB	18.12.2020 to 17.12.2023	4.5
54	Unraveling the conformational changes during photocyclization of o-arenes by femtosecond time-resolved circular dichorism CRG/2020/000321	Dr. Y Adithya Lakshmanna	SERB	18.12.2020 to 17.12.2023	6.0
55	The role of colonic hepatic Tumor Over-expressed Gene (chTOG) in regulation of kinetochore size and fidelity of mitotic chromosome segregation BT/HRD-NBA-NWB/38/2019-20[7]	Dr. Tapas Kumar Manna	DBT	19.02.2020 to 18.02.2023	0
56	Integrating collective behaviour with biomechanics of social spider webs CRG/2019/003805	Dr. Hema Somanathan	SERB	19.03.2020 to 18.07.2023	0.5
57	Neural-network quantum state (NQS) based variational wave function for strongly correlated electron systems CRG/2021/005792	Dr. Amal Medhi	SERB	19.03.2022 to 18.03.2025	0
58	INSPIRE Faculty Award INSPIRE FACULTY AWARD - IFA-15-MA-72	Dr. Dhanya Rajendran	DST	20.04.2016 to 19.04.2022	0
59	Unrevealing the entry mechanism of Tick-borne Kyasanur Forest diseases Virus BT/PR32565/MED/29/1554/2020	Dr. Stalin Raj Victor	DBT	20.07.2021 to 19.07.2023	7.6
60	INSPIRE Faculty Fellowship DST/INSPIRE/04/2019/002507	Dr. Mathew Arun Thomas	DST	20.10.2020 to 19.10.2025	19.39
61	Study of Exotic Ground States in Frustrated Triangular Lattice Antiferromagnets CRG/2019/000960	Dr. Ramesh Chandra Nath	SERB	20.12.2019 to 19.12.2022	2.5
62	Control of stem cell heterogeneity during shoot regeneration in Arabidopsis - a functional and mechanistic analysis of is epigenetic regulators EMR/2017/002503	Dr. Kalika Prasad	SERB	21.05.2019 to 20.05.2022	0
63	Design and fabrication of electrocatalytic microcells using elemental 2-dimensional materials CRG/2021/006246	Dr. M M Shaijumon	SERB	22.03.2022 to 21.03.2025	0

ON-GOING EXTRAMURAL GRANTS

64	FIST Program SR/FST/CSII-042/2016 [C]	HoD, SoP	DST	22.07.2019 to 21.07.2024	0
65	INSPIRE Faculty Fellowship DST/INSPIRE/04/2020/001237	Dr. Anand Narayana Sarma	DST	22.10.2021 to 21.10.2026	21.39
66	Utilization of Oleophilic Atomically Precise Metal Nanocluster in Aqueous Medium Through Host-Guest Self-Assembly Approach PDF/2020/001085	Dr. Sourav Biswas	SERB	22.12.2020 to 21.12.2022	0.61 (Relieved from the Institute on 06.12.2022)
67	HPC technologies and large-scale simulation of the electromechanics for the heart function DST/NSM/R&D_HPC_ Applications/2021/03.28	Dr. Nagaiah Chamakuri	DST	23.03.2021 to 22.03.2023	0
68	Noble-Metal free Advanced Catalysts for Hydrogen Generation and Fuel Cell Applications DST/TMD/MES/2K18/136 [C] & [G	Dr. M M Shaijumon	DST	23.10.2019 to 22.10.2023	12.28
69	Development and Evaluation of diagnostics and Candidate VACacines for emerging SARS-Coronavirus-2 (Dec-VAC-SARS) IPA/2020/000070	Dr. Stalin Raj Victor	SERB	23.12.2020 to 22.12.2023	5.0
70	Quasi-optimality of adaptive finite element methods for elliptic optimal control problems SRG/2020/001027	Dr. Asha Kisan Dond	SERB	23.12.2020 to 22.12.2022	2.5
71	Design of chiral self-sorting and stimuli-responsive dynamic chiral cages and host-guest chemistry SRG/2020/001486	Dr. Soumen De	SERB	23.12.2020 to 22.12.2022	1.2
72	Realizing distributed quantum computing with silicon- based spin qubits DST/ICPS/QuST/Theme-4/2019/General	Dr. Madhu Thalakulam	DST	24.02.2020 to 31.03.2024	0
73	Open quantum systems - Non Markovian dynamics and Not Completely Positive Maps DST/ICPS/QuST/Theme-4/2019/General	Dr. Anil Shaji	DST	24.02.2020 to 31.03.2024	0
74	Organisation of Summer Schools DST/ICPS/QuST/Theme-4/2019/General-Organisation of Summer Schools	Dr. Anil Shaji	DST	24.02.2020 to 31.03.2024	0

75	Transparent solar cells: A perspective for bifacial solar cells CRG/2021/003874	Dr. Manoj A G Namboothiry	SERB	24.02.2022 to 23.02.2025	0
76	Asymptotic preserving IMEX-DG schemes on adaptive grids for multiscale compressible flows CRG/2021/004078	Dr. K R Arun	SERB	24.02.2022 to 23.02.2025	0
77	Understanding diversification of Impatiens species in the Northern Western Ghats BT/PR27535/NDB/39/600/2018	Dr. Ullasa Kodandaramiah	DBT	24.09.2018 to 23.03.2022	0.13
78	IISER TVM-KLDB Collaborative Project KLDB COLLABORATIVE PROJECT	Dr. N Sadananda Singh	OTHERS	24.09.2021 to 23.09.2026	0
79	Twistronics with transition metal dichalcogenides IPA/2020/000021	Dr. Rajeev N Kini	SERB	26.03.2020 to 26.03.2025	0
80	Structural elucidation of the bacterial transcription elongation complex with Gre factors: focus on Mycobacterium tuberculosis RNA polymerase KSCSTE/264/2021-BLP	Dr. Sandrea Maureen Francis	OTHERS	26.04.2021 to 25.04.2024	5.61
81	Combinatorial exploration and property control of oxide based power semiconductors DST/INT/JSPS/P-288/2019	Dr. Kumaragurubaran Somu	DST	26.06.2019 to 25.06.2022	0
82	Conformal approach to supergravity: New Perspectives and Applications CRG/2018/002373	Dr. Bindusar Sahoo	SERB	27.03.2019 to 26.09.2022	1.5
83	FIST Program SR/FST/LS-II/2018/217 [C]	HoD, SoB	DST	27.08.2019 to 26.08.2024	0
84	INSPIRE Faculty Award DST/INSPIRE Faculty Award/2016/DST/INSPIRE/4/2015/2111	Dr. Vinayak B Kamble	DST	28.07.2016 to 27.07.2022	15.46
85	Autophagy upregulation as a therapeutic approach for Parkinson's disease SRG/2021/000981	Dr. Poonam Thakur	SERB	28.12.2021 to 27.12.2023	4.0
86	Efficient Neuromorphic Memory via Nano-engineered Composite Film SRG/2021/000423	Dr. Tuhin Subhra Maity	SERB	28.12.2021 to 27.12.2023	0

ON-GOING EXTRAMURAL GRANTS

87	Identification and characterization of the molecular factors for the quality-control of kinetochore size and fidelty of spindle-chromosome attachment BT/PR30271/BRB/10/1740/2018	Dr. Tapas Kumar Manna	DBT	29.07.2019 to 28.07.2023	5.12
88	Efficient means of zero-error communication through coherent controlling of noisy quantum channels SRG/2021/000267	Dr. Manik Banik	SERB	29.12.2021 to 28.12.2023	0 (Relieved from the Institute on 10.06.2022)
89	Junction barrier modulation study in engineered core-shell oxide heterostructure gas sensor device DST/NM/NT/2018/124 [C] & [G]	Dr. Vinayak B Kamble	DST	30.10.2018 to 30.04.2022	0
90	Engineering a site-specific synthetic chromatin remodeler for genome editing and gene expression SPR/2020/000427	Dr. Nishant K T	SERB	31.08.2021 to 30.08.2024	0
91	Integration of 2D materials in organic and organic-inorganic hybrid solar cells:Insights into charge extraction and transport STARS/APR2019/PS/308/FS	Dr. Manoj A G Namboothiry	MoE	31.12.2019 to 04.02.2024	5.36
92	Quantum point contract charge amplifiers embedded in a planar superconducting microwave resonator: Quantum-limited charge sensing and counting STARS/APR2019/PS/363/FS	Dr. Madhu Thalakulam	MoE	31.12.2019 to 04.02.2024	5.83
93	Structural characterization of functional prion domain of mammalian cytoplasmic polyadenylation element-binding protein 3 (CPEB3) STARS/APR2019/BS/708/FS	Dr. Vinesh Vijayan	MoE	31.12.2019 to 18.02.2024	10.51
94	Electrophilic aluminium compounds for catalytic CO_2 hydrosilylation STARS/APR2019/CS/250/FS	Dr. Ajay Venugopal	MoE	31.12.2019 to 18.02.2024	2.44
95	Epigenetic modulation of centromeres to produce in vivo haploids by triggering uniparental genome elimination in plants STARS/APR2019/BS/818/FS	Dr. Ravi Maruthachalam	MoE	31.12.2019 to 18.03.2024	6.7
96	ENDFLU - Evaluation of Rationally Designed Influenza Vaccines DBT-EU-BT/IN/EU-INF/15/RV/19-20	Dr. Stalin Raj Victor	DBT	31.12.2020 to 30.12.2025	22.35

NEW MEMORANDA OF UNDERSTANDING/ R&D AGREEMENTS

New Memoranda of Understanding (MoUs) and R&D Agreements Signed in 2022-23				
Sl. No	Partner Organization	Purpose/Brief Description	Date of Signing	Remarks
1	Kerala University of Digital Sciences, Innovation And Technology, Thiruvananthapuram	For academic cooperation. Exchange of faculty and/or staff. Exchange of graduate and/ or undergraduate students. Exchange of scientific materials, publications, and information. Exchange of cultural activities. Joint conferences and academic programs. Joint research activities and publications.	23.01.2023	For a period of 5 years
2	Institute for Protein Research, Osaka University, Japan	Activities such as collaborative research, lectures, symposiums etc. The exchange of information and materials in those fields, which are of interest to the two institutions. The exchange of undergraduate students and graduate students. Identification of special short-term academic projects and programs of mutual benefits to both institutions.	17.08.2023	Renewed for a period of 5 years

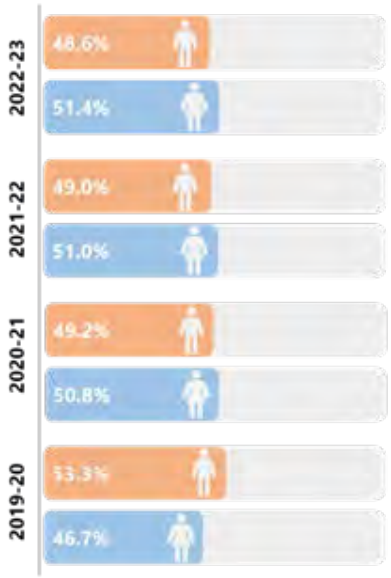
ACADEMIC PROGRAMS

ACADEMIC PROGRAMS

Academic programs at IISER Thiruvananthapuram includes undergraduate, graduate and postgraduate degrees. All the schools offer an array of courses for students to choose from. Different academic programs offered at IISER Thiruvananthapuram include BS-MS degree (in Biology, Chemistry, Mathematics and Physics), Integrated and Interdisciplinary BS-MS degree (in Biology, Chemistry, Data Science, Mathematics and Physics), MSc degree (in Biology, Chemistry, Mathematics and Physics), Integrated PhD degree (in Biology, Chemistry, Mathematics and Physics) and PhD degree (in Biology, Chemistry, Mathematics and Physics)

Total Strength of Students across Programs

	2022-23	2021-22	2020-21	2019-20
BS-MS				
Male	496	502	509	462
Female	635	601	579	429
MSc				
Male	86	46	NA	NA
Female	60	31	NA	NA
Integrated PhD/PhD				
Male	251	238	216	182
Female	186	187	169	136
Total	**1714**	**1605**	**1473**	**1209**



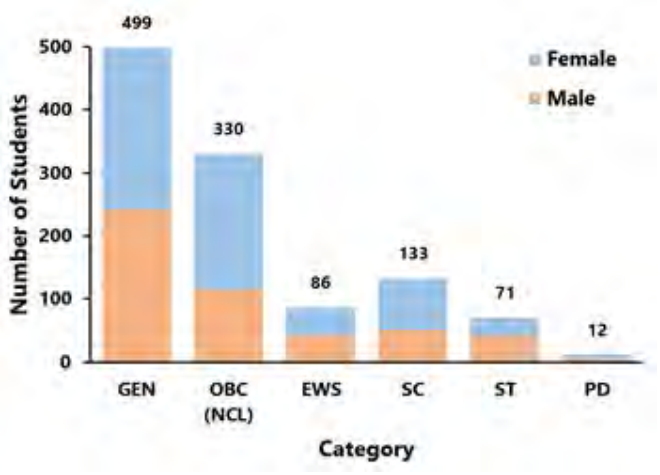
IISER TVM has successfully maintained a balanced representation of genders among its students, fostering an inclusive and diverse learning environment.

BS-MS Programme

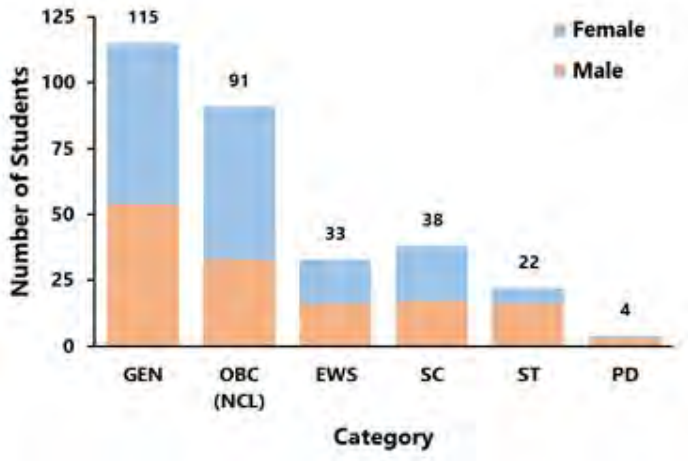
The BS-MS Programme at IISER TVM is tailored to meet contemporary needs with a strong emphasis on interdisciplinary studies. The first two years focus on foundational courses encompassing natural sciences, mathematics, computation, and language skills for scientific communication. In the third and fourth years, students specialize in one major (Biology, Chemistry, Mathematics or Physics) and one or more minors. A research project is undertaken in the fifth year.

Gender & Category-wise distribution of all BS-MS Students

	GEN	OBC (NCL)	EWS	SC	ST	PD	Total
Male	242	116	42	51	41	4	496
Female	257	214	44	82	30	8	635
Total	499	330	86	133	71	12	1131



Gender & Category-wise distribution of BS-MS Students enrolled in 2022							
	GEN	OBC (NCL)	EWS	SC	ST	PD	Total
Male	54	33	16	17	16	3	139
Female	61	58	17	21	6	1	164
Total	115	91	33	38	22	4	**303**



Sources of scholarship for all BS-MS Students		Sources of scholarship for BS-MS Students Enrolled in 2022	
	No of Students		No of Students
DST-INSPIRE	240	DST-INSPIRE	56
KVPY	31	Others	20
Others	178		
Total	449	Total	76

GEN: General; OBC (NCL): Other Backward Class (Non-Creamy Layer); EWS (Economically Weaker Section); SC: Scheduled Caste; ST: Scheduled Tribe; PD: Person with Disability

In 2022, a total of 303 students were enrolled in the BS-MS program. However, 44 students subsequently discontinued from the program, resulting in a final enrollment number in 2022 to 259 students

Details of the fifth-year projects carried out by BS-MS students during 2022-23

School of Biology

S No	Name of Student	Roll No	Supervisor	Project Title
1	A Anjali	IMS17001	Dr. Nishant K. T.	Effect of Salt Stress on LOH
2	Abel John Koshy	IMS17005	Dr. Jishy Varghese	Unravelling the Role of miR-100 and Shc In Insulin Signalling and Metabolism
3	Abhishek Raghunathan	IMS17012	Prof. S. Murty Srinivasula	Dissection of the determining factors of the localisation of the E3 ligase CARP2: a delicate interplay between lipid PTM's and phospholipid binding
4	Afwan K K	IMS17023	Dr. Ramanathan Natesh	Towards targeting the globular domain of Mycobacterium tuberculosis Gre factor
5	Akhila S Kumar	IMS17033	Dr. Satish Khurana	Mapping of Extramedullary Hematopoietic Stem Cell Niche in the Murine Spleen
6	Akshay J	IMS17037	Dr. Nishant K. T.	Genome-wide localisation of Msh5 during meiosis in mutant backgrounds of Saccharomyces cerevisiae
7	Akshay J Ganesh	IMS17038	Dr. Satish Khurana	Computational Screening of Molecular Regulators of Hematopoietic Stem Cell Function during Hematopoietic Development in Mouse
8	Amit Santhu Sabu	IMS17048	Prof. Tapas K. Manna	Studying the Molecular Regulation of Kinetochore Proteins During Mitosis
9	Amith B	IMS17049	Dr. N. Sadananda Singh	Target Identification of Novel Proline Imidazolidinones
10	Anish Varghese	IMS17060	Dr. Poonam Thakur	Effect of glycation on α-synuclein fibril formation
11	Annu Mariyam Joseph	IMS17065	Dr. Satish Khurana	Determining the role of Integrin signaling in modulating bone niche via altering mesenchymal stem cell function
12	Anu Anil	IMS17066	Dr. Nishant K. T.	Effect of Environmental Stress on LOH
13	Saralkar Anumit Devendra	IMS17067	Prof. Hema Somanathan	Silk Production Anatomy and Competitive Effects of Sociality in Indian Social Spider Stegodyphussarasinorum
14	Archana Rajan V	IMS17071	Dr. Ravi Maruthachalam (For Dr. Kalika Prasad)	Cell Division & Cell Polarity Pattern Instructs De-Novo Shoot Regeneration
15	Arunima Muliyil	IMS17073	Prof. Tapas K. Manna	To Explore Insights in FBXW7 Ubiquitin Ligase Mediated Regulation of a Centriolar Assembly Protein - STIL
16	Aryan Jakhar	IMS17076	Prof. Hema Somanathan	Optimization of flight properties in Tetragonulairidipennis
17	Asha A S	IMS17078	Dr. V. Stalin Raj	Molecular Cloning and Expression of Ferret Cytokines in Prokaryotes
18	Aswin Ashok	IMS17083	Dr. N. Sadananda Singh	Elucidating the Functional Role of Circular RNA in Gene Regulation
19	Ayisha Marwa M P	IMS17086	Dr. Jishy Varghese	Role of miR-184 in growth and development of Drosophila melanogaster
20	Azmi Sheriff	IMS17087	Dr. Ullasa Kodandaramaiah	Understanding clinal patterns of hybrid zones and colour variation among Impatiens
21	Bhagyanath S	IMS17089	Prof. Tapas K. Manna	Deciphering the Role of chTOG and TACC3 in Microtubule Polymerization and their Interaction with γ-TuRC
22	Charutha V S	IMS17093	Dr. Satish Khurana	Elucidating the role of outside-in integrin signaling in the regulation of SDF-1□ expression in hematopoietic stem cell niche
23	Chilupuri Ranjith Kumar	IMS17094	Prof. Tapas K. Manna	Phosphoregulation of EB1-Ska1 interaction and their structural organisation on microtubules

24	Devika Radhakrishnan	IMS17096	Dr. Nisha N. Kannan	Investigating the role of neuropeptides in the interplay between circadian clock and metabolism in Drosophila melanogaster
25	Devika S P	IMS17097	Prof. Hema Somanathan	Spontaneous colour preferences and colour learning in the Giant Asian honeybee, Apisdorsata.
26	Dhanapal Charan Viswa	IMS17098	Dr. Nisha N. Kannan	Elucidating the role of Adenosine in sleep and metabolism of Drosophila melanogaster
27	C L Dheeraj	IMS17099	Dr. Ullasa Kodandaramaiah	Trade-offs between larval growth rate and life-history traits in butterflies
28	Fabi Rasheed	IMS17102	Dr. Sabari Sankar Thirupathy	Investigating the role of double-strand break repair pathways in maintaining genome stability in Bacillus subtilis
29	Gagan Vishaya Shetteppanavar	IMS17104	Dr. Sabari Sankar Thirupathy	Effects of replication-transcription conflicts on gene expression noise in Bacillus subtilis.
30	Gayathri Soman	IMS17106	Dr. Sabari Sankar Thirupathy	Analyzing the effect of gene orientation on gene expression errors in Bacillus subtilis
31	Gayatri Anand	IMS17107	Prof. Hema Somanathan	Quantitative approaches for studying the behaviour and global distribution of Asian honeybees
32	Gifty Alin Jacob	IMS17109	Prof. Hema Somanathan	Olfactory communication in the stingless bee, Tetragonulairidipennis
33	Gokul Prabhu C	IMS17112	Dr. Ullasa Kodandaramaiah	A meta-analysis on the preference performance hypothesis in butterflies
34	Gopakumar V V	IMS17113	Dr. N. Sadananda Singh	Understanding the role of E3 Ubiquitin ligases in cytoskeleton regulation
35	Hazekaiah Graham Laloo	IMS17118	Dr. Ullasa Kodandaramaiah	Pupal colour plasticity in tropical butterflies: Environmental factors affecting it and its correlation with adult wing polyphenism
36	Hemamshu R	IMS17119	Dr. Ravi Maruthachalam (For Dr. Kalika Prasad)	Computational study of Auxin and Pin1 dynamics in shoot regeneration in Arabidopsis thaliana
37	Jeyasri S V	IMS17124	Dr. Sabari Sankar Thirupathy	Examining the effects of RNA polymerase backtracking on DNA damage response and spontaneous mutations in Bacillus subtilis
38	Krishna Nair	IMS17132	Dr. Nisha N. Kannan	Interplay of Circadian Clock with Pre-Adult Development Time and Short-Term Memory
39	Maria John	IMS17142	Dr. Nisha N. Kannan	Role of microRNAs in the circadian regulation of locomotor activity in Drosophila melanogaster
40	Melvin Daniel Roji	IMS17145	Dr. V. Stalin Raj	Production of recombinant envelope proteins and pseudotyped viruses of KFD Virus
41	Nandana N	IMS17153	Dr. Nishant K. T.	Assessment of genome stability in a wild strain of Saccharomyces cerevisiae
42	Neha Hanna Daniel	IMS17156	Dr. Poonam Thakur	Binding of calcium ions to Alpha-Synuclein: A molecular docking study
43	Niranjana Nair	IMS17163	Dr. V. Stalin Raj	Cloning, Production and Characterization of Adenovirus host cell receptors
44	Niranjana S Manoj	IMS17164	Dr. Ravi Maruthachalam	Fine resolution mapping and gene complementation of bushy mutant in Arabidopsis thaliana
45	P Charulekha	IMS17166	Dr. V. Stalin Raj	Determination of Host Factors for SARS-CoV-2 Entry and Development of Recombinant Adenovirus Vector Vaccine
46	Pavithra C K	IMS17167	Dr. Ravi Maruthachalam	Generation of transgene cassettes for complementation of UNI gene and for characterizing kinetochore protein, DSN1 in Arabidopsis thaliana

47	Prajakta Bodkhe	IMS17170	Dr. Jishy Varghese	Elucidating tissue-specific responses to nutrient and oxygen deprivation in Drosophila melanogaster.
48	Prema Mondal	IMS17172	Prof. S. Murty Srinivasula	Role of ubiquitin ligases in regulation of Golgi homeostasis
49	Seetha Lakshmi Rajeev	IMS17193	Dr. Jishy Varghese	Fat body specific screen of microRNA sponge lines to elucidate their role in metabolism in Drosophila melanogaster
50	Shradha Ajith	IMS17198	Dr. Sabari Sankar Thirupathy	Examining the Effects of Sublethal Levels of Antibiotics on E. coli
51	Siddharth Shivanandan	IMS17202	Dr. Ravi Maruthachalam	Understanding kinetochore assembly in CenH3 deficient holocentromeres
52	Sidharth T	IMS17204	Dr. N. Sadananda Singh	Identification of genes involved in the cytotoxic effect of Doxorubicin
53	Sneha S	IMS17208	Dr. Ramanathan Natesh	Towards Structure-based Drug Design Targeting Mycobacterium tuberculosis Mfd RNAP Interacting Domain
54	Sreeparvathy V E	IMS17215	Dr. Satish Khurana	Understanding the role of HIF-1α in the activity and maintenance of the adult NSC pool
55	Sreyas Sreekumar	IMS17216	Dr. Sabari Sankar Thirupathy	Examining the effects of sublethal levels of antibiotics on Bacillus subtilis
56	Sudev Sankar	IMS17219	Dr. Ravi Maruthachalam	Verification of the putative gene targets of MEDEA and DEMETER in Arabidopsis thaliana sporophyte
57	Sukhada Darpe	IMS17221	Dr. V. Stalin Raj	A study on SARS-CoV-2 variants using computational and molecular biology approaches
58	Uthpala M L	IMS17228	Prof. S. Murty Srinivasula	Insights into selective targeting and degradation of master regulator protein of mitophagy, PINK1
59	Vinayak G Kamath	IMS17231	Prof. Hema Somanathan	Foraging dynamics of the giant honeybee, Apisdorsata
60	Riya Sheokand	IMS17241	Dr. N. Sadananda Singh	Identification of novel regulators of PCSK9 and their involvement in Cholesterol Homeostasis
61	Rigzin Norboo	IMS16158	Dr. Ullasa Kodandaramaiah	Host plants effect on Life History traits of Ypthima huebneri

School of Chemistry

S No	Name of Student	Roll No	Supervisor	Project Title
1	Abhindev K V	IMS17010	Dr. Reji Varghese	Design and synthesis of barbituric acid-tetraphenyl ethylene conjugate for tunable aggregation-induced emission
2	Adil Aboobacker	IMS17016	Dr. R. S. Swathi	Anion-π Interactions Involving Double-Decker Graphynes: A Computational Study
3	Afna E	IMS17022	Dr. Alagiri Kaliyamoorthy	Synthesis of Various 1-Heteroaryl-1-propynes and 2-Arylimidazo[1,2-a]pyridines
4	Aiswarya P	IMS17027	Dr. Subrata Kundu	Nitric Oxide Generation from Nitrite at a Phenolate Bridged Dizinc(II) Site
5	Ajay Shaji	IMS17029	Dr. Gokulnath Sabhapathi	Unraveling the optical and redox properties of Dithienopyrrole based bridged Octaphyrins
6	Ajith George	IMS17030	Dr. Soumen De	Synthesis and exploration of axially chiral hosts for recognition of guest molecules and catalysis
7	Ajsal K	IMS17032	Dr. Gokulnath Sabhapathi	Attempt towards triply fused Benzi-Corrole dimer
8	R Akilan	IMS17034	Dr. R. S. Swathi	Permeation of Fullerenes through Coronoids

9	Akshaya C	IMS17040	Prof. K. George Thomas	Altering the Emission Landscape of Trap Emissive Quantum Dots: A Proof of Concept
10	Akshaya N	IMS17041	Prof. Mahesh Hariharan	Single Atom Substitution Alters the Charge Transport Properties in Hydrogen Bonded Napthothiazole Crystals
11	Amit Kumar	IMS17047	Dr. Yatham Veera Reddy	Visible light mediated coupling of alkynyl bromides and unactivated Alkyl iodides for the synthesis of internal alkynes
12	Angela P A	IMS17058	Dr. Sukhendu Mandal	Water-Soluble Nanoclusters Encapsulated in ZIF-8 as Heterogeneous Electrocatalysts for Hydrogen Evolution and Oxygen Reduction Reaction.
13	Anjali Das	IMS17061	Dr. Muthukrishnan A.	Measuring the density of states of an organic semiconductor using electrochemical impedance spectroscopy.
14	Arunima S	IMS17074	Dr. Vinesh Vijayan	Understanding the structural characteristics of the prion domains of CPEB3
15	Arya S Ajay	IMS17075	Dr. Subrata Kundu	Synthesis and characterization of n-Heterocyclic Carbene Complexes of first-row late transition metals
16	Ashish Kumar Meena	IMS17080	Dr. Sivaranjana Reddy	A theoretical investigation of the ESIPT phenomenon in 2□ (2□ Hydroxyphenyl)Benzazole derivatives
17	Athira Jojo	IMS17084	Dr. Muthukrishnan A.	Exploring carbon encapsulated copper sulfide catalysts for hydrogen evolution reaction
18	Athira K Prakash	IMS17085	Dr. Basudev Sahoo	Silver-Catalyzed Alkylation of N-Heteroarenes with Substituted Dihydroquinazolinones
19	Bhargav R M	IMS17091	Dr. Ajay Venugopal	Zinc hydride compound for catalytic activation of unsaturated molecules
20	Devika P Thankachan	IMS17095	Prof. Y. D. Vankar (Jointly with Dr. Soumen De)	Attempts towards the synthesis of 2-C-FORMYL glycals and 2C-branched C-ARYL glycosides
21	R Hariny	IMS17117	Dr. Joydeb Mandal	Synthesis and stabilization of segmented copolymers: a study of immiscibility driven self-assembly
22	Hiba Haneena K	IMS17120	Prof. K. George Thomas	Probing the surface reactivity of silver capped gold nanoparticles using single-particle scattering spectroscopy
23	Jeswin Sunny	IMS17123	Prof. Mahesh Hariharan	Excimer Formation in Conformationally Flexible Bichromophores Hampers the Lifetime of Symmetry-Broken Charge Separated State
24	Kamalini S	IMS17128	Dr. Gokulnath Sabhapathi	5,15-A2BC Type Donor Acceptor Porphyrin System Bearing Two Different Polycyclic Aromatic Hydrocarbons
25	Kuruva Pruthvi	IMS17134	Prof. K. M. Sureshan	Synthesis of Hydrophobic Pseudopolypeptides Containing Aib-Ile Repeat Sequence via Topochemical Polymerization
26	Mahesh Kumar Choudhary	IMS17137	Dr. Subrata Kundu	Reactivity of Nitrite at Monometallic and Heterobimetallic Metal Site
27	Monisha V	IMS17147	Dr. R. S. Swathi	An analytic approach for estimation of plasmonic properties of metal nanodisks
28	Muhsin Abdul Majeed	IMS17148	Dr. Soumen De	Synthesis and reversible photoswitching of chiral container molecules
29	Nancy Bhadiar	IMS17151	Dr. Sukhendu Mandal	Monometallic and Bimetallic nanoclusters synthesis using 1-Ethynyladamantane as ligand
30	Nikitha S	IMS17158	Dr. Sooraj B.	Computational studies on the formation of solid-electrolyte interface in lithium-ion batteries
31	Prince Yadav	IMS17173	Dr. Ramesh Rasappan	Synthesis of benzylic pivalates for utilization in C-Si cross-coupling reactions
32	Raniya P	IMS17175	Prof. Mahesh Hariharan	Investigation of Dual Fluorescence in Amine-substituted Perylenediimide.

33	Rasajna M	IMS17176	Dr. Rajendar Goreti	Studies towards the synthesis of diaportinol and neocosmosins B and C
34	Rejith Raj R	IMS17177	Dr. Subrata Kundu	Nitric oxide release from Copper(II) and Cobalt(II) nitrite complexes via oxygen atom transfer
35	Renjith V	IMS17178	Dr. Vinesh Vijayan	Probing the Seeded Aggregation of Tau Construct K19 Using NMR Spectroscopy
36	Revathy Raveendranath	IMS17180	Dr. Sukhendu Mandal	A molecular dynamics study on the effect of 312P and 310Y on the conformational preferences of R3 peptide
37	Rithika Saroj Sankar	IMS17181	Dr. Vinesh Vijayan	Structural and aggregation studies on the lmd domain of CPEB3 protein
38	Riya Krishnan	IMS17182	Dr. Sukhendu Mandal	Synthesis and characterization of a thiazolothiazole-based metal-organic framework
39	Rizwana Rahmathulla A	IMS17184	Dr. Yatham Veera Reddy	Visible Light-Promoted Alkylative Cyclization of 2-Isocyanobiphenyls with Unactivated Alkyl Iodides
40	Sabith Saleem K P	IMS17186	Prof. K. M. Sureshan	A study on property tuning of polymers obtained via topochemical reactions
41	Sangeetha S	IMS17190	Dr. Ajay Venugopal	Access to Sb-Sb bonds and deciphering the reactivity
42	Satya Prakash Suman	IMS17192	Dr. Basudev Sahoo	Exploring Alkylidenecycloalkanes in Transition Metal-catalyzed multicomponent Carbo-borylation
43	Chittaluri Shasheeshwar	IMS17196	Dr. Sooraj B.	Effect of Ni Concentration on the Mechanism of Formation and Structure of Cathode Electrolyte Interface in LiNixCoyMn1−x−yO2 Cathode Materials
44	Sivasanker K A	IMS17207	Dr. Ajay Venugopal	Computational Comparison of Pentamethylcyclopentadienyl and Hydrotris(3,5 dimethyl pyrazolyl) borate PnicogensDications
45	Sowbarnika S	IMS17209	Dr. Rajendar Goreti	Studies Towards the Synthesis of Colveols A & B: Synthesis of 2-Acyl Resorcinols from 1,3-Cyclohexadiones
46	Sreelakshmi P V	IMS17213	Dr. Vinesh Vijayan	Phase Separation Studies of T-Cell Intracellular Anitigen -1 (TIA1) Protein
47	Sreelakshmi Unnikrishnan	IMS17214	Dr. Alagiri Kaliyamoorthy	Synthesis of Various Halogenated Heterocycles & Synthesis of Various Trideuteromethyl and Cyanomethyl Sulfoxides from β-Sulfinyl Esters
48	Swetha K V	IMS17224	Dr. Joydeb Mandal	Structurally Isomeric Janus Brush like Polymers: A Study of Side-Chain Crystallisation
49	Tessy Paul Kulangara	IMS17225	Prof. Mahesh Hariharan	Triangular Crystalline Architecture in Bisaryl Substituted Pentacene
50	Thejus P	IMS17226	Prof. K. M. Sureshan	Design and Synthesis of a Difficult Peptide Sequence via Topochemical Polymerization
51	Vinayak Pradeep	IMS17232	Dr. Reji Varghese	G-Quadruplex based Forced Intercalation Probe for Analyte Detection
52	Dommeti Viswa Kalyan Kumar	IMS17233	Dr. Reji Varghese	Nucleobase-derived Nanosheet as a Nanozyme for Targeted Three-in-One Cancer Therapy
53	Debaditya Sinha	IMS17236	Dr. Sukhendu Mandal	Selective Mercury Sensing in a Azo-Pyridine based Cobalt Metal-Organic Framework
54	Divesh Nazar	IMS17237	Prof. K. George Thomas	Effect of Discrete and Alloyed Shell on Blinking of CdSe Nanoplatelets
55	Kamble Sakshi Uttam	IMS17242	Dr. Sukhendu Mandal	Coreactant-less Transformation of Cyclohexanethiol-protected Gold Nanoclusters
56	Vaibhav Wani	IMS17244	Dr. Sukhendu Mandal	[Cu18H3(S-Adm)12(PPh3)4Cl2]: Fusion of Platonic and Johnson Solids Through Cu(0) Center and Its Photophysical Properties

