IISER
THIRUVANANTHAPURAM

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH THIRUVANANTHAPURAM

ANNUAL REPORT
2021 - 2022

Indian Institute of Science Education and Research Thiruvananthapuram

ANNUAL REPORT
2021 - 2022

Credits

Publication Committee:
Dr. Nishant K.T.
Prof. Hema Somanathan
Prof. Mahesh Hariharan
Dr. Viji Z. Thomas
Dr. Joy Mitra
Dr. Ravi Pant
Dr. Sainul Abideen P
Mr. Sreehari S
Mr. Ramesh B. V.
Mrs. Sruthi U. A.
Mrs. Divya V. J.
Ms. Shylaja R Rao

Citation:
IISER Thiruvananthapuram Annual Report 2021–22

Published by:
Prof. J. N. Moorthy,
Director, IISER Thiruvananthapuram
Maruthamala PO, Vithura,
Thiruvananthapuram, Kerala,
India - 695551
T: +91 0471-2778009, 8044, 8028
E-Mail: padirector@iisertvm.ac.in

Compiling and Editing:
Ms. Shylaja R Rao

Hindi Translation:
Mrs. Sruthi U. A.

Design:
Akshara Offset

Images:
School of Biology
School of Chemistry
School of Mathematics
School of Physics
Student Welfare Council
Student Academic Clubs
Mr.Vimal V M
Mr. Allipra Sreejith

Contents

Director's Foreword

I am pleased to present the 13th Annual Report of the Indian Institute of Science Education and Research Thiruvananthapuram (IISER TVM) and the 3rd under my leadership. The last two years of my directorship have been against the backdrop of the pandemic, and dealing with the uncertainties and constantly evolving circumstances, which demanded high levels of resourcefulness and resolve from the entire IISER community. As I reflect on the year that has gone by, I must say that our faculty, staff, and students have collectively exhibited high resilience to tackle the worst crisis in our living memory.

While 2020-2021 was primarily a year of crisis management, the year 2021-2022 remained a year of careful forward thinking and strategic planning for the Institute. In spite of the disruptions to the academic calendar, we never lost sight of our objectives, namely, providing holistic and future-ready education to our students, and equipping them for the challenges and emerging careers of tomorrow. This was possible through the smart adoption of hybrid teaching/learning models and assessment procedures, leveraging the power of technology.

Gratifyingly, our campus was safe throughout, even when the second wave of the corona virus was wreaking havoc across the state and the country. This was possible only through the resolute and persevering efforts of the Institute administration and the COVID Response Team (CRT). A careful strategy of testing, tracing, and quarantining was put in place on the campus from the start

of the COVID-19 pandemic. Stringent COVID-19 safety guidelines continue to be implemented in the campus. Further, the Institute administration together with the CRT and the Health Centre coordinated with the State health department and other government agencies/government-appointed private establishments and conducted two vaccination drives on the campus in June and September 2021. All eligible persons on campus are now vaccinated with both doses of COVID-19 vaccine. These measures have undoubtedly helped to keep the COVID-19 cases on campus in check and ensured that research and academic activities continued right throughout the pandemic.

In the context of academic instruction, IISER TVM has seen an overall increase of 14% in student intake over the previous year. The M. Sc. program introduced this year has been conducted at full strength. The flexible syllabus introduces students to frontier areas of research and offers them a challenging and diverse learning environment. The total number of registered students on our campus, across all branches of study, stands at 1605, of which 247 are Ph. D. scholars, 178 are I-Ph. D. scholars, 1103 are BS-MS students and 77 students belong to M. Sc. program. This year, ten students (seven Ph. D scholars and three I-Ph. D. scholars) received the prestigious PMRF Awards.

Our overall faculty strength has risen to 79 this year with new faculty joining all four Schools. I am delighted to place on record that 16 faculty members have received prestigious national and international awards/recognitions for their contributions to research in their chosen areas of research. IISER TVM has been constantly expanding its academic programs with plans to introduce a new School of Earth, Atmospheric, and Ocean Sciences. The Institute has been endeavoring to secure all necessary clearances towards this end and will have this School commissioned in the coming year. Our Central Instrumentation Facility (CIF) now has a new international center, the Centre for Advanced Materials Research with International Engagement (CAMRIE), with state-of-art instrumentation for advanced characterization of molecular compounds and materials.

The students of IISER TVM participate in a number of extracurricular activities to hone their creative and sporting talents, and also to break the monotony of academic pursuits. The Cultural Council, Sports Council, Science and Technology Council, and the Student Academic Clubs hosted a number of competitive and entertaining events, in both online and offline modes. While a number of events were held online due to the restrictions imposed by the pandemic, some programs and events began to be conducted offline from the last quarter of 2021. Anvesha 2021, the official Science Fest of the Institute, was conducted in offline mode but was open only to the students of the Institute.

I am proud to announce that our students from the School of Biology participated in the prestigious 'International Genetically Engineered Machine' (iGEM) international competition in Synthetic Biology and won the Silver medal for 2021 for developing Moldemort - a novel class of eco-friendly antifungal therapeutics against Invasive Fungal Infections. The IISER TVM iGEM team is the first team from Kerala to participate in this competition.

Our combined efforts and achievements have ensured the submission of 'appraisal report' to the Ministry of Education for exit from project mode. The efforts and achievements along with details of our academic pursuits, research interests, and accomplishments are chronicled in this Annual Report. We have a compelling vision for IISER TVM. We are re-aligning our priorities and endeavoring fervently to ensure that our vision is a reality.

J. N. Moorthy
Director

Board of Governors

Chairman

Prof. Arvind A Natu
Professor, IISER Pune

Members

Prof. J. N. Moorthy
Director, IISER TVM

Additional Secretary, *DHE, MoE, Govt. of India*

Director, *Indian Institute of Science, Bangalore*

Director, *IIT Hyderabad (up to 19.06.2021)*

Director, *IIT Dharwad (from 06.08.2021)*

Secretary, *Department of Science & Technology, Govt. of India*

Secretary, *Department of Industrial Policy & Promotion, Govt. of India*

Chief Secretary, *Govt. of Kerala*

Joint Secretary & Financial Advisor, *MoE , Govt. of India*

Prof. K George Thomas
School of Chemistry, IISER TVM

Prof. M P Rajan
School of Mathematics, IISER TVM

Prof. Hema Somanathan
School of Biology, IISER TVM (from 12.12.2021)

Prof. Mahesh Hariharan
School of Chemistry, IISER TVM (from 12.12.2021)

Secretary

Col. Robinson George (Retd.)
Registrar, IISER TVM

Finance Committee

Chairman

Prof. Arvind A Natu
Professor, IISER Pune

Members

Prof. J. N. Moorthy
Director, IISER TVM

Additional Secretary, *DHE, MoE, Govt. of India*

Joint Secretary & Financial Advisor, *DHE, MoE, Govt. of India*

Prof. Yatindra Nath Singh
Dean of Infrastructure and Planning, IIT Kanpur

Prof. Anil Shaji
School of Physics, IISER TVM

Secretary

Col. Robinson George (Retd.)
Registrar, IISER TVM

Building & Works Committee

Chairman

Prof. J. N. Moorthy
Director, IISER TVM

Members

Shri. V R Rengasamy
Head, EM & C, NCBS-TIFR, Bangalore

Shri. Anil Kumar Jain
Former Special Director General (Retd.), CPWD

Prof. B V S Viswanadham
Dean of Infrastructure, Planning and Support, IIT Bombay

Prof. K George Thomas
School of Chemistry, IISER TVM

Dr. Manoj Kumar K
Professor, Kerala State Institute of Design, Kollam

Col. Robinson George (Retd.)
Registrar, IISER TVM

Shri. S Sreehari
Project and Estate Officer I/C, IISER TVM

Member-Secretary

Prof. K M Sureshan
Dean Infrastructure & Planning,
IISER TVM (from 20/11/2021)

Senate

Chairman

Prof. J. N. Moorthy, *Director, IISER TVM*

Members

Prof. Suresh Das, *Emeritus Professor, School of Chemistry, IISER TVM*

Prof. Yashwant D Vankar, *Emeritus Professor, School of Chemistry, IISER TVM*

Prof. Neela Nataraj, *Professor, Dept. of Mathematics, IIT Bombay*

Prof. N Venkata Reddy, *Dept. of Mechanical and Aerospace Engineering, IIT Hyderabad*

Prof. Binay Kumar Pattnaik, *Dept. of Humanities and Social Sciences, IIT Kanpur*

Prof. Srinivasa Murty Srinivasula, *School of Biology, IISER TVM*

Prof. K George Thomas, *School of Chemistry, IISER TVM*

Prof. M P Rajan, *School of Mathematics, IISER TVM*

Prof. M R N Murthy, *Visiting Professor, School of Biology, IISER TVM*

Prof. M K Mathew, *Visiting Professor, School of Biology, IISER TVM*

Prof. Hema Somanathan, *Head, School of Biology, IISER TVM (from Dec. 01, 2021)*

Prof. Tapas Manna, *School of Biology, IISER TVM*

Prof. Kana M Sureshan, *School of Chemistry, IISER TVM*

Prof. Mahesh Hariharan, *Head, School of Chemistry, IISER TVM (from Mar. 22, 2021)*