School of Physics

S No	Name of Student	Roll No	Supervisor	Project Title
1	A M Anirudhan	IMS17003	Dr. Tanumoy Mandal	B-meson Anomalies and Dipole Moments in Leptoquark Scenarios
2	A S Dolly Nambi	IMS17004	Dr. Deepshikha Jaiswal Nagar	A study of quantum phase transitions in strongly correlated electron systems
3	Abhijith P V	IMS17007	Dr. Vinayak B. Kamble	Frequency Domain Analysis of ZnO Chemiresistors
4	Abhinand. V	IMS17009	Dr. Ravi Pant	Visible Light Generation in Silica Microspheres
5	Abin Tom	IMS17013	Dr. Deepshikha Jaiswal Nagar	Instrumentation of feedback based gas sensing setup and calibration
6	Adheena P	IMS17015	Prof. Ramesh Chandra Nath	Synthesis and Magnetic Properties of Frustrated Square Lattice Compounds LnKNaNbO5 (Ln=Pr, Nd, Sm, Eu, Gd)
7	Adithi Ajith	IMS17017	Prof. AniI Shaji	Can Quantum Zeno Effect Test Quantum Darwinism?
8	Aditya Kurup	IMS17020	Dr. Suheshkumar Singh	Light Sheet Fluorescence Microscopy: Simulation and Experimental Validation Study
9	Agneya V D	IMS17024	Dr. Rajeev N Kini	Engineering the Thermoelectric Properties of Superlattice Nanowire
10	Airin Antony	IMS17025	Dr. Manik Banik	Resource dependent undecidability: Computability landscape of distinct Turing theories
11	Akshay. A	IMS17035	Dr. Mathew Arun Thomas	Flavour violating charged lepton decays in Little Randall-Sundrum Model
12	Alan Daniel Santhosh	IMS17042	Dr. Bindusar Sahoo	The Study of Black Hole Entropy in N=4 Conformal Supergravity
13	Alex Shaji	IMS17043	Dr. Bikas C. Das	Semi-Transparent Solar Cell Design using Silver Nanowire based Transparent Top Electrode
14	Alphin Joseph M J	IMS17044	Dr. Joy Mitra	Exploring the Effects of Terbium Doping InZnO Nanostructures
15	Amal Chandran C	IMS17045	Dr. Manoj A. G. Namboothiry	Protein based Electronics Bio-Memristors based on natural silk fibroin
16	Amal Sebastian	IMS17046	Dr. Deepshikha Jaiswal Nagar	Quantum Criticality of a Spin-1/2 Heisenberg Antiferromagnetic Chain
17	Anagha M	IMS17051	Dr. Bikas C. Das	Anodized Metal Thin Films: Dielectric Properties and Transistor Applications
18	Anakha Anson	IMS17052	Dr. Vinayak B. Kamble	V2O5 Nanowire Sensor Devices for Food Quality Monitoring
19	Ananthu Sunil	IMS17056	Dr. Mathew Arun Thomas	Effect of the Low-Energy Observable Le on SMEFT at 1-Loop and Matching with Leptoquarks
20	Aneena Mohan	IMS17057	Prof. Ramesh Chandra Nath	Study of Transition Metal d7 (Co2+) based Kitaev Materials
21	Aniket Anaji Masaye	IMS17059	Dr. Tanumoy Mandal	Search for monoleptonic decay of Z' → NRNR in U(1) leptophobic model
22	Anjali Kumari	IMS17062	Dr. Somu Kumaragurubaran	Surface modification of 6H-SiC by femtosecond laser irradiation
23	Ankit	IMS17064	Dr. Madhu Thalakulam	Optimizing fabrication process for high-quality NbSe2 superconducting devices
24	Ardra A V	IMS17072	Dr. Manik Banik	Study of Genuine Activation of Non-locality
25	Ashly Wilson	IMS17081	Dr. D. V. Senthilkumar	Studying chimera states and oscillation death states with non-local coupling and the effect of non-isochronicity parameter and asymmetrical coupling on a locally coupled system

26	Aswadh S Sajeevan	IMS17082	Dr. M. M. Shaijumon	Upcycling of Spent Cathode Materials for Energy Conversion Applications
27	Dhurjati Sai Abhishikth	IMS17100	Dr. Madhu Thalakulam	Engineering Ohmic Contacts in MoS_2: An Experimental and Computational Study
28	Gegari M Thomas	IMS17108	Dr. M. M. Shaijumon	Prussian Blue Analogues (PBAs)| Synthesis and electrochemical evaluation as cathode materials for aqueous Zinc-ion batteries
29	Godwin Paul	IMS17110	Dr. Bikas C. Das	Liquid Phase Exfoliated 2-D MoS_2 Thin Film Memristor for Neuromorphic Device Application
30	Govind Lal Sidhardh	IMS17115	Prof. AniI Shaji	Non-Locality as a Resource for Multi-Agent Reinforcement Learning
31	Jayaganeshan S R	IMS17122	Dr. D. V. Senthilkumar	Effect of filtering on the dynamics of the coupled Stuart-Landau oscillators
32	Jinto Reji Mathew	IMS17125	Dr. Joy Mitra	A review on the existing theoretical and experimental results on Schottky junctions
33	Jones K Saji	IMS17126	Dr. Sreedhar B. Dutta	Toy Model with Time Uncertainty
34	Jyothish Raj	IMS17127	Dr. Vinayak B. Kamble	High Temperature Thermal Conductivity Measurement Apparatus and SnO Thermoelectrics
35	Kartik Deepak Bhide	IMS17129	Dr. Tanumoy Mandal	Prospecting for Vector-Like Quarks: A New Channel at the Large Hadron Collider
36	Mayalakshmi K	IMS17143	Dr. Manik Banik	Study of Non-local correlations and their post-quantum behaviour for polygon models
37	Mukundan R Pillai	IMS17149	Dr. Bikas C. Das	Nanoscale Photoresponse of Sb Doped CsPbBr3 Perovskite Nanoplatelets
38	R Nandakishore	IMS17152	Dr. M. M. Shaijumon	Metal Chalcogenides as Electrocatalyst for HER, OER & ORR
39	Nayan Babu	IMS17155	Dr. Tanumoy Mandal	Gauge Extensions of the Standard Model and Neutrino Mass Generation Mechanisms
40	Noora Naushad	IMS17165	Dr. Vinayak B. Kamble	Transport and Magnetic Properties of LaCoO3/ La1-X SrXCoO3, and Superlattice Thin Films.
41	Jadhav Rajkumar Mahadeo	IMS17174	Dr. Ravi Pant	Characterisation of Spherical Whispering Gallery Mode Sapphire Microresonator
42	Reshma P Pradeep	IMS17179	Dr. Tuhin Subhra Maity	The Magnetocaloric effect in SmCaCoMnO6 nanoparticles
43	Riya Varghese	IMS17183	Dr. Ravi Pant	Investigation of Multiband Photonic Bandpass Filter Using Single Sideband Modulation in a Single Mode Fiber
44	Samgeeth P	IMS17187	Dr Manik Banik	Thermodynamic Signatures of Genuine Entanglement
45	Sandhya S Menon	IMS17189	Dr. Soumen Basak	Parameter Estimation of Gravitational Waves From Massive Black Hole Binaries
46	Shravan	IMS17199	Prof. AniI Shaji	Quantum control using a Non Markovian environment
47	Shyam Raj K	IMS17200	Dr. Madhu Thalakulam	Development of Ionic Gels for Inducing Phase Transitions in Two-Dimensional Materials
48	Siddharth Samir Bhatt	IMS17201	Dr. Soumen Basak	Numerical Analysis of Inflationary Dynamics: Background and Fluctuations
49	Sidharth R	IMS17203	Dr. Manoj A. G. Namboothiry	Approaches for High Efficiency in Next Generation Perovskite Based Solar cells
50	Sijil Jose	IMS17205	Dr. Soumen Basak	Analysis of Black Hole Ringdowns using Normalizing Flows
51	Siv Sachin S D	IMS17206	Dr. Rajeev N. Kini	Non-Destructive Evaluation and Charge Density Wave Studies using Terahertz Spectroscopy
52	Sreehari Rajendran	IMS17211	Dr. Joy Mitra	ZnO nanostructured materials: Effect on droplet evaporation

53	Sreelakshmi A	IMS17212	Dr. M. M. Shaijumon	Towards the Fabrication of All-Solid-State Sodium-ion Battery with $Na_3V_2(PO_4)_3$/C Composite Cathode
54	S P Sruthy	IMS17217	Dr. Deepshikha Jaiswal Nagar	Optimising the pH conditions for the synthesis of phase pure powders &magnetisation studies 3 on oxygenated YBa_2Cu_3-xAlxO_6+δ single crystal.
55	M Subrabalan	IMS17218	Dr. Bindusar Sahoo	It's been a Weyl Multiplet (or) Relating Conformal Supergravities in Various Dimensions
56	Mulani Sufayan Ikabal	IMS17220	Dr. Suheshkumar Singh	Real-time Image Reconstruction and its Improvement in Photoacoustic Tomography
57	Sushma Lakshmi R	IMS17223	Dr. Deepshikha Jaiswal Nagar	Quantum Criticality Study on Spin-1/2 Antiferromagnetic Heisenberg Chain
58	Thigazholi Muruganandan	IMS17227	Dr Manik Banik	Study of Entanglement Classes in Bipartite Regular Polygon Systems
59	S Vasudevan	IMS17229	Dr. Bindusar Sahoo	Matrix model and JT gravity
60	Yousuf Alishan	IMS17234	Dr. Manoj A. G. Namboothiry	Enhanced charge extraction and photovoltaic performances enabled by interface engineering in non-fullerene organic solar cell

School of Mathematics

S No	Name of Student	Roll No	Supervisor	Project Title
1	A Gokula Karthik	IMS17002	Dr. Dharmatti Sheetal	Implementing of Parallel Programming in Image Processing
2	Adithya S Jith	IMS17018	Dr. Sarbeswar Pal	Algebraic Geometry: From Varieties to Schemes
3	P L Aditya Naresh	IMS17021	Dr. Sudarshan Kumar K.	Iterative study on diffusion equations of Perona-Malik type
4	Aiswarya Harilal	IMS17026	Dr. Nagaiah Chamakuri	Accurate numerical schemes for the monodomain model: Predicting the cardiac toxicity of drugs
5	Ajmala Jasmine .J	IMS17031	Dr. Sudarshan Kumar K.	Higher Order Finite Difference Scheme and Adaptive Wavelet Viscosity Method for Hyperbolic Conservation Laws
6	Akshay Balaso Parit	IMS17036	Dr. Dharmatti Sheetal	Infectious Disease Modeling
7	Akshay Raj K	IMS17039	Dr. Shrihari Sridharan	Invariant Measures and Visualizing Ergodic Partition
8	Amjad Hasan P	IMS17050	Dr. Dond Asha Kisan	WENO Schemes of Adaptive Order for Convection-Diffusion Problems
9	Chavan Anand Shivaji	IMS17053	Dr. Shrihari Sridharan	Dirichlet Boundary Value Problem in One and Several Complex Variables
10	Anandhakrishnan	IMS17054	Dr. P. Devaraj	Duality and Erasure Optimisation in Frames
11	Ananth Narayanan K	IMS17055	Dr. Srilakshmi Krishnamoorthy	Some Topics in Graph Theory
12	Bharath Krishnan G	IMS17090	Dr. P. Devaraj	Gabor Frames Generated by Characteristic Functions and their Application in ECG Signal Classification
13	G Ananthakrishna	IMS17103	Dr. Saikat Chatterjee	Differentiable Stacks, Groupoids and Cohomology
14	Hariharan G	IMS17116	Dr. K. R. Arun	Curvature-driven flows of planar curves
15	Indulekha M S	IMS17121	Dr. Dhanya Rajendran	Existence and Qualitative Properties of Solutions of Quasilinear Equations
16	Kartikey Garkhal	IMS17130	Dr. Geetha T.	Representation theory of Finite Group and Burnside's Theorem
17	Krutik Sudhir Khillare	IMS17133	Prof. M. P. Rajan	Data Analytics Engine
18	Uppuluru Naga Saveri	IMS17150	Dr. K. R. Arun	Level Set Method for Geometric PDE's

19	Nikhil Alex Verghese	IMS17157	Dr. Dhanya Rajendran	Use of Newton'S Method and Morse Index on Semilinear Elliptic PDEs and a Further Case Study on Graphs
20	Nilanjana Daimary	IMS17159	Dr. Sachindranath Jayaraman	Location and Perturbation of Eigenvalues of Matrices
21	Ningthoujam Saviour Mangang	IMS17162	Dr. Saikat Chatterjee	A Study of Torus Theorem by Elie Cartan
22	Ghonmode Prem Suresh	IMS17171	Dr. Viji Z. Thomas	The Modular Representation Theory of Finite Groups
23	Thakar Samrudhi Abhay	IMS17188	Dr. Viji Z. Thomas	Profinite Groups
24	Selja S	IMS17194	Dr. Dond Asha Kisan	Finite Difference Methods in Schrödinger Equation
25	Shivaram M	IMS17197	Prof. Utpal Manna	Marcus Modification of the HJMM Equations
26	Sradha R Bhat	IMS17210	Dr. Nagaiah Chamakuri	Implicit, Explicit and Semi-implicit time discretization schemes for the Monodomain model
27	Sagnik Saha	IMS16163	Dr. Srilakshmi Krishnamoorthy	Class Field Theory and Quadratic Number Fields

Achievements of outgoing BS-MS students:

A total of 204 students were awarded BS-MS Dual Degree in 10th Convocation held on 30th July 2022.

Institute Gold Medal is given to a student having all-round excellence in academics in terms of CGPA, research publications, national or international awards or fellowships, and commendable performance in extra-curricular activities in the graduating batch. This year it was awarded to Mr M Subrabalan (Major in Physics; CGPA of 9.72)

Director's Gold Medal for academic excellence is awarded to the student with highest CGPA among all the students of the graduating batch of BS-MS. It was awarded to Ms Indulekha M S (Major in Maths; CGPA of 9.87).

Cultural Medal is presented to a student with the best accomplishments in extracurricular activities such as sports, cultural, outreach, literature, etc. in the graduating batch. Ms Akhila S Kumar (Major in Biology) was its recipient.

Prof Vijaya Kumar Challa Gold Medal is given to the Chemistry (Major) student with highest CGPA. Ms Hiba Haneena K received the medal for her CGPA of 9.42.

Best Undergraduate Researcher Medal is awarded to students having best record of research publications. This year recipients were Mr Siddharth Sivanandan (Major in Biology), Ms Akshaya N (Major in Chemistry), Ms Indulekha M S (Major in Maths) and Mr Govind Lal Sidhardh (Major in Physics).

School Gold and Silver Medals:

- Ms Hiba Haneena K (Chemistry Gold)
- Mr Akshay J (Biology Gold)
- Mr Shravan (Physics Gold)
- Mr Abhindev K V (Chemistry Silver)
- Ms Arunima Muliyil (Biology Silver)
- Mr M Subrabalan (Physics Silver)
- Mr Ananth Narayanan K (Maths Silver)

Integrated and Interdisciplinary Sciences (i^2 Sc) BS-MS Programme

This relatively new 5-Year BS-MS programme comprises of 5 distinct streams viz. Biological Sciences, Chemical Sciences, Data Sciences, Mathematical Sciences and Physical Sciences, each centered around a core discipline and its corresponding thematic domains. After completing the foundational courses in the initial two years, students have the flexibility to select one of the five streams to pursue advanced studies in the core discipline and specialize in the associated thematic areas. It also involves a year-long research project in the fifth year.

Gender & Category-wise distribution of all i^2 Sc BS-MS Students

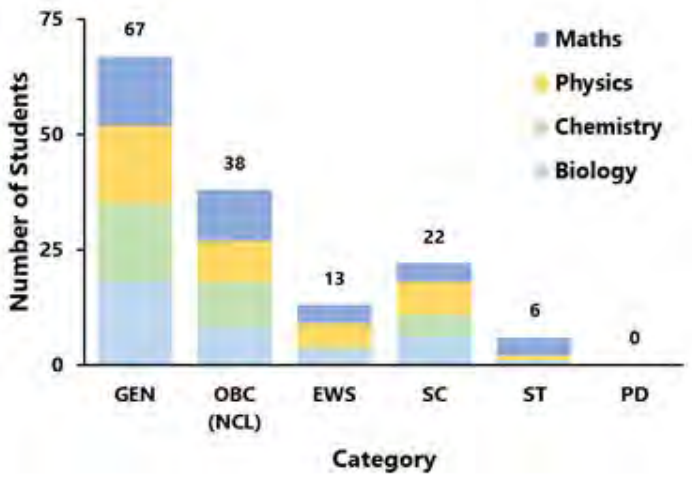
	GEN	OBC (NCL)	EWS	SC	ST	PD	Total
School of Biology							
Male	3	2	1	-	-	-	6
Female	7	2	-	-	-	-	9
School of Chemistry							
Male	5	2	-	-	-	-	7
Female	4	4	-	-	-	-	8
School of Physics							
Male	3	3	-	1	2	-	9
Female	1	3	-	-	2	-	6
School of Mathematics							
Male	-	-	2	1	1	-	4
Female	5	1	-	2	-	-	8
School of Data Sciences							
Male	4	4	1	-	3	-	12
Female	1	4	-	-	2	-	7
Total	33	25	4	4	10	-	**76**

Master of Science (MSc) Programme

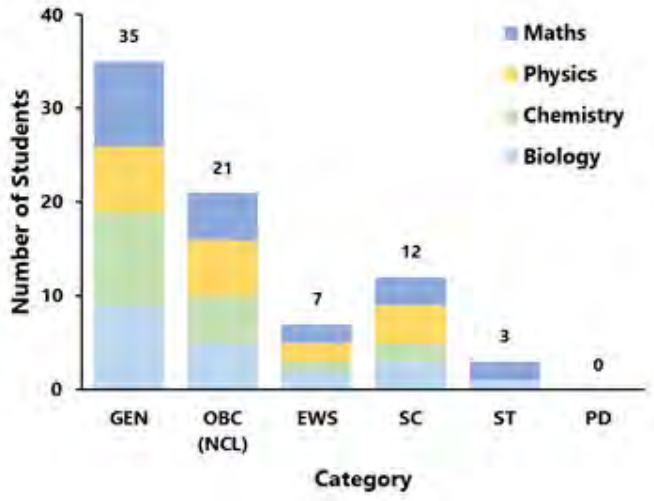
The two-year MSc programme is positioned in a manner that it bridges the flagship, five-year BS-MS programme of the institute with the PhD programme. The MS programme aims to extend the training in science to bright undergraduate students selected competitively from across the country.

Gender & Category-wise distribution of all MSc Students

	GEN	OBC (NCL)	EWS	SC	ST	PD	Total
School of Biology							
Male	10	7	-	2	1	-	20
Female	8	1	3	4	-	-	16
School of Chemistry							
Male	4	7	-	1	-	-	12
Female	13	3	1	4	-	-	21
School of Physics							
Male	12	7	4	2	1	-	26
Female	5	2	1	5	-	-	13
School of Mathematics							
Male	12	7	2	3	4	-	28
Female	3	4	2	1	-	-	10
Total	67	38	13	22	6	-	**146**



Gender & Category-wise **distribution of MSc Students enrolled in 2022**							
School of Biology							
	GEN	OBC (NCL)	EWS	SC	ST	PD	Total
Male	5	3	-	1	1	-	10
Female	4	2	2	2	-	-	10
School of Chemistry							
	GEN	OBC (NCL)	EWS	SC	ST	PD	Total
Male	2	5	-	1	-	-	8
Female	8	-	1	1	-	-	10
School of Physics							
	GEN	OBC (NCL)	EWS	SC	ST	PD	Total
Male	4	6	1	2	-	-	13
Female	3	-	1	2	-	-	6
School of Mathematics							
	GEN	OBC (NCL)	EWS	SC	ST	PD	Total
Male	6	3	2	1	2	-	14
Female	3	2	-	2	-	-	7
Total	35	21	7	12	3	-	78



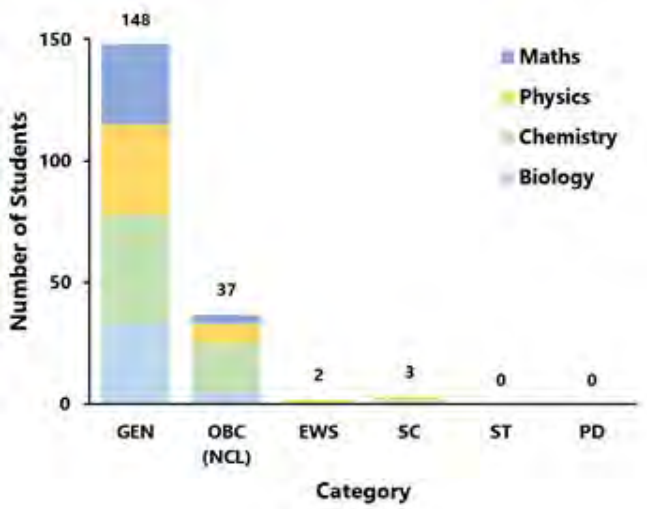
In 2022, a total of 78 students were enrolled in the MSc program. However, 6 students subsequently discontinued from the program, resulting in a final enrollment number in 2022 to 72 students.

Sources of scholarship for all MSc Students		**Sources of scholarship for MSc Students Enrolled in 2022**	
	No of Students		No of Students
DST-INSPIRE	7	DST-INSPIRE	2
NSP	5	NSP	1
STATE OF BIHAR	1	STATE OF BIHAR	1
E-GRANTZ GOVT KERALA	1	E-GRANTZ GOVT KERALA	1
Total	14	Total	5

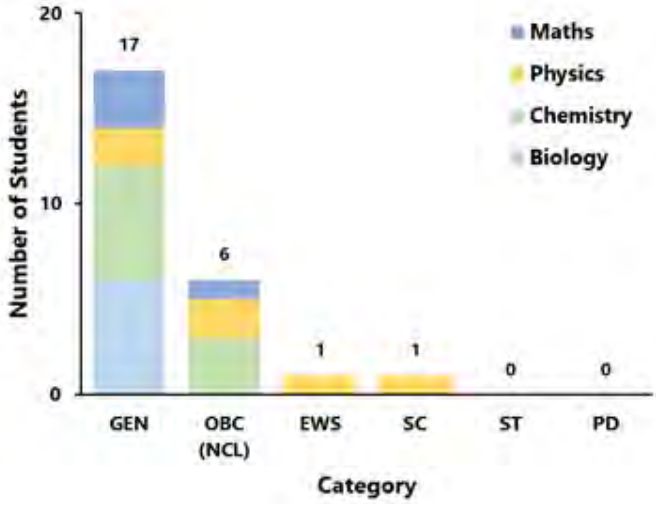
Integrated PhD (iPhD) Programme

It's a research programme at the end of which, Master of Science and PhD degree are awarded. The first four semesters consist of core and elective courses specialized in one subject (Biology, Chemistry, Physics or Mathematics). Students have option to exit with an MS by research degree after third year or continue with PhD research subject to fulfilling other requirements

Gender & Category-wise distribution of all iPhD Students							
School of Biology							
	GEN	OBC (NCL)	EWS	SC	ST	PD	Total
Male	16	2	-	-	-	-	18
Female	17	3	-	-	-	-	20
School of Chemistry							
	GEN	OBC (NCL)	EWS	SC	ST	PD	Total
Male	24	8	-	1	-	-	33
Female	21	12	-	1	-	-	34
School of Physics							
	GEN	OBC (NCL)	EWS	SC	ST	PD	Total
Male	30	6	1	1	-	-	38
Female	7	2	1	-	-	-	10
School of Mathematics							
	GEN	OBC (NCL)	EWS	SC	ST	PD	Total
Male	21	3	-	-	-	-	24
Female	12	1	-	-	-	-	13
Total	148	37	2	3	-	-	190



Gender & Category-wise distribution of iPhD Students enrolled in 2022-23							
School of Biology							
	GEN	OBC (NCL)	EWS	SC	ST	PD	Total
Male	3	-	-	-	-	-	3
Female	3	-	-	-	-	-	3
School of Chemistry							
	GEN	OBC (NCL)	EWS	SC	ST	PD	Total
Male	4	1	-	-	-	-	5
Female	2	2	-	-	-	-	4
School of Physics							
	GEN	OBC (NCL)	EWS	SC	ST	PD	Total
Male	2	1	1	1	-	-	5
Female	-	1	-	-	-	-	1
School of Mathematics							
	GEN	OBC (NCL)	EWS	SC	ST	PD	Total
Male	3	1	-	-	-	-	4
Female	-	-	-	-	-	-	-
Total	17	6	1	1	-	-	25



In 2022, a total of 25 students were enrolled in the iPhD program.

Sources of fellowship for all iPhD Students		Sources of fellowship obtained by iPhD Students during FY2022-23	
	No of Students		No of Students
CSIR	1	PMRF	5
SERB	1	Institute (IISER-TVM)	25
PMRF	12		
Institute (IISER-TVM)	176		
Total	190	Total	30

Details of the iPhD thesis of students who received the dual degrees during 2022-23

School of Biology				
S No	Name of Student	Roll No	Supervisor	Project Title
1	Atreyi Biswas	IPHD14002	Dr. Satish Khurana	Role of outside-in integrin signaling in murine embryonic hematopoiesis
School of Chemistry				
S No	Name of Student	Roll No	Supervisor	Project Title
1	Rishika Rai	IPHD14003	Prof. Kana M Sureshan	Diverse peptidomimetics synthesized via topochemical polymerization and their properties
2	Swathi V C	IPHD14006	Dr. Reji Varghese	Design, synthesis and self-assembly of tetraphenylethylene-based systems: Applications in bio-imaging and as fluorescent nanomaterials
3	Swathi	IPHD14005	Prof. K George Thomas	Emergence of Chirality in Phenyleneethynylene Based Molecular Assemblies: Experimental and Theoretical Study
School of Mathematics				
S No	Name of Student	Roll No	Supervisor	Project Title
1	Tikekar Sharvari Neetin	IPHD14004	Dr. Shrihari Sridharan	Analysis on a Unilateral Full Shift Space over Finite Symbols
2	**Joyentanuj Das**	**IPHD16009**	**Prof. Utpal Manna**	**On Inverse of Distance Matrix of Graphs**

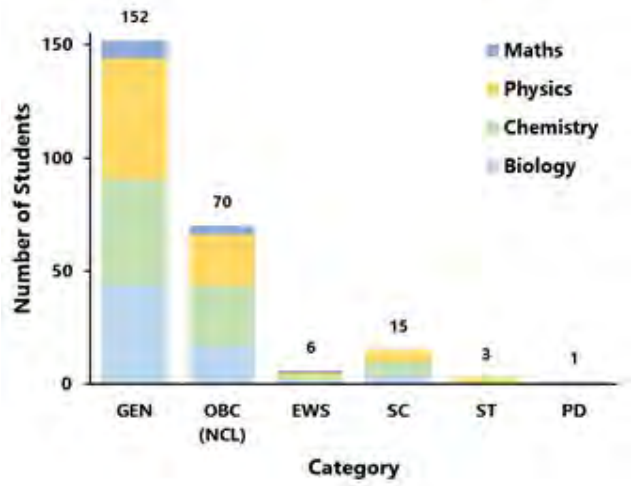
Details of the iPhD thesis of students who have completed requirements for a PhD during 2022-23

School of Chemistry				
S No	**Name of Student**	**Roll No**	**Supervisor**	**Project Title**
1	Shourya Gupta	IPHD15024	Dr. Subrata Kundu	Nitrite Reduction at First Row Late Transition Metal Sites: Insights into Ene-diol and Phenol Oxidations
2	Devika S	IPHD15010	Prof. Mahesh Hariharan	Exciton and Charge Transfer Interactions in Molecular Aggregates
3	R Arthi	IPHD13003	Prof. Kana M Sureshan	Synthesis of inositol-based inclusion complexes, structural mimics of inositol and polyinostols
4	Muhammed Shafeek	IPHD15016	Dr. Vinesh Vijayan	Visualizing the Transient Dark States in Biological Systems using Relaxation-Based Solution NMR
School of Physics				
1	Arun Kumar Maurya	IPHD13004	Dr. Amal Medhi	Correlated electrons in multi-band systems with Hund's coupling and spin-orbit interaction: A slave-spin mean field theory study
2	Madhu Mishra	IPHD15012	Dr. Bindusar Sahoo	Deformation of Supergravity Theory and Black Hole Thermodynamics
3	Arun Kumar Maurya	IPHD13004	Dr. Amal Medhi	Correlated electrons in multi-band systems with Hund's coupling and spin-orbit interaction: A slave-spin mean field theory study
School of Mathematics				
S No	**Name of Student**	**Roll No**	**Supervisor**	**Project Title**
1	Amrutha P	IPHD15004	Dr. Geetha Thangavelu	A combinatorial approach to the representation theory of certain class of Complex reflection groups

PhD Programme

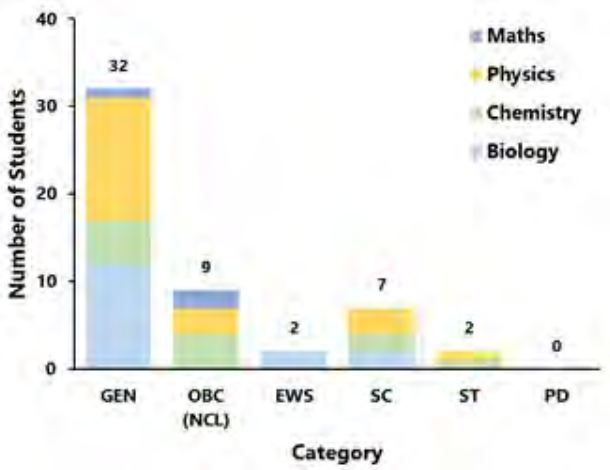
The institute offers a vibrant PhD programme in the areas of Biological Sciences, Chemical Sciences, Mathematical Sciences, Physical Sciences and Interdisciplinary areas. PhD scholars are admitted in 2 sessions (August and January) each academic year.

Gender & Category-wise distribution of all PhD Students							
School of Biology							
	GEN	**OBC (NCL)**	**EWS**	**SC**	**ST**	**PD**	**Total**
Male	22	9	2	4	-	-	37
Female	22	8	-	-	-	-	30
School of Chemistry							
	GEN	**OBC (NCL)**	**EWS**	**SC**	**ST**	**PD**	**Total**
Male	25	8	1	5	1	-	40
Female	22	19	-	1	-	-	42
School of Physics							
	GEN	**OBC (NCL)**	**EWS**	**SC**	**ST**	**PD**	**Total**
Male	29	15	2	4	2	-	52
Female	24	7	-	1	-	-	32
School of Mathematics							
	GEN	**OBC (NCL)**	**EWS**	**SC**	**ST**	**PD**	**Total**
Male	6	2	-	-	-	1	9
Female	2	2	1	-	-	-	5
Total	152	70	6	15	3	1	**247**



Gender & Category-wise distribution of PhD Students enrolled in 2022-23							
School of Biology							
	GEN	**OBC (NCL)**	**EWS**	**SC**	**ST**	**PD**	**Total**
Male	5	-	2	2	-	-	9
Female	7	-	-	-	-	-	7
School of Chemistry							
	GEN	**OBC (NCL)**	**EWS**	**SC**	**ST**	**PD**	**Total**
Male	4	1	-	2	1	-	8
Female	1	3	-	-	-	-	4
School of Physics							
	GEN	**OBC (NCL)**	**EWS**	**SC**	**ST**	**PD**	**Total**
Male	8	2	-	3	1	-	14
Female	6	1	-	-	-	-	7
School of Mathematics							
	GEN	**OBC (NCL)**	**EWS**	**SC**	**ST**	**PD**	**Total**
Male	1	1	-	-	-	-	2
Female	0	1	-	-	-	-	1
Total	32	9	2	7	2	-	**52**

In 2022, a total of 52 students were enrolled in the PhD program. However, 8 students subsequently discontinued from the program, resulting in a final enrollment number in 2022 to 44 students.



Sources of fellowship for all PhD Students		**Sources of fellowship obtained by PhD** Students during FY2022-23	
	No of Students		**No of Students**
CSIR	40	**CSIR**	4
DBT	10	**DBT**	4
ICMR	2	**UGC**	16
DST-INSPIRE	15	**PMRF**	10
UGC	41	**Institute (IISER TVM)**	24
PMRF	19		
Institute (IISER TVM)	119		
Sponsored Project	1		
Total	**247**	**Total**	**58**

Details of the PhD thesis of students who were conferred with a PhD during 2022-23

School of Biology

S No	Name of Student	Roll No	Supervisor	Project Title
1	A Sreejith	PHD142005	Dr. Ravi Maruthachalam	Unravelling the plant kinetochore architecture with special emphasis on elucidating the kinetochore and non-kinetochore role of the NNF1
2	Niyas Rehman	PHD142007	Dr. Jishy Varghese	Larval diet affects adult metabolic status in Drosophila melanogaster
3	Monica P	PHD152004	Dr. Ramanathan Natesh	Structural, biochemical, and biophysical studies on Plasmodium falciparum apicoplast Gyrase B and Mycobacterium tuberculosis LexA
4	Pathak Himani Madhav	PHD152014	Dr. Jishy Varghese	Functional Characterization of Novel Genes Regulating Nutrient Homeostasis in Drosophila Melanogaster

School of Chemistry

S No	Name of Student	Roll No	Supervisor	Project Title
1	Rajesh Ghosh	PHD131014	Dr. Thirumurugan A.	Use of Gemini Surfactants as Soft-Templates in the Synthesis of Hierarchically Porous HKUST-1 MOFs
2	Perumal D	PHD141005	Dr. Reji Varghese	Design and Synthesis of DNA-Based Amphiphiles for Cancer Diagnosis and Therapy
3	Parvathy Jayan	PHD141005	Dr. Vinesh Vijayan	Structural and functional studies of VDAC and microtubule domain of Tau protein
4	Dhanya S R	PHD151006	Dr. Vinesh Vijayan	Structural studies on the prion domains of CPEB3, responsible for long-term memory retention in mammals
5	Elizabeth Mariam Thomas	PHD151007	Prof. K. George Thomas	Semiconductor Quantum Dots: Blinking and Plasmon-Enhanced Photoluminescence
6	Feba Thomas P	PHD162003	Dr. Ramesh Rasappan	Transition-Metal Catalysis: Radical Cyclization of Alkyl Halides and Cross-Coupling Reactions via C-N Bond Cleavage
7	Kalaiselvan A	PHD162005	Dr. Gokulnath Sabapathi	Carbazole-based Macrocycles: Synthesis, Structure, Sensing and Photophysical Properties
8	Lekshmi R S	PHD162006	Dr. Vennapusa Sivaranjana Reddy	Intersystem Crossing Via Higher Triplet States In Organic Aromatic Molecules
9	Remya Ramakrishnan	PHD162009	Prof. Mahesh Hariharan	Supramolecular and Multichromophoric Systems: Structural Emergence and Implications on Electronic and Photophysical Properties
10	Ajay J	PHD161001	Dr. Gokulnath Sabapathi	Effect of Heteroatom, Peripheral Fusion and BF_2 Complexation on the Conformation and (Anti) aromaticity of Expanded Porphyrinoids
11	Reshma Mathew	PHD161022	Prof. K. George Thomas	Ultrafast Structural Dynamics during Excited-State Proton Transfer: A Nonlinear Spectroscopic Perspective
12	Sulfikarali Thondikkal	PHD161031	Dr. Gokulnath Sabapathi	m-and p-Phenylene Embedded π-Expanded Macrocycles: Effect of Conjugation on Aromaticity, Conformation and Optical Properties
13	Sunnapu Ranganayakulu	PHD161031	Dr. Rajendar Goreti	Preparation of Proline Based Chiral Auxiliary for Asymmetric Acetate Aldol Reactions, Total Synthesis of MethoxylCitreochlorols, (+) & (-)-Diaportinol, and (+) & (-) Desmethyldiaportinol

School of Physics				
1	Siva Shakthi @ Radhalakshmi A	PHD141014	Dr. Ravi Pant	Coherent Brillouin Interactions in the Microwave Domain: Physics and Applications
2	Prasanta Kumbhakar	PHD151015	Dr. Madhu Thalakulam	Quantum point contact-superconducting planar resonator system: a shot-noise-limited broadband electrical amplifier
3	Sonu Prasad Keshri	PHD162012	Dr. Amal Medhi	Investigation of transport properties of a few selected thermoelectric materials using first-principles method
4	Anjali Thomas	PHD161002	Dr. M. Suheshkumar Singh	Development of Photoacoustic Imaging Systems and Study on Enhancement of Photoacoustic Signal Strength and Image Quality
5	Anjusree S	PHD161003	Dr. Bikas C. Das	Organic Photovoltaic Devices: Materials, Ambient Processing, and Nanoscale Probing with Conductive Atomic Force Microscope
6	Ben Johns	PHD161009	Dr. Joy Mitra	Infrared Photonics of Epsilon-Near-Zero Thin Films
7	Shams Sohel Islam	PHD161027	Prof. Ramesh Chandra Nath	Magnetic properties of two frustrated magnets with competing exchange interactions
8	Soniya N	PHD161028	Dr. Ravi Pant	Investigation of light amplification in the polymer based planar coupled waveguide
9	Srikrishna Sagar	PHD161030	Dr. Bikas C. Das	Strategy to Develop Low Voltage Organic Thin-Film Transistors with Various Emerging Applications
10	Vishnu Surendran	PHD161033	Dr. M. M. Shaijumon	Engineered Carbon Materials for Energy Storage and Conversion
11	Kusuma Urs M B	PHD172008	Dr. Vinayak B. Kamble	Low Dimensional Materials and their Hierarchical Heterostructures for Hydrogen Sensing
School of Mathematics				
S No	**Name of Student**	**Roll No**	**Supervisor**	**Project Title**
1	Perisetti Lakshmi Naga Mahendranath	PHD151025	Dr. Sheetal Dharmatti & Prof. Utpal Manna (Co-Guide)	Control Problems for Phase-field Systems
2	Mcr Praphulla Kumar Koushik	PHD161016	Dr. Saikat Chatterjee	Geometric Structures on Lie Groupoids and Differentiable Stacks

Details of the PhD thesis of students who have completed requirements for a PhD during 2022-23

School of Biology				
S No	**Name of Student**	**Roll No**	**Supervisor**	**Project Title**
1	Sagar Salim	PHD171018	Dr. Nishant K. T.	Regulation of Msh5 binding during meiosis in budding yeast
2	Rishith Ravindran	PHD151029	Prof. S. Murty Srinivasula	Discovery of a novel role for an endosomal- associated ubiquitin ligase in the elimination of mitochondria
3	Baheeerathan M	PHD151003	Prof. Hema Somanathan	Visual ecology of pteropodid bats of southern India
4	Resmi Rajeev	PHD151028	Prof. Tapas K. Manna	Role of transforming acidic coiled-coil 3 (TACC3) in the regulation of microtubule assembly at the centrosomes
5	Jeswin Joseph	PHD182006	Dr. V. Stalin Raj	The study of highly pathogenic emerging RNA viruses using recombinant envelope proteins and pseudotyped viruses

School of Chemistry				
S No	**Name of Student**	**Roll No**	**Supervisor**	**Project Title**
1	Manju P Maman	PHD161017	Dr. Sukhendu Mandal	A Case Study on Cyclohexanethiolate-Protected Au_{23} Nanocluster Transformation via Ligand Exchange
2	Ebin Sebastian	PHD172005	Prof. Mahesh Hariharan	Orthogonal Bichromophoric Systems: From Null Exciton Coupling to Symmetry-Breaking Charge Separation
3	Sujith M	PHD162014	Prof. K. George Thomas	Chiroptical Properties in Molecules and Nanomaterials: From Ligand-Induced to Exciton-Coupled Chirality
4	Venkadesh B	PHD172011	Dr. Ramesh Rasappan	Cross-Coupling Reactions via C−O Bond Cleavage: Silylations and Multicomponent Reactions
5	Chithra M J	PHD171006	Dr. Vennapusa Sivaranjana Reddy	Theoretical insights into the efficient T_1 state formation mechanism in organic chromophores
6	Cijil Raju	PHD172003	Prof. Kana M. Sureshan	Engineering Supramolecular Interactions for the Synthesis of Non-covalent & Covalent Polymers
7	Athira T John	PHD171005	Prof. Mahesh Hariharan	Modulating Charge Transport in Angular Naphthothiazoles Through Crystal Engineering
8	Amritha R	PHD171002	Dr. Alagiri Kaliyamoorthy	Brønsted Base-Mediated 1,6-Conjugate Addition Reaction of Alkyl Azaarenes and Alkynyl Azaarenes to para-Quinone Methides
9	Manoj B	PHD151013	Prof. K. George Thomas	Exploration into Light Harvesting and Carrier Dynamics in Indium Phosphide Quantum Dots
10	Kakarlamudi Akhil Chakravarthy	PHD172007	Dr. Vennapusa Sivaranjana Reddy	Theoretical Investigation of Optical Properties of Neutral AndDication Cycloparaphenylenes
School of Physics				
1	Sandhya K M	PHD161024	Dr. Bikas C. Das	Doping of Semiconductors at Nanoscale to Tune the Electronic and Optoelectronic Properties
2	Dileep N P	PHD171023	Dr. M. M. Shaijumon	Synthesis of Nanostructured Ternary Bismuth-Antimony Trichalcogenides and their Heterostructures for Energy Conversion
3	Rinsa S R	PHD161023	Dr. M. Suheshkumar Singh	Simultaneous multiple-level magnification selective planeillumination microscopy (sMx-SPIM): a cost-effective imaging system for biological applications
4	Rajiv G Pereira	PHD161021	Dr. Sreedhar B. Dutta	Coarsening and critical dynamics in anisotropically driven nonconserved systems
5	Litty Thomas Manamel	PHD171011	Dr. Bikas C. Das	Band Structure Modulation and Emerging Non-Linear Electrical Properties of Solution Processed Two-Dimensional Molybdenum Disulfide
6	Somesh K	PHD171020	Prof. Ramesh Chandra Nath	Frustrated Magnetism in low-dimensional antiferromagnets α-$HCrO_2$ and α-$KVOPO_4$
School of Mathematics				
S No	**Name of Student**	**Roll No**	**Supervisor**	**Project Title**
1	Ankush Kumar Garg	PHD161004	Dr. P. Devaraj	A Study on Reconstruction from Local Average and Random Average Samples over Shift-Invariant Spaces


sunburn
TREMENT

INSTITUTE EVENTS & ACTIVITIES

INSTITUTE EVENTS

EVENTS	
1 Apr 2022	**Pareeksha Pe Charcha** Pariksha Pe Charcha (PPC) is an annual event hosted by the Hon'ble Prime Minister of India, Shri Narendra Modi since 2018. IISER Thiruvananthapuram proudly displayed the PPC 2022 banner on its website and actively promoted the event among students through banners, mails and social media platforms. The program was live-streamed in seminar hall and was attended by Prof. J. N. Moorthy, Director IISER Thiruvananthapuram, Deans, Heads of Departments, faculty, staff and students of the Institute, following COVID appropriate behavior. Additionally, the event was also live-streamed on YouTube channel enabling even higher reach.
6 May 2022	**Project Kick-Off Meeting: DST-IISER Thiruvananthapuram IC-MAP on Storage** The newest Centre at the Institute is the integrated clean energy material acceleration platform on storage, set up by the Department of Science and Technology (DST). The consortium at IISER Thiruvananthapuram consists of a core team of researchers from 15 partnering institutes. The primary purpose of the consortium is to accelerate the development of Solid-State Battery technology using Machine Learning and Artificial Intelligence. The project kick-off meeting was inaugurated by Prof. J. N. Moorthy, Director IISER Thiruvananthapuram and was attended by PIs and researchers from all the partnering institutes spread across the country.
23 May 2022	**30th Mathematical Training and Talent Search Program 2022** As part of academic outreach activities,the Institute conducted the 30th Mathematical Training and Talent Search Program (MTTS), the most popular undergraduate/graduate training program in Mathematics. The program is run under the aegis of MTTS Trust and funded by National Board of Higher Mathematics.
21 Jun 2022	**International Day of Yoga 2022** The theme for this year's celebrations 'Yoga for Humanity' portrayed how yoga helped people build resilience and stay fit physically, mentally and emotionally during the pandemic years. Guruji Sree Rishisagar, the Chief Guest for the event spoke about the benefits of practicing yoga. To commemorate the occasion, a Yoga performance was held in the indoor stadium by the IISER community, led by Ranjini Rajasekharan, the institute's yoga instructor.
15-17 Jul 2022	**Teacher Training Program** This three-day Teacher Training Program was conducted jointly with the Collegiate Education Department, Government of Kerala. About 250 teachers from different districts of Kerala, teaching in the departments of Biology, Chemistry, Mathematics and Physics attended this training program that was conducted by subject matter specialists from across the country. The primary focus of this outreach program was to introduce them to new resources, tools and methods of teaching that would make teaching and learning a more interactive, engaging and enjoyable experience.
30 Jul 2022	**10th Convocation of the Institute** We were honored to have Shri Dharmendra Pradhan, Hon'ble Minister of Education and Minister of Skill Development and Entrepreneurship, Government of India, as our Chief Guest for the occasion and deliver the convocation address. Prof. Aravind A Natu, Chairperson of the Board of Governors, presided over the function. Prof. J. N. Moorthy, Director, IISER Thiruvananthapuram, presented a report of the activities and achievements of the Institute. Our Founding Director, Padma Shri Prof. E. D. Jemmis was the Guest of Honor. A total of 204 BS-MS students, 30 PhD students, and 6 Integrated PhD students who completed their studies in the last academic session were awarded their degrees. Additionally, six students were awarded an MS by Research degree.

8-21 Aug 2022	**Visit of Dr. Thomas Colacot as 'Distinguished Scientist'** Dr. Thomas Colacot, R&D Fellow & Director, Global Technology Innovation, Millipore Sigma was at the Institute as a "Distinguished Scientist". He delivered several interesting lectures and interacted with faculty and research scholars of our Institute.
13-15 Aug 2022	**'Har Ghar Tiranga' Campaign** The 'Har Ghar Tiranga' campaign launched under the aegis of the Azadi Ka Amrit Mahotsav (AKAM), was executed with great pride and honor in IISER Thiruvananthapuram, with the National Flag fluttering from all buildings in the campus. The Institute prominently displayed the campaign on the website and all its social media platforms.
15 Aug 2022	**76th Independence Day Celebrations** IISER Thiruvananthapuram celebrated the 76th year of India's Independencewith much enthusiasm and fervor and wholehearted participation from its students, staff and faculty. The celebrations began with Prof. J. N. Moorthy, Director IISER Thiruvananthapuram inspecting the Guard of Honor and unfurling the National Flag. After delivering the Independence Day address, he participated in the cultural programs presented by students of the Institute. Prof. Moorthy also distributed prizes to meritorious students, staff and faculty of the Institute. The two-hour long program ended with the recitation of the National Anthem.
15 Sep 2022	**Cleanliness Rally** A 'Cleanliness Rally' was conducted from Theviyode junction to Kalingu junction in the town of Vithura covering a distance of 2.5 Km. Around 50 students and faculty members marched through the length of the town shouting slogans, holding placards depicting different ways to be more responsible towards the environment and ways to ensure hygiene and cleanliness all around.
10-16 Sep 2022	**Hindi Diwas Celebrations** The week-long Hindi Diwas celebrations at IISER Thiruvananthapuram saw a number of interesting events being conducted. A two-day exhibition of Hindi books was organized on 14-15 Sep 2022, which was open to all members of the IISER fraternity. The concluding ceremony was graced by renowned Hindi writer, Dr. Jitendra Bhatia as the Chief Guest. In his talk titled "Satyajit Ray ka Cinema", Dr. Bhatia explained the making of Satyajit Ray movies and interspersed his discussion with small clips from Satyajit Ray movies. Winners of the various competitions held as part of the Hindi Diwas celebrations received prizes from the Director.
18 Oct 2022	**Institute Colloquium by Mr. C. Balagopal** Under its 'Institute Colloquium' series, IISER Thiruvananthapuram invites eminent personalities from across a wide range of sectors to interact with the students, faculty and staff of the Institute. Mr. C. Balagopal, Founder Terumo Penpol and Chairman, The Federal Bank Ltd, in his talk, 'Crowd Sourcing in Science Education and Research: an idea whose time has come',described his entrepreneurial journey and stressed the need to contribute one's resources to improve the lives of the less-privileged.
27 Oct 2022	**Rashtriya Ekta Diwas (National Unity Day)** This year IISER Thiruvananthapuram celebrated the Rashtriya Ekta Diwas a few days earlier. The Director of the Institute, Prof. J. N. Moorthy administered the Unity pledge to all the students, faculty, and staff of the Institute.
31 Oct 2022	**14th Foundation Day of IISER Thiruvananthapuram** The Institute celebrated its 14th Foundation Day with great enthusiasm. The event was graced by Prof. Arvind A. Natu, Chairperson of the Board of Governors, along with the Founding Directors of IISER Pune, IISER Bhopal, IISER Mohali, IISER Tirupati, and NISER Bhubaneswar. Prof. J. N. Moorthy, Director of IISER Thiruvananthapuram, welcomed the esteemed guests. Each founding director shared insights and anecdotes from their directorial journey, while Prof. Srinivasa M Srinivasula, Deputy Director of IISER Thiruvananthapuram, expressed gratitude to all attendees. The celebration concluded with a mesmerizing flute recital by the renowned artist Shashank Subramanyam, captivating the audience with his melodious performance.

31 Oct-6 Nov 2022	**Vigilance Awareness Week** 'Corruption-free India for a Developed Nation' was the theme of the Vigilance Awareness Week 2022. The Vigilance Awareness Week was inaugurated by Prof. J. N. Moorthy who administered the Integrity pledge to all the staff and faculty. Various activities organized as part of the Vigilance Awareness Week included a mass contact program that brought vendors and contractors together, a Vigilance Matters Quiz, an insightful lecture titled 'Honesty is still the Best Policy'delivered by Shri Manoj Abraham, Director of the Vigilance and Anti-Corruption Bureau, and a workshop tailored for faculty and staff on 'Recent Changes of Purchase Procedures'.
14 Nov 2022	**National Seminar On Climate Change** A half-day Seminar organized by IISER Thiruvananthapuram delved into the serious issues faced by the world today as a result of climate change. An elite panel of speakers such as Prof. J. Srinivasan and Prof. K. Krishnamoorthy spoke about various topics related to climate change. The seminar was intended for students and faculty across all disciplines.
5-22 Dec 2022	**Refresher & Preparative Winter School (RPWS)** RPWS was organized for final year MSc and BS-MS students in Biology, Chemistryand Physics to prepare them for national-level exams such as NET, GATE,JGEEBILS, JEST etc. Program involved interactive lecture sessions, research seminars,hands-on experience of science labs. Around 180 students from all over the country were selected to participate in this program.
12 Dec 2022	**Higher Secondary School Teacher's Transformation Program 2022** This program was conducted jointly with the Department of General Education, Government of Kerala. The Director of IISER Thiruvananthapuram, Prof. J. N. Moorthy inaugurated the program. Thisin-service training program aims to empower the teachers to strengthen higher secondary education by providing excellent and quality academic experience.
26-30 Dec 2022	**Nurturance Program for National Talent Search Awardees** IISER Thiruvananthapuram hosted this five-day long program with support from National Council of Educational Research and Training (NCERT) for a cohort of nationally-selected students.Participants were given lectures as well as hands-on demos in the labs for few key concepts and they got acquainted with state-of-the-art equipment.
13 Jan 2023	**3rd Professor M.V. George Memorial Endowment Lecture** The Professor M.V. George Memorial Endowment Lecture has been graciously instituted by Prof. C. N. R. Rao and Mrs. Indumati Rao in fond remembrance of their enduring friendship and the contributions of Professor George to Chemical Sciences. The third lecture titled "Phosphate based Rings, Chains, Cages, and Layered Material for Energy Applications" was delivered by Professor Ramaswamy Murugavel, Biswas Palepu Distinguished Chair Professor and J. C. Bose National Fellow at the Indian Institute of Technology Bombay, Mumbai.
18 Jan 2023	**Institute Colloquium by Prof. David Cahen** Under its 'Institute Colloquium' series, IISER Thiruvananthapuram invited Prof. David Cahen, Weizmann Institute of Science, Israel who presented a lecture titled 'Thoughts on Scientist's in Society, in/on war & peace, and on their Ego-s and Prizes'.
26 Jan 2023	**74th Republic Day Celebrations** With enthusiastic involvement from the Institute's students, staff, and faculty, IISER Thiruvananthapuram commemorated India's 74th Republic Day. The event commenced as Prof. J. N. Moorthy, Director of IISER Thiruvananthapuram, addressed the institute's community and hoisted the National Flag. Prof. Moorthy further honored exceptional students, staff, and faculty members by presenting them with awards during the celebration. The program also included colorful cultural performances by the students.

27 Jan 2023	**Pareeksha Pe Charcha 2023** Latest edition of Pariksha Pe Charcha, an annual initiative designed to inspire and connect with students by the Hon'ble Prime Minister of India, Shri Narendra Modi, was actively endorsed and facilitated by broadcasting it live in our Seminar Hall. The event was attended by the institute's dignitaries, students, faculty and staff in large numbers.
1 Mar 2023	**Institute colloquium by Prof. Sundar Saru** Under its 'Institute Colloquium' series, IISER Thiruvananthapuram invited Prof. Sundar Sarukkai, founder of Barefoot Philosophers and formerly at Centre for Society and Policy, IISc Bengaluru. He delivered a talk titled 'Discovering the nature of Science' where he discussed the role of philosophy, history and sociology in uncovering and discovering the true nature of Science.
1 Mar 2023	**Inauguration of DST-IISER Thiruvananthapuram Centre for IC-MAP on Storage** This DST funded centre led by Prof. M. Shaijumon was inaugurated by the Director, Prof. J. N. Moorthy. The consortium at IISER Thiruvananthapuram, consisting of a core team of researchers from 15 partnering institutes is now housed in the Central Instrumentation Facility building. This Centre aims to accelerate the development of Solid-State Battery technology through collaborative research.

Live Telecast of Pariksha Pe Charcha 2022

Independence Day Celebration at the Institute

Prof J. N. Moorthy, Director IISER Thiruvananthapuram administering Integrity Pledge during Vigilance Awareness Week

DEPARTMENTAL ACTIVITIES

School of Biology

SEMINARS/TALKS (National)	
7 Apr 2022	**The Centromere Code Hypothesis** Invited talk by Prof. Kaustuv Sanyal, Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru
6 Jul 2022	**Epigenetic regulation of leukemia pathogenesis & targeted therapy** Invited talk by Dr. Amitava Sengupta, CSIR-IICB, Kolkata
28 Jul 2022	**Cholesterol, amino acids at lipid-water-interface and molecular evolution of TRPV ion channels** Invited talk by Dr. Chandan Goswami, NISER Bhubaneshwar
8 Aug 2022	**Biosafety Training Seminar** Training for students on biowaste management byDr. Poonam Thakur, IISER Thiruvananthapuram
25 Nov 2022	**Synaptic autophagy in health and disease** Invited talk by Dr. Ravi Manjithaya, Jawaharlal Nehru Centre for Advanced Scientific Research, Bengaluru
SEMINARS/TALKS (International)	
19 Apr 2022	**Mitochondria in Ageing and Cancer (Erudite-Scholar in Residence Program)** Talk by Dr. Keshav Singh, University of Alabama, Birmingham, USA
16 May 2022	**Structural and Aggregation Properties of Amyloid Proteins Associated with Neurodegenerative Diseases** Invited talk by Dr. Senthil Kumar Thangaraj, EPFL, Switzerland
31 Aug 2022	**Quantifying the origins and future of tetrapod evolutionary diversity** Invited talk by Dr. Gopal Murali, Ben-Gurion University of the Negev, Israel
29 Sept 2022	**Interplay of autophagy and RNA metabolism: Effects of the disease factors implicated in C9-ALS/FTD on macromolecular homeostasis** Invited talk by Dr. Varun Bhaskar Friedrich Miescher Institute for Biomedical Research, Basel, Switzerland
18 Jan 2023	**Affective state and decision making in bumblebees** Invited talk by Dr. Vivek Nithyananda, Newcastle University, UK
19 Jan 2023	**All the colours of the rainbow: Evolution of flower colour variation** Invited talk by Prof. Yuval Sapir, Tel Aviv University, Israel
14 Feb 2023	**From 1940 to Present: What Bacteria Tell Us About the Mechanisms of Phenotypic and Genotypic Changes** Invited talk by Prof. Jue D Wang University of Wisconsin-Madison, USA

21 Feb 2023	**Regulation of microtubules by drugs and protein partners** Invited talk by Prof. (Dr.) Michel Steinmetz, Paul Scherrer Institute, Switzerland
27 Feb 2023	**Regulation of adult neurogenesis and axon regrowth during spinal cord regeneration** Invited talk by Dr. Vishnu Muraleedharan, Saraswathy Washington University, St. Louis, USA
CONFERENCE/SYMPOSIA	
29 Apr-1 May 2022	**Frontier Symposium in Biology 2022 (FS-BIO 2022)** The symposium covered a wide range of cutting-edge research topics spanning across all fields of biology. It included talks by eminent scientists, flash talk by students and poster presentations.
20-22 Jul 2022	**National Post-Doctoral Symposium (5th NPDS)** Jointly organized by the School of Biology of IISER Thiruvananthapuram, PDFA, and Bangalore Life Science Cluster comprising NCBS, InStem, and C-CAMP.
14-18 Dec 2022	**Chromosome Stability 2022** The 5th meeting on Chromosome Stability was jointly organised with JNCASR, Bengaluru
17-19 Mar 2022	**Frontier Symposium in Biology (FS-BIO 2023)** The meeting included talks by eminent scientists, flash talk by students and poster presentations.
WORKSHOPS	
25 Nov 2022	**Workshop on basics of microscopic techniques** Workshop was conducted by C V Ajith Kumar,CEO InBiotech. It included one lecture session on microscopy and one training session.
4-16 Dec 2022	**EMBO Practical Course CEM3DIP 2022: Single Particle Cryo-EM of Macromolecular Assemblies and Cellular Tomography** This was 4th in the series of CEM3DIP cryoEM biennial Practical course/Workshop since 2016.
OTHER ACTIVITIES	
4-6 May 2022	**Microbiology and Pathogenesis Lecture Series** This 3-day lecture series hosted lectures by eminent microbiologist, Prof. Dipshikha Chakravortty (Dept. of Microbiology and Cell Biology, IISc Bangalore).
19-20 Aug 2022	**4th BioGroup-India Meeting** It included talks on various fields of biology by 21 invited speakers, 2 student short talks and one industry talk.
3 Mar 2023	**EMBO | India Research Partnership** Members of EMBO Life Science community from Israel and Europe visited to inform about their funding programs, postdoctoral and scientific exchange programs, collaborative grants, lecture courses and workshops. The program was aimed towards early career faculty, senior PhD students and postdocs. The programme included scientific talks by the visiting scientists, soft-skills training provided byEMBO Press editors and EMBO Solutions trainers.

School of Chemistry

SEMINARS/TALKS (National)	
22 Apr 2022	**Computational Catalysis and Machine Learning as Applied to Homogeneous Catalysis** Invited talk by Prof. R. B. Sunoj, IIT Bombay, Mumbai
15 Jun 2022	**Ethics and Academic Integrity in Research** Invited talk by Prof. Uday Maitra, Indian Institute of Science, Bengaluru
6-7 Oct 2022	**Crystal engineering strategies based on weak interactions: A structural perspective Structure elucidation through X-ray crystallography** Invited talks by Prof. P. Venugopalan, Panjab University, Chandigarh
25 Oct 2022	**Polymerizable Porogens - A new approach for controlling pore size and pore functionality in cross linked porous polymers** Invited talk by Prof. S. Ramakrishnan, Indian Institute of Science, Bengaluru
22 Nov 2022	**Biomimetic Natural Product Syntheses to Overcome Drug Resistance** Invited talk by Prof. Rajesh Viswanathan, IISER Tirupati
25 Nov 2022	**Polymerizable Porogens - A new approach for controlling pore size and pore functionality in cross linked porous polymers** Invited talk by Prof. S. Ramakrishnan, Indian Institute of Science, Bengaluru
20 Dec 2022	**Two's Company or Crowd? The Importance of Being Single for Energy Delivery** Invited talk by Prof. Kothandaraman Ramanujam, IIT Madras, Chennai
18 Jan 2023	**Electronic doping in soft semiconductors: Opportunities and challenges** Invited talk by Dr. Pabitra Nayak, TIFR Hyderabad
27 Jan 2023	**The importance of electron repulsions** Invited talk by Prof. S. Ramasesha, Indian Institute of Science, Bengaluru
24 Feb 2023	**Our Odyssey with Dehydrogenation Chemistry for Sustainable Development** Invited talk by Dr. Ekambaram Balaraman, IISER Tirupati
22 Mar 2023	**Buckling and Defects in Two - Dimensional Atomically Thin Monolayers** Invited talk by Prof. Ayan Datta, IACS Kolkata
SEMINARS/TALKS (International)	
13 Jul 2022	**Managing Molecular Excitons in Crystalline Metal-Organic Frameworks for Heterogeneous Photocatalysis** Invited talk by Dr. Pravas Deria Southern Illinois University, Carbondale, USA

10 Aug 2022	**Preformed Palladium and Iridium Catalysts for Modern Cross-Coupling and C-H Borylation** Invited talk by Dr. Thomas Colacot, Global Technology Innovation, Millipore, USA
19 Oct 2022	**Protocol to describe Accurate Absorption Spectra of Organic Semiconductors** Invited talk by Prof. Bernd Engel,s Institut für Physikalische und Theoretische Chemie, Julius-Maximilians-Universität Würzburg, Germany
3 Jan 2023	**Understanding the Regenerative Response Induced by Biomaterials Systems** Invited talk by Prof. Abhay Pandit, CURAM, University of Ireland, Ireland
27 Jan 2023	**Development of Novel Materials for Aerospace Applications** Invited talk by Prof. Michael Gozin Tel Aviv University, Israel
14 Feb 2023	**Radicals on Multifunctional Graphene oxide: Mechanism of formation, Types and Use as Photosensitizers** Invited talk by Prof. Alberto Bianco, CNRS Strasbourg, France
24 Mar 2023	**Playing with the Photophysics of Atomically Precise Gold Nanoclusters: from Photo- Thermal to Photodynamic Effects** Invited talk by Prof. Rodolphe Antoine, University of Lyon1-CNRS, France
CONFERENCE/SYMPOSIA	
8–10 Apr 2022	**Frontier Symposium in Chemistry 2022 (FS-CHM 2022)** The annual meeting included talks by eminent scientists, flash talk by students and poster presentations.
28 Jul 2022	**One Day International Symposium on Functional Nanoscale Materials**
13-15 Jan 2023	**Frontier Symposium in Chemistry 2023 (FS-CHM 2023)** The annual meeting included talks by eminent scientists, flash talk by students and poster presentations.
9-12 Feb 2023	**International Conference on Main Group Synthesis and Catalysis** The conference brought together practicing main group chemists around the globe fostering discussions on topical areas of interest in the field. The conference featured 40 talks, posters and networking opportunities.
22 Feb 2023	**One-Day Conference on Crystal Engineering and Solid-State Chemistry** This one-day conference covered oral presentations from leading researchers from India and abroad, in the areas of crystal engineering, MOFs, and other areas of solid-state chemistry.
WORKSHOPS	
11-12 Apr 2022	**Workshop Series on Microscopic & Spectroscopic Methods-TEM** By Prof. N. Ravishankar, Indian Institute of Science, Bengaluru
28-29 Apr 2022	**Workshop Series on Microscopic & Spectroscopic Methods-XPS** By Dr.Vinod C Prabhakaran, National Chemical Laboratory, Pune
6-8 Jan 2023	**FCS XIII: National Workshop on Raman and Fluorescence Spectroscopy** FCSXIII was jointly organized with RGCB Thiruvananthapuram, with support from TIFR Mumbai and Fluorescence Society.
21 Feb 2023	**Workshop in disorders in crystal** By Dr. Angshuman Roy Chowdhury, IISER Mohali

School of Physics

SEMINARS/TALKS (NATIONAL)	
18 Jul 2022	**Many-body localization in presence of random long-range interaction** Invited talk by Dr. Yogeshwar Prasad, Saha Institute of Nuclear Physics, Kolkata
31 Jan 2023	**Climate change: The story of its discovery** This DAE CV Raman lecture was sponsored by Indian Physics Association and delivered by Prof R Shankar, Retd, IMSc Chennai
10 Feb 2023	**Non-linearity calibration of CMOS sensors** Invited talk by Dr. Kamal Sant
24 Feb 2023	**Indian Planetary and Space Missions** Invited talk by Prof. Anil Bhardwaj, Director, Physical Research Laboratory, Ahmedabad
6 Mar 2023	**From milk to magnets: An overview of the not `so well-known' Mpemba effect** Invited talk by Prof. Subir K. Das, Chair of Theoretical Sciences Unit, JNCASR, Bengaluru
10 Mar 2023	**MoSe 2 – a 2D transition metal dichalcogenide and its heterostructures for versatile applications** Invited talk by Prof. Sameer Sapra, Indian Institute of Technology Delhi
27 Mar 2023	**Entanglement properties of the graviton** Invited talk by Prof. Justin David from IISc, Bengaluru
28 Mar 2023	**Thermal one-point functions, large d, andinterior geometry of black holes** Invited talk by Prof. Justin David from IISc, Bengaluru
30 Mar 2023	**Neutrino mass and leptogenesis, a pedagogical introduction and some recent advances** Invited talk by Dr. Ananya Mukherjee, Saha Institute of Nuclear Physics, Kolkata
SEMINARS/TALKS (INTERNATIONAL)	
11 Apr 2022	**Multi-modal Imaging: Photoacoustic Imaging Plus More** Invited talk by Prof. Chulhong Kim, Pohang University of Science and Technology (POSTECH), South Korea
18 Apr 2022	**Programmable Quantum Simulations with Laser-cooled Trapped Ions** Invited talk by Dr. Kazi Rajibul Islam, Institute for Quantum Computing and Dept of Physics and Astronomy, University of Waterloo, Canada

25 Apr 2022	**Disordered QFTs and Parisi-Sourlas supersymmetry** Invited talk by Dr. Apratim Kaviraj, DESY, Hamburg
11 Aug 2022	**Symmetry in Physics** Invited talk by Prof. Sarada G. Rajeev, University of Rochester, USA
17 Oct 2022	**Mining the Universe: machine learning in Cosmology** Invited talk by Dr.Nicoletta Krachmalnicoff, SISSA (International School for Advanced Studies), Trieste, Italy
2 Mar 2023	**Tomographic exploration of active solar/stellar atmospheres with modern mm-radio telescopes** Invited talk by Dr. Atul Mohan, Rosseland Centre for Solar Physics (RoCS), Institute of Theoretical Astrophysics, University of Oslo, Norway
CONFERENCE/SYMPOSIA	
3-5 Nov 2022	**9th Theme meeting on Ultrafast Sciences (UFS 2022)** The theme meetings on Ultrafast Sciences is an annual event which started in 2013. It was organised along with School of Chemistry and themes included Ultrafast Spectroscopy in Condensed Matter, Ultrafast Photochemistry, Ultrafast Dynamics in Chemical and Biological systems, Terahertz Spectroscopy, Ultrafast Optics, Ultrafast Lasers etc. Speakers from across the world participated in the meeting.
24-26 Feb 2023	**Frontier Symposium in Physics 2023 (FS-PHY 2023)** It is annual series of scientific meetings organized by the School of Physics and serves as a platform for the examination and dissemination of current and emerging research in Physics and interdisciplinary areas.
WORKSHOPS	
5-6 Jan 2023	**International Workshop on Nano-engineered Materials 2023** Co-organized with IIT Kharagpur and TIFR Hyderabad, this workshop featured invited talks about latest advances in nano-engineered materials and their applications for energy devices, sensing, electronic and opto-electronic applications.A dedicated session for post graduate students to give them an exposure to advanced materials research and an exclusive poster session for scholars to showcase their findings were the highlights of this workshop.

School of Mathematics

SEMINARS/TALKS (National)	
27 Mar 2022	**On Squares in Arithmetic Progression** Invited talk by Prof. Shanta Laishram, ISI Delhi
22 Sep 2022	**Divergence-free methods for hyperbolic PDEs** Invited talk by Prof. Praveen C, TIFR CAM, Bengaluru
11 Oct 2022	**A multispecies totally asymmetric zero range process and Macdonald polynomials** Invited talk by Prof. Arvind Ayyer, Indian Institute of Science, Bengaluru
29 Nov 2022	**On Drinfeld oldforms and newforms** Invited talk by Dr. Tarun Dalal from IIT Hyderabad
SEMINARS/TALKS (International)	
5 Aug 2022	**Proportion of points satisfying a Wieferich-type property** Invited talk by Mr. Bhakta Subham, University of Goettingen, Germany
10 Nov 2022	**Operator Means, Wasserstein mean and logarithmic mean of positive definite matrices and unipotent matrices** Invited talk by Dr. Vatsalkumar N. Mer, Chungbuk National University, Republic of Korea
18 Nov 2022	**Coupled shallow surface and subsurface flow** Invited talk by Prof. Dr. Peter Bastian, University of Heidelberg, Germany
29 Mar 2023	**Finitely presented Bestvina-Brady groups** Invited talk by Dr. Mallika Roy, University of the Basque Country (UPV/EHU)
CONFERENCE/SYMPOSIA	
8-10 Apr 2022	**Frontier Symposium in Mathematics 2022** Symposium gaveparticipants exposure of various fields of mathematics from leading experts in the fields. The contents covered include, but are not restricted to Algebra, Analysis, Applied Mathematics, Number Theory, Topology and Geometry.
17-19 Feb 2023	**Frontier Symposium in Mathematics 2023** Annual seminar series in Mathematics that included talks by eminent scientists, flash talk by students and poster presentations.
WORKSHOPS	
23 May-17 Jun 2022	**Mathematical Training and Talent Search Program** Training for undergraduate students. Almost 100 students from various parts of the country participated.

30 May- 25 Jun 2022	**Annual Foundation School** Basic knowledge in algebra, analysis and topology forms the core of all Advanced Instructional Schools organized by NCM. The main objectives of AFS are to bring up students with diverse background to a common level and help them acquire basic knowledge in these subjects required in Advanced Instructional Schools.
18-27 Jul 2022	**NCM Workshop on Complex Fluids and Liquid Crystals** The training school was structured to be a set of introductory courses to the mathematics, modelling, analysis and applications of complex fluids and nematic liquid crystals.
19-24 Sep 2022	**NCM Workshop on Numerical Methods for Partial Differential Equations** This workshop offered an introduction to some important numerical methods for linear and non-linear ordinary and partial differential equations, and various numerical discretization techniques for their solution. It also included an introduction to Machine Learning, Deep Learning, and Physics Informed Neural Networks (PINNs).This workshop was intended for PhDs and Postdocs.
10-11 Dec 2022	**Two-day workshop in Mathematics** It was organized in association with the Indian Mathematics Consortium and Bhaskaracharya Pratishthana, Pune, India
OTHER ACTIVITIES	
18 Sep 2022	**Outreach Program by CMIT** A one-day outreach program was organized for school students of classes 8 to 12 from schools around the Institute and from the city of Thiruvananthapuram. The primary aim of the program was to give school children an opportunity to visit the campus and allow them to explore the exciting world of mathematical research and its application in everyday life.

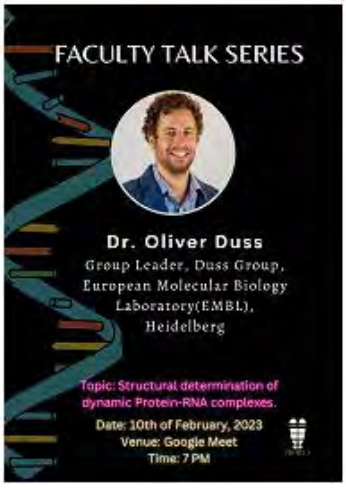
ACADEMIC CLUB ACTIVITIES

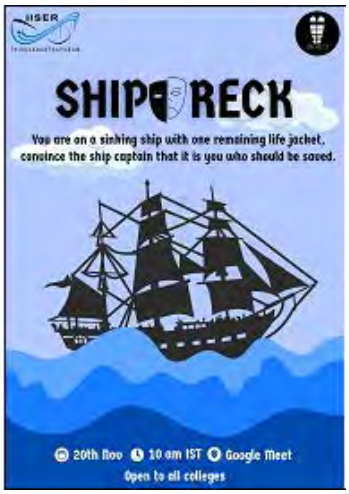
PROTEUS

Proteus is the biology club of IISER Thiruvananthapuram, dedicated to disseminating knowledge and nurturing a passion for the subject among young students. Through initiatives like the 'Rhetor' symposium series, the club has orchestrated three highly triumphant events. Additionally, they have just released the inaugural edition of their annual magazine, named 'Nucleus'. Proteus also operates an outreach endeavor named 'Shiksha', aimed at bringing the excitement of biology to schools across India.Apart from these, the club had released merchandise for the year 22-23. The club also continuously uploaded interesting illustrative articles on its website and social media pages. Major activities carried out by the club are listed below.

FACULTY TALKS/SEMINARS	
15 Oct 2022	**The Model Organism - Mouse in Research** Talk by Dr. Poonam Thakur, School of Biology, IISER Thiruvananthapuram. This was part of Model Organism Talk Series, where speakers talk about the fascinating model organism they work with and explain about the significance of the model organism.
10 Feb 2023	**Tracking assembly and function of single active protein-RNA complexes in real time** Invited talk by Dr. Olivier Duss, Group Leader, Duss Group, EMBL, Heidelberg.
SYMPOSIUM	
1 Nov 2022 – 26 Nov 2022	**Rhetor 3.0** The Annual Club Symposiumwas conducted online in the month of November. Its theme was 'Et Cetera: A timeline of Biological Manipulations' and included diverse range of nine talks. The speakers included Dr. Tamal Das (TIFR, Hyderabad), Prof. Kushagra Bansal (JNCASR, Bengaluru), Dr. Gayathri Pananghat (IISER Pune), Prof. Mohit Prasad (IISER Kolkata), Dr. Satish Khurana (IISER Thiruvananthapuram), Dr. Devapriya Chattopadhyay (IISER Pune), Prof. Subhadra Channa (Delhi University), Dr. Arjun Krishnan (University of Colorado, USA) and Ms. Maj-Britt Karlman Asp (Stockholm University).
PEER DISCUSSION	
27 Jan 2023	**Start-ups in Biology, an overview and how-to!** The first ever peer discussion by Proteus was conducted by Mr Nikilesh Vijayan. He explored the various possibilities of setting up a Start-Up in the field of biology.
HIKSHA (Club Outreach Program)	
26 Oct 2022	**Shiksha session at All Saints Public School, Vithura, Thiruvananthapuram** This was part of Anvesha program. Volunteers talked about the hierarchy from molecules to organism and showed the videos of how lab work is done in a biology lab. Drosophila and bat specimens, culture plates and insect boxes were also shown.
15 Dec 2022	**Shiksha session at Pratap Public School, Karnal, Haryana** Over 100 students from the 9th and 10th grades participated in the session led by Anusha. The discussion covered a wide range of topics including general science concepts, various experimental biology techniques, strategies for pursuing interest in science, and guidance on gaining admission to IISERs.
22 Dec 2022	**Shiksha session at Puri, Odisha** Approximately 60-70 students spanning grades 9 to 12 actively participated in this event organised by Gatikrushna on the birthday of Srinivasa Ramanujan.
7 Feb 2023	**Shiksha session at Vocational Higher Secondary School, Edamon** Our team engaged with the students, discussing diverse techniques in experimental biology, providing them with insights into insect boxes, culture plates, and other relevant materials.