Prof. Utpal Manna, *School of Mathematics, IISER TVM*

Prof. Ramesh Chandra Nath, *School of Physics, IISER TVM*

Prof. Anil Shaji, *School of Physics, IISER TVM*

Dr. Nishant KT, *Head, School of Biology, IISER TVM (till Nov. 30, 2021)*

Dr. Viji Z Thomas, *Head, School of Mathematics, IISER TVM*

Dr. Joy Mitra, *Head, School of Physics, IISER TVM*

Dr. Swathi R. S., *Associate Dean, R&D, IISER TVM (from Dec. 01, 2021)*

Member-Secretary

Col. Robinson George (Retd.), *Registrar, IISER TVM*

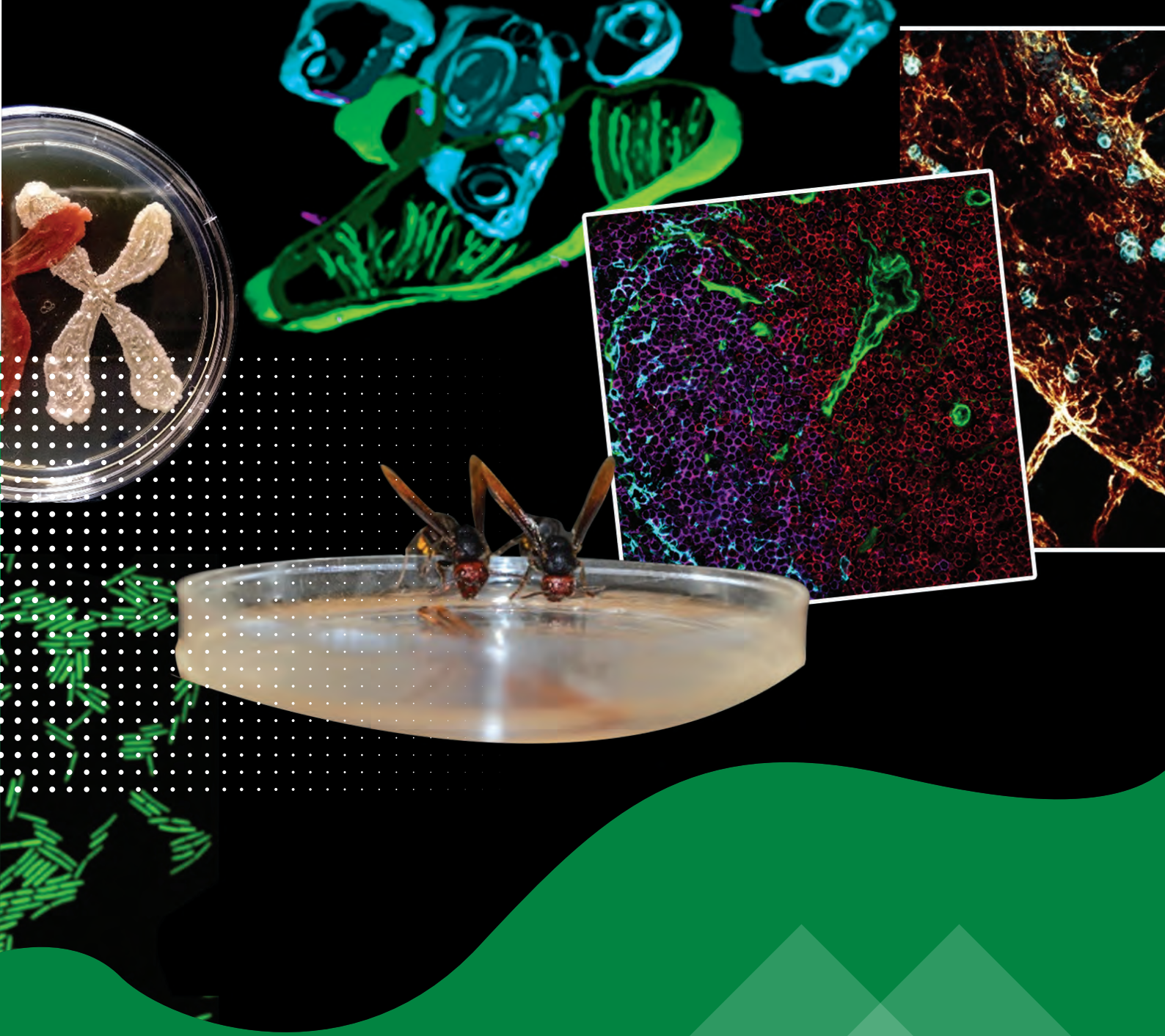
RESEARCH REPORTS

School of Biology

School of Chemistry

School of Mathematics

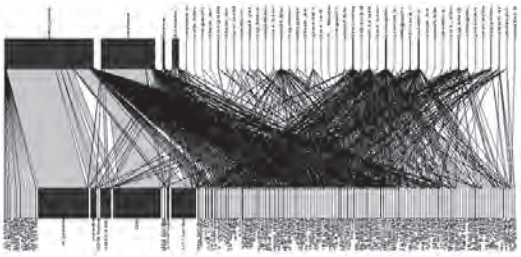
School of Physics



SCHOOL OF BIOLOGY

Hema Somanathan
Professor & Head of Department

Evolutionary Ecology, Sensory Ecology



Plant-bee annual network is nested with social bee species acting as a network hub.

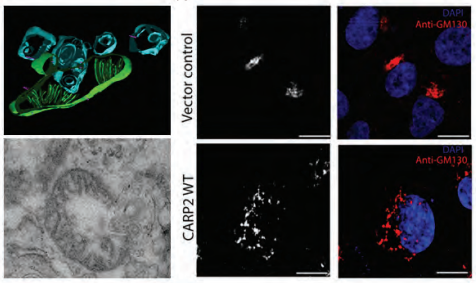
Apis dorsata, an important pollinator in the Asian tropics.

Current research in my lab includes investigating the visual ecology of honey bees and stingless bees. We are investigating the role of colour in floral constancy and colour learning in *Apis dorsata*. We have also examined the spatial resolution and contrast sensitivity of their vision in comparison to the tiny stingless bee *Tetragonula iridipennis* which is also a common bee species in India. In another study, we are examining the role of visual and olfactory cues on homing and nest recognition in stingless bees. Another theme in my group is to study dance communication and migration in honey bees. We are also currently conducting field studies to understand the structure of plant-bee networks in the Eastern and Western Ghats by investigating the roles of floral traits including colour, morphology and rewards on pollinator preferences.

Organelle homeostasis

S. Murty Srinivasula
Professor

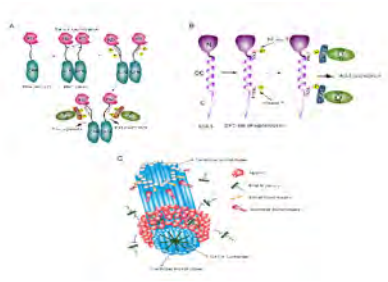
Prof. Murty's group broadly aims to unravel the mechanisms behind how organelles inside cells like Golgi apparatus and mitochondria is maintained healthy and how cells respond to the various pathogenic insult. Towards this end, the group have recently demonstrated that the Golgi apparatus is fragmented in response to EGF stimulation and endosomes regulate mitochondrial elimination by sharing a dynamic association with mitochondria. In the past, the group have also found that tumor-associated variants of RNF167 promote lysosomal exocytosis and plasma membrane resealing, which might contribute to tumor progression. The group has also found that some of these tumor-associated mutations show increased NF-kB activation in TNF alpha-treated cells. Prof. Murty's group is also involved in various collaborative projects on multiple aspects of interdisciplinary research. The groups showed that Vanadium pentoxide nanoparticles induce autophagy and involved in the development of Simultaneous multiple-level magnification selective plane illumination microscopy (sMx-SPIM) imaging system.



Correlative Light-Electron Microscopy (CLEM) images showing newly identified E3 ligase and its association with mitochondria along with endosomes (left) and Golgi apparatus fragmentation in response to expression of CARP2 WT (right)

Tapas K. Manna
Professor

Cytoskeleton, Cell Division

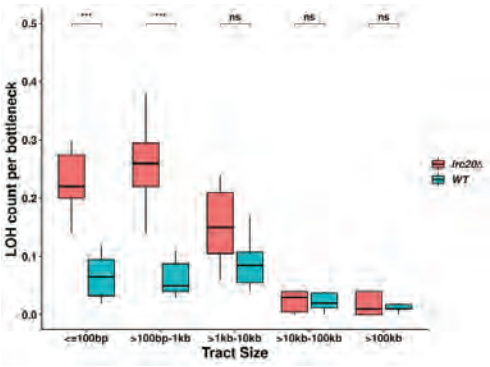


Error-free chromosome segregation is crucial for the maintenance of genome integrity in almost all eukaryotic organisms and its deregulation leads to tumorigenesis. Chromosome segregation is orchestrated by kinetochore (KT) of the chromosome and centrosome, which assembles the mitotic spindle. We study the fundamentals of kinetochore and centrosome biology, their assembly, biogenesis, and cellular processes associated with their functions.

- Our recent work has identified an important molecular link responsible for duplication of new centriole/ centrosome from the existing centrioles in human cells. We have shown that interaction between the centriole assembly protein SAS-6 and microtubule nucleation complex, the Gamma-tubulin ring complex initiates new centriole formation in cells.
- We have identified an important role of the evolutionarily conserved E3 ubiquitin ligase in controlling centriole amplification, a factor that promotes cancer progression. The Ubiquitin ligase targets the centriole assembly factor SAS-6 and thereby ensures formation of only a single centriole from each parental centriole during the cell cycle.

Genome Stability

Dr. Nishant' s 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 mutations, loss of heterozygosity (LOH) and aneuploidy during mitotic divisions.