OTHER ACTIVITIES	
8 Jun 2022	**Bio Art 2.0** An art competition where participants submitted both digital or hand-drawn paintings related to the theme, 'Evolution of Biology'. Winners were Sayantani Biswas of IISER Berhampur and Nirmegh from IISER Thiruvananthapuram.
3 Jul 2022	**Blast 2.0** An online treasure hunt competition conducted on Discord Platform. Out of 60 teams that participated, 11 teams qualified for the final round held on 28 Aug 2022. The event saw many participants from outside the institute.
19 Nov 2022	**Five Seconds Rule** Organized as a part of Rhetor 3.0, this was a game of quick thinking and fast action. The questions were to be answered within 5 seconds.
20 Nov 2022	**Shipwreck** Shipwreck was a fun dialogue competition, wherein participants had to convince the judges that they should be picked over their opponents by highlighting reasons as to why their lives were more important.
04 Feb 2023	**Official Launch of Proteus club Magazine-Nucleus** The club magazine was launched in the presence of chief guest Dr. Sandhya Sekhar, Manager at Mongabay India, Dr. N Sadananda Singh, students and faculties. The e-version was shared with everyone.





Launch of the Club Magazine, Nucleus in presence of Dr. Sandhya Sekhar

Talk by Dr. Poonam Thakur in the Model Organism Talk Series

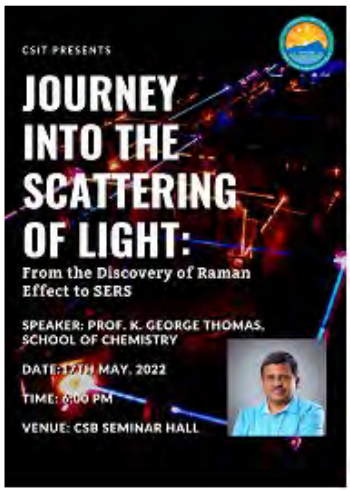
Shiksha outreach session at Pratap Public School, Karnal, Haryana

CHEMICAL SOCIETY OF IISER THIRUVANANTHAPURAM (CSIT)

CSIT is a student-led club affiliated with the School of Chemistry. The club's mission is to promote awareness of chemistry and science among students and society. Comprising chemistry enthusiasts, CSIT arranges diverse events like competitions, talks, workshops, and seminars. Through a robust online presence, CSIT shares engaging educational content, releasing a monthly newsletter named 'The Catalyst' and a semester magazine named 'Synthesis', which features articles spanning chemical research, interdisciplinary science perspectives, and related areas of interest. Major activities carried out by the club are given below.

FACULTY TALKS/SEMINARS	
17 May 2022	**Journey into the scattering of light** A talk by Prof. K George Thomas, IISER Thiruvananthapuram on the history of the discovery of Raman Effect, and subsequent evolution of Raman Spectroscopy.
22 Jun 2022	**Queering Science** This talk by Mr. Sayantan Datta, Krea University was focussed on the problems of adequate representation of diverse communities in the scientific world.
19 Oct 2022	**Dynamics of Protein Aggregration: An NMR Perspective** A talk by Dr. Vinesh Vijayan, IISER Thiruvananthapuram.
29 Jan 2023	**The Chemical Logic of Kreb's Cycle** A talk by Dr. Ravi Maruthachalam, IISER Thiruvananthapuram.
30 Jan 2023	**Basic Aspects of Light-Matter Interactions** A talk by Prof. Edamana Prasad, IIT Madras.
31 Jan 2023	**Machines that sniff Chemicals: Physical means of identifying chemical species** A talk by Dr. Vinayak Kamble, IISER Thiruvananthapuram.
2 Feb 2023	**Challenges associated with process chemistry** A talk by Prof. K R Prasad, IISc Bengaluru. Unique challenges with regards to organic transformations and syncretism between academia and industry were the main topics of discussion.

3 Feb 2023	**Photoredox mechanisms and photocatalyst development** An online talk by Prof. Oliver Wenger, University of Basel.
3 Feb 2023	**Quantum sieving using atom-thick membranes** A talk by Dr. R S Swathi, IISER Thiruvananthapuram.
4 Mar 2023	**Methodology development in Organofluorines and photochemistry** A talk by Prof. Mathew Hopkinson, Newcastle University
STUDENT TALKS	
16 Jul 2022	**Biochemistry of Snake Venom** A talk by Shreyas Kuchibhotla , Imperial College, London was organised on World Snake Day.
29 Jan 2023	**Can the average pursue excellence?** A motivational talk by Allwin Ebenezer S, IISER Thiruvananthapuram.
1 Feb 2023	**Data-driven Chemistry** An online talk by IISER Thiruvananthapuram Alumini, Vinayak Bhat, currently at University of Kentucky.
14 Feb 2023	**Stimuli-induced structural transformation in the confined space of co-ordination cages** A talk by IISER Thiruvananthapuram Alumini, Dr. Hema Kuntrapakam, currently at Weizmann Institute of Science, Israel.
PEER DISCUSSIONS & WORKSHOP	
10 Apr 2022	**Concepts in Basic Quantum Chemistry** Student discussion on basic concepts of quantum chemistry and how they apply to real-world problems
11 Apr 2022	**Group Theory in Chemistry** Student discussion around the diverse uses of group theory in chemistry
14 Jun 2022	**Reaction Mechanisms in Organic Chemistry** A discussion by Ashutosh Mishra on different classes of organic reaction mechanisms, and how can one elucidate them.
22 Dec 2022	**Evolution of Microscopy** A discussion by Philip Daniel Maret on the evolution of microscopy as a technique and the scope for future developments.
5 Feb 2023	**Plotting and Analysis using Origin** A workshop by Shreetam Parida, Prajval and Girish on how Origin software can be used for plotting and analyzing data. Data collected from experimental studies like XRD, NMR, UV-Vis and IR spectroscopy was demonstrated.
OTHER ACTIVITIES	
14 Sep 2022	**No-Reaction** A quiz competition on Chemistry trivia
30 Jan 2023	**Chem-Scribble** Chemistry Pictionary Competition
1 Feb 2023	**Re-Action** Chemistry charades, a game on explaining the science behind movie sequences
11 Mar 2023	**Screening of Radioactive** It's a film based on the life of Madame Curie and her contributions to Science



CSIT Farewell party 2023

PHYSICS SOCIETY OF IISER THIRUVANANTHAPURAM [PSI(t)]

PSI(t) is a student-operated club associated with the School of Physics. The club's primary objective is to ignite a shared enthusiasm for Physics and cultivate a conducive learning ambiance for those devoted to the subject. Its year-round activities include informative content distributed across social media platforms, frequent peer discussions that delve into stimulating subjects, and the hands-on pursuit of constructing rockets and radio telescopes. A summary of its activities is given below.

FACULTY TALKS/SEMINARS	
22 Jan 2023 – 26 Jan 2023	**Club Foundation Week Talks** To commemorate Foundation week, a series of talks in diverse fields were delivered by Dr.V. R. Lalithambika, ISRO, Dr. Vijayakumar, ICTS, Dr. Mayarani, IIT-P, Dr. Michael Coughlin, University of Minnesota and Dr. Stefan Vogel, CERN.
STUDENT TALKS	
1 Sep 2022	**Quantum Transport** An Elective Series talk by Rohit V Menon.
13 Nov 2022	**QFT** An Elective Series talk by Sharing Iyer.
14 Feb 2023	**Soft Matter** A talk by Dr. Jyotishraj N, an IISER Thiruvananthapuram alumini on active nematic defects in flat and curved spaces
PEER DISCUSSIONS	
2 Jul 2022	**An overview of the Standard Model** Student discussion on What is standard Model? What is its importance in particle physics? Is it wrong?
20 Aug 2022	**The physics of semiconducting spin qubits** In this discussion, students explored the physics behind this class of qubits and how they are realized and controlled.
OTHER ACTIVITIES	
26 Jun 2022	**Screening of the movie Space Odyssey**
13 Aug 2022	**Screening of the movie Back to the future**
18 Sep 2022	**Screening of the movie Back to the future - 2**
21 Jan 2023	**Treasure hunt** A Treasure hunt competition held as part of Foundation week events
27 Jan 2023	**Rebus Quiz** A quiz competition held as part of Foundation week events
28 Jan 2023	**Photography Competition** A photography competition held as part of Foundation week events

Dr. V. R. Lalithambika (Director of Human Space Program, ISRO) speaking during Second Foundation Week Celebration of PSI(t)

Prof. Joy Mitra presenting Prof. J. N. Moorthy with a Memento during the second PSI(t) Foundation Week

CLUB OF MATHEMATICS IISER THIRUVANANTHAPURAM (CMIT)

CMIT is a student-led Mathematics club with in the institute, officially recognized by the department. The club operates with the primary goals of advancing Mathematics and establishing a platform for students to convene, exchange ideas, learn, and partake in a range of activities spanning the entirety of the year. Major activities carried out by the club are listed below.

FACULTY TALKS/SEMINARS	
18 Sep 2022	**Are all Triangles Equilateral?** A talk by Dr. Shrihari Sridharan, IISER Thiruvananthapuram.This talk was organized as a part of Foundation Day celebrations.
15 Mar 2023	**p-Rationality of consecutive quadratic fields and Iizuka's conjecture** A talk by Dr. Jaitra Chattopadhyay organized as a part of Pi Week celebrations.
17 Mar 2023	**A Brief Introduction to Survival Analysis** A talk by Dr. Priyanka Majumder, IISER Thiruvananthapuram organized as a part of Pi Week celebrations.
STUDENT TALKS	
10 Sep 2022	**A journey towards Hyperbolic geometry and Tessellations** A talk by Shyam M during Annual Foundation Day celebrations.
18 Sep 2022	**The Konigsberg Problem: Pathway to Graph Theory** A talk by Anitha Valliappan during Annual Foundation Day celebrations.
16 Mar 2023	**Probability 101: What are the odds?** A talk by Rishica Arora and Adithya V during Pi Week celebrations.
PANEL DISCUSSION	
30 Aug 2022	**Opportunities in Mathematics: India and Abroad** Panel consisted of Dr. Dharmatti Sheetal, Dr. Nagaiah Chamakuri, Dr. Shrihari Sridharan, Dr. Viji Z Thomas and Dr. Arun K R from IISER Thiruvananthapuram.
PEER DISCUSSIONS	
12 Aug 2022	**Game Theory 101: from rock-paper-scissors to Rivalry, from dice to Diagnostics** Speakers: Rishica Harish Arora and Anitha Valliappan

19 Aug 2022	**Tiki Taka with Catalan numbers** Speaker: Bharath Krishna S
27 Aug 2022	**Choice and its Convenience** Speaker: Ashish Kujur
2 Sep 2022	**RSA Cryptosystem** Speaker: Adithya V
10 Oct 2022	**Multiplicity of roots of multivariable polynomials** Speaker: Muneeswaran
14 Oct 2022	**Bevy of Cantor's Set and the Devil's Staircase** Speaker: Ajin Shaji Jose
24 Jan 2023	**The Legendary Question 6** Speaker: Tony Nixon Mavely
31 Jan 2023	**It takes Two to Tango! The interplay between Math and Kolam** Speaker: Bharath Krishna S
7 Feb 2023	**Dedekind Cuts** Speaker: Chaitanya Sanjeev Joglekar
12 Feb 2023	**Triangles** Speaker: Anitha Valliappan
COMPETITIONS	
7 Jan 2023	**Axiomatica** This quiz competition conducted in collaboration with QSI was aimed to develop interest in Mathematics among the newer batches of students
14 Mar 2023 - 19 Mar 2023	**Pi-uiz 4.0 and Meme Contest and Strokes** These competitions were organised as a part of Pi Week celebrations.
OTHER ACTIVITIES	
18 Sep 2022	**CMIT Outreach Program for Schools** The aim of this program was to inculcate interest towards mathematics in school kids and encourage their mathematical creativity. Several events including talks by faculty and students were organized.
22 Nov 2022	**Screening of the Korean Movie - In Our Prime**

CMIT Outreach Program for School students

School studentsin the Outreach Program making Rangoli using mathematical concepts

SCIENCE AND TECHNOLOGY COUNCIL ACTIVITIES

SCIENCE AND TECHNOLOGY (S&T) COUNCIL

The Science and Technology Council (S&T) is a body comprised of elected student representative at IISER Thiruvananthapuram. Working closely with faculty members, it organizes a diverse range of science-focused events within the institution, most notably the annual science fest called Anvesha.Under the guidance of the S&T Council, several distinctive clubs thrive, each with a specific focus. The Coding Club, Ecological Society, Parsec-Astronomy Club, Quizzing Society, and Exhibit A Magazine all operate under its stewardship.Beyond facilitating coordination among various clubs, the S&T Councilconducts outreach initiatives in schools and public domains.

FACULTY TALKS/SEMINARS	
6 Nov 2022	**Nobel Lecture Series** The lecture series provided expert insights into the research and significance of the Nobel Prizes awarded in 2022. Prof. Kana M. Sureshan, Prof. Anil Shaji, Dr. Nishana M and Dr. Alice Sebastian talked about the Nobel prize in Chemistry, Physics, Physiology and Economics respectively.
7 Nov 2022	**Playing Games: Mathematically speaking** A talk by Prof. R. Ramanujam who discussed Game theory.
8 Nov 2022	**Entanglement Public Lecture Series** A lecture series aimed to invoke curiosity and introduce scientific research among the visiting school students of Class 9 to 12. Lectures were delivered by Dr Jerry A. Fereiro, Dr Shabnam Iyyani, Dr Viji Thomas and Dr Ravi Maruthachalam.
26 Mar 2023	**Studying Abroad & Preparing your Statement of Purpose** Ms. Neha Agrawal, an academic communication expert and the founder of WiseUp Communicationscovered topics such as selecting universities, the application process, and crafting SOPs and personal statements.
PANEL DISCUSSIONS	
17 Dec 2022	**Guidance Session on applying for Internships** A Q&A session was held with a panel comprising of Dr. Jerry A. Fereiro, Dr. Rajendra Khurapati and Dr. Dhanya Rajendran, who provided their valuable perspective.Akshita Mittal, IISER Thiruvananthapuram also delivered a talk on 'How to Win an Internship: A Modern Guide to the Art of Persuasion'.
11 Feb 2023	**Contribution and representation of Women in Science** In celebration of the International Day of Women and Girls in Science, a panel comprising of Prof. G.Ambika, Dr. R. S. Swathi, Dr. Nisha Kannan and Ms. Diksha Pandey shared their experiences and achievements, emphasizing the significance of women's contributions and representation in the field. Prof. G. Ambika also delivered a talk on'Women in STEM'.
28 Feb 2023	**Depression: Origin, Causes, and Remedies** In this panel discussion, Prof. Mahesh Hariharan, Prof. Joy Mitra, Dr. Deepshika Jaiswal Nagar, Dr. R. S. Swathi and other student members shared their stories of fighting against the odds, and discussed how they can together build a more friendly environment on the campus.
WORKSHOPS	
29 Oct 2022	**Introduction to scientific illustration** Scientific illustrator, Rafeeque Mavoor, conducted a day-long workshop. Participants had the valuable opportunity to acquire practical skills in utilizing Blender, progressing from fundamental concepts to more sophisticated methods.

30 Oct 2022	**Upskill- unleash and explore your inner self** Sherin Kalathil, an experiential learning facilitator and NSQF certified master trainer, conducted an interactive session focused on enhancing participants' soft skills through inhibition-breaking activities and games.
6 Nov 2022	**Interferometer simulations using FINESSE** The workshop introduced participants to FINESSE (Frequency domain INterfErometer Simulation SoftwarE), a simulation package for gravitational wave interferometers.
7 Nov 2022	**Gravitational wave open data workshop** The workshop emphasized skills such as data downloading from the Gravitational Wave Open Science Center (GWOSC) and employing match-filtering techniques to identify signals amidst noise.
OTHER ACTIVITIES	
15 Sep 2022	**Swachhta Pakhwada Rally** An awareness rally was held during the Swachhta Pakhwada in Vithura. More than 100 students and faculty members joined the rally.
18 Sep 2022	**Outreach at JNV Vithura** The S&T council, along with the iGEM team, PSI(T), and Parsec interacted with over 500 students and demonstrated science equipment.
4 Oct 2022	**Code Battle** The sequel to the Battle of coders, it was a data-science and programming based competitive coding battle that was conducted on Hackerrank.
23 Oct 2022	**Treasure Hunt** Theme of this Treasure Hunt was time travel and civilizations. Teams of 3 participants each solved clues scatteredaround campus.
26 Oct 2022	**Outreach at Vithura Schools** Second outreach session was conducted before Anvesha'22. More than 1000 students participated in this outreach.
28 Oct 2022	**Speak-Up** Participants presented a 5-minute talk on the topic assigned to them randomly.
30 Oct 2022	**Outreach at Mall of Travancore** This programme was conducted for general public with the help of Theatrics Society and featured a drama highlighting the importance of science in life.
31 Oct 2022	**Potpourri** This event was designed for individuals who love solving puzzles such as rebus, anagrams, and crosswords.
1 Nov 2022	**Integration Bee** Competition involves exhibiting one's integration techniques. Event included Integration Bee for Real functions and Integration Bee for Complex functions.
2 Nov 2022	**BlackBox** It was a game that teststhe skill in guessing and arranging a circuit based on given input and output signals.

3 Nov 2022	**BahFest** A comedic science competition that showcases humorous and deliberate ridiculous scientific theories. Participants present their satirical hypotheses with a humorous twist, often involving bizarre explanations for real-world phenomena.
4 Nov 2022	**Inquisitio** The fourth edition of the online intercollegiate treasure hunt, Inquisitio 4.0, was organised as part of the Anvesha'22 fest.
5 Nov 2022	**CSI (Crime Scene Investigation)** One of the biggest online events designed by the Anvesha'22 crew, where participants were to solve the top secret crime.
8 Nov 2022	**Aficionados - Science Expo** The Science Expo, with the support of other academic clubs, provided a platform for individuals to exhibit their creative flair and passion for science. Participants from diverse disciplines contributed physical and theoretical exhibits to captivate the audience.
7 Feb 2023	**Outreach at Edamon HSS & VHSS** The program aimed to raise awareness about the IISERs and science research opportunities in the country. The sessions covered topics such as the IISER system, admission process, and the BS-MS course program.

Nobel Prize Lecture Series

School students attending Anvesha'22

Glimpses of Annual
Science Fest Anvesha'22

Entanglement Lecture by
Prof Viji Thomas

PARSEC

Parsec, an Astronomy Club under the Science and Technology Council at IISER Thiruvananthapuram, operates as a student-led initiative. It offers a platform for students to engage in diverse activities encompassing peer discussions, weekly screenings, stargazing sessions, telescope experiences, workshops, outreach initiatives, and small-scale projects during the science fest. Notably, the club recently unveiled its first-ever set of merchandise. The club's essence lies in uniting astronomy enthusiasts, providing them with a space to discuss, collaborate, and raise awareness about the enigmatic realms of the cosmos.

STUDENT TALK	
23 Aug 2022	**Astrophotography Session** Thissession by Kaustubh Verma was arranged as a part of the Foundation Week activities of the Club. It focused on the basics of astrophotography ranging from simpler objects like the moon, Milky Way to deep-sky objects.
PEER DISCUSSIONS	
26 May 2022	**Basic Physics of GW150914** The discussion was based on the first-ever Gravitational Wave (GW) detection. Itcentered on how GW is generated and methods for its detection and analysis.
3 Jun 2022	**Match-Filtering** In this peer discussion, we focused on Match-filtering, which is a technique used to identify and model the observed Gravitational Wave signal data.
25 Jun 2022	**Gamma Ray Bursts (GRBs)** Students discussed concepts and theories of GRBs.
8 Jul 2022	**Geometry** The discussion was based on the concept of gravity as proposed by Albert Einstein and the curvature of space-time.
25 Aug 2022	**Exoplanetary Atmosphere** The activity was a part of the Foundation Week of the club. The discussion was based on exoplanet detection and atmospheric research and techniques used for the same.
12 Jan 2023	**Rotating Black Holes** The discussion was based on concepts relating to rotating black holes.
OTHER ACTIVITIES	
5 Jun 2022	**Telescope Demo Session** Session to familiarize students with the usage of available telescopes with the club.
14 Jun 2022	**Telescope Session: Supermoon** The event was organized to observe the Supermoon visible during that period.
25 Jun 2022	**Telescope Session: Penta-Conjunction** The event was organized to observe the 5 planets viz. Mercury, Venus, Mars, Jupiter, and Saturn in a rare alignment with the Moon.
21 Aug 2022	**Spatium Scientia** A quiz competition in collaboration with QSI was conducted as a part of the Foundation Week program of the club.
28 Aug 2022	**Hands-on Session: Visualization of HR diagram & calculating the age of Star Cluster** The session was to provide hands-on experience with software like TOPCAT, which analyses data collected from Gaia spacecraft.
18 Sep 2022	**Outreach Programme in Schools of Vithura** Outreach Programme was conducted as a part of Anvesha 2022 in nearby schools of Vithura. The members showedschool students a telescope and discussed fascinating space concepts.
25 Oct 2022	**Telescope Session:Partial Solar Eclipse & Sunspots**

8 Nov 2022	**Anvesha: Aficionados** The club helped in the coordination of a few projects like Small scale Radio Telescope, Transit photometry etc.
Apr 2022 – Feb 2023	**Screening of Movies/Series** Multiple movie/Series screenings were held throughout the year. Some of these include Dune, Alien World, The Martian, Rocketry: The Nambi Effect, Interstellar, Feynman Messenger Lecture 1, Comet Catcher: Rosetta Landing etc.
10 Jan 2023	**Astrophotography Competition** It was intended to encourage people to try to capture the International Space Station, Hubble Space Telescope, and Tiangong Space Station, which were visible in the night sky during that period.

Student volunteer explaining about telescope during its outreach program in the neighboring school

ECOLOGICAL SOCIETY OF IISER THIRUVANANTHAPURAM (ESI)

ESI is a club of nature enthusiasts who create awareness about the natural world and the importance of sustainability among our campus community. We conduct numerous events like quizzes, documentary screenings, nature walks, bird identification workshops, bingos, clean-up drives, etc. ESI is not just an ecological science-based club but a group of people who are passionate about nature, climate change and the environment as a whole.Major activities carried out by the club are given below.

FACULTY TALKS/SEMINARS	
6 Feb 2023	**Effect of climate change on ecology** An online talk Dr. Meghna Krishnadas, CCMB Hyderabad.
9 Feb 2023	**Understanding our ecosystem through plants** An online talk by Dr. Vinita Gowda, IISER Bhopal
STUDENT TALK	
17 Apr 2022	**The Secret Lives of Bats** A talk by Dr Baheerathan M, IISER Thiruvananthapuram.
WORKSHOP	
8 Feb 2023	**Nature Photography Workshop** In this workshop, Mr Kaustubh Verma talked about various techniques and provided various tips on clicking photos of the natural world around us.
OTHER ACTIVITIES	
24 Apr 2022	**Plant and spider walk** Itwas conducted by Vishwathiga J, Anumit Saralkar and Sachin Bhasker.
7 Jun 2022	**What on Earth?** A quiz competition organized on the occasion of World Environment Day in collaboration with QSI and S&T Council of IISER Thiruvananthapuram.
26 Oct 2022	**Outreach Programme in Schools of Vithura** Outreach Programme was conducted as a part of Anvesha 2022 in nearby schools of Vithura.
5 Nov 2022	**Wildlife Bingo** A 5x5 Bingo sheet was to be completed within 24 hours based on the species found on the campus.
5 Feb 2023 – 11 Feb 2023	**Wildlife Week 2023** To celebrate the Wildlife Week, multiple competitions such as Nature Photography, Nature Writing, Treasure Hunt and Quiz based on Wildlife, and a Waste-themed contest, Trash to Treasure, were organised.
Apr 2022 – Mar 2023	**Screening of Movies/Series** Multiple movie/Series screenings were held throughout the year. Some of these include Back to the Outback, David Attenborough: A Life On Our Planet, Green Planet, On the Brink, The Year Earth Changed, The Elephant Whisperers, My Octopus Teacher, Zootopia etc.
Apr 2022 – Mar 2023	**Nature Walk** A walk around the campus to rediscover the biodiversity and the species richness of the campus.
13 Feb 2023	**Snake Awareness Session** Mr Gnaneswar Chfrom Madras Crocodile Bank conducted asnake awareness session for the residents of IISER Thiruvananthapuram. He explained how to identify different snake species and coexist with them.
18 Feb 2023	**Campus Bird Count** This campus bird count was done in collaboration with eBird India and Bird Count India.

Wildlife week treasure hunt

Artwork made from garbage

Herp Walk

Plant and spider walk

Team ESI

Outreach activities of the ESI in the neighboring schools

CODING CLUB

The Coding Club at IISER Thiruvananthapuram aims to foster programming skills among students across all proficiency levels. Functioning as an entity under the guidance of the Science and Technology Council, the club provides a platform for engaging discussions that enhance the learning experience beyond traditional coursework. Moreover, the club oversees activities related to Data Science, Financial Studies, Applied Sciences, and Mechatronics. It has organized a talk on the 'Importance of Coding in Natural Sciences' by Sharang Iyer, Nishil Mehta, Diksha Pandey and Sameer Joshi on 30 June 2022. A tutorial session on July 7, 2022, led by Aryan Bhatia, provided an introductory understanding of code functioning, followed by problem-solving in the C language. On 28 August 2022, Nanda Nair conducted a peer discussion session on Python and Matplotlib, a Python visualization library.Another peer discussion session on 21 December 2022, led by Prajval K, centered around 'Git, GitHub, and their basics'. The peer discussion elaborated on Git, a free and open-source version control system, adept at managing projects of varied sizes.

QUIZZING SOCIETY OF IISER THIRUVANANTHAPURAM (QSI)

The club remains a consistent presence in campus life, overseeing events like Put Funda during Ishya, Utsuk, and Jigyasa during Anvesha, alongside numerous other collaborations with other clubs in the campus. Their enthusiasm for organizing quizzes knows no bounds, encompassing topics ranging from the mundane to the extraordinary.

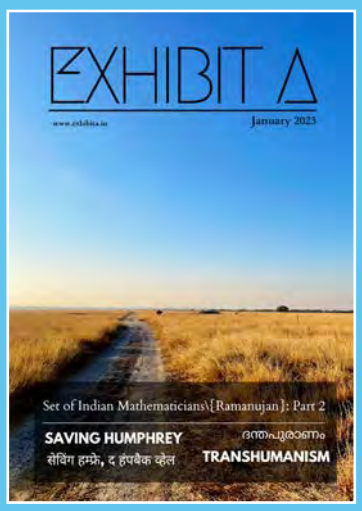
QUIZES	
30 Apr 2022	**Hello and Goodbye Quiz** A general quiz to welcome the new batch (BS-MS 21) and a farewell to the ones leaving (BS-MS 17).
27 May 2022 & 7 Jan 2023	**Axiomática** These math quiz competitions were conducted in collaboration with CMIT for the new batches of students on the campus.
7 Jun 2022	**What on Earth?** A quiz competition organized on the occasion of World Environment Day in collaboration with ESI.
19 Jun 2022	**Total Football Quiz**
14 Aug 2022	**Bharat, Ek Quiz (Inter-Collegiate and Inter-School)** An India quiz to celebrate the 75th year of our Independence in collaboration with the Cultural Council was organised for school as well as college students.
21 Aug 2022	**Spatium Scientia** An astronomy quiz competition in collaboration with Parsec was organised.
26 Aug 2022	**Funda-mental** A general quiz hosted by Manas Mohit and Karthik
5 Sep 2022	**Literature Quiz**
14 Sep 2022	**No-Reaction** A quiz competition on Chemistry trivia in collaboration with CSIT.
15 Sep 2022	**Hindi MELA quiz** A quiz based on music, entertainment, literature and arts to celebrate Hindi Diwas.
18 Sep 2022	**GanitWiz** A math quiz for school students as a part of CMIT's outreach program.
28 Oct 2022	**General Quiz**
8 Nov 2022	**Utsuk** A school quiz conducted by the members of QSI on the open day of Anvesha.
10 Nov 2022	**CricMania** A cricket quiz during the T20 IPL season in collaboration with the sports council.
13 Nov 2022	**Jigyasa** The official open general quiz of Anvesha.
16 Nov 2022	**MELA quiz** A quiz based on music, entertainment, literature and art by Abhinav G.
20 Nov 2022	**Fantastic Fundas and Where to Find Them** A fantasy quiz by Tony Nixon Mavely and Samyukta Anand.
27 Nov 2022	**We the People** A quiz to commemorate Constitution Day was organized in collaboration with the Cultural Council.

8 Jan 2023	**Football Quiz** A general football quiz, with a special focus on World Cups.
10 Jan 2023	**Lit Quiz** A quiz on profane literature by Shreya V and Naveen
21 Jan 2023	**Bamboozled** A general quiz by Hana Lukman
4 Feb 2023	**War, Peace, and Everything in Between** A history quiz by Anitha
7 Feb 2023	**What on Earth? 2.0** A wildlife quiz organized in collaboration with ESI during their Wildlife Week celebrations.
14 Feb 2023	**Garden of Fundamental Absurdities** A general quiz hosted by Dr Jyothishraj.
15 Feb 2023	**Around the World in 42±7 Questions** A geography and travel quiz hosted by Dr Jyothishraj.
28 Feb 2023	**Inter-departmental Science quiz** An inter-department quiz to commemorate National Science Day in collaboration with the Science and Technology Council of the institute.
14 Mar 2023	**Pi-uiz 4.0** A math quiz in collaboration with CMIT during their Pi-Week celebrations.
16 Mar 2023	**Into the Quizverse of Madness** A Marvel quiz hosted by Tony Nixon Mavely
24 Mar 2023	**Put Funda** The official open general quiz of Ishya.


BYJU'S
INDIA

EXHIBIT A

Within research institutions, the presence of a platform for uninhibited exchange of ideas is of utmost importance. Exhibit A is the official publication of the Science and Technology Council of IISER, Thiruvananthapuram. Our objective revolves around comprehensive reporting, encompassing the entire spectrum, ranging from cutting-edge research developments to well-established paradigms. Concurrently, we embrace our role as a channel for students at IISER Thiruvananthapuram to articulate and convey their thoughts and perspectives.In the October 2022 edition of Exhibit A, we presented an engaging blend of content that not only features research highlights from IISER Thiruvananthapuram but also included, perspectives from YouTube content creators and their audience, and winners of our recruitment competition. Our November 2022 edition was released in time for Anvesha science fest. It featured 'Book Review: The Dawn of Science' along with regular research highlights. December2022 edition boasts an array of content, including an assortment of research highlights, book review and a new series to celebrate Indian mathematicians. The January 2023 edition also featured articles in non-English languages. Our February 2023 edition of Exhibit A encapsulates the energy of CSIT and PSIT's Foundation Week events, Science Day celebrations, ESI's Wildlife week events as well as the launch of 'Nucleus', annual magazine of Proteus club.



Cultural Council Activities

CULTURAL COUNCIL

The Cultural Council is a student-elected representative body under the Student Affairs Council that provides a platform to nurture and unveil the talents of the IISER Thiruvananthapuram community. Since its inception in 2019, the Cultural Council has grown to encompass eight major sub-societies and three sub-clubs that actively engage students in a plethora of art and literary events, thereby promoting a vibrant campus atmosphere. The Cultural Council is also responsible for organising Ishya, institute's grand annual cultural fest.

Dance Society:

The Dance Society is a platform for people who start dancing and grooving to the slightest rhythm anytime, anywhere. The members held weekly dance sessions at the Student Recreation Center to teach and learn different dance forms. The year-round theme challenge introduced in the previous year, where people had to perform based on a theme -given for each month, was continued. The dance society represented the institute in the group dance competitions organised by cultural fests of external institutes such as Nadanta -Group Dance Competition of Dhwani- held at CET Thiruvananthapuram from 21-23 May 2022 and Group Dance Competition of Dhanak- held at IIST Thiruvananthapuram on 17th March 2023. All the passionate dancers of the club came together to celebrate various occasions such as Ganesh Chaturthi, Ishya 2023, Pride month, Hindi Diwas, Diwali Celebration and Republic day.

It conducted an online dance competition for Onam celebrations named as 'Disco in Drape' on 4th September 2022 to show off the Onam costumes. The dance society exhibited an energetic flashmob performance on 30th October 2022 at the Mall of Travancore as part of Anvesha, institute's Science Fest. The dance society released its first-ever merchandise- STEP UP Tee, the range of oversized tees on 7th October 2022. It also launched an online dance challenge called as 'Jack of All Trades' 19th January 2023 where one has to create a video incorporating various dance genres, styles and techniques in under a minute.

Music Club:

The Music Club is a place for music enthusiasts of all genres and styles, let it be Western pop, Indian classical or Folk songs. Regular weekly jamming sessions were held to promote and discover new musical talents and offer a platform for musicians to showcase their skills. The Music club enthralled its audiences by performing on various occasions on and off-campus over the year such as at International conferences organized by IISER Thiruvananthapuram, Independence Day, Republic Day, Hindi Diwas and Ishya. The Music Club paid homage to Krishnakumar Kunnath, a prominent Indian play-

back singer, by releasing three popular songs sung by him on our Instagram handle. On 8th April 2023, Tyagarajana Aaradhana was organised to pay tribute to the illustrious Carnatic music composer, Tyagaraja. The festival involved group renditions (Goshti Gayanam) of the composer's famous compositions, thus commemorating his invaluable contributions to music.

Movie Club:

The Movie Club of IISER Thiruvananthapuram is the perfect niche for all movie buffs, from movie screenings to fun activities. The screenings were conducted in the seminar halls and billboard and received a wide reception from the student community. The club screened movies on weekends from a variety of genres and languages bringing inclusivity to all cultures around the globe. Some of the movies include Zodiac, Garden of Words, Pulp Fiction, Everything Everywhere all at Once, Top Gun Maverick, Kantara, Aftersun, Chhello Show etc. The club also screened movies on days of national and international significance such as Janajatiya Gourav Diwas, Independence day, National Unity Day to increase awareness. Special screenings were also done as part of the festivities. Bingo Night in collaboration with Mazhavil (LGBTQ+ pride club) and Movie Review writing competitions were also conducted.

Literature and Fine Arts Society (ISLA):

The Literature and Fine arts society of IISER Thiruvananthapuram is a group of creative youngsters transforming the artistic culture of the campus, bringing exquisite flavors of art and literature alike. It encompasses a Book Club and a newly formed Oratory Club. The book club put out fiction and non-fiction must-read 'Book of the Month' for its avid reading community and held engaging discussions on these books every month. For Pride Month, various online events like Rainbow Art and Craft competition and Pride quiz were conducted. On the occasion of the 75th Independence Day, ISLA organised a poster making competition. On 1st November 2022, ISLA, along with student volunteers, organised a Halloween-themed open mic, which included a costume contest and games, among other cultural performances. Scary shots, a short story competition, was also organised in connection with this.

To commemorate the Janajatiya Gaurav Divas on 15th Nov 2022, the club conducted a Debate competition in the PSB Seminar Hall on the topic 'Did tribal fighters fight a distinct and different battle for India?'. To promote debating and oratory skills among the student community, ISLA formed an Oratory club and

conducted an inauguration debate competition on the topic 'Reservations in higher education institutions promote social progress of the society' on 26th Jan 2023. A student group visit was arranged by ISLA to the fourth edition of Mathrubhumi International Festival of Letter (MBIFL) at Thiruvananthapuram on the 4-5 February 2023. MBIFL is regarded to be South India's biggest Literature festival for literary enthusiasts. Our debate team represented IISER Thiruvananthapuram in Altus Disputatio, the flagship Debate Competition hosted by NUALS (National University of Advanced Legal Studies), Cochin, from March 11th to 12th. The team put up an impressive performance by reaching the semi-finals, and Ananthakrishna Panuganti won the title of 'Overall Best Speaker'. ISLA also organised a Book Fair for the first time in collaboration with DC Books and Mathrubhumi Book House as part of Ishya from 21-23 March 2023.

Sopanam: The Magazine

Sopanam, the official college magazine of IISER Thiruvananthapuram, is the creative outlet for its student community. The club host a pack of content creators, editors, illustrators, and designers who curate articles, poems, stories, photographs and artworks in every edition. It publishes Campus Chronicles, the journalistic newsletter that covers the highlights of every month, complete with facts, perspectives, and interesting anecdotes. After two years of continuous efforts the Sopanam 2022 edition was launched during Ishya festivities on 25th March 2023. The virtual copy is made available at https://sopanamtheblog.wordpress.com/sopanam-2023-edition/. The magazine holds various sections of literary and artistic content and a stunning collection of photos of student activities and fests. This year's edition highlights a travelogue of Kerala, 'Escape'. The magazine also bids farewell to the graduating batch of 2023 with a yearbook sharing the batch's experiences. The club also played a crucial role in organising the Syaahi, literary events of Ishya 2023, which included Essay writing, Short Story writing, and Poetry writing in three different languages (English, Hindi, Malayalam).

Media Society:

Media Society is a community of creative folks enthusiastic about Photography, Video Production, Animation and Design thinking. It held a month-long photography event in September 2022, Cliktember, that featured different themes every day. A reel-making competition, Wrap up 2k22, was organised where participants created a captivating video capturing their best moments from 2022. Different Photography competitions such as 'India through my lens' and 'That's Amore' were organised by the club to showcase the photography skills of the student community. All the entries were shared on the club's Instagram page. On 14th January 2023, a hands-on workshop on portrait photography was organised by alumnus Anees Mohammed (Batch14), a founding members of the Media Society. In addition, it conducts weekly workshops and training sessions for its members. Media Society also plays an integral role in covering various events that are held on the campus

Theatrics Society:

Theatrics Society intends to nurture the theatre skills of the students of IISER Thiruvananthapuram. As part of the pride month celebrations, the theatrics society performed its first-ever musical drama and organised fashion show, games and an open mic on 22 June 2022. The society has exhibited impressive on-stage Drama performances on various occasions such as Kaalchakra on 15th Aug, which was an eye-opening

drama comparing the realities of modern India with days of pre-independent India and the freedom movement. Similarly, a mime depicting patriotism on 76th Republic day celebration was performed.

On 11th September 2022, in collaboration with the iGEM'22 team, society performed a drama named 'നേരിടാം ധൈര്യത്തോടെ' (Let's face it with courage) at the Mall of Travancore, Thiruvananthapuram. The drama aimed to create awareness regarding Breast Cancer and methods of early detection

and treatment methods. Theatrics society also participated in the outreach drama for Anvesha 2022, the annual science fest and Ishya'23, the annual cultural fest. In Jan-Feb 2023, it organised an online competition 'Scene Contra- Make a Scene', where participants have to shoot and send a video of them creating a scene (prank) in public.

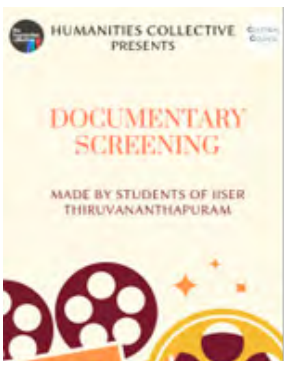
Ek Bharat Shreshtha Bharat (EBSB):

As part of this year's EBSB program the cultural council in collaboration with the Quizzing Club of IISER Thiruvananthapuram (QSI) organised 'Bharat, Ek Quiz', a quiz competition at inter-collegiate and inter-school levels. The quiz tested the participant's knowledge of India's rich heritage, diverse cultures, and history of India, also celebrating 75 years of India's Independence. The competition was held on campus and received significant participation from external students.

Humanities Collective (HCIT):

The Humanities Collective (HCIT) is a vibrant community that promotes lively discussions among students through talks and seminars. It includes Mazhavil, the LGBTQIA+ pride club. HCIT screened many socially relevant documentaries, movies and short films such as Stolen Innocence: India's untold story of Human Trafficking, Chernobyl, Pariyerum Perumal and five selected documentaries made by IISER Thiruvananthapuram students as a part of their Humanities coursework. Humanities Collective has hosted several talks on various topics, ranging from mental health to scientific temper and transgenderism.

	TALKS
8 Apr 2022	'Encoding mental health in little devices' by Claudia Lang (University of Leipzig)
11 Apr 2022	'Open chat session with women professionals in media' by Veena Prasad Kannan (Manorama News), Prameela Govind (Jai Hind TV) and Saritha S. Balan (The News Minute)
13 Sep 2022	'Transgenderism: Navigating the social and academic spheres as transgender individuals' by Dr Anuradha Krishnan (Transgender activist and Cofounder of Queerythm)
18 Oct 2022	'Mental health and academia' by Dr Sheena G Soman (Consultant Psychiatrist, Mental Health Center Thiruvananthapuram)
17 Nov 2022	'Superstitions, Scientific Temper and Science Education" by Dr. Vaisakhan Thampi (Rationalist, Physicist, Science Communicator)



HCIT also hosted Students' discussions over various topics such as 'The war between Russia and Ukraine-history and current situation', 'The necessity of LGBTQ+ pride clubs in educational institutions', 'Co-existing with Animals (concerns related to stray dogs and cats on campus) - conflicts and resolution'. It conducted its first-ever competition, titled 'Opinionation'. This content creation competition was themed 'Feminist Movements Around the World' and received an overwhelming response from the students. Since its inception in June 2022, its sub-club, Mazhavil, has been actively involved in conducting various offline and online events such as group discussions, LGBTQIA+ themed movie nights and game nights to increase awareness and inclusivity within the campus. The club also successfully organised Ishqya (Prom night) as part of Ishya 2023 on 18th February 2023.

Inter IISER Cultural Meet (IICM) 2022:

Inter-IISER Cultural Meet (IICM) is the joint annual cultural festival of all seven IISERs, IISc Bengaluru and CEBS Mumbai. After two long years of absence due to the pandemic, IICM 2022 was hosted by IISER Pune from 28-30 December 2022, and encompassed a plethora of cultural activities and competitions, ranging from dance, music, art, literature, dramatics, and design. A 66-member contingent represented IISER Thiruvananthapuram in various competitions at the fest. Our talented team showcased outstanding performances in almost all arenas and exhibited immense team spirit, winning the First Runner-Up title for IICM 2022. We obtained first position in Synchro Dance, Group Dance and Wall Painting.

Ishya'23

Ishya, the annual cultural fest of IISER Thiruvananthapuram, was back with inter-collegiate events after three long years. Ishya'23 was the biggest the campus had yet witnessed, with the main celebrations spanning from 23 to 26 March 2023. This edition of Ishya was themed as 'Unveil the Unseen'. Ishya '23 was officially announced on 12th March, revealing this year's logo with open mic event and games. Multiple pre-event activities were held in collaboration with different clubs. Ishya'23 organised its very first Book Fair with ISLA and the second edition of Iksha, an art exhibition from the 21-23 March 2023 at the Lecture Hall Complex lounge. It also launched its range of merchandise including bookmarks, badges, stickers, tote bags, oversized t-shirts and holographic hoodies for this year edition. Through a wider range of outreach initiatives and the campus ambassador program, participation from external institutes was encouraged. Many online events including Lumera Obscura (photography contest), Avant Garde (short film competition) and a two-day open

workshop on Quantum Computing in collaboration with Qkrishi Quantum, were organised. Other offline events included Put Funda (open general quiz), Bon-Mot (intercollegiate debate), JAM (Just A Minute-Extempore), Mushaira (Poetry recital), Alekhya (creative arts events), Syaahi (literary events) and gaming events.

The main days of Ishya'23 featured the much anticipated on-stage events, pro-show and the highly anticipated DJ night. All events on the main stage were live-streamed through Ishya's YouTube channel. This year, besides external participants, the IISER Thiruvananthapuram campus welcomed the public to witness the exciting on-stage competitions and pro-shows.

The on-stage intra-collegiate events included Tarang (Group Dance Competition), Rawaaz (Fashion Show), Domitor (Personality Contest), Aalap (Duet Singing Competition), Mime, Ishya unplugged (Acoustic Cover Competition), Awaaz (Solo Singing Competition) etc. A number of cultural programmes from students and faculties on all main days added colour and vibrance to the celebrations. The Anand Bhaskar Collective Band, popularly known as ABC, enthralled the audience in rock pro-show. Ishya'23 ended with a bang by the performance of DJ Shaan and DJ Trement on 26th March

Sports Council Activities

SPORTS COUNCIL

This year witnessed a bustling calendar of diverse sporting events that drew enthusiastic participation from our community. The establishment of dedicated clubs for different sports and introduction of coaching sessions led by certified coaches led to enhanced student engagement. The successful execution of the annual sports meet, ITSAV, was among the highlights of this year. The institute team in IISM Bhopal secured a notable fourth position. In addition, various activities such as live match screenings brought together sports enthusiasts for shared enjoyment of sports. Selected activities are listed below.

Jogo Bonito

The first edition of Jogo Bonito was kickstarted on 22nd April and received an overwhelming response, with 28 teams enrolling in the tournament. During the inaugural edition, Pique Blinders from BS-MS18 and Chellakili from BS-MS19 emerged as the champions in the men's and women's categories. Latest edition of Jogo Bonito partnered with ISHYA'23, institute's cultural festival and was held from March 18 to March 22, 2023. It saw the participation of 20 teams with Makki Pacha FC emerged as the men's champions, while Janko Nee Pettu claimed the women's title.

World Bicycle Day

On June 4th, Sports Council arranged a 10 Km Cycling Rally from the IISER campus to Theviyode and back to celebrate World Bicycle Day 2022.

Total Football Quiz and CricMania

The Sports Council and the Quizzing Society of IISER (QSI) teamed up to conduct a Football Quiz titled 'Total Football Quiz' on June 19 and first-ever Cricket Quiz, CricMania on November 10.

National Sports Day

To mark National Sports Day on August 29, 2022, an Open Badminton doubles tournament and an Open futsal tournament (Jogo Bonito 2.0) were organized during this week. As anticipated, both tournaments showcased numerous thrilling matches, resulting in a resounding success for the event.

ITSAV'22

IISER Thiruvananthapuram hosted ITSAV in its grandest form after a four-year hiatus from 10 Oct 2022 to 1 Nov 2022. Witnessing the participants compete with immense enthusiasm and energy was truly captivating. All the games in IISM, except tennis, were included in the tournament. Additionally, for the first time, athletic events took place within the campus at Kathippara ground. ITSAV lasted 22 days and the four houses, Alpha, Bravo, Charlie, and Delta fiercely competed in various sporting events. In the end, Charlie emerged as the Champion with 1127 points, while Bravo secured the runner-up position with 975 points. Recognizing exceptional athleticism, Sanjay MS of BS-MS18 and Mridula K of BS-MS19 were given the prestigious Best Athlete of ITSAV awards.

Unity Run

On 27 Oct 2022, the campus observed the celebration of National Unity Day. The celebration commenced with a ceremony where participants took a pledge, followed by a 'Unity Run' that traversed the campus. The run was flagged off by the director, Prof J. N. Moorthy. Sanjay MS and Govind Ram of Batch 20 emerged as the winners of the 'Unity Run'.

Torque Football Championship

During the third week of November, the IISER women's football team emerged victorious in the inter-collegiate football championship, Torque, organized by the Government Medical College Thiruvananthapuram. The team showcased dominating performances throughout the tournament..

Inter IISER Sports Meet 22

The 9th IISM'22 was held at IISER Bhopal with a participation of ten institutes from all over India including six IISERs, NISER, IISc and CEBS Mumbai. The IISER Thiruvananthapuram contingent had a total strength of 128 students including 79 boys and 49 girls. Our contingent finished fourth overall, with 5 gold, 8 silver and 7 bronze medals. Sanjay M. S. with three gold medals in Individual events, became the Individual Champion of the Athletic meet IISM 2022.

IISER Football League (IFL)

After a long pandemic break, the IISER Football League made a spirited comeback at Kathippara ground. The tournament included five men's and four women's teams, concluding in three weeks. Mukri FC and Deathly Hallows were crowned as the men's and women's champions, respectively. Aravind of BS-MS19 and Anu Harshin of BS-MS21 received the Golden Boot and Golden Glove awards.

Inter-Batch Basketball Tournament

The Inter-batch basketball tournament witnessed improved gameplay due to coaching sessions. In the third week of February, six men's teams and four women's teams battled for the titles. Alley Oops of BS-MS18 and Bandits of BS-MS19 emerged as the champions for the men's and women's categories, respectively.

Inter-Batch Volleyball Tournament

In the first week of February, th nter-batch volleyball tournament took place on the newly renovated court, featuring six men's teams and four women's teams. Batch 20 emerged victorious in the men's category, while Batch 21 claimed the women's title.

IISER Cricket League

The highly anticipated IISER Cricket League (ICL) kicked off during the third week of January, attracting increased participation compared to the previous year. Notably, faculty and staff teams also joined the league, adding to the excitement. The matches were played in the T20 format. In an intense final, the faculties team emerged victorious, defeating the students' team to secure the coveted cup.

Chess - Blitzing Friday Arena

Chesslers, the chess club of IISER Thiruvananthapuram, organized an online blitz chess tournament called 'Blitzing Friday Arena' on 17 Mar 2023. The tournament concluded with Akhilan EM of BS-MS18 being crowned the Blitz champion.

In addition, Sports Council organized Open Carroms Singles Tournament, Open Badminton Doubles Tournament, shootouts and juggling competitions during FIFA World Cup as well as a series of friendly matches with IIST and a few local clubs in football, basketball, cricket, badminton, and table tennis

Centres

DST-IISER THIRUVANANTHAPURAM IC-MAP ON STORAGE

DST-IISER Thiruvananthapuram Integrated Clean Energy Material Acceleration Platform (IC-MAP) on Storage is one of the three MAP consortiums set up by DST and Mission Innovation. The centre headed by Prof. M. M. Shaijumon, IISER Thiruvananthapuram (Admin PI) and Yogesh Sharma, IIT Roorkee (Lead PI) commits to the accelerated development of solid-state battery technologies providing high power and energy densities, safety, and longevity. Conceptualized by Dr. Anita Gupta and Dr. Ranjith Krishna Pai, Department of Science and Technology (India), this centre would leverage the expertise and knowledge of the team toward solid-state battery research.

The consortium consisting of a core team of 16 researchers from 15 partnering institutes, aims to accelerate the development of solid-state battery technology using machine learning and artificial intelligence through automated processes. The project is supported by Mission Innovation, a global initiative catalyzing a decade of action and investment in research, development and demonstration to make clean energy affordable, attractive and accessible for all.

Timeline of the facility	
Date	**Event**
4 Apr 2022	**Project launch** Three IC-MAP were launched at the Mission Innovation Annual Gathering. Hon'ble Minister of Science and Technology, Dr Jitendra Singh, awarded the citations to the three centre leads of the Clean Energy Material Acceleration Platforms. The platforms constitute a knowledge network of more than 38 elite institutions and 80 research personnel working on next-generation low-cost advanced energy materials.
6 May 2022	**Project kick-off meeting** The meeting was attended by the PIs from all the partnering institutes across the country, academicians and other experts including Prof. J. N. Moorthy (Director, IISER Thiruvananthapuram), Dr. Ranjith Krishna Pai, (Scientist E, TMD-EWO, DST). Two of the DST staff members Ms. Anu and Mr. Vaibhav also attended the meeting.
1 Mar 2023	**Centre inauguration and Webpage launch** The Centre located at CIF building was inaugurated by Prof. J. N. Moorthy, Director, IISER Thiruvananthapuram in presence of the faculty, administrative staff and students. Its webpage https://icmap.iisertvm.ac.in was also launched.
13 Mar 2023	**First review meeting** To review the progress and achievements of the IC-MAP on Storage, the first review meeting was held.

Official launch of IC-MAP centres by Hon'ble Minister of Science and Technology, Dr. Jitendra Singh at New Delhi

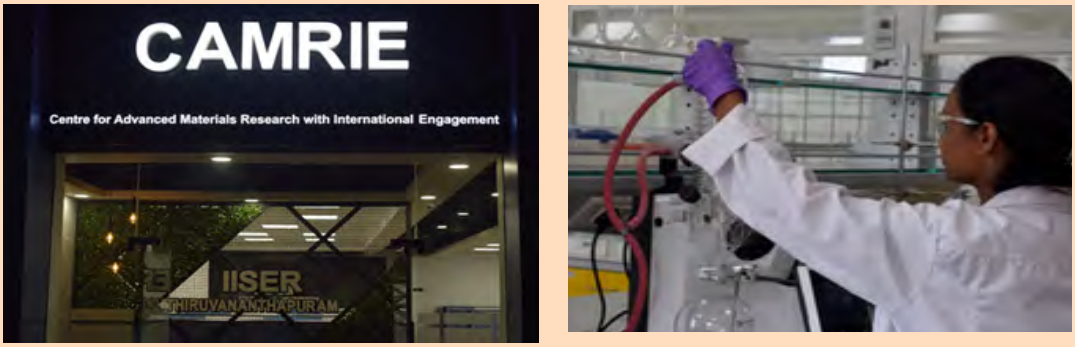
Glimpses of the Project Kick-off meeting held on 6 May 2022

Inauguration of the facility and launch of its webpage by Prof. J. N. Moorthy, Director, IISER Thiruvananthapuram

CENTRE FOR ADVANCED MATERIALS RESEARCH WITH INTERNATIONAL ENGAGEMENT

The Centre for Advanced Materials Research with International Engagement, abbreviated as CAMRIE, is an initiative to leverage the expertise and knowledge of the existing faculty members across the disciplines for solving emerging scientific challenges of bigger nature in advanced materials research, in collaboration with global researchers. At present, 21 faculty members from various disciplines are associated with the centre. Stationed at IISER Thiruvananthapuram, it aims to accelerate and exploit international networking with interdisciplinary approach. Thrust area of research include Condensed Matter Physics, Energy Materials and Devices, Biomaterials and Bioengineering, Computational Materials Science, Materials Modelling, Supramolecular Chemistry, Opto-Electronic Materials, and Smart and Adaptive Materials.

The PhD students with different backgrounds – including science, engineering, medicine, etc. with a true sense of interdisciplinary nature – will be admitted. The Ph.D. students registered in the centre will be engaged in exchange visits with the international partnering institutes to allow for a broad research perspective and immersive research experience. On 5th July 2022, 25 students appeared for the interview and 4 students joined the campus.



CAMRIE facility

CENTER FOR HIGH-PERFORMANCE COMPUTING

The Center for High-Performance Computing (Center for HPC) is an interdisciplinary core facility for scientific computing and research on parallel algorithms at IISER Thiruvananthapuram. It is a multi-disciplinary research center based on High-Performance Computing, and the main aim is to pursue cutting-edge research in all areas of science and technology.

Selected Activities

Date	Event
20 Jul 2022	**one API HPC Workshop** Introduction to Intel Archetecture, oneAPI, DPC++, C++ Compiler and Vectorization, VTUNE and ITAC was provided.
24 Sep 2022	**Parallel Computing Workshop** Information on how to write efficient MATLAB Code, GPU computing using MATLAB, using Parallel Computing Toolbox as well as how to submit MATLAB jobs on IISER's HPC was provided.

Inauguration of CHPC facility

Ancillary Facilities

CENTRAL LIBRARY

The central library of the institute supports the academic and research needs of the Institute community. The state of the art library facilitates access to online and print resources to its users. Reputed international journals and online resources in science and allied areas have been made available. The library is providing most of the resources in electronic format which facilitate 24X7 e-library.

Resources

The library's extensive online collection from more than 50 international scientific publishers and societies includes full-text e-journals, databases, e-journal archives, video journals, e-books, bibliographic and review databases etc. Online full-text resources from major publishers including AACR, ACS, AGU, AIP, AMS, Annual Reviews, APS, ASM, Company of Biologists, Elsevier, JOVE, JSTOR, Springer Nature, Optica Publishing Group, OUP, Royal Society Publishing, RSC, SIAM, Wiley etc are prominent among them.

Number of journals by publishers such as Wiley, Royal Society of Chemistry, Springer-Nature, World Scientific, NEJM, American Geophysical Union, American Meteorological Society, Cambridge University Press were added to the library collection during this period.

Major bibliographic databases including *Web of Science*, *SciFinder-n*, *MathSciNet* etc. are also made available. Apart from the online resources, the library possesses print books, CD ROMs and thesis in core and allied subjects. *OpenAthens* remote login facility has been extensively utilized by the faculty and student community for off-campus access of the online resources.

The library provides web-based plagiarism detection and originality checking services such as '*Ouriginal*' and '*Turnitin*'. Similarity reports of all thesis submitted to the institute were generated using these tools. Library also provides access to the '*Grammarly*', an online grammar checking and document authentication tool. The library is equipped with advanced RFID based self-service kiosk, which provides self-check-in and check-out of books.

External Collaborations

IISER Thiruvananthapuram signed MoU with Inflibnet Centre on 6th Dec 2022 to participate in the *eShodhGanga*, a digital repository of theses and dissertations. All PhD theses awarded from the institute have been uploaded to the *eShodhGanga* repository.

Central library also has membership/affiliation in major library consortium/network including *e-ShodSindhu*, IISER Library Consortium, and the *Developing Library Network* (DELNET).

Activities carried out by the Central Library facility

S No	Date	Activity
1	2-12 Aug 2022	**Library orientation sessions for the MSc, iPhD and PhD (Batch 22) students** The orientation covered various aspects such as using print and online resources, tour of the facility, demonstration of the RFID self-check-in/out kiosk, using the library OPAC, reserving books, and exploring online services, including journals, archives, videos, and full-text resources.
2	14-15 Sep 2022	**Exhibition of Hindi Books** The exhibition was held as part of the Hindi Week celebrations and jointly organized by the central library and the Official Language Implementation Committee of the institute.
3	19-20 Nov 2022	**Library orientation program for the BSMS (Batch 22) students**

4	6 Dec 2022	**Training programme on 'Web of Science'** This hands-on training session conducted by Dr. Sainul Abideen P was attended by the PhD, iPhD and winter school students as well as staff members.
5	6 Dec 2022	**Training programme on 'How to access e-Books'** In this hands-on training session, students learnt advanced features of e-book databases such as Springer Link, CUP and McGraw-Hill e-book library.

Dr. Sainul Abideen P, Assistant Librarian, received the Best Librarian Award by the Indian Academic Researchers Association (IARA) in 9th International Conference on Publications Ethics held at Kolkata (May 2022). He also received Web of Science Certification for successfully completing the three-part series of the Web of Science Certification Program conducted by Clarivate.

Publication:

Sainul Abideen, P. Bibliometric Analysis of the Coronavirus Research Publications Data before and after the Outbreak of the COVID: A Comparison. *DESIDOC Journal of Library & Information Technology* **2022**, 42(3), 139-148. DOI:10.14429/djlit.42.3.17350

Exhibition of Hindi Books organized by the Central Library and the Official Language Implementation Committee

IT SECTION

IT Section of IISER Thiruvananthapuram facilitates the day-to-day functioning of the institute. It manages the following:

- 1 Gbps internet leased line provided by National Knowledge Network (NKN) and 1 Gbps internet leased line provided by BSNL
- Local Area Network (LAN) of the campus
- Email service for faculty, staff and students
- Wireless access points installed in all the hostel rooms and academic area
- Audio visual support for 9 class rooms, auditorium of Lecture Hall Complex (LHC) and 3 seminar halls
- High Performance Computing cluster (Padmanabha)
- IP phones and IP cameras
- Software and hardware installation as well as their troubleshooting
- Computer labs

HEALTH CENTRE

The health centre operates around the clock, every day of the year, offering both outpatient and inpatient services. Staffed with two doctors, four nurses and four nursing assistants, the centre features in-patient/isolation wards, observation room, minor surgical unit and a pharmacy. It is fully equipped with essential medication, injections, IV fluids, consumables as well as medical instruments/equipment inclusive of ECG, patient monitors, oxygen concentrators/cylinders, glucometer and pulse oximeters. Service with compassion and care, promotion of healthy life style, prevention of communicable diseases, alleviation of suffering and facilitating faster recovery from illnesses through evaluation, diagnosis and rendering of appropriate care, is our motto and regularly practiced by our medical staff.

An ambulance service is available 24X7 and is used in case of emergencies, referrals and patients who require specialist's care. Psychiatrist and psychologist services are also conveniently accessible within the campus and normally available thrice a week. Gynecologist services are provided once a week and thrice a month, and the availability of a specialist pediatrician is scheduled monthly. The institute ensures students' well-being by providing group health insurance coverage. Moreover, the health centre has established agreements with two medical colleges and several other hospitals in the district, ensuring prompt emergency or specialist care for those in need.

During the reported period, the health centre organized three voluntary blood donation drives and conducted a comprehensive First Aid and Basic Life Support training program. It also extended medical coverage to all institute events throughout the year.

Activities carried out by the Health Centre

S No	Date	Activity
1	19 May 2022	**Prayati** This blood donation camp was organized in liaison with Sree Chitra Tirunal Institute of Medical Sciences and Technology (SCTIMST), Thiruvananthapuram

2	14 Jun 2022	**World Blood Donor Day Celebrations in partnership with Student Welfare Council** The program aimed to promote voluntary blood donation and a total of 75 participated joined the voluntary blood donation awareness run. 50 students who had previously donated blood during the institute's blood camp (Prayati) held on 19th May 2022, were presented with certificates of appreciation
3	19 Jun 2022	**Prayati 2.0** This blood donation camp was organized in liaison with Sree Chitra Tirunal Institute of Medical Sciences and Technology (SCTIMST), Thiruvananthapuram and Govt. Medical College, Thiruvananthapuram
4	22 Oct 2022	**First Aid & Basic Life Support (BLS) Hands-on Training Program** This program was conducted in partnership with Student Welfare Council, Indian Medical Association and Neyyar Medicity Hospital. It involved presentation on BLS, CPR techniques, and the Heimlich Maneuver. It was followed by practical demonstration of First Aid for snake bites, choking, drowning, road traffic accidents, heart attack, burns and chemical injuries. About 60 participants had the chance to practice CPR on mannequins.
5	4 Feb 2023	**Prayati 3.0** This blood donation camp was organized in liaison with Govt. Medical College, Thiruvananthapuram

Prof. Srinavasa M. Srinivasula, Deputy Director, addressing the participants on World Blood Donor Day

First Aid & Basic Life Support (BLS) Hands-on Training Program

Poster for the blood donation drive, Prayati 3.0

Volunteer blood donors during one of the Prayati event

COUNSELLING CENTRE

The IISER Thiruvananthapuram Counselling Centre, offers mental health services to the students to support their mental well-being and enhanced quality of life. Staffed by psychologist Dr. Neelima Gopinath and psychiatrist Dr. Mary P R, the centre offers counseling services to address a wide range of student issues. Over the past year, 215 students sought counseling, with many engaging in regular follow-up sessions. Increased awareness has led to a greater number of students seeking help. During the past year 563 counselling/psychotherapy sessions were conducted for a total of 146 BS-MS students, 42 PhD/iPhD students, 20 MSc students and 7 others that included Postdocs, Project assistants etc. Some cases necessitated referral to the psychiatrist. A total of 68 students consulted the psychiatrist, and 272 therapy sessions were conducted. Utmost confidentiality is maintained, with detailed case files for each student.

The predominant problems faced by students included academic stress, relationship, family and other personal issues. Primary psychiatric illnesses were also detected in a few of the students. Among the 68 students who consulted the psychiatrist, 44% of them were having adjustment disorders and anxieties, 17% were with depressive disorders and mood disorders, 13% had borderline traits and comorbid conditions, and the rest were having ADHD, OCD, sleep disorders etc. Students were given supportive counselling, psychotherapy, stress management programs as well as medication in appropriate cases. Emergency situations were managed accordingly.

In the beginning of the semester, an orientation program was conducted that introduced newcomers to counseling's importance. Also, a brochure for counselling is sent to them so as to give them an overall idea about the functioning of the centre and how they can make use of the facilities being provided to them. Regular emails on stress management, exam anxiety and other relevant materials is send to the community. The centre's Facebook page was created that has been successful in promoting mental health awareness and reducing stigma around seeking help, benefitting more students.

PROJECT ENGINEERING OFFICE

The core purpose of our Project Engineering Office revolves around the creation and upkeep of all campus infrastructure, aiming to guarantee seamless operations across all amenities. From April 2022 to March 2023, this Office assumed control over multiple structures previously built by CPWD, assuming responsibility for their ongoing maintenance. New infrastructure including Residence building D1 and D2, as well as key facilities including the High-Performance Computing Facility, Tennis Court, Children playing area near Residence blocks, Cricket Practice Facility, Kho-Kho Court, Volleyball Court near the Recharge Lounge and a Food Court have been developed this year. In addition to routine maintenance of the facilities in the campus, several minor works were also executed.

Roads and pathways

The project office supervised the laying of top coat to the roads in the residential area. Additionally, activities such as white line marking and curb painting were successfully executed, leading to an enhanced quality of the internal roads across the campus. Further, a pedestrian pathway has been constructed, establishing a seamless connection between the Central Library and the hostels ensuring safer movement for pedestrians between the academic and hostel regions.

Facilities for students

A tennis court with 9-layer synthetic acrylic standard system flooring with covered fencing and dugout has been constructed. In addition, food courts have been constructed and made functional during these period. A digital billboard has been installed and commissioned for infotainment of our community.

Energy use and other initiatives

IISER Thiruvananthapuram embraces sustainability as a core value and activities of the Institute are geared towards meeting sustainable development goals. The Institute is, in a phased manner, switching to more efficient and cleaner sources of power to meet its energy needs. Phase 2 hostel area have been provided with solar street lights. In view of reducing the power consumption, occupancy sensors have been installed for the lights and exhaust fans inside all the toilets in the campus. As part of campus beautification, different varieties of flowering plants have been planted all across the campus. Appropriate plant species for slope stabilization, and soil and water conservation have also been planted.

Details of newly inaugurated infrastructure in FY 2022-23

S No	Date	Infrastructure	Chief Guest
1	30.07.2022	Central High Performance Computing Facility	Prof. E. D. Jemmis
2	30.07.2022	Residence Block D1 & D2	Prof. Arvind A. Natu
3	30.11.2022	Digital Billboard	Prof. J. N. Moorthy
4	01.03.2023	DST-IISER Thiruvananthapuram IC-MAP facility	Prof. J. N. Moorthy
5	31.03.2023	Tennis Court	Prof. J. N. Moorthy

Inauguration of Residence Block D1 & D2

HOSTELS & STUDENT COOPERATIVE MESS

IISER Thiruvananthapuram has eleven halls of residence, Anamudi- A, B, C, D & E- blocks, Eravimala, Sispara, Mukurthi, Pushpagiri, Agasthya and Ponmudi. The elected hostel secretaries along with two representatives from each hall of residence liaise with the administration/facilities and the service office to ensure smooth residential experience for all students. Every room in each hall of residence is now equipped with Ethernet ports and Wi-Fi access points. One wing of each floor in hostel is now fitted with electric geyser.

The Student Cooperative Mess (SCoM) is a not-for-profit student-run venture, formed in 2013 for providing quality food to the students at affordable prices. The SCoM currently looks after the smooth functioning of two canteens (CDH-1 & CDH-2) and two cafes (i-cafe & j-cafe) and has generated employment for around 45 staff from different parts of the country. The SCoM is divided into two committees: Mess Supervision Committee (1-year tenure) and Daily Supervision Committee (3X4 months). Six members from the Student Welfare Council along with six volunteers constitute the Mess Supervision Committee and help ensure the smooth functioning of SCoM. Apart from serving the regular meals, SCoM helps in organsing special meals for students for festive and special occasions with the help of volunteers from general student body.

Activities carried out by the SCoM

S No	Date	Activity
1	27 Apr 2022	Special lunch to IISER Community for 10th anniversary of SCoM
2	30 Jul 2022	Special lunch for students and families on 10th Convocation Day
3	02 Sep 2022	Special dinner on Ganesh Chaturthi
4	04 Sep 2022	Traditional Onsadhya was served to all the staff and students for Onam
5	24 Oct 2022	Special dinner for Diwali

6	15 Jan 2023	Special meal for Pongal containing Tamil dishes
7	19 Feb 2023	Special Bengali style lunch for Saraswati Puja
8	8 Mar 2023	Special North Indian style lunch for Holi
9	2022-2023	In view of the 'International year of Millets', Millet Payasam was included in the menu

10th anniversary celebration of SCoM

The Director and the Deputy Director join the Onsadhya meal

Staff of SCoM in their new uniform

Faculty and students during millet awareness programme

RIGHT TO INFORMATION (RTI)

Right to Information has been recognized as a fundamental right under Article 19(1) of the Constitution. The Right to Information Act, 2005 empowers citizens to obtain information from any 'Public Authority'. All Public Authorities are mandated to provide timely responses to any queries from citizens on the functioning of the Public Authority. The Government of India has an online portal, the RTI Request & Appeal Management System (RTI-MIS) through which an applicant can seek information on any Public Authority. IISER Thiruvananthapuram is registered with the RTI-MIS. An applicant can obtain information about the Institute either through this online portal or by sending a request directly to the Public Information Officer, IISER Thiruvananthapuram, Maruthamala P.O., Vithura Grama Panchayath, Thiruvananthapuram - 695551. The Institute also files the statutory returns of RTI applications, details of appeals received and appeals disposed, on a quarterly basis.

The institute has implemented the guidelines of proactive Suo Moto disclosure u/s 4 of RTI Act, 2005 vide O.M. No. 1/6/2011-IR of Department of Personnel and Training, Government of India, dated 15th April 2013. The same is available on the institute website at the link https://www.iisertvm.ac.in/pages/rti_act. It is to be noted that every year Transparency Audit of Suo-Moto disclosures is being carried out by one of the respective Training Institutes under each Ministry/Department/Public Authority and across the States and Union Territories. Our Institute also nominates one of the Training Institute to conduct third party audit of proactive disclosures under RTI Act. The Third-party transparency audit of the proactive Suo Moto disclosure of IISER TVM for the year 2022-23 was conducted by Prof. Virender Kumar Bharti, Nodal officer, RTI Cell, Indian Institute of Mass Communication, New Delhi.

IISER TVM, received a total of 157 RTI queries in the financial year 2022-23, of which 151 queries were resolved in the first instance, 4 were resolved after the first appeal and 2 were not pertaining to IISER TVM.