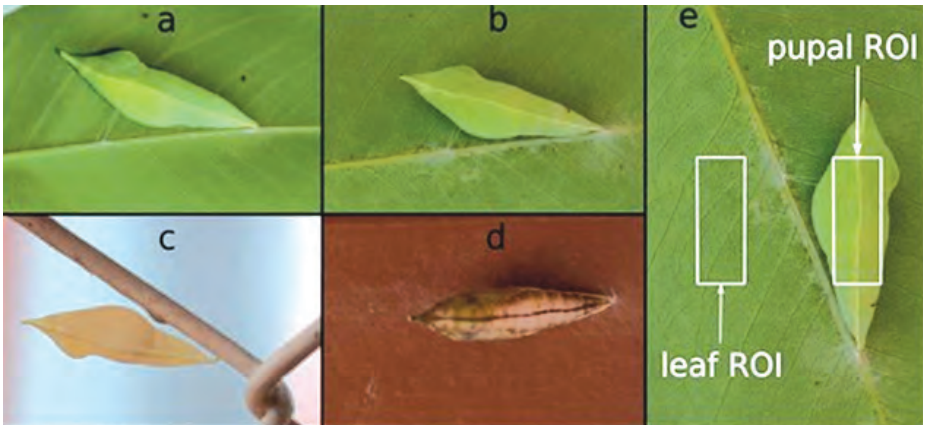


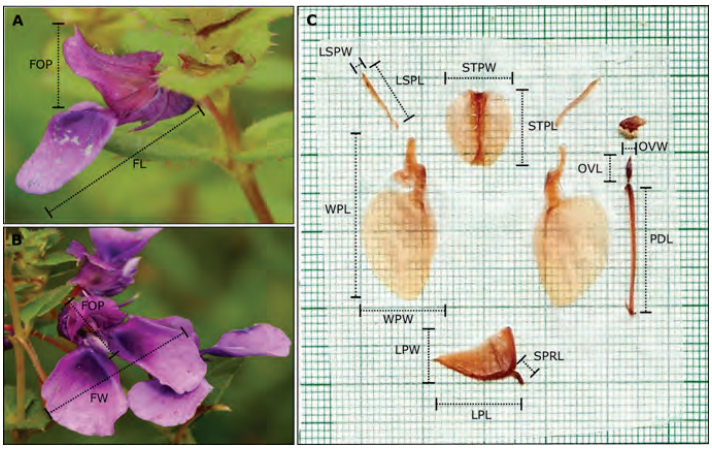
Nishant K.T
Associate Professor

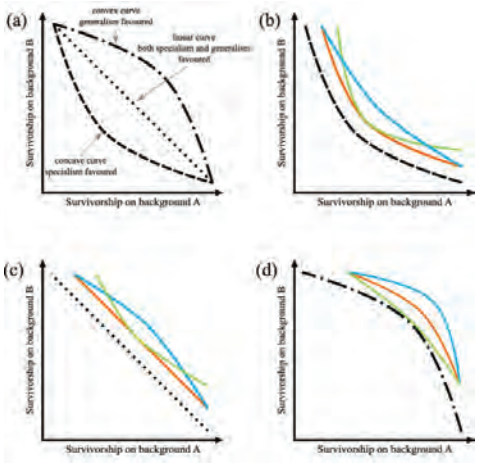
Loss of Heterozygosity (LOH) due to mitotic recombination is frequently associated with the development of various cancers. During 2021-22, we have identified a gene IRC20 (conserved in humans) that regulates LOH tract length. Further, LOH was enhanced significantly in irc20 mutant as compared to wild type. These results are significant because factors regulating LOH tract size are poorly understood. Further, in collaborative work we have provided insights into the role of Exo1 protein in meiotic crossover formation (bioRxiv: https://doi.org/10.1101/2021.08.29.458102).

Evolutionary Ecology

Ullasa Kodandaramaiah
Associate Professor







Our lab works on understanding the diversification of phenotypes in nature. We work on various model systems, primarily butterflies and plants. Our recent research has been in the following themes

1) *Evolution of anti-predatory colouration*: We have investigated how properties of the background determine the effectiveness of prey colour patterns in avoiding predation.

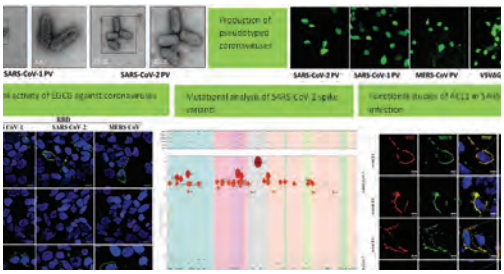
2) *Phenotypic plasticity*: We have investigated the environmental determinants of pupal colour in multiple tropical butterflies, and the adaptive significance of pupal colour plasticity.

3) *Insect- host plant coevolution*: We have studied how host preferences diverge among populations of the butterflies *Catopsilia pomona* and *Acraea terpsicore*, and how this is related to population divergences. We have performed assays of female oviposition preference and larval performance on various host plants, and show that populations have evolved distinct hierarchies.

4) *Evolution of hybrid zones in* Impatiens: We have identified and characterized a hitherto unreported hybrid zone between two plants, *Impatiens balsamina* and *Impatiens rosea*. We have conducted a series of field and laboratory experiments to understand the ecological reasons due to which the narrow hybrid zone is maintained while the two lineages are otherwise allopatric.

Molecular Virology

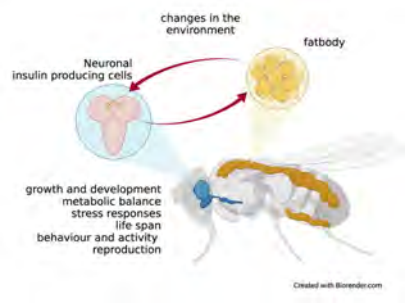
V Stalin Raj
Associate Professor



In the year 2021-2022, we have been working on diverse applications of pseudotyped corona viruses and recombinant spike proteins of all major CoVs including SARS-CoV-2. We used various invitro approaches to functionally validate the pseudotyped viruses including specific receptor-mediated entry of CoV pseudoviruses. In addition, we developed an antibody neutralization assay for CoVs and showed the antiviral activity of Epigallo-catechin-3-gallate against emerging CoVs. Further, as the trendline of SARS-CoV-2 infections boomed up, the rate of emergence of spike mutations increased which shows altered pathogenesis and antibody escape phenotype. We analyzed the spike mutations using custom python scripts and selected the highest frequency mutations for the generation of pseudotyped viruses. These viruses will be used for functional studies including antibody neutralization efficacy. Apart from pseudotyped viruses, we produced recombinant spike proteins and different forms of SARS-CoV-2 receptor ACE2 and proved by various in-vitro assays that the cytoplasmic domain of ACE2 is not necessary for entry of SARS-CoV-2. The role of different other host factors in viral entry needs to be addressed. Altogether, we have published 4 peer-reviewed research articles in international journals.

Jishy Varghese
Assistant Professor

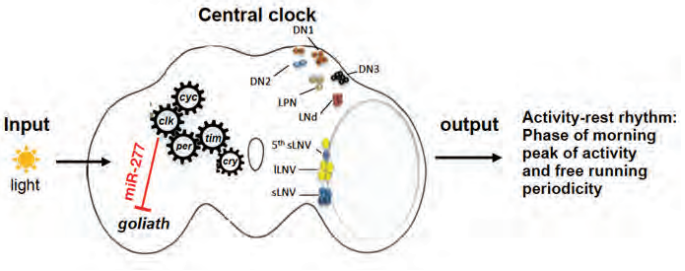
Energy Homeostasis
Nutrient Sensing
Neural Integrity and ageing



My laboratory is focused on understanding the molecular mechanisms that aid in maintenance of energy homeostasis. In our lab we use the developmental model organism Drosophila melanogaster to address some interesting questions in this area of research. Our recent publication show that nutrient environment of the growing larvae can affect adult metabolism and physiology (Rehman and Varghese, 2021). We also identified two novel factors that play a role in managing growth and metabolism, an outcome of a large scale genetic screen we performed in the Drosophila fat body, a tissue similar to mammalian liver and adipocytes. We show for the first time that an ER residing factor Edem1, crucial for protein quality control, plays a role in regulating nutrient balance in Drosophila (Pathak and Varghese, 2021). We also show that trachea, the oxygen delivery tubes in insects, is crucial for larval growth and insulin signalling. When the tracheal luminal space was defective the size of flies were affected, which was mainly due to lower insulin levels (Pathak et al, 2021). Using another large scale genetic screen to identify microRNAs that regulate growth and lifespan, we found that miR-184 microRNA plays a crucial role in managing survival during scarce food supply to Drosophila larvae (Fernandes and Varghese, 2022 a). We also identified several micro RNAs which act in the insulin producing neurons which determines lifespan (Fernandes and Varghese, 2022 b).