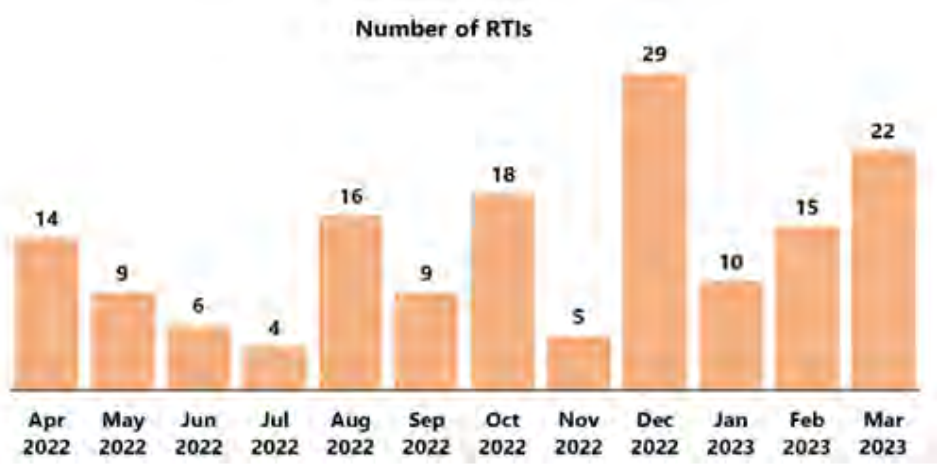
Month-wise details of RTI requests received in the year 2022-23

Section	Apr 2022	May 2022	Jun 2022	Jul 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022	Jan 2023	Feb 2023	Mar 2023	Total
Academics	02	03	03	-	06	03	06	01	10	02	07	06	49
Academics/ DoFA	-	-	-	-	-	01	-	-	-	-	-	-	01
HR	06	03	01	02	02	02	09	04	10	02	05	07	53
DoFA	-	-	-	-	03	-	01	-	01	01	01	01	08
Finance	-	-	-	-	01	-	-	-	-	-	-	-	01
DoSA	-	-	01	-	01	-	-	-	-	01	-	-	03
DoIP	-	-	-	-	-	-	-	-	-	-	01	-	01
Library	02	-	-	-	-	-	-	-	-	-	-	-	02
Academics/ Finance	-	01	-	-	-	-	-	-	-	-	-	-	01
Academics/ HR	-	-	-	-	-	-	-	-	01	-	-	-	01
HR/DoFA	03	-	01	-	03	02	-	-	01	01	-	03	14
DoSA/ Finance	-	01	-	-	-	-	-	-	-	-	-	-	01
JAC	-	01	-	-	-	-	-	-	-	-	-	-	01
R&D	-	-	-	-	-	-	-	-	01	-	-	03	04
R&D/ DoFA	-	-	-	-	-	-	-	-	-	01	-	-	01
Internal Committee	-	-	-	-	-	-	01	-	01	-	-	02	04
DoFA/ HR/ Finance	-	-	-	01	-	-	-	-	-	-	-	-	01
Academics/ ICC/R&D	-	-	-	-	-	-	-	-	-	01	-	-	01
Placement Cell	-	-	-	-	-	-	01	-	-	-	01	-	02
Finance/ DoFA/ Academics	-	-	-	-	-	-	-	-	01	-	-	-	01
Finance/ Alumni/ Academics	-	-	-	-	-	-	-	-	01	-	-	-	01

Ranking/ Alumni/ HR/ Academics	-	-	-	-	-	-	-	-	-	01	-	-	01
Transferred (to other public authorities)	01	-	-	-	-	-	-	-	02	-	-	-	03*
Rejected	-	-	-	01	-	01	-	-	-	-	-	-	02
Total	14	09	06	04	16	09	18	05	29	10	15	22	**157**

Month-wise details of RTI appeals received in the year 2022-23

Section	Apr 2022	May 2022	Jun 2022	Jul 2022	Aug 2022	Sep 2022	Oct 2022	Nov 2022	Dec 2022	Jan 2023	Feb 2023	Mar 2023	Total
HR	-	-	-	-	-	-	-	01	-	01	01	-	03
ICC	-	-	-	-	-	-	-	01	-	-	-	-	01
Transferred (to other public authorities)	01	-	-	-	-	-	-	-	01	-	-	-	02
Total	01	-	-	-	-	-	-	02	01	01	01	-	**06**



IISER THIRUVANANTHAPURAM FACULTY INFORMATION

Faculty Strength

Mode of Engagement	Numbers
Regular Faculty	87
Contractual Faculty	2
Emeritus Professor	2
Visiting Professor	11
Adjunct Professor	10
Ad Hoc Faculty	2

Faculty positions

Position	Departments	Numbers
Professors	School of Biology	4
	School of Chemistry	4
	School of Mathematics	2
	School of Physics	5
Associate Professors	School of Biology	6
	School of Chemistry	8
	School of Mathematics	6
	School of Physics	11
Assistant Professor (Grade I)	School of Biology	8
	School of Chemistry	12
	School of Mathematics	9
	School of Physics	10
	School of Data Sciences	1
	School of Earth, Environmental and Sustainability Sciences	1
Assistant Professor (Grade II)	School of Biology	0
	School of Chemistry	0
	School of Mathematics	0
	School of Physics	0
	School of Data Sciences	2

SCHOOL OF BIOLOGY

S No.	Name of Faculty	Designation
1	Prof. Hema Somanathan	Professor
2	Prof. S Murthy Srinivasula	Professor
3	Prof. Tapas Manna	Professor
4	Prof. Nishant KT	Professor
5	Dr. Ullasa Kodandaramaiah	Associate Professor
6	Dr. V Stalin Raj	Associate Professor
7	Dr. Ramanathan Natesh	Associate Professor
8	Dr. Ravi Maruthachalam	Associate Professor
9	Dr. Jishy Varghese	Associate Professor
10	Dr. Satish Khurana	Associate Professor
11	Dr. N Sadananda Singh	Assistant Professor (Grade I)
12	Dr. Sabari Shankar Thirupathy	Assistant Professor (Grade I)

13	Dr. Nisha N Kannan	Assistant Professor (Grade I)
14	Dr. Poonam Thakur	Assistant Professor (Grade I)
15	Dr. Sandhya Ganesan	Assistant Professor (Grade I)
16	Dr. Kamalakannan Vijayan	Assistant Professor (Grade I) Joined on 15.07.2022
17	Dr. Nishana Mayilaadumveettil	Assistant Professor (Grade I) Joined on 26.08.2022
18	Dr. Sanu Shameer	Assistant Professor (Grade I) Joined on 27.03.2023

SCHOOL OF CHEMISTRY

S No.	Name of Faculty	Designation
1	Prof. K George Thomas	Professor
2	Prof. Kana M Sureshan	Professor
3	Prof. Mahesh Hariharan	Professor
4	Dr. Sukhendu Mandal	Professor
5	Dr. Vinesh Vijayan	Associate Professor
6	Dr. RS Swathi	Associate Professor
7	Dr. Reji Varghese	Associate Professor
8	Dr. Ajay Venugopal	Associate Professor
9	Dr. Ramesh Rasappan	Associate Professor
10	Dr. Gokulnath Sabapati	Associate Professor
11	Dr. V. Sivaranjana Reddy	Associate Professor
12	Dr. Subrata Kundu	Associate Professor
13	Dr. A Thirumurugan	Assistant Professor (Grade I)
14	Dr. Alagiri Kaliyamoorthy	Assistant Professor (Grade I)
15	Dr. Rajendra Goreti	Assistant Professor (Grade I)
16	Dr. A Muthukrishnan	Assistant Professor (Grade I)
17	Dr. Basudev Sahoo	Assistant Professor (Grade I)
18	Dr. Soumen De	Assistant Professor (Grade I)
19	Dr. Veera Reddy Yatham	Assistant Professor (Grade I)
20	Dr. Y. Adithya Lakshmanna	Assistant Professor (Grade I)
21	Dr. Rajendra Kurapati	Assistant Professor (Grade I)
22	Dr. Pushpita Ghosh	Assistant Professor (Grade I)
23	Dr. Jerry Alfred Fereiro	Assistant Professor (Grade I)
24	Dr. Ramaraj Ayyappan	Assistant Professor (Grade I) Joined on 23.08.2022

SCHOOL OF MATHEMATICS

S No.	Name of Faculty	Designation
1	Prof. M.P. Rajan	Professor
2	Prof. Utpal Manna	Professor
3	Dr. P. Devraj	Associate Professor
4	Dr. Sachindranath Jayaraman	Associate Professor
5	Dr. Shrihari Sridharan	Associate Professor
6	Dr. Viji Z Thomas	Associate Professor
7	Dr. KR Arun	Associate Professor
8	Dr. Sarbeswar Pal	Associate Professor
9	Dr. Dharmatti Sheetal	Assistant Professor (Grade I)
10	Dr. Saikat Chatterjee	Assistant Professor (Grade I)
11	Dr. Srilakshmi K.	Assistant Professor (Grade I)
12	Dr. Geetha Thangavelu	Assistant Professor (Grade I)
13	Dr. Dond Asha Kisan	Assistant Professor (Grade I)
14	Dr. Dhanya Rajendran	Assistant Professor (Grade I)
15	Dr. Sudarshan Kumar K	Assistant Professor (Grade I)
16	Dr. Chamakuri Nagaiah	Assistant Professor (Grade I)
17	Dr. Mohammed Ramiz Reza	Assistant Professor (Grade I)

SCHOOL OF PHYSICS

S No.	Name of Faculty	Designation
1	Prof. Anil Shaji	Professor
2	Prof. R. C. Nath	Professor
3	Dr. Joy Mitra	Professor
4	Dr. MM Shaijumon	Professor
5	Dr. Manoj AG Namboothiry	Professor
6	Dr. Rajeev N. Kini	Associate Professor
7	Dr. Madhu Thalakulam	Associate Professor
8	Dr. Bindusar Sahoo	Associate Professor
9	Dr. Soumen Basak	Associate Professor
10	Dr. Somu Kumaragurubaran	Associate Professor
11	Dr. Deepshika Jaiswal Nagar	Associate Professor
12	Dr. Amal Medhi	Associate Professor
13	Dr. Ravi Pant	Associate Professor
14	Dr. Bikas C. Das	Associate Professor
15	Dr. M Suheshkumar Singh	Associate Professor

16	Dr. D.V. Senthilkumar	Associate Professor
17	Dr. Sreedhar B. Dutta	Assistant Professor (Grade I)
-	Dr. Manik Banik	Assistant Professor (Grade I) Resigned on 10.06.2022
18	Dr. Tuhin Subhra Maity	Assistant Professor (Grade I)
19	Dr. Tanumoy Mandal	Assistant Professor (Grade I)
20	Dr. Vinayak B. Kamble	Assistant Professor (Grade I)
21	Dr. Shabnam Iyyani Syamsunder	Assistant Professor (Grade I)
22	Dr. Debashis Saha	Assistant Professor (Grade I) Joined on 16.08.2022
23	Dr. Pramitha M	Assistant Professor (Grade I) Joined on 01.08.2022
24	Dr. Nithin Yadav	Assistant Professor (Grade I) Joined on 22.08.2022
25	Dr. Chandrakala Meena	Assistant Professor (Grade I) Joined on 21.12.2022
26	Dr. Souvik Paul	Assistant Professor (Grade I) Joined on 09.02.2023

SCHOOL OF DATA SCIENCES

S No.	Name of Faculty	Designation
1	Dr. Priayanka Majumder	Assistant Professor (Grade I) Joined on 27.02.2023
2	Dr. Saptarsh Bej	Assistant Professor (Grade II) Joined on 13.03.2023
3	Dr. Alwin Poulose	Assistant Professor (Grade II) Joined on 16.01.2023

SCHOOL OF EARTH, ENVIRONMENTAL AND SUSTAINABILITY SCIENCES

S No.	Name of Faculty	Designation
1	Dr. Prasanath Valayamkunnath	Assistant Professor (Grade I) Joined on 22.12.2023

VISTING PROFESSORS		
S No.	Name of the Faculty	School
1	Prof. N. Sathyamurthy	School of Chemistry
2	Prof. G. D. V. Gowda	School of Mathematics
3	Dr. Sagar Sengupta	School of Biology
4	Dr. Shantanu Godbole	School of Mathematics
5	Dr. T. V. Anil Kumar	School of Biology
6	Prof. Ajayan Vinu	School of Chemistry
7	Prof. M.R.N. Murthy	School of Biology
8	Prof. M. K. Mathew	School of Biology
9	Prof. Somasekharan Pillai	School of Mathematics
10	Dr. Unnikrishnan Cheramangalath	School of Data Sciences
11	Dr. Preetam Mukherjee	School of Data Sciences
ADJUNCT PROFESSORS		
1	Prof. R. B. Sunoj	School of Chemistry
2	Prof. Vinay Namboodiri	School of Data Sciences
3	Prof. Amit Mitra	School of Mathematics
4	Prof. Michael Gromiha	School of Mathematics
5	Prof. N. Ravishankar	CAMRIE
6	Prof. Ligy Philip	School of Earth, Environmental and Sustainability Sciences
7	Prof. Neela Nataraj	School of Mathematics
8	Prof. Dipshikha Chakravorthy	School of Biology
9	Prof. Ajayaghosh	School of Chemistry
10	Prof. Thomas Kuruvila	Humanities

EMERITUS PROFESSOR		
1	Prof. Rajeev Bhaskaran	School of Mathematics
2	Prof. G. Ambika	School of Physics
HONORARY PROFESSOR		
1	Prof. Suresh Das	School of Chemistry

ADMINISTRATIVE & SUPPORT PERSONNEL

S No	Name of the Official	Designation
1	Col. Robinson George	Registrar (up to 15.10.2022)
2	Prof. Mahesh Hariharan*	Registrar (from 15.10.2022)
3	Shri Siva Dutt V K	Superintending Engineer
4	Shri B V Ramesh	Deputy Registrar (Finance & Accounts)

5	Shri Hariharakrishnan S	Deputy Registrar (Administration)
6	Shri Sudin B Babu	Deputy Registrar (Purchase, Stores & Faculty Affairs)
7	Dr. Sainul Abideen P	Assistant Librarian
8	Shri Priji E Moses	Assistant Executive Engineer (Civil)
9	Shri Sreehari S	Assistant Executive Engineer (Electrical)
10	Smt. Nimi Joseph Chaly	Assistant Registrar (Research & Development)
11	Shri Satya Srinivas Naraharisetti	Assistant Registrar (Student Affairs)
12	Dr. Goldwin Hemalatha M	Medical Officer
13	Dr. Thiraviam P	Medical Officer
14	Smt. Divya V J	Technical Officer
15	Shri P Y Sreekumar	Scientific Officer (IT)
16	Shri Arun Raj J R	Physical Education Instructor
17	Smt. Darli K G	Private Secretary
18	Smt. Navya Paul	Senior Technical Assistant
19	Shri Vijesh K	Senior Technical Assistant
20	Shri Krishna Kumar A	Senior Technical Assistant
21	Shri Sangeeth M	Senior Technical Assistant
22	Shri Jins Joseph	Nurse
23	Smt. Divya A T	Nurse (Resigned on 28.02.2023)
24	Smt. Nafeesa C K	Library Information Assistant
25	Shri Jayaraj J R	Library Information Assistant
26	Shri Alex Andrews P	Technical Assistant
27	Shri Adarsh B	Technical Assistant
28	Shri Anilkumar P R	Technical Assistant
29	Shri Naveen Sathyan	Technical Assistant
30	Smt. Sandhya P S	Technical Assistant
31	Shri Aneesh A	Technical Assistant
32	Smt. Nithya Rani	Technical Assistant
33	Smt. Lekshmi Thampi	Technical Assistant
34	Smt. Deepthi P	Technical Assistant
35	Smt. Lekshmi Devi L	Technical Assistant
36	Shri Praveen Peter	Junior Engineer (Civil)
37	Shri Ashinraj D	Junior Engineer (Civil)
38	Smt. Mini Philip	Personal Assistant
39	Smt. Veena P	Personal Assistant
40	Shri Ajith Prabha	Superintendent
41	Shri Satheesh Raghavan	Superintendent
42	Shri Arun Raghunath	Superintendent
43	Shri Manoj M T	Accountant

44	Smt. Sruthi U.A	Junior Hindi Translator
45	Smt. Suja V R	Office Assistant (Multi Skill)
46	Smt. Vidya Senan I	Office Assistant (Multi Skill)
47	Smt. Archana P R	Office Assistant (Multi Skill)
48	Smt. Beena N K	Office Assistant (Multi Skill)
49	Shri Muruganandam A	Office Assistant (Multi Skill)
50	Shri Rajesh A P	Office Assistant (Multi Skill)
51	Shri Rakesh M V	Office Assistant (Multi Skill)
52	Smt. Sruthi R Balu	Office Assistant (Multi Skill)
53	Shri Anil Prakash M	Office Assistant (Multi Skill)
54	Shri Pradeep Kumar C	Office Assistant (Multi Skill)
55	Shri Santhosh B S	Office Assistant (Multi Skill)
56	Shri Nagarjuna Paidisetty	Office Assistant (Multi Skill)
57	Smt. Sarika Mohan	Junior Technical Assistant
58	Shri Vivek V G	Junior Technical Assistant
59	Shri Pradeep Kumar G T	Junior Technical Assistant
60	Shri Nibith Kumar K P	Junior Technical Assistant
61	Ms. Lakshmi C	Junior Technical Assistant
62	Shri Packiya Rajan	Junior Technical Assistant
63	Shri Muthukumaran A	Junior Technical Assistant
64	Ms. Amritha Sivan	Junior Technical Assistant
65	Smt. Lincy Varghese	Junior Technical Assistant
66	Ms. Aathira S	Junior Technical Assistant
67	Shri Subin S	Junior Technical Assistant
68	Shri Arun Kumar M	Attendant –Electrical
69	Shri Ratheesh C	Attendant –Plumber

CONSULTANTS AND CONTRACTUAL OFFICERS

S No	Name of the Official	Designation
1	Shri Gopakumaran Nair	Assistant Security Officer (up to 30.04.2022)
2	Shri Jayan V	Assistant Security Officer (up to 30.09.2022)
3	Shri Santhosh Kumar G	Assistant Security Officer (from 20.06.2022)
4	Shri Sunil Kumar K	Assistant Security Officer (from 26.09.2022)

Gender & Category-wise distribution of IISER Thiruvananthapuram staff						
Faculty						
	GEN	**OBC (NCL)**	**SC**	**ST**	**PD**	**Total**
Male	51	10	8	1	1	71
Female	11	5	1	1	0	18
Non-Teaching						
	GEN	**OBC (NCL)**	**SC**	**ST**	**PD**	**Total**
Male	35	7	1	0	1	44
Female	21	2	1	0	0	24

Gender & Category-wise distribution of IISER Thiruvananthapuram staff recruited in FY 2022-23						
Faculty						
	GEN	**OBC (NCL)**	**SC**	**ST**	**PD**	**Total**
Male	3	4	0	1	0	8
Female	1	3	0	1	0	5
Non-Teaching						
	GEN	**OBC (NCL)**	**SC**	**ST**	**PD**	**Total**
Male	0	0	0	0	0	0
Female	0	0	0	0	0	0

COLLECTIVE ACTION FOR RURAL EMPOWERMENT (CARE)

UNNAT BHARAT ABHIYAN (UBA)

IISER Thiruvananthapuram joined the Unnat Bharat Abhiyan (UBA) as a participating institution in the year 2015 before becoming the Regional Coordinating Institute (RCI) in 2019. Currently, it is leading 72 participating institutions functioning in Kerala's four districts namely Thiruvananthapuram, Kollam, Pathanamthitta and Alappuzha. We have also adopted five nearby villages namely Vithura, Thennoor, Aryanad, Vellanad and Tholicode. UBA regularly conducts meetings with Panchayath, Block Panchayath, Kudumbasree, Integrated Child Development Services (ICDS), Haritha Karma Sena. As a result of these meetings, around 16 programs were conducted in the adopted villages during 2022-23 in the area of education, health, and women empowerment. IISER Thiruvananthapuram has nearly 200 students as UBA volunteers. These student volunteers help in UBA's academic and social activities. Apart from conducting its regular activities, as an RCI, we regularly monitor the progress of other institutes.

Some of the important activities carried out during 2022-23 by UBA RCI are given below:

Societal Outreach Programmes:

1. Medical Camps:

- Medical camp at the Mookuthi Mala tribal settlement (5 April 2022)
- Medical camp at the Kottoor Tribal settlement (25 Nov 2022)
- Breast cancer awareness and screening camp at tribal settlement (3 Dec 2022)

2. Health and Hygiene Initiatives:
    - Distribution of reusable triple-layer cloth masks produced by self-help groups to the tribal settlements located in the adopted villages (12 May 2022)
    - Clean water conservation and preservation awareness camp (27 July 2022)
    - Awareness class on emergency life support for the members of Kudumbasree, ICDS, Asha workers, Haritha Karma Sena in Vithura panchayath (24 Jan 2023)
    - Cancer awareness programme in Thenoor Panchayath (3 Feb 2023)
3. Community Engagement:
    - Conducting Gram Sabha to obtain overview of the development activities initiated in the current year and the activities that needed to be undertaken for the next financial year

Student Outreach Programmes:

1. Educational Support:
    - Distribution of periodic table charts for the high school students of tribal areas of Manali ward (26 July 2022)
    - Skill development program for school students of Anappara school (06 Aug 2022)
    - One-day science awareness workshop for school students (17 Oct 2022)
    - Special tutorial sessions in Maths and English for tribal school students of Anappara school in association with 'Insight for Innovation' (19 Dec 2022)
2. Adolescent Health and Awareness:
    - Adolescent awareness class and adolescent health program for school students covering topics such as HIV and substance abuse (16 Nov 2022)

Teacher Training Programmes:

- Teacher training program to enhance student participation in science, mathematics, and social science festivals (7 Oct 2022)

Awards/Honours:

- Bharat Sevak Samaj (New Delhi) presented Bharat Seva Award 2022 to Prof. M.P. Rajan, the nodal officer of UBA, for his outstanding contribution to social development activities.
- National Service Scheme (Kerala) awarded Certificate of Excellence to UBA coordinator for ensuring the smooth implementation of project 'Ganitham' held from Jan 1 to Feb 28, 2023.
- National Service Scheme (Kerala) presented the Bronze Level Award in recognition of the extraordinary performance shown by the UBA student volunteers during project 'Ganitham'.

Conducting tutorial sessions for tribal school students (Project Ganitham)

Receiving Bronze Level Award for Project Ganitham

Breast cancer awareness and screening camp

Cancer awareness program in Thenoor Panchayath

Medical camp at the Kottoor tribal settlement

Distribution of periodic table charts for the high school students of tribal areas

Conducting skill development program for the school students

Annual Accounts

ANNUAL ACCOUNTS

BALANCE SHEET AS OF 31st MARCH 2023

Amount in ₹

SOURCES OF FUNDS	Schedule No	2022-23	2021-22
UNRESTRICTED FUND			
CORPUS/ CAPITAL FUND	1	9,42,90,70,392	8,80,36,63,253
DESIGNATED/ EARMARKED FUNDS	2		
CURRENT LIABILITIES AND PROVISIONS	3	72,37,90,492	65,26,42,806
UNSPENT BALANCE OF EXTERNAL PROJECTS	3A	20,74,39,538	26,39,34,172
SPONSORED FELLOWSHIPS & SCHOLARSHIPS	3B	1,77,08,361	1,08,91,278
UNSPENT BALANCE OF GRANT - MHRD	3C	25,816,505	28,79,73,245
TOTAL		**10,403,825,288**	**10,01,91,04,754**
APPLICATION OF FUNDS			
FIXED ASSETS	4		
TANGIBLE ASSETS		8,28,38,27,975	7,81,89,41,611
INTANGIBLE ASSETS		3,03,13,173	1,91,29,004
CAPITAL WORK-IN-PROGRESS		1,70,39,982	2,02,12,476
INVESTMENTS FROM EARMARKED / ENDOWENT FUNDS	5		
LONG TERM INVESTMENT			
SHORT TERM INVESTMENT			
INVESTMENT - OTHERS	6		
CURRENT ASSETS	7	1,796,390,796	1,30,75,56,476
LOANS, ADVANCES & DEPOSITS	8	27,62,53,362	85,32,65,187
TOTAL		**10,40,38,25,288**	**10,01,91,04,754**
SIGNIFICANT ACCOUNTING POLICIES	23		
CONTINGENT LIABILITIES AND NOTES TO ACCOUNTS	24		

(B.V. Ramesh)
Deputy Registrar (F&A)

(Prof. Mahesh Hariharan)
Registrar

(Prof. Srinivasa Murty Srinivasula)
Deputy Director

(Prof. Jarugu Narasimha Moorthy)
Director

INCOME AND EXPENDITURE ACCOUNT
FOR THE YEAR ENDED 31ST MARCH 2023

Amount in ₹

PARTICULARS	Schedule No	2022-23	2021-22
INCOME			
Academic Receipts	**9**	9,51,10,866	8,70,28,238
Grants & Subsidies	**10**	82,58,32,561	63,94,78,694
Income from Investments	**11**	-	-
Interest Earned	**12**	-	-
Other Income	**13**	7,46,89,859	4,05,70,059
Prior Period Income	**14**	29,189	1,38,364
TOTAL (A)		**99,56,62,475**	**76,72,15,354**
EXPENDITURE			
Staff Payments & Benefits	**15**	33,46,45,150	28,49,54,353
Employees Retirement and Terminal Benefits	**15A**	1,41,18,130	2,48,74,363
Academic Expenses	**16**	18,62,16,893	12,48,43,537
Administrative & General Expenses	**17**	21,42,62,271	16,62,26,144
Transportation Expenses	**18**	74,48,984	55,90,344
Repairs & Maintenance	**19**	8,26,50,489	5,78,38,244
Finance cost	**20**	6,08,774	26,072
Other Expenses	**21**	-	-
Depreciation	**4**	43,91,92,385	40,57,68,339
Prior Period Expenses	**22**	-	37,421
TOTAL (B)		**1,27,91,43,076**	**1,07,01,58,817**
Balance being excess of Income over Expenditure (A-B)		**(28,34,80,601)**	**(30,29,43,463)**
Transfer to/ from Designated Fund			
Building Fund			
Others (Specify)			
BALANCE BEING SURPLUS/(DEFICIT) CARRIED TO CAPITAL FUND		**(28,34,80,601)**	**(30,29,43,463)**
Significant Accounting Policies	**23**		
Contingent Liabilities & Notes on Accounts	**24**		

SCHEDULES FORMING PART OF BALANCE SHEET AS OF 31st MARCH 2023

SCHEDULE 1- CORPUS/CAPITAL FUND

Amount in ₹

PARTICULARS	2022-23		2021-22	
Balance as at the beginning of the year		8,80,36,63,253		7,36,42,65,317
Add: Contributions towards Corpus/ Capital Fund				
Add: Grant from UGC, Government of India and State Government to the extent utilised for capital expenditure	83,65,24,180		1,77,06,55,597	
Add: Assets purchased out of Earmarked funds				
Add: Assets purchased out of sponsored projects, where ownership vests in the institution	7,42,18,757			
Add: Assets donated/gifts received				
Add: Other additions	(18,55,197)		(2,83,14,198)	
Add: Excess of income over expenditure transferred from income and expenditure account	(28,34,80,601)		(30,29,43,463)	
TOTAL		9,42,90,70,392		8,80,36,63,253
Less: Deficit transferred from the income and expenditure account				
BALANCE AT THE YEAR-END		9,42,90,70,392		8,80,36,63,253

SCHEDULES FORMING PART OF BALANCE SHEET AS OF 31st MARCH 2023

SCHEDULE 3- CURRENT LIABILITIES AND PROVISIONS

Amount in ₹

PARTICULARS	SUB SCH NO.	2022-23	2021-22
A. CURRENT LIABILITIES			
1. Deposits from staff			
2. Deposits from students			
3. Sundry Creditors:			
a) For Goods & Services	1		
b) Others	2	9,94,61,160	6,14,66,731
4. Deposits Others (including EMD, Security Deposits)	3	5,36,79,678	4,16,51,327
5. Statutory Liabilities (GPF,TDS,WC TAX, CPF, GIS, NPS)			
a) Overdtue			
b) Others	4	76,17,746	51,05,995
6. Other current Liabilities	5	43,68,60,204	43,26,29,119
a) Salaries			
b) Receipts against sponsored projects			
c) Receipts against sponsored fellowships and scholarships			
d) Unutilised Grants			
e) Grants in advance			
f) Other Funds			
g) Other liabilities			
Total (A)		59,76,18,788	54,08,53,172
B. PROVISIONS			
1. For Taxation			
2. Gratuity 3. Superannuation/Pension 4. Accumulated Leave Encashment 5. Trade Warranties/Claims 6. Others (Specify)	6	12,61,71,704	11,17,89,634
Total (B)		12,61,71,704	11,17,89,634
Total (A+B)		72,37,90,492	65,26,42,806

SCHEDULES FORMING PART OF BALANCE SHEET AS OF 31st MARCH 2023

SCHEDULE 3(a)-ENDOWMENT FUNDS (Sponsored Projects)

Amount in ₹

S No	Name of the Project	Opening Balance 2021-22		Receipts / Recoveries during FY	Total	Expenditure during the year		Closing Balance 2022-23	
		Credit	Debit			Recurring	Capital	Credit	Debit
1	CHANAKYA FELLOWSHIP-DR MANIK BANIK-PDF-2021-22/008	12,64,557	-	(11,15,210)	1,49,347	1,49,347	-	-	-
2	CMNPDF-KSHEC-A1/144(C)195-DR ASWATHI K	-	-	25,034	25,034	24,971	-	63	-
3	CMNPDF-KSHEC-A1/144(C)/195-DR HIJAS	-	-	25,034	25,034	24,979	-	55	-
4	CMNPDF-KSHEC-A1/144(C)/195-DR NEEMA P	-	-	2,00,034	2,00,034	25,000	-	1,75,034	-
5	CSIR-CCMB-DR.RAVI MARUTHACHALAM-31-2(281)/2018-19/Budget	7,33,848	-	22,203	7,56,051	-	6,200	7,49,851	-
6	CSIR-DR.SHADAK ALEE-03(1457)/19/EMR-II	2,42,312	-	7,104	2,49,416	-	-	2,49,416	-
7	CSIR-DR SUKHENDU MANDAL-01(3024)/21/EMR-II	1,97,108	-	3,884	2,00,992	1,88,253	-	12,739	-
8	CSIR- DR.TAPAS K MANNA-37(1688)/17-EMR-II	-	82,993	1,271	(81,722)	-	-	-	81,722
9	CSIR-EMR11-DR RAMESH RASAPPAN-02(0409/21)	5,68,687	-	9,089	5,77,776	1,414	5,00,000	76,362	-
10	CSIR-SUBRATA KUNDU-CSIR-01-3025-21-EMR- II	-	-	6,43,809	6,43,809	1,03,194	-	5,40,615	-
11	DAE-DR RAMESH CHANDRANATH-37(3)/14/26/2017	-	-	1,16,644	1,16,644	1,16,644	-	-	-
12	DBT-A1-DR.HEMASOMANATHAN-BT/PR12720/COE/34/21/2015	5,28,315	-	(4,88,741)	39,574	-	-	39,574	-
13	DBT-A2-DR.HEMASOMANATHAN-BT/PR12720/COE/34/21/2015	5,21,441	-	(4,80,251)	41,190	-	-	41,190	-
14	DBT-A3-DR.ULLASA.K-BT/PR12720/COE/34/21/2015	1,45,851	-	(1,31,857)	13,994	-	-	13,994	-

15	DBT-BT-RAMALINGASWAMY FELLOW-SHIP - DR.RAJENDRA KURAPATI	18,13,700	-	39,220	18,52,920	10,00,662	-	8,52,258	-
16	DBT-BT/RLF/RE-ENTRY-DR SWATHI DEVIREDDY	-	-	24,82,045	24,82,045	12,86,388	-	11,95,657	-
17	DBT-DR.REJI VARGHESE-BT/PR30172/MNT/28/1593/2018	9,80,358	-	(1,56,308)	8,24,050	8,13,454	-	10,596	-
18	DBT-DR STALIN RAJ-BT/PR32565/MED/29/1554/2020	12,49,580	-	7,33,702	19,83,282	8,76,852	11,00,000	6,430	-
19	DBT-DR.SUHESHKUMARSINGH-BT/PR30005-2018	1,88,614	-	(1,27,116)	61,498	61,498	-	-	-
20	DBT-DR TAPAS K MANNA-BT/HRD/NWB/38/2019-20(7)	8,62,140	-	(17,047)	8,45,093	8,36,494	-	8,599	-
21	DBT-DR.TAPAS K.MANNA-BT/PR30271-2018	22,16,472	-	(5,97,957)	16,18,515	13,85,652	-	2,32,863	-
22	DBT-DR.ULLASA-BT/PR27535/2018	-	81,068	(1,169)	(82,237)	1,82,188	-	-	2,64,425
23	DBT-DR.ULLASA.K-BT/PR7713/NDB/39/261/2013	1,20,955	-	(478)	1,20,477	-	-	1,20,477	-
24	DBT-EU-INF/15/RV/19-20/DR STALIN RAJ	47,81,238	-	14,70,613	62,51,851	27,23,503	34,51,140	77,208	-
25	DBT -IISC-MOHAMMED AIYAZ	42,400	-	-	42,400	-	-	42,400	-
26	DBT-PR41371-DR.NISHANT KT	-	-	3,615	3,615	4,86,632	-	-	4,83,017
27	DBT-RAMALINGASWAMI-DR ANIRBAN GUHA	-	-	24,72,000	24,72,000	4,74,000	-	19,98,000	-
28	DBT-RAMALING.-DR.NONG.SADAN-BT/RLF-RE-ENTRY/17/2015	9,920	-	4,94,522	5,04,442	4,79,038	-	25,404	-
29	DBT-RICE DR KALIKAPRASAD RE-SEARCH ASSOCIATESHIP PRG	1,22,117	-	(1,22,117)	-	-	-	-	-
30	DBT-SRINIVASAMURTY-BT/PR21325/BRB/10/1554/2016	10,30,931	-	(1,74,628)	8,56,303	7,61,843	-	94,460	-
31	DBT-TAPASKUMAR-BT/PR12514/BRB/10/1352/2014-(NEW)	2	-	(2)	-	-	-	-	-
32	DRDO - DLJ/TC/1025/1/73 - DR. RA-MESH CHANDRA NATH	-	-	11,84,428	11,84,428	4,59,518		7,24,910	-

33	DR RAVI MARUTHACHALAM-ICAR-NASF-BGAM-9021-22-23	-	-	9,38,439	9,38,439	6,81,483	2,50,000	6,956	-
34	DST-DR.A.MUTHUKRISHNAN-DST/TMD/HFC/2K18/24	3,76,929	-	(1,31,801)	2,45,128	2,44,864	-	264	-
35	DST-DR MADHU THALAKULAM-ICPS/QUST/THEME-4/2019	8,45,46,256	-	22,44,842	8,67,91,098	9,86,697	1,79,97,888	6,78,06,513	-
36	DST-DR M M SHAIJUMON-DST/TMD/HFC/2K18/136(C)&(G)	1,723	-	(12,906)	(11,183)	2,80,029	-	-	2,91,212
37	DST-DR M M SHAIJUMON-IC-MAP(INTEGRATED CLEAN ENERGY	70,05,292	-	(1,28,094)	68,77,198	28,23,370	24,40,000	16,13,828	-
38	DST-DR NAGAIAH CHAMAKURI-NSM/R&D-HPC-2021	20,74,019	-	(11,76,250)	8,97,769	8,93,993	-	3,776	-
39	DST-DR PRAMITHA M-INSPIRE/04/2020/001105	-	-	1,78,880	1,78,880	1,77,106	-	1,774	-
40	DST-DR.TAMIL SEL-SR/WOS-A/CS-105/2016(G)	7,774	-	235	8,009	-	-	8,009	-
41	DST-FIST-DR MAHESH-5751/IFD/2016-2017	3,98,691	-	(3,98,690)	1	-	-	1	-
42	DST-HOD-SOP-FIST-SR/FST/PSII/2018/54 ()	2,46,50,880	-	3,76,060	2,50,26,940	-	2,03,82,811	46,44,129	-
43	DST-INSPIRE FACULTY AWARD-DR CHANDRAKALA MEENA	-	-	-	-	1,11,879	-	-	1,11,879
44	DST-INSPIRE FACULTY AWARD-DR.SRI-LAKSHMI-2013/MA-23	23,491	-	711	24,202	-	-	24,202	-
45	DST/INSPIRE FACULTY/BATCH-18/2022,1,13-DR NITIN Y	-	-	5,79,012	5,79,012	1,31,729	4,47,283	-	-
46	DST/INSPIRE FACULTY/BATCH-18/2022,1,13-DR PRASANTH V	-	-	11,84,497	11,84,497	7,19,968	4,64,529	-	-
47	DST-INSPIRE FACULTY -DR ANAND NARAYANA SARMA	16,28,820	-	6,60,285	22,89,105	18,05,212	4,78,857	5,036	-
48	DST-INSPIRE FACULTY-DR.S.GOKUL-NATH-FA12-CH-74	-	1,07,172	-	(1,07,172)	-	-	-	1,07,172
49	DST-INSPIRE FACULTY-DR SHABNAM IYYANI	11,48,147	-	(5,86,222)	5,61,925	3,92,131	1,67,049	2,745	-
50	DST-INSPIRE FACULTY-DR.VINAY-AK.K-04/2015/002111	16,52,041	-	(15,09,070)	1,42,971	46,277	-	96,694	-

51	DST-INSPIRE FACULTY FELLOW-SHIP-DR MATHEW ARUN THOMAS	32,58,450	-	(9,73,649)	22,84,801	21,36,308	1,25,036	23,457	-
52	DST-INSPIRE FACULTY FELLOW-SHIP-DR SOORAJ K	29,80,480	-	(25,41,286)	4,39,194	4,39,194	-	-	-
53	DST-INSPIRE FAUCULTY AWARD-DR DHANYA RAJENDRAN	2,83,791	-	(29,838)	2,53,953	40,369	2,09,475	4,109	-
54	DST-JSPS-DR.KUMARAGURUBA-RAN.S-DST/INT/JSPS/P-288/2019	72,369	-	(72,369)	-	-	-	-	-
55	DST-JSPS-DR.SUKHENDU M-DST/INT/JSPS/P-285/2019	2,80,582	-	(2,80,582)	-	-	-	-	-
56	DST-NANO MISSION-DR K GEORGE THOMAS-NM/TUE/EE-01/19	1,66,40,990	-	20,19,567	1,86,60,557	12,84,447	4,64,598	1,69,11,511	-
57	DST(NANOMISSION)K GEORGETHO-MAS/SR/NM/NS-23/2016-C	64,886	-	(64,886)	-	-	-	-	-
58	DST-QUEST-SUMMER SCHOOL-DR ANIL SHAJI	20,74,840	-	58,008	21,32,848	8,24,868	-	13,07,980	-
59	DST-QUEST/THEME-4/2019/GENER-AL-DR ANIL SHAJI	85,68,582	-	2,45,396	88,13,978	8,33,864	-	79,80,114	-
60	DST-RAMANUJAN-DR.RAMESH RASAP-PAN-SB/S2/RJN-059/2015	46,139	-	(46,139)	-	-	-	-	-
61	DST-RAMANUJAN-DR.RAVI PANT-SB/S2/RJN-069/2014	1,96,163	-	(1,96,163)	-	-	-	-	-
62	DST-SERI-DR MANOJ NAMB-DST/MD/SERI/S15(G)-(NEW)	360	-	(360)	-	-	-	-	-
63	DST-SJF-DR.K.M.SURESHAN-DST/SJF/CSA-02/2012-13	1,00,674	-	(95,397)	5,277	5,277		-	-
64	DST-STUTI-DR NISHANT			6,90,771	6,90,771	6,90,771	-	-	-
65	DST-TMD-DR.DEEPSHIKA-DST/TMD/HFC/2K18/37	84,659	-	(34,019)	50,640	2,30,573	-	-	1,79,933
66	DST-TMD-IC-MAP/2K20/03 - DR. MANOJ AG NAMBOOTHIRY	-	-	36,38,062	36,38,062	13,12,524	-	23,25,538	-
67	DST-TMD/IC-MAP/DR. DEEPSHIKHA JAISWAL NAGAR /2K20/0	-	-	90,80,307	90,80,307	14,87,882		75,92,425	-
68	DST-TMD-MES-DR.M.M SHAIJU-MON-2K16/114(G)	8,338	-	(8,338)	-	-	-	-	-