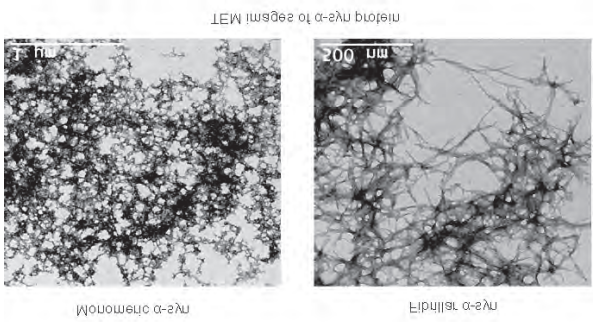
Nisha N Kannan
Assistant Professor

Chronobiology



Dr. Nisha N Kannan's 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. Emerging evidence indicates an important role for microRNAs in post-transcriptional regulation, however the broad impact of miRNAs in regulating diverse aspects of circadian rhythm remains to be elucidated. To assess the role of microRNA in posttranscriptional regulation of circadian rhythms, we initiated a genetic screen in which we assessed whether any of the microRNAs expressed in the clock neurons govern circadian clock mediated activity rest rhythm. We identified microRNA 277 (miR-277) to be critical regulator of the phase, free running period and robustness of the circadian clock. miR-277 suppresses the expression of circadian transcriptional-translational feedback loop component *Clock*. The eye specific gene *Goliath* is a direct target of CLOCK and thus miR-277 makes a significant contribution to the cycling amplitude of *Goliath* to govern the phase of *circadian* rhythm in *Drosophila*.

Neurodegeneration, Protein aggregation

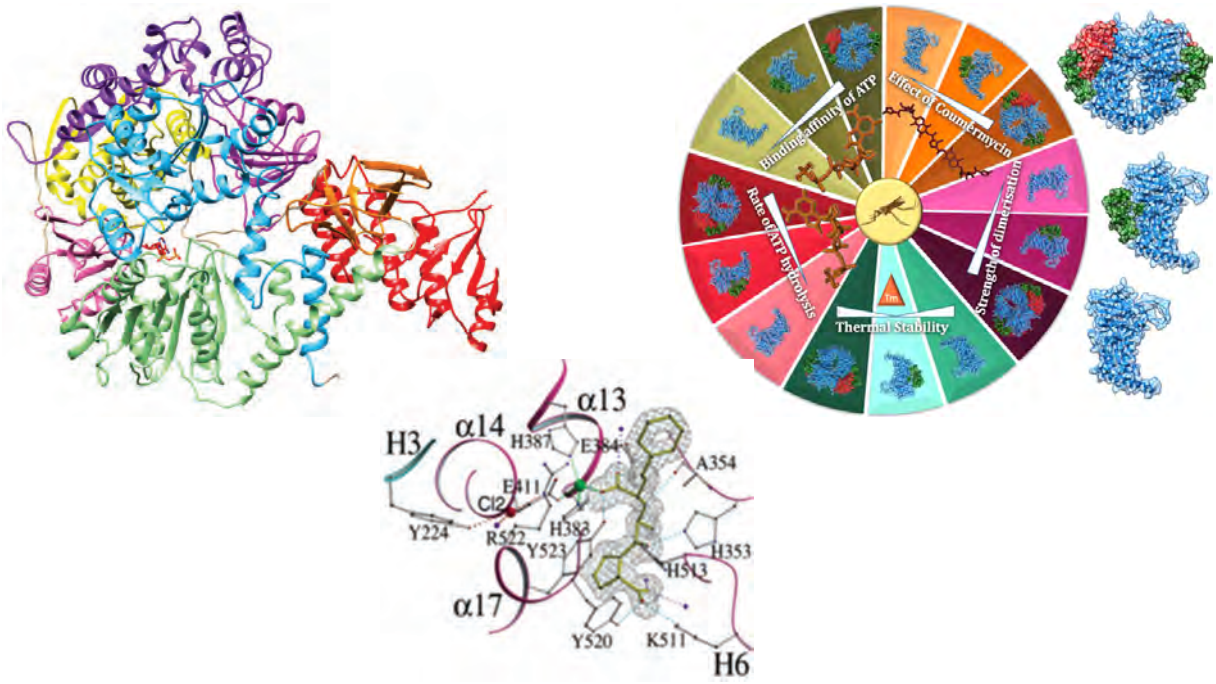


Parkinson's disease (PD) is one of the most common progressive neurodegenerative disorder. While symptoms and progression of the disease vary with each patient, histopathologically, PD is associated with the aggregation of α-synuclein protein and progressive loss of dopaminergic neurons (DA-neurons). Animal models are vital tools for elucidation of molecular pathogenesis of disease and 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. Dr. Poonam Thakur's lab works on developing better models of PD that can model the complex pathophysiology of PD. Utilizing these mouse model and electrophysiological approaches, they want to study the mechanisms behind selective loss of dopamine neurons in PD. This understanding will also be utilized to develop potential therapeutic targets.

Poonam Thakur
Assistant Professor

Ramanathan Natesh
Assistant Professor

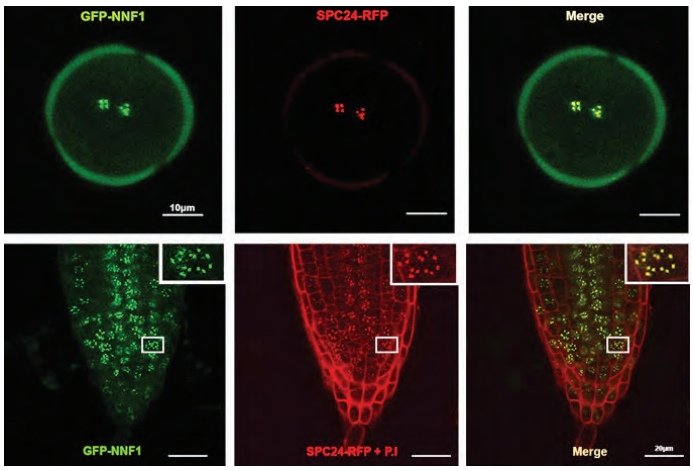
- Transcription regulation and DNA damage repair
- Structural Molecular Biology
- Single Particle CryoEM and Protein Crystallography



Our research interests involve studies of proteins and its complexes in human health and diseases. Our current focus is on structural studies of protein complexes involved in DNA damage repair, topology manipulators and genome stability. The lab aims to understand the mechanisms by which the Transcription regulation/ DNA damage repairs are carried out using two principle techniques viz., Cryo Electron Microscopy (CryoEM) and Protein Crystallography (PX) along with range of other biochemical, biophysical and bioinformatics methods. Recently, our group in collaboration with Prof. S C Raghavan group IISc, showed that hypomorphic mutations in human DNA ligase IV lead to compromised DNA binding efficiency, hydrophobicity and thermal stability (Maddi et. al., **2022, *Protein Eng Des Sel.***). In another project we showed that stability of p53 is hampered upon oligomerisation (Luwang et al., **2021, *Biochimie***). Further we showed optimization strategies for expression and purification of soluble N-terminal domain of human centriolar protein SAS-6 in *E. coli (*Maddi et. al., **2021, *Protein Expr Purif.***). In another research work we reported the role of two unique regions (L1 and L2) identified in PfGyrBN. Through mutational and ITC studies we showed that these regions may play an important role in ATPase activity and the oligomeric state of PfGyrBN. Our results suggests that L1 region of PfGyrBN is likely to be functionally important and may provide a unique dimer interface that affects its enzymatic activity. Since deletion of L1 region decreases the affinity of ATP to the protein, this region can be targeted towards desinging novel inhibitors of ATP hydrolysis (Purushothaman et. al., **2022, *Protein Sci.***).

Ravi Maruthachalam
Assistant Professor

Plant Centromere biology, Haploid genetics, aneuploidy

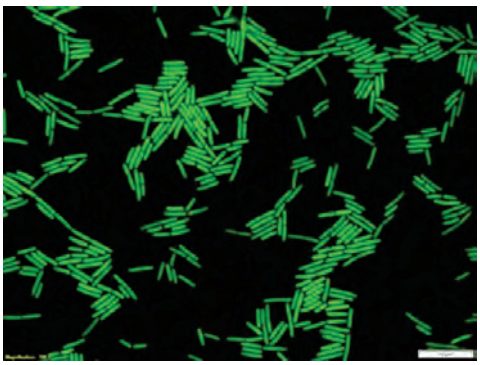


[AtNNF1 localizes to the kinetochores of somatic and reproductive tissues (Allipra et al., 2022)]

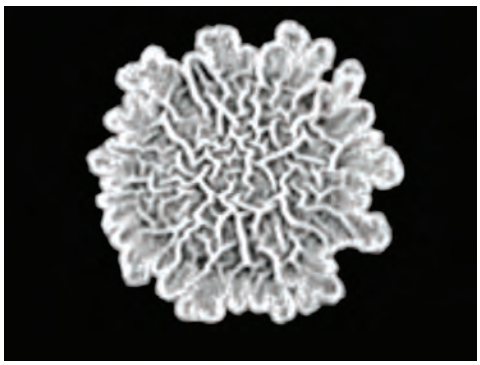
Research in my lab is aimed at understanding the mechanistic basis of uniparental genome elimination in plants and exploit this process for accelerated plant breeding and genetics. In this year, in collaboration with Luca Comai from UC Davis, we have shown that epigenetically mismatched centromeres trigger uniparental genome elimination in hybrids. In addition, we have characterized the outer kinetochore protein NNF1 in Arabidopsis and apart from its canonical role, we show a non-kinetochore role regulating polyamine and gibberellin metabolism in plants. Furthermore, by examining the aneuploids, we believe that the recently reported new organ in Arabidopsis "Cantil" is a morphological oddity resulting from the physiological and genome balance perturbances rather being a unique organ.