69	DST-WOS-A-SMITHA VISHNU-LS-457/2017(G)	19,449	-	(10,531)	8,918	8,918	-	-	-
70	DST-WOS-B-DR T SHYAMA-LA-AFE-20/2021(G)	9,48,379	-	2,78,358	12,26,737	12,08,467	-	18,270	-
71	DUPONT YOUNG PROFESSOR PROGRAM-DR.RAVI.M	12,24,331	-	33,022	12,57,353	2,67,527	-	9,89,826	-
72	EICL-DR.M.M.SHAIJUMON	2,42,697	-	6,277	2,48,974	90,365	-	1,58,609	-
73	FIST PROJECT-SCHOOL OF BIOLOGY	25,46,238	-	(1,57,306)	23,88,932	3,22,969	15,92,077	4,73,887	-
74	GE INDIA INDUSTRIAL PVT LTD PROJECT-DR.RAJEEV KINI	4,02,847	-	1,917	4,04,764	-	11,727	3,93,037	-
75	ICAR-DR.RAVI M-NASF/GT-7024/2018-19	2,26,392	-	1,51,323	3,77,715	1,88,587	-	1,89,128	-
76	IKS INTERNSHIP 2022- DR.SANDHYA GANESAN - 109628	-	-	1,89,318	1,89,318	1,88,212	-	1,106	-
77	INSPIRE FACULTY AWARD-DR MANIK BANIK	8,76,881	-	(8,76,881)	-	-	-	-	-
78	ISRO-DEEPSHIKA/DS-2B-13012(2)42/2017	28,452	-	873	29,325	-	-	29,325	-
79	ISRO-DR.DEEPSHIKHA JAISWAL NAGAR./19012/35/2016-II	48,751	-	1,475	50,226	-	-	50,226	-
80	ISRO-DR K M SURESHAN-ISRO/RES/3/861/20-21	3,42,314	-	(6,260)	3,36,054	4,15,061	-	-	79,007
81	JC BOSE-DR.K.GEORGE THOMAS-SB/S2/JCB-64/2013-2019	-	1,49,768	23,08,715	21,58,947	11,75,953	-	9,82,994	-
82	KLDB-DR N SADANANDA SINGH	30,18,473	-	88,317	31,06,790	26,32,864	-	4,73,926	-
83	KSCSTE(KSYSA)RAJEEV N KINI-KSCSTE-431/2018-KSYSA-RG	62,444	-	(62,444)	-	-	-	-	-
84	KSCSTE-MS.SANDREA MOUREEN FRANCIS-264/2021-BLP	95,846	-	5,65,397	6,61,243	6,16,493	-	44,750	-
85	KSCSTE-SWATHI-430/2018	34,925	-	(34,925)	-	-	-	-	-
86	MED/BT/PR30459/DR SATISH KHURANA	-	-	4,015	4,015	6,16,999	9,13,362	-	15,26,346

87	MHRD-COE-DR.AMAL MEDHI-(FN. NO.5-5/2014-TS.VII)	2,61,120	-	(2,61,120)	-	-	-	-	-
88	MHRD-DR MANOJ NAMBOOTHIRI-STARS/APR2019/PS/308/FS	-	73,962	4,71,257	3,97,295	9,97,851	-	-	6,00,556
89	MHRD-STARS-DR RAVI MARUTHACHALAM-APR2019/BS/818/FS	92,567	-	6,17,926	7,10,493	6,64,553	43,310	2,630	-
90	MHRD/STARS-DR VINESH VIJAYAN-STARS/APR2019/BS/708	45,098	-	10,07,208	10,52,306	10,51,546	-	760	-
91	MOMENTIVE PERFORMANCE-DR M M SHAIJUMON	12,12,468	-	31,777	12,44,245	4,29,029	-	8,15,216	-
92	SERB-DR.VIJI Z THOMAS-MTR/2020/000483	1,06,586	-	2,661	1,09,247	73,543	-	35,704	-
93	MYCO/ADHOC/1/2022/ECD-II-DR NISHANT	-	-	21,33,000	21,33,000	82,256		20,50,744	-
94	NBHM-MS. ARATI SHASHI-PDF/0204/16(6)/2020/R&D-II	1,05,525	-	5,52,869	6,58,394	6,54,760	-	3,634	-
95	NPDF-DR PRASANTA KUMAR BARIK	3,33,497	-	(1,62,803)	1,70,694	1,70,694		-	-
96	OTHERS	45,95,139	-	3,71,855	49,66,994	2,46,865	-	47,20,129	-
97	SCHOOL-CONFERENCE/WORKSHOP/SYMPOSIUM	-	-	1,75,35,015	1,75,35,015	1,35,53,681	-	39,81,334	-
98	RAENG-DR.JOY MITRA	13,45,321		38,996	13,84,317	-	-	13,84,317	-
99	RAMANUJAN FELLOWSHIP-DR JOYDEB MANDAL	4,25,518	-	4,61,213	8,86,731	8,86,731		-	-
100	SERB-DR SOUMEN DE-SRG/2020/001486	4,80,212	-	1,27,037	6,07,249	5,13,663	-	93,586	-
101	SERB-CRG-006873-DR R S SWATHI	-	-	10,87,386	10,87,386	2,12,495	-	8,74,891	-
102	SERB-CRG-2022-000568-DR KM SURESHAN	-	-	39,93,319	39,93,319	2,55,066	-	37,38,253	-
103	SERB-CRG-2022-000984-DR SUKHENDU MANDAL	-	-	24,64,770	24,64,770	2,37,783	-	22,26,987	-
104	SERB-CRG-2022-002516-DR ALAGIRI KALIYAMOORTHY	-	-	12,03,140	12,03,140	2,08,071	-	9,95,069	-

105	SERB-CRG-2022-002612-DR REJI VARGHESE	-	-	41,54,532	41,54,532	1,59,000	-	39,95,532	-
106	SERB-CRG-DR VINAYAK-2022/006973	-	-	22,20,000	22,20,000	-	-	22,20,000	-
107	SERB-DR ADITHYA LAKSHMANA-CRG/2020/000321	60,70,970	-	7,80,640	68,51,610	3,78,579	4,15,215	60,57,817	-
108	SERB-DR AJAY VENUGOPAL / CRG/2019/005040	83,602	-	1,54,187	2,37,789	2,09,952	-	27,837	-
109	SERB-DR. AMAL MEDHI-CRG/2021/005792	15,94,047	-	33,987	16,28,034	2,37,948	10,00,000	3,90,086	-
110	SERB-DR.ANIL SHAJI-EMR/2016/007221	1,00,064	-	(1,00,064)	-	-	-	-	-
111	SERB-DR BASUDEV SAHOO-SRG/2021/000572	20,55,581	-	45,324	21,00,905	5,96,671	14,38,127	66,107	-
112	SERB-DR BIKAS C DAS-CRG/2021/000567	24,55,416	-	2,17,027	26,72,443	1,54,548	16,68,009	8,49,886	-
113	SERB- DR BIKAS C DAS-EEQ/2021/000810	43,24,668	-	1,27,501	44,52,169	2,79,878	-	41,72,291	-
114	SERB-DR.BINDUSAR SAHOO-CRG/2018/002373	3,09,309	-	(2,36,796)	72,513	72,513	-	-	-
115	SERB-DR DEEPSHIKA JAISWAL NAGAR- CRG/2021/001262	71,55,500	-	1,86,082	73,41,582	7,248	-	73,34,334	-
116	SERB-DR.DEEPSHIKA JAISWAL NAGAR-YSS/2015/001743	69,134	-	(69,134)	-	-	-	-	-
117	SERB-DR.DEVARAJ-MTR/2018/000559	99,060	-	(7,815)	91,245	91,245	-	-	-
118	SERB-DR DOND ASHA KISON-SRG/2020/001027	2,00,969	-	2,59,434	4,60,403	3,61,945	-	98,458	-
119	SERB-DR.GEETHA T -MTR/2017/000424	11,974	-	(11,974)	-	-	-	-	-
120	SERB-DR GEETHA T-SPG/2021/004200	-	-	7,68,227	7,68,227	66,164	1,49,860	5,52,203	-
121	SERB-DR GOKULNATH SAPABATHI-CRG/2019/006303	5,68,745	-	15,389	5,84,134	4,42,346	-	1,41,788	-
122	SERB-DR HEMA SOMANATHAN-CRG/2019/003805	67,679	-	51,685	1,19,364	63,353	-	56,011	-

123	SERB-DR.HEMA SOMANATHAN/ EMR/2014/000705	1,07,811	-	3,261	1,11,072	-	-	1,11,072	-
124	SERB-DR HEMA SOMANA-THAN-SPR/2021/000510	-	-	37,97,778	37,97,778	17,56,735	-	20,41,043	-
125	SERB-DR JISHY VAR-GHESE-EMR/2016/004978	76,017	-	(76,017)	-	-	-	-	-
126	SERB-DR JOY MI-THRA-CRG/2019/004965	3,34,101	-	9,259	3,43,360	93,511	-	2,49,849	-
127	SERB-DR.KALIKA PRASAD-EMR/2017/002503	1,94,594	-	(1,48,154)	46,440	46,440		-	-
128	SERB-DR.K.M.SURE-SHAN-CRG/2018/000577	3,58,101	-	(2,36,993)	1,21,108	1,21,108	-	-	-
129	SERB-DR K R ARUN-CRG/2021/004078	10,07,333	-	19,781	10,27,114	3,89,912	2,97,675	3,39,527	-
130	SERB-DR.KUMARAGURUBA-RAN-CRG/2021/000935	26,40,000	-	68,178	27,08,178	1,16,000	-	25,92,178	-
131	SERB-DR.MADHU THALAKU-LAM-CRG/2018/004213	2,02,817	-	5,228	2,08,045	54,725	-	1,53,320	-
132	SERB-DR.MAHESH HARIHA-RAN-CRG/2019/002119	2,35,558	-	2,08,856	4,44,414	4,10,843	18,895	14,676	-
133	SERB-DR MANIK BAN-IK-SRG/2021/000267	7,31,071	-	21,661	7,52,732	-	-	7,52,732	-
134	SERB-DR MANOJ NAM-BOOTHIRY-CRG/2021/003874	53,84,277	-	1,32,430	55,16,707	8,55,543	19,77,408	26,83,756	-
135	SERB-DR-M M SHAIJU-MON-CRG/2021/006246	35,02,000	-	84,039	35,86,039	7,32,966	25,50,000	3,03,073	-
136	SERB-DR.M.M.SHAIJU-MON-EMR/2017/000484	3,045	-	(3,045)	-	-	-	-	-
137	SERB-DR NAGAIAH CHAMAKU-RI-EMR/2017/000664	70,014	-	(15,381)	54,633	54,633	-	-	-
138	SERB- DR. NAGAIAH CHAMAKURI - MTR/2017/000598	21,489	-	(20,548)	941	-	-	941	-
139	SERB-DR-NISHANT K T-CRG/2018/000916	1,07,702	-	(93,268)	14,434	14,434	-	-	-
140	SERB-DR.N.SADANANDAS-INGH-ECR/2016/000979	1,55,538	-	(1,55,538)	-	-	-	-	-

141	SERB-DR POONAM THAK-UR-SRG/2021/000981	14,35,313	-	4,25,464	18,60,777	5,20,811	12,00,000	1,39,966	-
142	SERB-DR.PUSHPITA GHOSH-SRG/2022/000043	-	-	26,33,311	26,33,311	3,27,574	15,17,615	7,88,122	-
143	SERB-DR RAGENDAR GORETI/CRG/003737	4,23,230	-	4,67,265	8,90,495	7,47,724	-	1,42,771	-
144	SERB- DR RAJEEV N KI-NI-CRG/2019/004865	1,84,665	-	2,57,883	4,42,548	3,44,663	-	97,885	-
145	SERB-DR.RAJENDAR GORETI/ECR/2016/001580	5,315	-	(5,315)	-	-	-	-	-
146	SERB-DR.RAJENDRA KURAPATI - SRG/2022/000291	-	-	27,08,605	27,08,605	4,11,670	20,23,760	2,73,175	-
147	SERB-DR.RAMESH CH.NATH0 CRG/2019/000960	4,97,728	-	2,62,578	7,60,306	6,91,500	-	68,806	-
148	SERB-DR.RAMESH RASAP-PAN-EMR/2015/001103	92,656	-	(92,656)	-	-	-	-	-
149	SERB-DR RANI ALPHONSA JOSE-TAR/2021/000384	3,10,000	-	8,670	3,18,670	2,68,999	-	49,671	-
150	SERB-DR RAVI PANT-CRG/2019/000993	5,83,726	-	1,67,345	7,51,071	4,79,925	1,81,651	89,495	-
151	SERB-DR.RAVI PANT-EMR/2015/000363	2,49,140	-	7,537	2,56,677	-	-	2,56,677	-
152	SERB-DR.SADANADA SINGH-EEQ/2018/001090	82,997	-	(75,477)	7,520	7,520	-	-	-
153	SERB-DR.SAIKAT-MTR/2018/000528	8,198	-	343	8,541	-	-	8,541	-
154	SERB - DR.SANDHYA GANESHAN - SRG/2022/002157	-	-	22,14,739	22,14,739	4,70,921	6,35,930	11,07,888	-
155	SERB-DR.SARBESWAR PAL-EMR/2015/002172	4,185	-	(4,185)	-	-	-	-	-
156	SERB-DR SHEETAL DHARMAT-TI-CRG/2021/008278	6,69,487	-	17,605	6,87,092	2,84,500	1,45,990	2,56,602	-
157	SERB-DR.SOURAV BISWAS-PDF/2020/001085	4,70,099	-	69,413	5,39,512	5,38,927	-	585	-
158	SERB-DR.SRINIVASA MURTY/EMR/2016/008048	1,82,550	-	4,785	1,87,335	55,699	-	1,31,636	-

159	SERB-DR SUBOJ BABYKUT-TY-TAR/2021/000147	3,10,000	-	7,045	3,17,045	2,50,000	-	67,045	-
160	SERB-DR SUBRATA KUN-DU-CRG/2021/001174	14,68,829	-	8,46,930	23,15,759	10,55,877	11,06,000	1,53,882	-
161	SERB-DR.SUBRATAKUN-DU-ECR/2017/003200	727	-	(727)	-	-	-	-	-
162	SERB-DR SUDARSHAN KU-MAR-MTR/2017/000649	-	1,91,785	295	(1,91,490)	-	0	-	1,91,490
163	SERB-DR.SUHESH KUMAR/ ECR/2016/001232	1,30,353	-	(46,283)	84,070	-	84,070	-	-
164	SERB-DR SUJAY KUMAR NAN-DI-PDF/2021/002015	10,65,600	-	(10,65,600)	-	-	-	-	-
165	SERB-DR.SUMIT MOHANTY/ MTR/2017/000458	-	12,298	233	(12,065)	-	-	-	12,065
166	SERB-DR.TAPAS K MAN-NA-EMR/2016/001562	13,164	-	(13,164)	-	-	-	-	-
167	SERB-DR TAPAS KUMAR MAN-NA-CRG/2020/002452	1,18,189	-	20,40,362	21,58,551	15,89,500	-	5,69,051	-
168	SERB-DR TUHIN MA-ITY-SRG/2021/000423	26,67,925	-	60,886	27,28,811	2,31,160	24,00,000	97,651	-
169	SERB-ECR-DR SIVARANJA-NA-2016/000226	7,136	-	(7,136)	-	-	-	-	-
170	SERB-EEQ/2022/001034-DR NISHA N KANNAN	-	-	20,69,330	20,69,330	1,08,643	-	19,60,687	-
171	SERB-EEQ-DR. RAJENDRA KURAPATI -2022-000614	-	-	29,44,176	29,44,176	20,606	-	29,23,570	-
172	SERB-EEQ-DR VIANAYAK-2022/001016	-	-	43,65,000	43,65,000	1,73,725	-	41,91,275	-
173	SERB-EEQ-DR VINAYAK-2018/000769	11,063	-	(5,934)	5,129	-	-	5,129	-
174	SERB-EMR-DR SUKENDHU MAN-DAL-2016/007501	20,998	-	635	21,633	-	-	21,633	-
175	SERB-IMPRINT DR GEORGE THOMAS SR/S9/Z-05/2015	9,25,275	-	(7,99,705)	1,25,570	-	1,25,570	-	-
176	SERB-IPA-DR RAJEEV N KINI-2020/000021	17,03,948	-	(85,889)	16,18,059	1,28,994	16,66,868	-	1,77,803

177	SERB-IPA-DR STALIN RAJ-000070	25,64,315	-	5,73,049	31,37,364	26,70,352	-	4,67,012	-
178	SERB-MSC-DR UTPAL MAN-NA-2020/000029	16,272	-	(16,272)	-	-	-	-	-
179	SERB-MS.RESHMA BA-SAK-PDF/2020/000943	26,614	-	9,69,204	9,95,818	9,57,759	-	38,059	-
180	SERB-MS.SHRUTI SURIYAKU-MAR-PDF/2020/000209	7,00,699	-	15,781	7,16,480	7,30,686	-	-	14,206
181	SERB-MTR/2022/000265-DR ASHA KI-SAN DOND	-	-	2,21,241	2,21,241	20,000	-	2,01,241	-
182	SERB-MTR/2022/000780-DR DHANYA RAJENDRAN	-	-	2,20,000	2,20,000	20,000	-	2,00,000	-
183	SERB-SENTHILKUMAR D V-CRG/2021/000816	11,58,389	-	1,19,861	12,78,250	3,93,255	6,00,000	2,84,995	-
184	SERB-SPR/2020/000427-DR NISHANT K T	77,306	-	6,369	83,675	2,85,213	-	-	2,01,538
185	SERB-SRG/2021/000834-DR. VEERA REDDY YATHAM	21,32,670	-	38,616	21,71,286	3,71,754	17,41,427	58,105	-
186	SERB-SRG/2022/000211-DR SHABNAM IYYANI	-	-	17,00,413	17,00,413	85,500	-	16,14,913	-
187	SERB-TAR-2022-000048-DR SONIYA MOL JOSEPH	-	-	3,37,177	3,37,177	25,000	-	3,12,177	-
188	SERB-VINESH VI-JAYAN-CRG/2019/004880	1,29,561	-	2,56,339	3,85,900	2,53,882	-	1,32,018	-
189	SPARC-DR NISHANT KR-2018/19/58/SL(IN)	7,60,084	-	(4,25,493)	3,34,591	3,31,736	-	2,855	-
190	STARS-DR AJAY VENUGOPAL-APR2019/CS/250/FS	7,466	-	2,34,462	2,41,928	2,41,363	-	565	-
191	STARS-DR MADHU THALAKU-LAM-APR2019/PS/363/FS	3,14,465	-	(98,265)	2,16,200	2,12,640	-	3,560	-
192	STARS- DR RAMANATHAN NA-TESH-STARS/APR2019/BS/729/FS	2,71,671	-	6,57,183	9,28,854	9,13,112	-	15,742	-
193	TREEMERA GM-BH-CONS.-DR.A.MUTHUKRISHNAN	-	-	10,01,672	10,01,672	7,43,093	-	2,58,579	-
194	UGC-UKEIRI-DR JOY MITRA-184-16/2017(IC)	36,391	-	1,100	37,491	-	-	37,491	-

195	WT-DBT-DR POONAM THAKUR-IA/IE/17/1/503664	13,17,541	-	12,37,915	25,55,456	10,14,546	8,25,857	7,15,053	-
196	WT-DBT-DR.SATISH KHURANA-IA/1/15/2/502061	11,17,855	-	32,08,815	43,26,670	25,64,307	-	17,62,363	-
197	WT-DBT-NISHA KANNAN/1A/E/15/1/502329	2,55,456	-	17,48,384	20,03,840	8,31,824	-	11,72,016	-
198	WT-SABARI SANKAR THIRUPATHY	34,51,332	-	21,02,964	55,54,296	30,38,857	4,14,965	21,00,474	-
199	SERB-CRG-DR NAGAIAH CHAMAKURI/006421	-	-	11,65,698	11,65,698	-	-	11,65,698	-
200	SERB-DR SAM JOHN-TAR/2022/000226	-	-	3,35,000	3,35,000	-	-	3,35,000	-
201	SERB-DR ALAGIRI KALIYAMOORTHY-EEQ/2016/000231	2,01,181	-	(2,01,181)	-	-	-	-	-
202	DST-VINAYAK KAMBLE-NM/NT/2018/124(G)	3,94,731	-	(47,480)	3,47,251	3,47,251	-	-	-
203	DST-RAMANUJAN-RG-SB-S2/RJN-071/2015	77,859	-	(77,859)	-	-	-	-	-
204	SERB-DR.UTPAL MANNA-MTR/2018/000034	64,255	-	(17,330)	46,925	46,925	-	-	-
205	SERB-DR JERRY D FEREIRO-CRG/2022/000584	-	-	59,11,267	59,11,267	3,31,456	-	55,79,811	-
		26,39,34,172	**6,99,046**	**10,70,33,304**	**37,02,68,429**	**9,19,21,029**	**7,52,30,234**	**20,74,39,538**	**43,22,371**

SCHEDULES FORMING PART OF BALANCE SHEET AS OF 31st MARCH 2023

SCHEDULE 3(B)-SPONSORED FELLOWSHIPS AND SCHOLARSHIPS

Amount in ₹

S No	Name of the Sponsor	Opening Balance as on 01-04-2022		Transactions during the year		Closing Balance as on 31-03-2023	
		Credit	Debit	Credit	Debit	Credit	Debit
1	DST - INSPIRE - BSMS/ PHD	75,35,884		2,39,53,132	2,17,61,494	97,27,522	
2	CSIR (Ph D Research Scholars)	17,58,918		4,03,000	5,00,000	16,61,918	
3	UGC (Ph D Research Scholars)	5,21,303		2,17,000		7,38,303	
4	DBT (Ph D Research Scholar)	56,346		27,40,630	16,07,343	11,89,633	
5	PMRF (Ph D Research Scholars)	1,00,54,94		3,10,30,762	2,77,23,594	43,12,662	
6	ICMR FELLOWSHIP (Ph D Research Scholars)	13,333		8,11,838	6,98,698	1,26,473	
7	E-GRANTS			6,3070	1,14,220		51150
8	NATIONAL FELLOWSHIP FOR ST STUDENTS			37,500	34,500	3,000	
TOTAL		**1,08,91,278**		**5,92,56,932**	**5,24,39,849**	**1,77,59,511**	**51,150**

SCHEDULES FORMING PART OF BALANCE SHEET AS OF 31st MARCH 2023

SCHEDULE 3(C)- UNUTILIZED GRANTS FROM UGC, GOVERNMENT OF INDIA AND STATE GOVERNMENT

Amount in ₹

Particulars	2022-23	2021-22
A. Plan grants: Government of India (MoE)		
Balance B/F	28,79,73,245	1,49,28,01,786
Add: Receipts during the year	1,40,02,00,000	1,14,04,60,000
Total (a)	1,68,81,73,245	2,63,32,61,786
Less Refunds		
Less: Utilized for Revenue Expenditure	82,58,32,561	63,94,78,694
Less: Utilized for Capital Expenditure	83,65,24,180	1,70,58,09,847
Total (b)	1,66,23,56,741	2,34,52,88,541
Unutilized carried forward (a-b)	**2,58,16,505**	**28,79,73,245**
B. UGC Grants: Plan		
Balance B/F		
Add: Receipts during the year		
Total (c)	NIL	NIL
Less Refunds		
Less: Utilized for Revenue Expenditure		
Less: Utilized for Capital Expenditure		
Total (d)	NIL	NIL
C. UGC Grants: Non-Plan		
Balance B/F		
Add: Receipts during the year		
Total (e)	NIL	NIL
Less Refunds		
Less: Utilized for Revenue Expenditure		
Less: Utilized for Capital Expenditure		
Total (f)	NIL	NIL
D. Grants from State Government		
Balance B/F		
Add: Receipts during the year		
Total (g)	NIL	NIL
Less Refunds		
Less: Utilized for Revenue Expenditure		
Less: Utilized for Capital Expenditure		
Total (h)	NIL	NIL
Grand Total (A+B+C+D)	**2,58,16,505**	**28,79,73,245**

SCHEDULES FORMING PART OF BALANCE SHEET AS OF 31st MARCH 2023

SCHEDULE 4 - FIXED ASSETS

Amount in ₹

S No.	DESCRIPTION	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2022	Additions	Deductions	Closing Balance	Rate of Depreci-ation	Opening Balance	Depreciation for the year	Deductions / Adjustment	Total Depreciation	31-03-2023	31-03-2022
TANGIBLE ASSETS												
1	LAND:											
	a) Freehold											
	Land obtained from Govt	1			1	0.00%					1	1
	Vithura	9,54,506			9,54,506	0.00%					9,54,506	9,54,506
2	Site Development	-			-						-	-
3	BUILDINGS:	6,56,64,05,217	63,71,68,143	-	7,20,35,73,360	2.00%	33,24,81,164	14,40,71,467		47,65,52,632	6,72,70,20,728	6,23,39,24,053
4	Roads & Bridges	8,10,82,403	1,24,58,443	-	9,35,40,846	2.00%	1,01,33,993	18,70,817		1,20,04,810	8,15,36,036	7,09,48,410
5	Tubes & Water Supply	11,28,215	-	-	11,28,215	2.00%	90,256	22,564		1,12,821	10,15,394	10,37,959
6	Sewage & Drainage	-	-	-	-	2.00%	-	-		-	-	-
7	Electrical Installation and equipment	6,06,89,353	5,55,570	-	6,12,44,923	5.00%	1,53,65,457	30,60,586		1,84,26,043	4,28,18,880	4,53,23,896
8	Plant and Machinery	5,39,03,468	-	-	5,39,03,468	5.00%	2,25,70,724	26,95,173		2,52,65,898	2,86,37,570	3,13,32,743
9	Scientific & Laboratory Equipment	2,29,94,98,230	11,15,44,397	-	2,41,10,42,627	8.00%	1,20,14,22,543	19,23,63,272		1,39,37,85,816	1,01,72,56,811	1,09,80,75,687
10	Office Equipment	1,01,61,350	10,86,986	-	1,12,48,336	7.50%	24,67,567	8,43,625		33,11,192	79,37,144	76,93,783
11	Audio Visual Equipment	6,27,162	88,17,860	-	94,45,022	7.50%	68,181	7,08,377		7,76,558	86,68,464	5,58,981
12	Computers & Peripherals	18,00,40,427	1,08,80,267	-	19,09,20,694	20.00%	15,85,68,092	2,08,03,970		17,93,72,062	1,15,48,632	2,14,72,334
13	Furniture, Fixtures and Fittings	27,68,67,084	1,43,02,990	-	29,11,70,074	7.50%	10,17,04,467	2,11,46,562		12,28,51,028	16,83,19,046	17,51,62,617
14	VEHICLES	38,87,817	-	-	38,87,817	10.00%	21,50,529	3,18,677		24,69,207	14,18,610	17,37,288
15	Library Books & Scientific Journals	2,69,22,219	15,676	-	2,69,37,895	10.00%	2,26,96,006	6,40,127		2,33,36,133	36,01,762	42,26,213
16	Small Value Assets											-
	TOTAL (A)	**9,56,21,67,452**	**79,68,30,332**	**-**	**10,35,89,97,783**		**1,86,97,18,981**	**38,85,45,217**	**-**	**2,25,82,64,198**	**8,10,07,33,585**	**7,69,24,48,471**
17	CAPITAL WORK-IN PROGRESS - Construction	-	44,22,657	-	44,22,657						44,22,657	-

18	CAPITAL WORK-IN PROGRESS - Lab Equipment	2,02,12,476	5,04,711	80,99,862	1,26,17,325						1,26,17,325	2,02,12,476
CAPITAL WORK-IN PROGRESS (B)		**2,02,12,476**	**49,27,368**	**80,99,862**	**1,70,39,982**						**1,70,39,982**	**2,02,12,476**
TOTAL A+B											**8,11,77,73,567**	**7,71,26,60,947**

S No.	DESCRIPTION	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2022	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Amortizatio-n for the year	Deductions / Adjustment	Total Amortization / Adjustments	31-03-2023	31-03-2022
INTANGIBLE ASSETS												
19	Computer Software	2,15,01,683	13,51,800	-	2,28,53,483	40.00%	2,12,75,129	7,16,395	-	2,19,91,524	8,61,959	2,26,554
20	E-Journals	48,00,40,478	4,15,14,543	-	52,15,55,020	40.00%	46,13,50,690	3,09,29,795	-	49,22,80,485	2,92,74,536	1,86,89,788
21	Patents	3,23,850	-	-	3,23,850	9 Years	1,11,188	35,983	-	1,47,172	1,76,678	2,12,662
TOTAL (C)		**50,18,66,011**	**4,28,66,343**	**-**	**54,47,32,353**		**48,27,37,007**	**3,16,82,173**	**-**	**51,44,19,180**	**3,03,13,173**	**1,91,29,004**
GRAND TOTAL (A+B+C)		**10,08,42,45,939**	**84,46,24,042**	**80,99,862**	**10,92,07,70,119**		**2,35,24,55,988**	**42,02,27,391**	**-**	**2,77,26,83,379**	**8,14,80,86,740**	**7,73,17,89,951**

SCHEDULES FORMING PART OF BALANCE SHEET AS OF 31st MARCH 2023

SCHEDULE 4A - FIXED ASSETS (PLAN)

Amount in ₹

S No.	DESCRIPTION	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2022	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Depreciation for the year	Deductions / Adjustment	Total Depreciation	31-03-2023	31-03-2022
TANGIBLE ASSETS												
1	LAND:											
	a) Freehold											
	Land obtained from Govt	1			1	0.00%					1	1
	Vithura	9,54,506			9,54,506	0.00%					9,54,506	9,54,506
2	Site Development	-			-						-	-
3	BUILDINGS:	6,56,64,05,217	63,71,68,143	-	7,20,35,73,360	2.00%	33,24,81,164	14,40,71,467		47,65,52,632	6,72,70,20,728	6,23,39,24,053

4	Roads & Bridges	8,10,82,403	1,24,58,443	-	9,35,40,846	2.00%	1,01,33,993	18,70,817		1,20,04,810	8,15,36,036	7,09,48,410
5	Tubes & Water Supply	11,28,215	-	-	11,28,215	2.00%	90,256	22,564		1,12,821	10,15,394	10,37,959
6	Sewage & Drainage	-	-	-	-	2.00%	-	-		-	-	-
7	Electrical Installation and equipment	6,06,89,353	5,55,570	-	6,12,44,923	5.00%	1,53,65,457	30,60,586		1,84,26,043	4,28,18,880	4,53,23,896
8	Plant and Machinery	5,39,03,468	-	-	5,39,03,468	5.00%	2,25,70,724	26,95,173		2,52,65,898	2,86,37,570	3,13,32,743
9	Scientific & Laboratory Equipment	2,29,94,98,230	11,15,44,397	-	2,41,10,42,627	8.00%	1,20,14,22,543	19,23,63,272		1,39,37,85,816	1,01,72,56,811	1,09,80,75,687
10	Office Equipment	1,01,61,350	10,86,986	-	1,12,48,336	7.50%	24,67,567	8,43,625		33,11,192	79,37,144	76,93,783
11	Audio Visual Equipment	6,27,162	88,17,860	-	94,45,022	7.50%	68,181	7,08,377		7,76,558	86,68,464	5,58,981
12	Computers & Peripherals	18,00,40,427	1,08,80,267	-	19,09,20,694	20.00%	15,85,68,092	2,08,03,970		17,93,72,062	1,15,48,632	2,14,72,334
13	Furniture, Fixtures and Fittings	27,68,67,084	1,43,02,990	-	29,11,70,074	7.50%	10,17,04,467	2,11,46,562		12,28,51,028	16,83,19,046	17,51,62,617
14	VEHICLES	38,87,817	-	-	38,87,817	10.00%	21,50,529	3,18,677		24,69,207	14,18,610	17,37,288
15	Library Books & Scientific Journals	2,69,22,219	15,676	-	2,69,37,895	10.00%	2,26,96,006	6,40,127		2,33,36,133	36,01,762	42,26,213
16	Small Value Assets											-
TOTAL (A)		**9,56,21,67,452**	**79,68,30,332**	**-**	**10,35,89,97,783**		**1,86,97,18,981**	**38,85,45,217**	**-**	**2,25,82,64,198**	**8,10,07,33,585**	**7,69,24,48,471**
17	CAPITAL WORK-IN PROGRESS - Construction	-	44,22,657	-	44,22,657						44,22,657	-
18	CAPITAL WORK-IN PROGRESS - Lab Equipment	2,02,12,476	5,04,711	80,99,862	1,26,17,325						1,26,17,325	2,02,12,476
CAPITAL WORK-IN PROGRESS (B)		**2,02,12,476**	**49,27,368**	**80,99,862**	**1,70,39,982**						**1,70,39,982**	**2,02,12,476**
TOTAL A+B											**8,11,77,73,567**	**7,71,26,60,947**

S No.	DESCRIPTION	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2022	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Amortizatio-n for the year	Deductions / Adjustment	Total Amortization / Adjustments	31-03-2023	31-03-2022
INTANGIBLE ASSETS												
19	Computer Software	2,15,01,683	13,51,800	-	2,28,53,483	40.00%	2,12,75,129	7,16,395	-	2,19,91,524	8,61,959	2,26,554
20	E-Journals	48,00,40,478	4,15,14,543	-	52,15,55,020	40.00%	46,13,50,690	3,09,29,795	-	49,22,80,485	2,92,74,536	1,86,89,788
21	Patents	3,23,850	-	-	3,23,850	9 Years	1,11,188	35,983	-	1,47,172	1,76,678	2,12,662
TOTAL (C)		**50,18,66,011**	**4,28,66,343**	**-**	**54,47,32,353**		**48,27,37,007**	**3,16,82,173**	**-**	**51,44,19,180**	**3,03,13,173**	**1,91,29,004**
GRAND TOTAL (A+B+C)		**10,08,42,45,939**	**84,46,24,042**	**80,99,862**	**10,92,07,70,119**		**2,35,24,55,988**	**42,02,27,391**	**-**	**2,77,26,83,379**	**8,14,80,86,740**	**7,73,17,89,951**

SCHEDULES FORMING PART OF BALANCE SHEET AS OF 31st MARCH 2023

SCHEDULE 4D - FIXED ASSETS (OTHERS)

Amount in ₹

S No.	DESCRIPTION	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2022	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Depreciation for the year	Deductions / Adjustment	Total Depreciation	31-03-2023	31-03-2022
TANGIBLE ASSETS												
1	LAND:											
	a) Freehold											
	Land obtained from Govt					0.00%						
	Vithura					0.00%						
2	Site Development											
3	BUILDINGS:			-		2.00%						
4	Roads & Bridges			-		2.00%						
5	Tubes & Water Supply			-		2.00%						
6	Sewage & Drainage			-		2.00%						
7	Electrical Installation and equipment			-		5.00%						
8	Plant and Machinery			-		5.00%						
9	Scientific & Laboratory Equipment	14,03,94,270	7,29,93,984	9,41,589	21,24,46,665	8.00%	1,91,03,900	1,69,95,733	(2,957)	3,60,96,676	17,63,49,989	12,12,90,370
10	Office Equipment			-		7.50%						
11	Audio Visual Equipment	8,58,882	81,113		9,39,995	7.50%	73,390	70,500		1,43,890	7,96,105	7,85,492
12	Computers & Peripherals	67,67,827	23,94,713	3,78,470	87,84,070	20.00%	24,02,009	17,56,814		41,58,823	46,25,247	43,65,818
13	Furniture, Fixtures and Fittings	66,400	69,006	-	1,35,406	7.50%	14,940	10,155		25,095	1,10,311	51,460
14	VEHICLES			-		10.00%						
15	Library Books & Scientific Journals			-		10.00%						
16	Small Value Assets											
TOTAL (A)		**14,80,87,379**	**7,55,38,816**	**13,20,059**	**22,23,06,136**		**2,15,94,239**	**1,88,33,202**	**(2,957)**	**4,04,24,484**	**18,18,81,652**	**12,64,93,140**
17	**CAPITAL WORK-IN PROGRESS**	-		-	-							
CAPITAL WORK IN PROGRESS (B)		-		-	-							

S No.	DESCRIPTION	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2022	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Amortization for the year	Deductions / Adjustment	Total Amortization / Adjustments	31-03-2023	31-03-2022
INTANGIBLE ASSETS												
18	Computer Software					40.00%						
19	E-Journals					40.00%						
20	Patents					9 Years						
TOTAL (C)		-	-	-	-		-	-	-	-	-	-
GRAND TOTAL (A+B+C)		14,80,87,379	7,55,38,816	13,20,059	22,23,06,136		2,15,94,239	1,88,33,202	(2,957)	4,04,24,484	18,18,81,652	12,64,93,140

SCHEDULES FORMING PART OF BALANCE SHEET AS OF 31st MARCH 2023

SCHEDULE 4D-i - FIXED ASSETS (OTHERS -IRG)

Amount in ₹

S No.	DESCRIPTION	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2022	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Depreciation for the year	Deductions / Adjustment	Total Depreciation	31-03-2023	31-03-2022
TANGIBLE ASSETS												
1	LAND:											
	a) Freehold											
	Land obtained from Govt Vithura					0.00% 0.00%						
2	Site Development											
3	BUILDINGS:			-		2.00%						
4	Roads & Bridges			-		2.00%						
5	Tubes & Water Supply			-		2.00%						
6	Sewage & Drainage			-		2.00%						
7	Electrical Installation and equipment			-		5.00%						
8	Plant and Machinery			-		5.00%						

9	Scientific & Laboratory Equipment			-		8.00%						
10	Office Equipment			-		7.50%						
11	Audio Visual Equipment			-		7.50%						
12	Computers & Peripherals			-		20.00%						
13	Furniture, Fixtures and Fittings			-		7.50%						
14	VEHICLES		13,47,487	-	13,47,487	10.00%		1,34,749		1,34,749	12,12,738	-
15	Library Books & Scientific Journals			-		10.00%						
16	Small Value Assets											
TOTAL (A)			**13,47,487**	**-**	**13,47,487**			**1,34,749**		**1,34,749**	**12,12,738**	**-**
17	**CAPITAL WORK-IN PROGRESS**			-	-							
CAPITAL WORK IN PROGRESS (B)				-	-							

S No.	DESCRIPTION	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2022	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Amortization for the year	Deductions / Adjustment	Total Amortization / Adjustments	31-03-2023	31-03-2022
INTANGIBLE ASSETS												
18	**Computer Software**					**40.00%**						
19	**E-Journals**					**40.00%**						
20	**Patents**					**9 Years**						
TOTAL (C)		-	-	-	-		-	-	-	-	-	-
GRAND TOTAL (A+B+C)		-	13,47,487	-	13,47,487			1,34,749		1,34,749	12,12,738	-

SCHEDULES FORMING PART OF BALANCE SHEET AS OF 31st MARCH 2023

SCHEDULE 7- CURRENT ASSETS

Amount in ₹

PARTICULARS	SUB SCH NO.	2022-23	2021-22
1. Stock			
a) Stores and Spares			
b) Loose Tools			
c) Publications			
d) Laboratory Chemicals, consumables & glass wares			
e) Building materials			
f) Electrical materials			
g) Stationery	3	3,61,851	2,67,197
h) Water supply material			
2. Sundry Debtors:			
a) Debts Outstanding for a period exceeding six months			
b) Others			
3. Cash balances in hand (including cheques/drafts and imprest)	1		
4. Bank Balances:			
Institute balance			
a) With Scheduled Banks:			
-On Current Accounts	2	1,42,57,367	13,65,966
-On Term Deposit Accounts (includes margin money)	2	1,45,91,91,636	91,77,80,468
-On Savings Accounts	2	5,73,93,907	6,76,77,389
b) With non-Scheduled Banks:			
-On Current Accounts			
-On Term Deposit Accounts			
-On Savings Accounts			
Project Balance			
a) With Scheduled Banks:			
-On Current Accounts			
-On Term Deposit Accounts (includes margin money)	2	11,04,52,582	5,91,31,642
-On Savings Accounts	2	15,47,33,453	26,13,33,814
b) With non-Scheduled Banks:			
-On Current Accounts			
-On Term Deposit Accounts			
-On Savings Accounts			
5. Post Office- Savings Accounts			
TOTAL		**1,79,63,90,796**	**1,30,75,56,476**

SCHEDULES FORMING PART OF BALANCE SHEET AS OF 31st MARCH 2023

SCHEDULE 8 - LOANS, ADVANCES & DEPOSITS

Amount in ₹

PARTICULARS	SUB SCH NO.	2022-23	2021-22
1. Advances to employees: (Non-interest bearing)			
a) Salary			
b) Festival			
c) Medical Advance			
d) Other (to be specified)			
2. Long Term Advances to employees: (Interest bearing)			
a) Vehicle Loan			-
b) Home Loan			
c) Others (to be specified)			
3. Advances and other amounts recoverable in cash or in kind or for value to be received			
a) On Capital Account			
b) To suppliers			
c) Others	5	12,99,95,430	76,42,76,851
4. Prepaid Expenses			
a) Insurance			
b) Other Expenses	4	3,92,49,286	28,94,373
5. Deposits			
a) Telephone			
b) Lease Rent			
c) Electricity			
d) AICTE, if applicable			
e) Others (to be specified)			
6. Income Accrued:			
a) On Investments from Earmarked/Endowment Funds			
b) On Investments-Others			
c) On Loans and Advances			
d) Others (includes income due unrealized-Rs.)	6	3,08,28,365	2,29,92,453
7. Other Current Assets Receivables			
a) Debit balances in sponsored projects	9	43,22,372	6,99,046
b) Debit balances in fellowship & scholarships			
c) Grants recoverable			
d) Other receivables			
e) TDS	8	40,74,762	6,68,267
8. Claims Receivable	7	6,77,83,147	6,17,34,197
TOTAL		**27,62,53,362**	**85,32,65,187**

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2023

SCHEDULE 9 - ACADEMIC RECEIPTS

Amount in ₹

PARTICULARS	2022-23	2021-22
FEE FROM STUDENTS		
Academic		
a) Tuition fee	8,56,19,495	8,12,00,715
b) Admission fee		
c) Enrolment fee		
d) Library fee	11,13,958	7,94,340
e) Laboratory fee		
f) Art & Craft fee		
g) Registration fee	8,89,837	7,31,365
h) Syllabus fee		
i) Other Receipts	28,48,619	20,83,200
j) Alumni Fee	5,41,300	2,07,250
TOTAL (A)	**9,10,13,209**	**8,50,16,870**
Examinations		
a) Admission test fee		
b) Annual examination fee	11,13,958	8,89,465
c) Mark sheet, Certificate fee		
d) Entrance Examination fee		
TOTAL (B)	**11,13,958**	**8,89,465**
Other Fee		
a) Identity Card fee		
b) Fine/ Miscellaneous fee		11,500
c) Medical fee	-	5,99,993
d) Transportation fee		
e) Hostel Fee	29,83,699	5,10,410
f) Mess Establishment		
TOTAL (C)	**29,83,699**	**11,21,903**
Sale of publications		
a) Sale of admission forms		
b) Sale of syllabus and question paper		
c) Sale of prospectus including admission forms		
TOTAL (D)		
Other Academic Receipts		
a) Registration fee for workshops programmes		
b) Registration fees (Academic Staff College)		
GRAND TOTAL (A+B+C+D)	**9,51,10,866**	**8,70,28,238**

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2023

SCHEDULE 10 - GRANTS/SUBSIDIES

Amount in ₹

PARTICULARS	2022-23		2021-22
GRANTS/ SUBSIDIES (Irrevocable Grants & Subsidies received)			
Balance B/F		**28,79,73,245**	**1,49,28,01,786**
Add: Receipts During the Year			
Capital Grant			**34,59,60,000**
General	**54,60,00,000**		
SC	**2,37,00,000**		
ST	**1,03,00,000**	**58,00,00,000**	
Revenue Grant			**79,45,00,000**
General	**73,91,00,000**		
SC	**5,57,00,000**		
ST	**2,54,00,000**	**82,02,00,000**	
		1,68,81,73,245	**2,63,32,61,786**
Less: Capital Expenses Incurred during the year		**83,65,24,180**	**1,70,58,09,847**
Less: Closing Unspent balance of grant		**2,58,16,505**	**28,79,73,245**
		82,58,32,561	**63,94,78,694**
TOTAL		**82,58,32,561**	**63,94,78,694**

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2023

SCHEDULE 13 - OTHER INCOME

Amount in ₹

PARTICULARS	2022-23	2021-22
A. Income from Land & Building		
a) Hostel room rent	1,13,94,792	89,24,435
b) License fee	11,15,581	9,65,002
c) Hire charges of Auditorium/Playground/Convention Centre etc	-	-
d) Electricity Charges recovered	22,47,145	16,38,016
e) Water Charges recovered	-	-
Total A	**1,47,57,518**	**1,15,27,453**
B. Sale of Institutes Publications	-	-
Total B	-	-
C. Income from Holding Events		
a) Gross receipts from annual function/ sports carnival	-	-
Less: Direct expenditure incurred on the annual function/sports carnival	-	-

b) Gross receipts from fetes	-	-
Less: Direct expenditure incurred on fetes	-	-
c) Gross receipts on educational tours	-	-
Less: Direct expenditure incurred on tours	-	-
d) Others (to be specified and separately disclosed)	-	-
Total C	-	-
D. Interest On Term Deposits:		
a) With Scheduled Banks	5,02,52,486	2,14,87,783
b) With Non-Scheduled Banks	-	-
c) With Institutions	-	-
d) Others	-	-
Total D	**5,02,52,486**	**2,14,87,783**
E. Interest On Savings Accounts:		
a) With Scheduled Banks	13,18,382	12,43,561
b) With Non-Scheduled Banks	-	-
c) With Institutions	-	-
d) Others	-	-
Total E	**13,18,382**	**12,43,561**
F. On Loans:		
a) Employees/Staff	-	-
b) Others	-	-
Total F	**-**	**-**
G. Interest on Debtors and Other Receivables	-	-
Total G	-	-
H. Others		
a) Income from consultancy	-	-
b) RTI Fees	240	120
c) Income from royalty	-	-
d) Sale of application form	6,27,195	8,85,500
e) Misc. receipts (Sale of tender form, waste paper etc.)	77,34,038	54,25,642
f) Profit on sale/disposal of Assets	-	-
1. Owned asset	-	-
2. Assets acquired from grants or received free of cost	-	-
g) Other Incomes	-	-
Total H	**83,61,473**	**63,11,262**
GRAND TOTAL (A+B+C+D+E+F+G+H)	**7,46,89,859**	**4,05,70,059**

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2023

SCHEDULE 14 - PRIOR PERIOD INCOME

Amount in ₹

PARTICULARS	2022-23	2021-22
1. Academic Receipts		
2. Income from investments		
3. Interest earned		
4. Other Income	29,189	1,38,364
TOTAL	**29,189**	**1,38,364**

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2023

SCHEDULE 15 - STAFF PAYMENT & BENEFITS

Amount in ₹

PARTICULARS	2022-23	2021-22
a) Salaries and Wages		
Faculty	21,35,35,481	17,94,44,506
Non Faculty	6,24,79,129	5,80,93,090
b) Allowances and Bonus	11,13,893	10,42,800
c) Contribution to Provident Fund		
d) Contribution to Other Fund (Leave Salary & NPS Employer Share)	3,77,57,938	3,09,09,437
e) Staff Welfare Expenses		
f) Retirement and Terminal Benefits		
g) LTC facility	50,78,545	40,34,444
h) Medical facility	32,62,108	31,39,432
i) Children Education Allowance	50,97,000	25,40,677
j) Honorarium		
k) Others	63,21,056	57,49,967
TOTAL	**33,46,45,150**	**28,49,54,353**

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2023

SCHEDULE 15 A - EMPLOYEES RETIREMENT AND TERMINAL BENEFITS

Amount in ₹

PARTICULARS	PENSION	GRATUITY	LEAVE ENCASHMENT	TOTAL
Opening balance as on 01.04.2022			11,17,89,634.00	11,17,89,634.00
Add: Capitalized value of contributions Received from other Organizations				
Total (a)			**11,17,89,634.00**	**11,17,89,634.00**
Less: Actual Payment during the Year (b)			-	-
Balance available as on 31-03-2023 c (a-b)			**11,17,89,634.00**	**11,17,89,634.00**
Provision required on 31-03-2023 - As per Actuarial Valuation (d)				
A. Provision to be made in the current year			1,41,18,130.00	1,41,18,130.00
B. Contribution to New Pension Scheme				
C. Medical Reimbursement to Retired Employees				
D. Travel to Home town on Retirement				
E. Deposit Linked Insurance Payment				
TOTAL (A+B+C+D+E)	**-**	**-**	**12,59,07,764**	**12,59,07,764**

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2023

SCHEDULE 16 - ACADEMIC EXPENSES

Amount in ₹

PARTICULARS	2022-23	2021-22
a) Laboratory Expenses	10,10,41,234	4,37,33,037
b) Field Work/Participation		
c) Expenses on Seminar/Workshop		
d) Payment to visiting faculty		
e) Examination		
f) Student welfare expense		
g) Admission expense		
h) Convocation expense	20,18,423	9,64,805
i) Publication		
j) Stipend/Means-cum-merit scholarship	8,31,57,236	8,01,45,695
k) Subscription Expense		
l) Others (Specify)		
TOTAL	**18,62,16,893**	**12,48,43,537**

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2023

SCHEDULE 17 - ADMINISTRATIVE AND GENERAL EXPENSES

Amount in ₹

PARTICULARS	2022-23	2021-22
A. Infrastructure		
a) Electricity and power	6,52,65,231	5,73,22,860
b) Water charges	-	15,940
c) Insurance	-	16,811
d) Rent, Rates and Taxes	-	2,59,256
B. Communication		
e) Postage & Telegram	76,883	45,103
f) Telephone and Internet Charges	43,45,448	39,45,315
C. Others		
g) Printing and Stationary	8,40,199	7,65,096
h) Travelling and Conveyance Expenses	67,41,590	29,02,110
i) Expenses on Seminar/Workshops	2,91,837	4,61,126
j) Hospitality	36,016	9,743
k) Auditors Remuneration	1,50,630	5,47,600
l) Professional Charges	-	-
m) Advertisement and Publicity	11,40,153	4,53,640
n) Magazine & Journals	-	-
o) Others (specify)		

Sports / Cultural Festival / Celebration expense	53,29,580	15,96,843
Consumables	1,25,75,547	52,06,481
Cable TV Charges	-	-
Newspaper & Periodicals	53,675	48,057
Software License fees	-	-
Publication charges	28,000	5,90,412
Manpower charges	9,99,14,041	7,87,72,941
Guest house and other expenses	10,54,487	12,08,554
Other Administrative/Miscellaneous Expenses	67,32,087	54,40,469
Legal and consultancy charges	3,28,200	1,93,317
Expenses related to COVID 19	40,371	4,27,251
Medical Centre – Consumables & Medicines	3,94,498	-
Running of Generator Set	2,45,586	22,72,509
IT recurring expenses for service	66,78,212	37,24,710
TOTAL	**21,42,62,271**	**16,62,26,144**

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2023

SCHEDULE 18 - TRANSPORTATION EXPENSES

Amount in ₹

PARTICULARS	2022-23	2021-22
1. Vehicles (owned by educational institution)		
a) Running expense	10,12,953	5,75,193
b) Repairs & Maintenance	3,87,424	1,38,785
c) Insurance expense	40,027	71,432
2. Vehicles taken on rent		
a) Rent/Lease expense	60,08,580	48,04,934
3. Vehicle (Taxi) Hiring expense	-	-
TOTAL	**74,48,984**	**55,90,344**

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2023

SCHEDULE 19 - REPAIRS & MAINTANENCE

Amount in ₹

PARTICULARS	2022-23	2021-22
a) Building	5,04,15,241	3,06,37,745
b) Furniture & fixtures	1,31,75,238	57,83,824
c) Plant & machinery	15,82,858	1,96,65,003
d) Office equipment	1,60,50,627	16,525
e) Computers	-	-
f) Laboratory & scientific equipment	14,26,525	17,35,147

g) Audio-visual equipment	-	-
h) Cleaning material & services	-	-
i) Book binding charges	-	-
j) Gardening	-	-
k) Estate maintenance	-	-
f) Others (Specify)	-	-
TOTAL	**8,26,50,489**	**5,78,38,244**

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2023

SCHEDULE 20 - FINANCE COSTS

Amount in ₹

PARTICULARS	2022-23	2021-22
a) Bank Charges	6,08,774	26,072
b) Others (specify)		
TOTAL	**6,08,774**	**26,072**

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2023

SCHEDULE 22 - PRIOR PERIOD EXPENSES

Amount in ₹

PARTICULARS	2022-23	2021-22
1. Establishment Expenses	-	-
2. Academic Expenses	-	-
3. Administration Expenses	-	-
4. Transportation Expenses	-	-
5. Repair & Maintenance	-	-
6. Other Expenses	-	37,421
TOTAL	**-**	**37,421**

Schedule 23- Significant Accounting Policies

1. **Basis for preparation of Accounts:**

   The Annual Accounts of the institute are prepared on the basis of revised format and guidelines issued by the Ministry of Education, Government of India and approved by the C&AG of India for all Central Educational Institutes with effect from financial year 2014-15 (Communicated vide Lr.No.29-4/2012-IFD dated 17.04.2015 of MHRD, GOI).

2. **Accounting Convention:**

   The financial statements are prepared on the basis of Historical Cost Convention and ongoing concern concept unless otherwise stated. The institute follows accrual method of accounting.

3. **Revenue Recognition:**

   3.1 The institute is significantly funded by the Ministry of Education (MOE), Government of India. The Government release the Grants-in-Aid under two major heads i.e., Capital and Revenue. Grants-in-Aid from GOI is accounted for in the same financial year for which it is sanctioned by the MOE.

   3.2 Government Grants to the extent utilized for meeting revenue expenditure on accrual basis are treated as revenue income of the year and depicted in the Income and Expenditure Account.

   3.3 Admission fees, Tuition Fees and other fees received from students are accounted on cash basis.

   3.4 Interest on Fixed Deposits has been credited in the accounts on accrual basis.

   3.5 No interest bearing advances for House Building, Purchase of Vehicles etc., has been sanctioned to staff to the said period.

4. **Fixed Assets and Depreciation:**

   4.1 The fixed assets are valued at cost of acquisition including inward freight, duties, taxes, incidental and direct expenses related to acquisition, installation and commissioning.

   4.2 No fixed asset has been received directly by way of non-monetary grant during the year under consideration.

   4.3 The land at Jersey Farm, Vithura Nedumangad Taluk, Thiruvananthapuram District has been given by the Government of Kerala at no cost, hence the same has been shown at nominal value of Rs.1/- in Annual Account.

   4.4 No gifted/donated assets and Books have been received during the year under consideration.

   4.5 Fixed Assets are valued at cost less accumulated depreciation.

   4.6 No change has been made in the method of depreciation. Depreciation has been provided on fixed assets as per MoE Uniform Accounting Standards for Central Educational Institutions (CEIs) on Straight Line Method at the following rates:

Tangible Assets:

1.	Land	0%
2.	Site Development	0%
3.	Buildings	2%
4.	Roads and Bridges	2%
5.	Tube wells and water supply	2%
6.	Sewerage and Drainage	2%
7.	Electrical installation and equipment	5%
8.	Plant and Machinery	5%
9.	Scientific and Laboratory Equipment	8%

10.	Office Equipment	7.5%
11.	Audio Visual Equipment	7.5%
12.	Computer and Peripherals	20%
13.	Furniture, Fixtures and Fittings	7.5%
14.	Vehicles	10%
15.	Library Books and Scientific Journals	10%

Intangible Assets (Amortization)

1.	E-Journals	40%
2.	Computer Software	40%
3.	Patents and Copyrights	9 Years

4.7 Depreciation is provided for the whole year on additions during the year.

4.8 Where an asset is fully depreciated, it will be shown at a residual value of Rs.1/- in the Balance Sheet and will not be further depreciated.

4.9 Assets created out of Earmarked Funds and Funds of Sponsored Projects where the ownership of such assets vests in the Institution will be setup by credit in Capital Fund and merged with the Fixed Assets of the institution. Depreciation charged at the rates applicable to the respective assets. Accordingly, assets of Externally Funded Projects from the FY 2019-20 shown in Schedule 4-D Fixed Assets (Others).

4.10 Assets acquired out of IRG is shown separately under the schedule 4D-(Others-IRG).

4.11 Patents, copyrights and E Journals are grouped under intangible assets.

4.12 Electronic Journals (E-Journals) are separated from Library Books in view of the limited benefit that could be derived from the on-line access provided. E-Journals are not in a tangible form, but temporarily capitalized in view of the magnitude of expenditure and the benefit derived in terms of perpetual knowledge acquired by the Academic and Research Staff. Depreciation is provided in respect of E-Journals at a higher rate of 40% as against depreciation of 10% provided in respect of Library Books.

4.13 Software and Computer Peripherals are being shown under the Fixed Assets.

5. **Stocks:**

5.1 Expenditure on purchase of Chemicals, Lab ware, Office Consumables, Publications and other consumable items are accounted as revenue expenditure. Such items issued to Labs are treated as consumed and hence closing stock is taken as NIL.

5.2 Value of closing stocks (Stationary) as on 31st March 2023 is set up as inventories by reducing the corresponding Revenue Expenditure on the basis of information from the nodal departments and valued at cost.

6. **Retirement Benefits:**

6.1 All employees of the Institute are covered under the New Pension Scheme. As such no provision has been made for pension, gratuity however suitable provision on the basis of actuarial valuation has been made for the Earned Leave Encashment vide Schedule No.15 A.

6.2 No long term or Short Term Investments are made by the institute in Government Securities, Bonds, Debentures and Shares.

7. **Corpus / Earmarked / Designated Endowment Funds:**

Corpus / Capital Fund: It refers to fund contributed by Government for establishment and activities of the institute. Corpus / Capital fund is the main fund of the institute and it denotes a permanent fund kept for the existence of the institute. The additions to this fund are Grants from Government to the extent utilised for Capital Expenditure. Assets purchased out of earmarked funds

and sponsored project funds and excess of income over expenditure transferred from Income and Expenditure account.

8. **Government Grants:**
   - 8.1 Plan grants received from Government are accounted on accrual basis.
   - 8.2 To the extent utilised towards capital expenditure, Government Grants are transferred to the Capital Fund.
   - 8.3 Unutilised Government Grants are carried forwarded and depicted under Current Liability in the Balance Sheet.

9. **Capital Work-In-Progress:**
   Running Bills of Contractors and uninstalled equipment procured during the period are accounted under Capital work-in-progress till completion/ installation. No depreciation is charged on Capital work in progress.

10. **Sponsored Projects**:
    - 10.1 The amount received under Sponsored Projects has been separately shown in Schedule 3 A.
    - 10.2 The fellowships and scholarships funded by the UGC, CSIR, DBT, DST INSPIRE etc., are shown separately in Schedule 3B
    - 10.3 The Fellowships and Scholarships provided by the institute itself are accounted as Academic expenses.

11. **Income Tax:**
    The income of the institute is exempt from Income Tax u/s 10 (23) (C) (iiiab) of the Income Tax Act 1961. No provision for tax is therefore made in the accounts.

12. **Foreign Currency transactions**:
    Foreign Currency transactions are accounted for at the rate of exchange prevailing on the dates of such transactions.

Schedule 24 – Contingent Liabilities and Notes on Accounts

1. **Financial Statement and Notes on Accounts:**
   The financial statement of the institute is prepared in three parts:
   - i) Receipt and Payment Account
   - ii) Income and Expenditure Account
   - iii) The Balance Sheet.

   - 1.1 The Receipts and Payments Account consists of the figures of actual receipts and payments of the institute during the financial year 2022-23 as per Cash Book. The total receipts from the different sources as shown in Receipt and Payment Account includes grant of Rs. 140.02 cr. received from Ministry of Education (MoE).
   - 1.2 The Income and Expenditure Account is prepared on accrual basis.
   - 1.3 In Balance Sheet the acquired fixed assets, current assets are taken as assets while the Corpus Fund, Designated Fund, Endowment Funds, balance of Sponsored Projects and Grants received from Government and Current Liabilities etc., are shown in respective Schedules under Sources of Funds / Liabilities.
   - 1.4 Figures in Final Accounts have been rounded off to the nearest rupee.

2. **Schedules and Notes on Accounts:**

2.1 Schedule 1 to 22 are annexed and they form an integral part of Annual Accounts.

2.2 Institute have received following Grant from MoE for the year 2022-23;

Capital Grant	: Rs.	58,00,00,000
Revenue Grant	: Rs.	82,02,00,000
Total		**: Rs. 1,40,02,00,000**

2.3 Unspent Balance of Rs.5,97,93,505/- on Institute Promotion Fund (GPF), School Promotion Fund (SPF) and Personal Promotion Fund (PPF) are shown under Schedule 3-Current Liabilities.

2.4 Expenditure related to hostel running expenses included in Schedule 17 – Administrative and General expenses.

2.5 GST- Input tax credit available in the Electronic Credit ledger for the year 2022-23 to the tune of Rs. 28.00 Lakh depicted under Schedule 8 of the Balance Sheet.

2.6 Depreciation has been provided on all assets applying rates specified by MOE using straight line method.

2.7 A new books of account has been initiated from FY 2022-23 and has been included in the annual accounts under Schedule 3A to reflect financial transactions related to Conferences, Seminars, Symposiums, and other similar events of IISER TVM. The new books of account provide a comprehensive view of the funds collected by way of sponsorships and participation / registration fee etc., and the expenses associated with these activities and unspent balance of these activities.

2.8 The details of balances in Saving Bank, Current Accounts and in Fixed Deposit Accounts are given in Schedule 7 of the Balance Sheet. The following accounts under the CIF Code of the institute are not incorporated in the books of accounts, since these accounts are not involved as part of the institute activities.

BANK	ACCOUNT NUMBER	TYPE OF ACCOUNT
CANARA BANK	110048844820	SAVINGS BANK
CANARA BANK	110048845118	SAVINGS BANK
IDBI	0745104000090261	SAVINGS BANK
IDBI	0745102000003766	CURRENT ACCOUNT
IDBI	0745104000086125	CURRENT ACCOUNT
STATE BANK OF INDIA	67393409552	CURRENT ACCOUNT
STATE BANK OF INDIA	37296805549	SAVINGS BANK
STATE BANK OF INDIA	37368113694	SAVINGS BANK
STATE BANK OF INDIA	38202365676	CURRENT ACCOUNT
STATE BANK OF INDIA	39753417258	CURRENT ACCOUNT
STATE BANK OF INDIA	40218920183	CURRENT ACCOUNT
STATE BANK OF INDIA	38418690501	CURRENT ACCOUNT
STATE BANK OF INDIA	67369851762	CURRENT ACCOUNT
STATE BANK OF INDIA	67299294637	CURRENT ACCOUNT

2.9 During the financial year 2022-23, some small value assets / spare parts procured has been shown as consumable in the accounts being treated as augmentation to the Scientific / Lab equipment.

2.10 Secured advances and Mobilization advances and Deposit work with CPWD are disclosed

separately under the heads Loans and Advances.

2.11 The unutilized grant shown under Schedule 3(C) Plan Grants from MHRD is Rs. 2.73 Cr. is considering advance payment made to CPWD as Deposit work for construction of IISER Permanent Campus and excluding Pre-paid expenses shown under Sub-Schedule 4 & 5 of Schedules forming part of Balance Sheet (Schedule 8 – Loans, Advances and Deposits).

2.12 An appeal was filed against M/s. Consolidated Construction Consortium Ltd. (CCCL) before the Hon'ble High Court of Kerala challenging the award of arbitrator vide O.P(Arb.) No.446/2018. Institute have deposited B.G for 1/4th of the award amount in the court on 01.01.2019 as per the directions of the Sessions Court and the matter is posted for further hearing.

3. **Sponsored Project Accounts**:

The institute has received grants from DST, DBT, Wellcome Trust DBT Alliance Fellowships, DAE, ISRO, CSIR, UGC etc., in Research and Development (R&D) Projects. A separate bank account is maintained for Sponsored R & D Projects. The transactions of Sponsored Projects and Project wise closing balances are being shown in Schedule 3(A) of the Balance Sheet. As per the funding agencies guidelines project wise bank account(s) are being maintained with IDBI Bank and Canara Bank separately.

The treatment of Project Grant and its Utilization is on Cash Basis.

4. **Capital Works-in-Progress**:

The construction work of institute's permanent campus situated at Jersey Farm, Vithura is under progress and expenditure related to the same is shown under Schedule 4 (Fixed Assets) of the Balance Sheet.

The expenditure on capital work-in-progress as at 31.03.2023 was of Rs.1,70,39,982/- being uninstalled equipment procured / expenditure incurred on infrastructure activities of Institute during the period.

5. **Retirement Benefits:**

5.1 The **NPS** subscription recovered from employees and employer's contribution are remitted to NPS Trust Account regularly. NPS Accounts are maintained by NSDL. Hence separate schedule has not been prepared.

5.2 **GPF** is not applicable to the institute employees. Hence GPF accounts schedule has not been prepared.

6. **Other Additions:**

As per the institute's policy, the overhead generated from the Externally Funded Projects have been segregated into four parts vis-a-vis, (i) 45% - income from overheads to institute, (ii) 5% - Staff Welfare Fund, (iii) 25% - School Promotion Fund and (iv) 25% - Personal Promotion Fund. The said figures (ii) to (iv) have been depicted as other additions in Schedule 1 of Annual Accounts including the Student Friendship Fund.

RECEIPTS AND PAYMENTS FOR THE YEAR ENDED 31-03-2023

RECEIPTS			PAYMENTS		
DESCRIPTION	**2022-23**	**2021-22**	**DESCRIPTION**	**2022-23**	**2021-22**
I. Opening Balance			**I. Expenses**		
a) Cash in hand	-	-	a) Establishment Expense	20,57,37,698	30,37,56,825
b) Bank Balances			b) Academic Expense	1,27,68,878	12,50,18,659
i) In Current Accounts			c) Administrative Expense	1,35,03,073	13,92,30,344
a) Canara Bank A/c	23,656	25,650	d) Transportation Expense	-	58,30,237
b) IDBI Bank A/c	3,20,307	3,42,275	e) Repair & Maintenance Expense	-	5,11,40,733
c) SBI Bank A/c	10,22,003	4,79,875	f) Prior Period Expenses	-	-
ii) In Deposit/Savings Accounts					
a) Canara Bank	50,64,13,319	40,80,36,468	**II. Payments made against earmarked endowment funds**	-	-
b) SBI	47,76,19,538	27,18,13,278			
c) Canara Bank Project A/c (Cantonment Br)	60,48,384	83,97,349	**III. Payment against Sponsored Projects**	-	-
d) Canara Bank Project A/c	27,56,15,509	20,85,89,638	**IV. Payment against sponsored fellowships**	-	-
e) IDBI Bank Project A/c	3,88,01,563	7,49,61,546			
f) IDBI Bank	14,25,000	14,25,000	**V. Investments and deposits made**		
			a) Out of Earmarked/Endowment funds	-	-
II. Grants Received			b) Out of Own Funds (Investments-Others)	-	-
a) From Government of India	1,40,02,00,000	1,27,54,60,000			
b) From State Government	-	-	**VI. Term Deposits with Scheduled Banks**	-	-
c) From other sources	-	-			
			VII. Expenditure on Fixed Assets & Capital Work in Progress, Purchase of Fixed Assets and Expenditure	91,49,05,015	42,91,87,789
III. Academic Receipts	9,97,14,652	8,99,30,900			
			VIII. Other payment including Statutory payment	10,19,23,211	2,43,37,440
IV. Receipts against Earmarked/ Endowment Fund	-	-			
			IX. Refunds of Grants	-	13,50,00,000
V. Receipts against Sponsored Projects (including interest)	10,99,09,167	15,41,50,501			
			X. Deposits & Advances	21,52,08,046	25,55,39,074

VI. Receipts against Sponsored Fellowships and Scholarships	3,27,55,245	1,30,35,714	**XI. Other payments**	6,69,25,386	30,87,137
			Other payments-External projects	10,06,99,153	7,20,05,932
VII. Income on Investments from			**XII. Closing Balances**		
a) Earmarked/Endow. Funds	-	-	a) Cash in hand		
b) Own Funds (Other Investments)	-	-	b) Bank Balances		
			i) In current accounts		
VIII. Interest Received			a) Canara Bank A/c	21,886	23,656
a) On Bank deposits	4,24,16,574	1,32,64,822	b) IDBI Bank A/c	3,18,436	3,20,307
b) Loans. Advances etc.	-	-	c) SBI Bank A/c	1,26,33,023	10,22,003
c) Savings Bank Account	25,44,185	18,14,405	d) RBI TSA A/c	718	
			e) PMRF-CNA A/c	12,83,303	
IX. Investment encashed	-	-	ii) In Deposit /Savings Accounts		
			a) Canara Bank	62,81,21,238	50,64,13,319
X. Term Deposits with Schedule bank encashed	26,65,28,290	8,17,74,818	b) SBI	88,70,39,304	47,76,19,538
			c) Canara Bank Project A/c (Cantonment Br)	63,19,472	60,48,384
XI. Other Income (Including prior period income)	4,98,66,143	2,40,42,574	d) Canara Bank Project A/c	22,51,95,649	27,56,15,509
			e) IDBI Bank Project A/c	3,75,94,972	3,88,01,563
XII. Deposits & Advances	11,79,55,932	21,68,72,504	f) IDBI Bank	14,25,000	14,25,000
XIII. Miscellaneous receipts including Statutory receipts	24,43,996	70,06,132			
XIV. Any other receipts	-	-			
TOTAL	**3,43,16,23,463**	**2,85,14,23,449**	**TOTAL**	**3,43,16,23,463**	**2,85,14,23,449**

SEPARATE AUDIT REPORT OF THE COMPTROLLER & AUDITOR GENERAL OF INDIA ON THE ACCOUNTS OF INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (IISER), THIRUVANANTHAPURAM FOR THE YEAR ENDED 31 MARCH 2023.

We have audited the attached Balance Sheet of Indian Institute of Science Education and Research, Thiruvananthapuram as at 31 March 2023, the Income & Expenditure Account and Receipts & Payments Account for the year ended on that date under Section 19(2) of the Comptroller and Auditor General's (Duties, Powers and Conditions of Service) Act, 1971 read with section 22(2) of the NITSER Act, 2007. These financial statements are the responsibility of the Institute's management. Our responsibility is to express an opinion on these financial statements based on our audit.

2. This Separate Audit Report contains the comments of the Comptroller & Auditor General of India (CAG) on the accounting treatment only with regard to classification, conformity with the best accounting practices, accounting standards and disclosure norms, etc. Audit observations on financial transactions with regard to compliance with the Law, Rules & Regulations (Propriety and Regularity) and efficiency –cum – performance aspects, etc., if any, are reported through Inspection Reports /CAG's Audit Reports separately.

3. We have conducted our audit in accordance with auditing standards generally accepted in India. These standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatements. An audit includes examining, on a test basis, evidences supporting the amounts and disclosure in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of financial statements. We believe that our audit provides a reasonable basis for our opinion.

4. Based on our audit, we report that:

i 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;

ii The Balance Sheet, Income & Expenditure Account and Receipts & Payments Account dealt with by this report have been drawn up in the format approved by the Ministry of Education, Government of India;

iii In our opinion, proper books of accounts and other relevant records have been maintained by the Indian Institute of Science Education and Research, Thiruvananthapuram as required under Regulation 16.1 forming part of Memorandum of Association of the Institute in so far as it appears from our examination of such books; and

iv We further report that :

A Comments on Accounts

A.1 Income & Expenditure Account.

A.1.1 Repair and Maintenance Expenditure- ₹8.26 crore

The above head includes expenditure of capital nature amounting to ₹3.82 crore which have been wrongly classified as revenue expenditure. This has resulted in overstatement of Repair & Maintenance and understatement of Fixed Assets by ₹3.82 crore. The above cases may be capitalized and depreciation may be provided according to MHRD guidelines

B. General

B.1 Current Liabilities & Provisions ₹ 72.38 crore

The above head includes Earnest Money Deposit for an amount of ₹40.02 lakh shown as unclaimed for more than three years. These old outstanding deposits needs to be reviewed and suitable action for their adjustments may be taken with the approval of competent authority.

B.2 NPS Accounts.

According to Formats of Financial Statements for Central Higher Educational Institutions, it is necessary to prepare annually a Balance Sheet, an Income & Expenditure Account (on Accrual basis) and a Receipts and Payments Account for the NPS contributions and separately attach them to the accounts of the Institution. However, the institution has not prepared the financial statements for NPS contributions for the year 2022-23 and attached separately with the Accounts of the Institution.

B.3 Contingent Liabilities -Schedule 24

As per the uniform format of accounts, the details of liability towards guarantees given by the institute or by banks on its behalf and Letters of Credit outstanding as at the year end are required to be disclosed under Schedule 24 Contingent Liabilities and notes on accounts. No such disclosures regarding outstanding Letters of Credit were disclosed in the annual accounts.

C. Grant-in-Aid

The Institute received a grant-in-aid of ₹140.02 crore from the Ministry of Education, Government of India during 2022-23. Out of the total grant of ₹168.82 crore (including ₹ 28.80 crore being the unspent grant carried forward from previous year), the institute utilized an amount of ₹166.24 crore during the year, leaving a balance of ₹ 2.58 crore as on 31 March 2023.

D. Management Letter

Deficiencies which have not been included in the Audit Report have been brought to the notice of Indian Institute of Science Education and Research, Thiruvananthapuram through a management letter issued separately for remedial/corrective action.

v. Subject to our observations in the preceding paragraphs, we report that the Balance sheet, Income & Expenditure Account, and Receipts & Payments Account dealt with by this report are in agreement with the books of accounts.

vi. In our opinion and to the best of our information and according to the explanations given to us, the said financial statements read together with the Accounting Policies and Notes on Accounts, and subject to the significant matters stated above and other matters mentioned in Annexure I to this Audit Report, give a true and fair view in conformity with accounting principles generally accepted in India.

a. In so far as it relates to the Balance Sheet, of the state of affairs of the Indian Institute of Science Education and Research, Thiruvananthapuram as at 31 March 2023; and

b. In so far as it relates to Income & Expenditure Account, of the deficit for the year ended on that date.

For and on behalf of the C& AG of India

Principal Director of Audit (Central), Chennai.

Place: Chennai
Date: 22 November 2023

ANNEXURE I

1. **Adequacy of Internal Audit System:**

   The internal audit wing is not yet established in the Institute. The internal audit is conducted by em paneled Chartered Accountants.

2. **Adequacy of Internal Control Systems:**

   As per GFR 2017 all Central Autonomous Bodies should prepare and submit their approved annual accounts to the C&AG by 30th June. But Institute submitted it's approved accounts for audit on 22 July 2023.

3. **System of Physical Verification of Assets**:

   Physical verification of fixed assets has been conducted up to the year 2022-23.

4. **System of Physical Verification of Inventory:**

   Physical verification of inventory was conducted up to the year 2022-23.

5. **Regularity in Payment of Statutory Dues:**

   The Institute is regular in payment of statutory dues.

Deputy Director (DT) II

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