Mutagenesis, Gene Expression, Evolution

Sabari Sankar Thirupathy
Assistant Professor



Stochastic gene expression



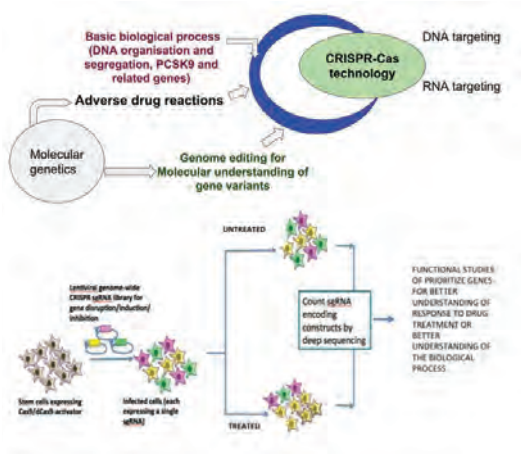
B. Subtilis biofilm

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.

N Sadananda Singh
Assistant Professor

- Application and understanding of CRISPR-Cas
- Molecular Biology
- Molecular Genetics

We are interested in investigating genetic factors and mechanism behind biological system and response to small molecule exposure including established anti-cancer drugs. Major areas of thrust would be:



- Application of genome editing technologies for finding genetic factors responsible for response to drug treatment and certain biological process using human cell lines as model system either by disruption, deletion or induction of particular gene or region.
- Development of CRISPR-Cas technology for those systems where the technology is not exploited yet.
- Diagnosis and hunting for genetic factors involved in lipid disorder. Molecular genetic analysis for lipid disorder (of particular interest to us, cholesterol disorder) are rarely performed and is needed to understand the disorder and to segregate genetic factors from external factors.

Host-pathogen interaction

Sandhya Ganesan
Assistant Professor

Future research plan:

- Broad goals are to identify and characterize mammalian defense mechanisms against pathogens.
- Our initial focus is on the human Syntaxin 11 (STX11), a vesicle-fusion protein that inhibits the intracellular replication of the bacterial pathogen *Coxiella burnetii*.
- Our lab has compiled a list of naturally occurring variants of STX11 in the human population and associated genetic changes to generate these constructs (Table 1).
- Our current focus is to reconstitute STX11-deficient cells with these variants to understand how they affect antimicrobial functions and structure-function relationship.

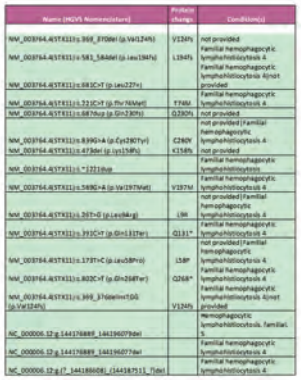
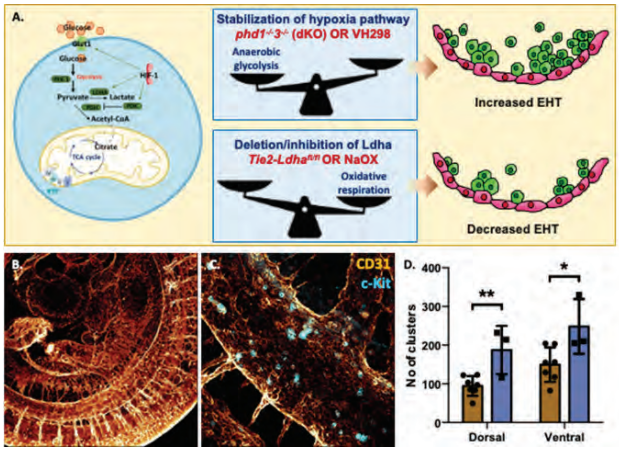


Table 1. STX11 variants. (NCBI, Clinvar databases)

Stem Cells and Developmental Biology

Satish Khurana
Assistant Professor

Satish's group has been involved in understanding the regulatory mechanisms underlying the functional superiority of fetal hematopoietic system over its adult counterpart. In the last few years, extensive gene expression profiling of the hematopoietic stem cells (HSCs) from across the developmental stages provided insight into the HSC-intrinsic functional regulators. Oxidative respiratory pathways were among the most up-regulated, coinciding with the stage of fetal hematopoiesis when expansion and maturation of definitive HSCs takes place. The group has followed this by extensive quantitative analysis of hematopoietic emergence in mid-gestation stage mouse embryos wherein metabolic pathways have been modulated to achieve either the promotion of oxidative respiration or the anaerobic glycolytic pathways (A). They have used pharmacologic as well as genetic means for metabolic modulation in developing mouse embryos. Using confocal based imaging of the whole mouse embryonic aorta at E10.5 (B) and quantification of the emerging hematopoietic clusters (C) was performed.

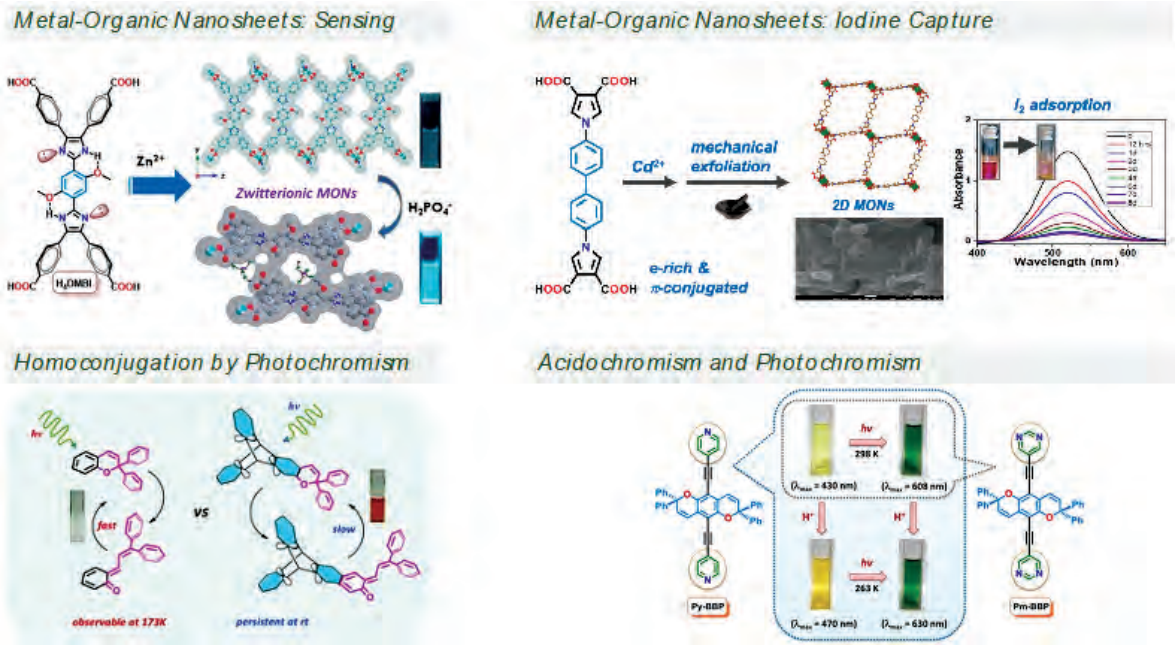


These studies have demonstrated the involvement of metabolic pathways in cell fate decisions during endothelial to hematopoietic transition (EHT) process crucial for hematopoietic emergence in vertebrates (D).

SCHOOL OF CHEMISTRY

J. N. Moorthy
Professor & Director

- Organic photochemistry
- Supramolecular chemistry
- Organic materials
- Mechanistic organic chemistry



In continuation of our ongoing research on bottom-up development of functional organic materials by *de novo* molecular design, we have shown that fluorescent layered metal-organic frameworks, that is, MOFs, can be accessed systematically. By exploiting the ultrasonication-induced liquid phase exfoliation (UILPE) technique, we have demonstrated access to fluorescent metal-organic nanosheets (MONs). The latter are shown to be applicable for sensing applications, e.g., selective sensing of H_2PO_4 anion, see: *Inorg. Chem.* **2022**, *61*, 3942. By rationally designing e-rich bis-pyrrole tetracarboxylic acid linker, we have shown that layered MOFs accessed by metalation can be readily subjected to exfoliation by mechanical grinding to yield 2D MONs. By a systematic investigation, the capture of iodine by MONs has been demonstrated for the first time. Indeed, we have shown that the extent of iodine capture can be correlated with the magnitude exfoliation, which is essentially determined by the duration of grinding. The observed notable iodine capture is attributed to i) a large increase in surface area with exfoliation, ii) ability of the e-rich π -conjugated organic linker to form a charge-transfer complex with iodine, and iii) the presence of free and uncoordinated carboxylic acids of the linker that reinforce binding of iodine through charge transfer, see: *Adv. Mater. Inter.* **2022**, 2200337.

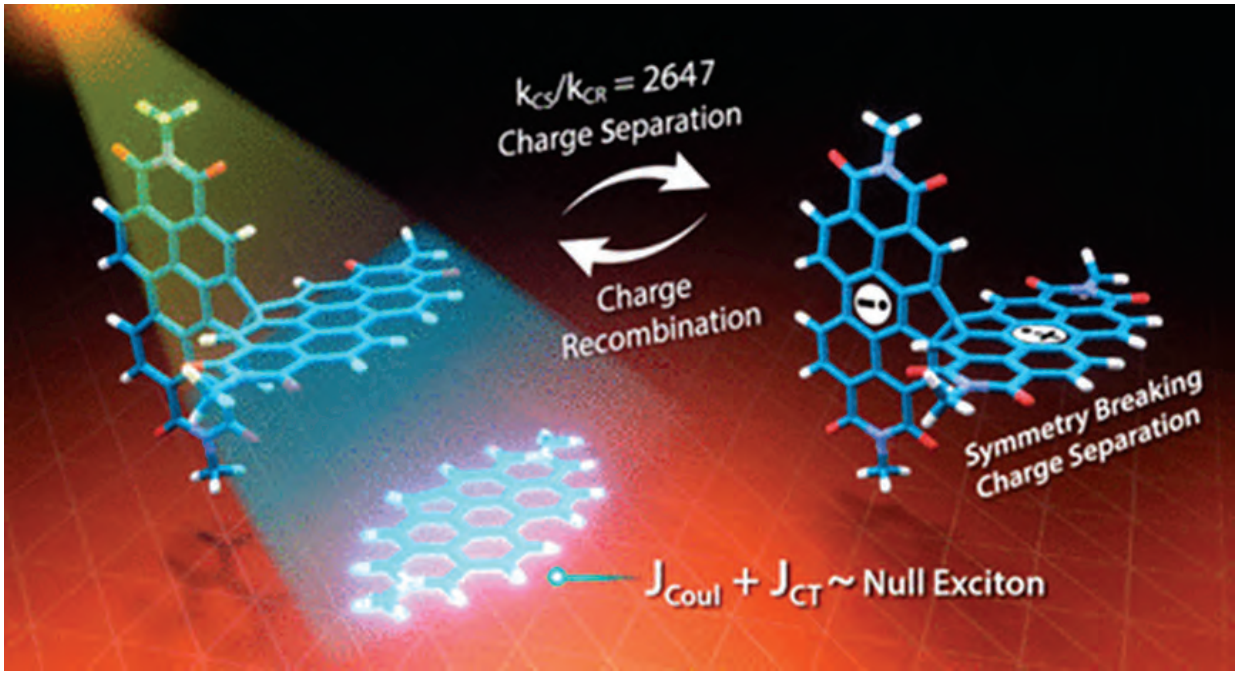
Photochromism is a phenomenon involving reversible interconversion of a species between two of its isomeric forms with distinct absorption properties. We have exploited photochromism associated with diarylbenzopyrans and diarylnaphthopyrans to demonstrate a variety of phenomena such as toroidal conjugation, phane effect, mesomeric effects, etc. In continuation of these studies, we have shown that the contentious issue of homoconjugation can be tested and validated, see: *New J. Chem.* **2022**, *46*, 582. Of course, highly conjugated diarylbenzopyrans with heterocyclic systems serve not only as photochromic systems, but also as useful systems that exhibit acidochromism, see: *ACS Omega*, **2021**, *04*, 449.

Mahesh Hariharan
Professor & Head of Department

Physical Organic Chemistry

Null Exciton-Coupled Chromophoric Dimer Exhibits Symmetry-Breaking Charge Separation.

A comprehensive understanding of the structure− property relationships in multichromophoric architectures has pushed the limits for developing robust photosynthetic mimics and molecular photovoltaics. The elusive phenomenon of null exciton splitting has gathered immense attention in recent years owing to the occurrence in unique chromophoric architectures and consequent emergent properties. Herein, we unveil the hitherto unobserved null exciton coupling assisted highly efficient photoinduced symmetry-breaking charge separation (SB-CS) in a Greek cross (+)-oriented spiro-conjugated perylenediimide dimer ($SpPDI_2$). Quantum chemical calculations have rationalized the infrequent manifestation of null exciton coupling behavior in $SpPDI_2$. Negligible contribution of long-range Coulombic and shortrange charge-transfer mediated coupling renders a monomer-like spectroscopic signature for Sp-PDI_2 in toluene. The Greek cross (+)-arranged Sp-PDI_2 possesses a selective hole-transfer coupling, facilitating the ultrafast dissociation of null excitons and evolution of the charge-separated state in polar solvents. Radical cationic and anionic spectroscopic signatures were characterized by employing

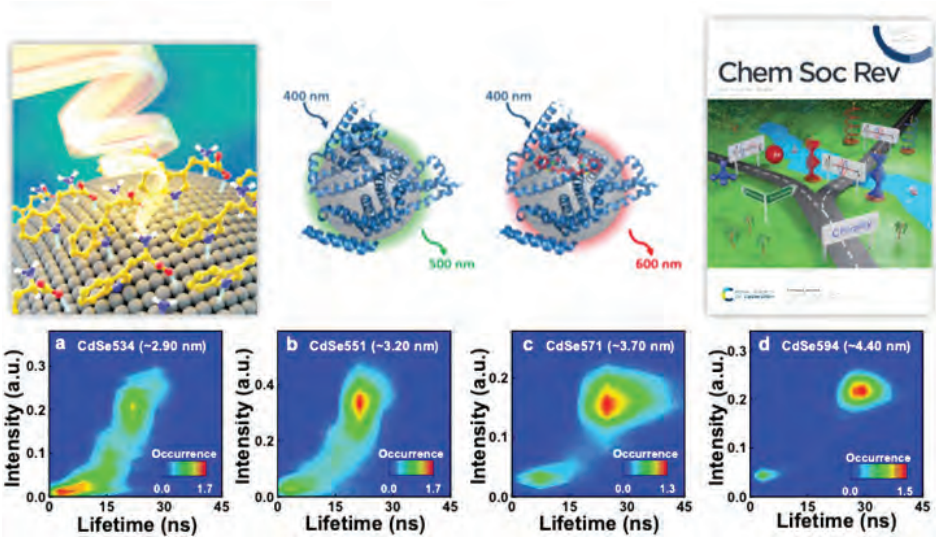


femtosecond transient absorption spectroscopy. The substantial hole transfer electronic coupling and lower activation energy barrier of Sp-PDI_2 accelerated the charge separation rate. The rate of charge recombination (CR) markedly decelerated due to falling into the inverted region of the Marcus parabola, where the driving force of CR is larger than the total reorganization energy for CR. Hence, the ratio of the rates for SB-CS over CR of Sp-PDI_2 exhibited an unprecedentedly high value of 2647 in acetonitrile. The current study provides impeccable evidence for the role of selective charge filtering in governing efficient SB-CS and thereby novel insights towards the design of biomimics and advanced functional materials

Light-Matter Interactions at the Nanoscale

K George Thomas
Professor and J C Bose National Fellow

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 2021-March 2022 are listed below.



i) Photoluminescence (PL) fluctuations in cadmium selenide quantum dots were investigated using time-resolved spectroscopy at a single particle level by systematically varying its core size, maintaining a constant shell thickness from which the electron trapping (k_t) and detrapping (k_d) rate constants were estimated. The increase in PL quantum yield observed with the increase in core size of CdSe at the ensemble level is related to the enhanced k_d/k_t and charge carrier wave function localization in the core (*J. Phys. Chem.* C, **2021**, *125* 25706–25716).

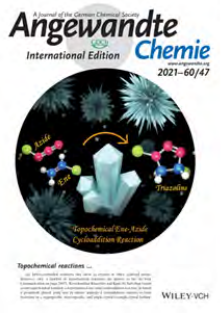
ii) The use of a bioconjugate, based on indium phosphide quantum dot and a protein (bovine serum albumin), as an energy transfer probe has been established by various steady-state and time-resolved emission studies (*J. Phys. Chem.* B, **2022**, *126*, 2635-2646).

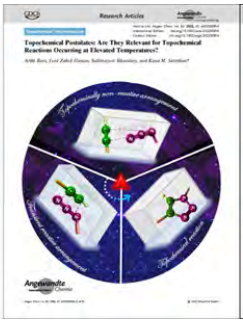
iii) We have designed free-standing silicon nanoparticles with chiral non-racemic absorption and emission attributes. Silicon nanoparticles capped with L- and D-isomers of tryptophan displayed positive and negative monosignated circular dichroic signals and circularly polarized luminescence indicating their ground- and excited-state chirality. The ground- and excited-state chiroptics in tryptophan-capped silicon nanoparticles originates from the collective effect of ligand-bound emissive charge-transfer states and chiral footprints. Being the first report on the circularly polarized luminescence in silicon nanoparticles, this work will open newer possibilities in the field of chirality (*J. Am. Chem. Soc.,* **2022**, *144*, 5074-5086).

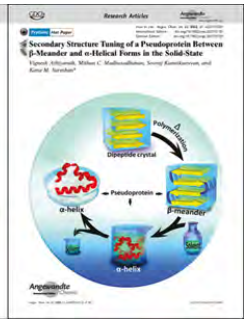
iv) A tutorial providing a comprehensive description of the origin of chiroptical properties of supramolecular and plasmonic assemblies in the UV–visible region of the electromagnetic spectrum has been published (*Chem. Soc. Rev.* **2021**, *50*, 11208-11226).

Kana M. Sureshan
Professor

Supramolecular Chemistry, Materials







In the past one year, we have scaled newer heights in terms of the complexity of the materials we could synthesize using topochemical reactions. For example, we have designed materials whose conformation can be tuned in solid state and we have identified a new topochemical reaction for better control over postpolymerization functionalization. We have also developed novel biomaterial-based porous core-shell sorbent for marine oil-spill recovery. Several scientific articles have been published in prestigious journals such as Angewandte Chemie, Chemical Science, ACS Sustainable Chem. Engg., Adv. Sust. Syst., Chem. Eur. J. Notably, we have received several invitations from the journal publishers for cover arts and frontispieces. Recently, our work on helical polymers has been accepted in a well-reputed interdisciplinary journal, PNAS.

Main Group Chemistry

Ajay Venugopal
Associate Professor

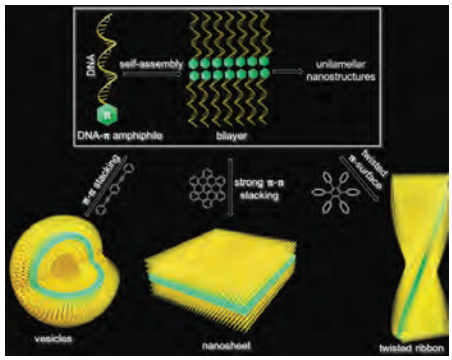
Over a decade we have developed expertise in accessing main group Lewis acids and explore their applicability in homogeneous catalysis. We have developed a design strategy to reverse the Lewis acidity from bismuth to antimony by manipulating the ligand strength, unprecedented in the literature. models of (Mesityl)2EX (E = Sb, Bi and X = Cl—, OTf—) have facilitated reversing the Lewis acidity from bismuth to antimony. We use this concept to demonstrate a higher efficiency of (Mesityl)2SbOTf over (Mesityl)2BiOTf in the catalytic reduction of phosphine oxides to phosphines. We have developed a sterically hindered monomeric alkoxomagnesium compound that has been used to explore the role of magnesium alkoxides in ketone hydroboration. Experiments and DFT calculations are suggestive of a concerted reaction pathway traversing through a six-membered transition state involving Mg−OCHPh2, B−H, and C=O bonds. Prompted by this hypothesis, we investigated the activity of [Mg(OCHPh2)2] (3), which exhibits turn-over frequency reaching up to 59,400 h−1 under solvent-free conditions and stability towards C=C, −OH, −NH2 and −NO2. Due to the non-existence of a metal hydride intermediate, such catalytic reactions will not get hindered in the presence of additional reactive functional groups.

Supramolecular chemistry, DNA Nanotechnology, Cancer Therapy

Reji Varghese
Associate Professor

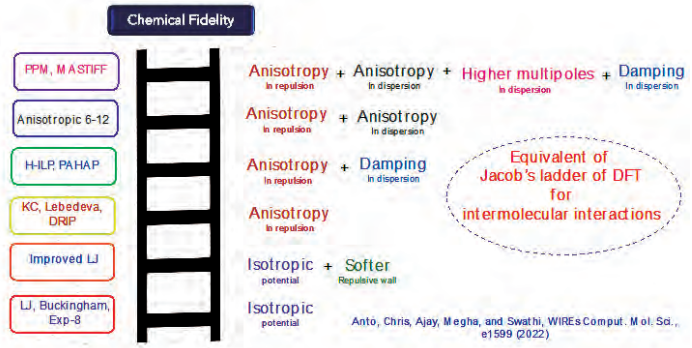
Our group is interested in the design, synthesis and self-assembly of DNA-based amphiphiles. We have shown that by the appropriate selection of the hydrophobic segment of the amphiphile, the morphology of the nanostructures can be tuned into various 1D and 2D nanoarchitectures.

The most unique structural feature of this kind nanostructures is the dense decoration of ssDNA of defined sequence on its surface that permits the integration of other functional molecules through sequence specific DNA hybridization. By using this strategy, we have demonstrated the design of several hybrid functional materials with unique applications. Currently our research interest focuses on the design of responsive DNA nanostructure as smart nanocarrier for targeted drug delivery applications. We are particularly interested in the development of DNA nanostructures that are responsive only inside the cancerous cells and are stable in normal cells, and hence they provide the opportunity of targeted delivery of the cargo with no/minimum damage to the normal cells.



Theoretical Chemistry

R. S. Swathi
Associate Professor

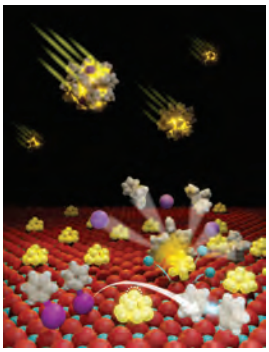


Development of empirical potentials with accurate parametrization is indispensable while modeling large-scale systems. Recently, our group has reported accurate parametrization of a range of empirical potentials for investigating the adsorption features involving layered materials: (i) pairwise potential model for probing the adsorption of noble gases on boron nitride sheets, (ii) improved Lennard-Jones potential for probing the adsorption of polycyclic aromatic hydrocarbons on graphynes, and (iii) Hod's interlayer potential for probing interlayer interactions in twisted graphynes. The parametrization of intermolecular interaction potential was carried out using first-principles results as the benchmark data. The thus-developed force fields were further employed in conjunction with particle swarm optimization, a swarm intelligence technique, to perform large-scale simulations involving adsorbed and intercalated clusters. Recently, we exemplified the hierarchy of empirical intermolecular potentials by depicting them on the various rungs of the Jacob's ladder equivalent of density functional theory for intermolecular interactions. The various rungs of this ladder symbolize research efforts in pursuit of the heaven of chemical accuracy, while the top-most rung indicates the highest level of accuracy of intermolecular force fields.

Sukhendu Mandal
Associate Professor

Metal Nanoclusters and Cluster-Assembles

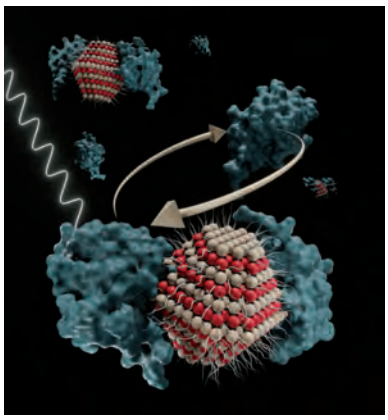
Our group has been digging deep into the mechanistic aspects of ultrasmall cluster-to-cluster transformations. We have reported about the importance of symmetry-breaking in the transformation of cyclohexanethiol-protected Au23 nanocluster (NC) to 4-tertbuylbenzenethiol protected Au36 NC via Au28 intermediate (J. Phys. Chem. Lett. 2021, 11, 1781). Expanding on that work, we have explored the kinetics of co-reagant-free transformations of Au28 to Au36 NC, and Au44 to Au36 NC (J. Phys. Chem. Lett. 2021, 12, 10987; J. Phys. Chem. C, 2021, 125, 12149). Both the works highlighted the importance of the surface and ligand restructuring to form the highly symmetrical and stable Au36 in both the cases.

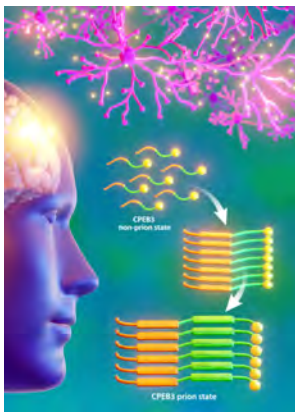


Apart from that, a very unique hexagonal close-packed (hcp) Ag14 kernel containing S2- templated [Ag50S13(StBu)20][CF3COO]4 quantum dot-like nanocluster has been reported from our lab. We have utilized its unprecedented electronic structure for photo current generation under irradiation of UV light source (Nano Lett. 2022, 22, 3721). Recently, my group crystallized a new [Cu18H3(S-Adm)12(PPh3)4Cl2] nanocluster with an unprecedented mononuclear Cu(0), where the core is uniquely constructed via kernel fusion through vertex sharing of the Platonic solid and Johnson solid geometry-like two kernels. The intrinsic violet emission of this Cu-NC at room temperature is further enhanced by confining the surface protecting ligands through host-guest supramolecular-assembled adduct formation. (Chem. Sci., 2022, DOI: 10.1039/D2SC02544B).

Vinesh Vijayan
Associate Professor

NMR spectroscopy, Biochemistry

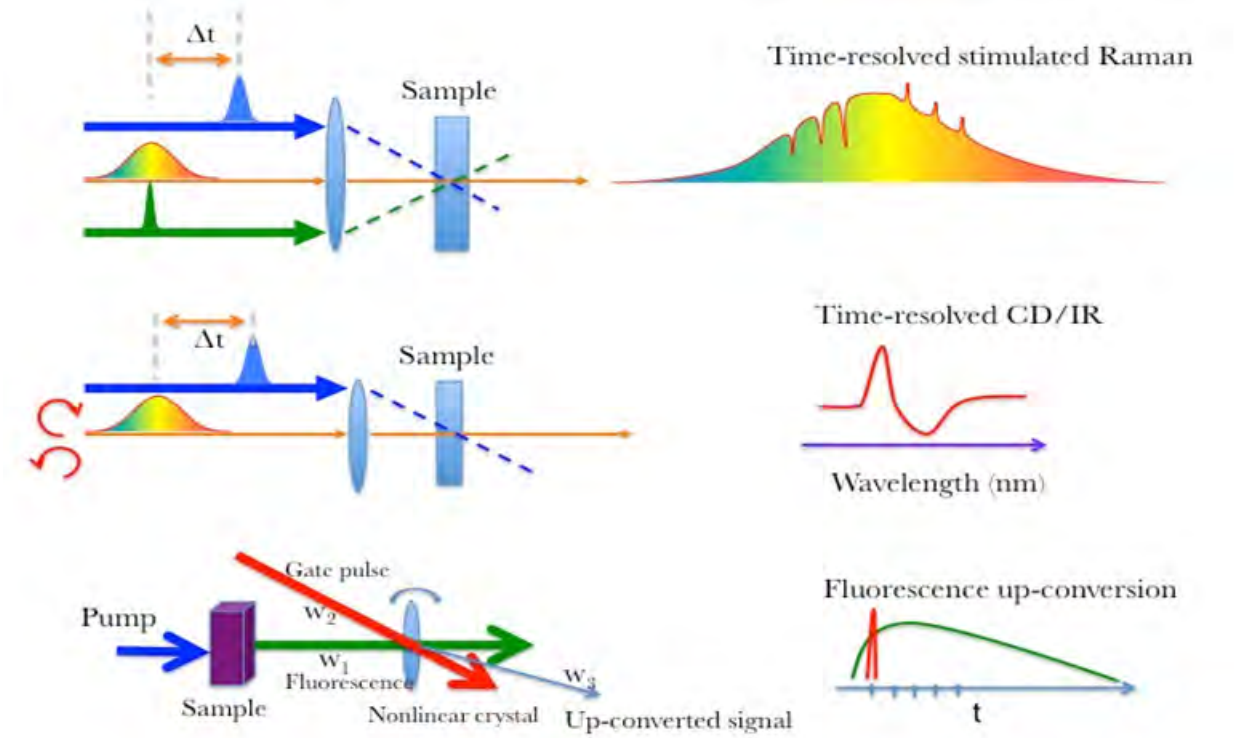




Our group works on the interface of solid, and solution state. Our lab focuses on developing and using NMR tools to study, and understand the structure, dynamics, and function of biomolecules. Our main focus on recent years were on characterizing the structural transitions in amyloidogenic proteins. We have been making considerable progress in mapping the aggregation of different segments of CPEB3 (cytoplasmic polyadenylation element binding) protein, whose prion character is responsible for the long-term memory in mammals. Using solution and solid-state NMR, we identified the prion forming critical region of the PRD1 domain of mouse CPEB3. This study provides the first step in identifying the structural trigger for the CPEB3 aggregation process. We have been also using relaxation-based solution NMR approach to probe the "dark" state involved in protein-fibril interaction. As a first step we examined the dynamics and exchange kinetics of the ubiquitin-CdTe model system, which undergoes a fast exchange in the transverse relaxation time scale. We applied the recently developed dark-state exchange saturation transfer (DEST), lifetime line broadening (ΔR2), and exchange-induced chemical shift (δex) solution NMR techniques to obtain a residue-specific binding behavior of the protein on the QD surface.

Y. Adithya Lakshmanna
Assistant Professor

Ultrafast Spectroscopy, Chiro-optical Spectroscopy, Nonlinear Vibrational Spectroscopy

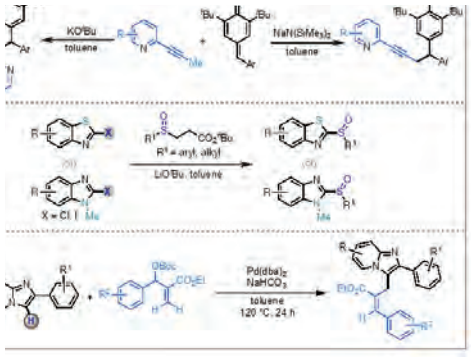


In recent times, photoinduced proton-coupled electron transfer (PCET) processes among various photoacids have been widely reported from both experimental and theoretical perspectives to address the sunlight-to-fuel production in the context of artificial light harvesting. However, analysis of such PCET processes involving photobases is relatively less explored due to the presence of multiple competitive channels. Biological systems such as DNA possess such bases with complex structural networks that govern their overall functioning. Upon photoexcitation of such systems, the excited state dynamics is predominantly governed by the dynamics in the hydrogen-bonding networks at intra and intermolecular levels. In this context, we focus our research particularly on elucidation of the excited state structural dynamics during photoinduced PCET reactions in various molecular-dyads involving photoacids and photobases. Such analysis enables one to relate the underlying intricate dynamics in large-scale biological processes. To achieve this, we employ ultrafast spectroscopic methods such as femtosecond transient absorption, IR, and femtosecond stimulated Raman scattering. Recently, we have initiated establishing the state-of-the-art spectroscopic method i.e., femtosecond time-resolved circular dichroism that enables tracking the evolution of the chiral activity in real time and addressing the complex conformational dynamics in the photo-excited states.

Alagiri Kaliyamoorthy
Assistant Professor

Development of new synthetic methodology for an organic synthesis

Dr. Alagiri group's research interests are directed toward an organic synthesis with a focus on developing new synthetic strategies. Currently, his group primarily works on the activation of less reactive pronucleophiles and subsequent C–C bond-forming reactions with various electrophiles. To this end, we developed a Brønsted base-mediated regioselective allenylation and propargylation of various *para*-quinone methides using unfunctionalized 2-alkynyl azaarenes as the pronucleophiles. The use of KO^{t}Bu as a Brønsted base led to the formation of allenylated products, whereas $NaN(SiMe_3)_2$ furnished the propargylated products. In addition, we have 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, we have stretched out the sulfenate ion chemistry to synthesize various trideuteromethylated sulfoxide derivatives in the presence of NaO^{t}Bu base. Also, our group has been actively involved in developing palladium-catalyzed cross-coupling reactions and in this aspect, we developed a palladium-catalyzed regioselective allylation of imidazopyridines using MBH carbonate as the allyl source.



Basudev Sahoo
Assistant Professor

Sustainable Organic Synthesis Catalysis

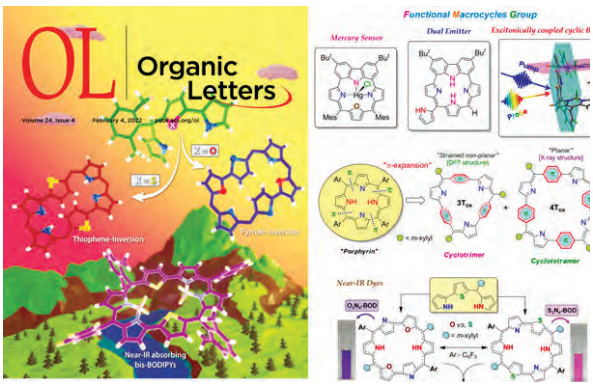
Sustainability is an aspect that has emerged to be widely considered in modern organic synthesis. Despite the chemical inertness, the utilization of renewable and easily available feedstocks have captured the broader attentions of synthetic organic chemistry community, while developing synthetic strategies for the constructing value-added products. Our research investigation includes the following topics:

- **Transition Metal catalysis:** In this research area, we intend to explore the novel reactivity of transition metal-based catalysts through its rational design, mechanistic probing and practical applications. The utilization of earth abundant metals holds the immense interests in organic synthesis while developing novel synthetic methods for the construction of complex molecular architectures from simple feedstocks.
- **Photocatalysis:** Visible Light Photocatalysis has emerged to be a mild catalytic technique to activate the inert substrate for forging molecular linkages. We will develop the synthetic strategy for selective functionalization of inert bonds as well as less reactive functionality for late-stage modifications of natural products, pharmaceuticals and so on.
- **Metal Free Coupling Reactions:** As an alternative to the transition metal catalysis paradigm, metal-free approach has well been accepted in synthetic organic chemistry, where we would like to contribute in the coupling chemistry arena, promoted by Phosphorus or Boron-based catalyst/reagent, dealing with the molecular entities that find difficulty in transition-metal catalysis.

π Extended Macrocycles / Near-IR Dyes / Molecular Sensors

S. Gokulnath
Assistant Professor

Gokulnath group focusses on synthesis, structure and optical property investigation of various functional macrocycles. A carbazole-Based Porphyrins synthesized in our laboratory exhibit unique structure and photophysical property and showed reversible mercury ion sensing in aqueous media with LOD of *ca.*100 nM (*Org. Lett.* **2020**, *22*, 4494−4499). Further, two stable di-*m*-benzihexaphyrins and di-*m*-benziheptaphyrins have been synthesized and structurally characterized. Despite the presence of *m*-phenylene units interrupting the global delocalization but showed a black dye property as a "*metal-free*" porphyrinoid (*J. Org. Chem.* **2020**, *85*, 8021−8028). Next, we encountered a double intramolecular hydrogen transfer assisted dual emission in a carbazole-embedded porphyrin-like macrocycle (*Chem. Commun.* **2021**, *57*, 4420-4423). Further, we also employed a carbazole containing key building block to disclose two planar carbazole based hexaphyrin-like macrocycles which led to a box-shaped cyclic BODIPYs exhibit large Stokes shifts and excitonic coupling (*Chem. Commun.* **2021**, *57*, 11485-11488). Recently, a 1,4-Phenylene-linked cyclotrimer (**3T**) and cyclotetramer (**4T**) have been synthesized with disruption of annulenic conjugation in both **3T** and **4T** that prevented them from global antiaromaticity (*Org. Lett.* **2022**, *24*, 245−249). Two conformationally Distinct [26] Heterorubyrin (1.1.0.1.1.0) macrocycles and their *Bis*-BODIPYs were synthesized. Both BODIPYs shows near-IR emission identical to their parent free-base forms (*Org. Lett.* **2022**, *24*, 1000−1004).



Jerry Alfred Fereiro
Assistant Professor

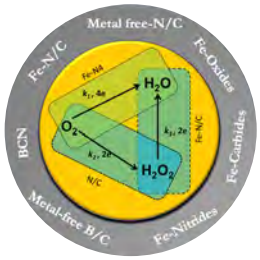
Bioderived Molecular Electronics

Our group at IISER TVM is an interdisciplinary research group that focuses on the design and development of bio/molecular electronic junctions, which will enable us to study their use as circuit elements in working devices. The group's main motivation will be extended from the fundamental understanding of concepts at the molecular level to proof-of-principal electronic devices with new electronic functions not possible with conventional semiconductor electronics. As the feature size of the electronic components approaches the molecular scale, quantum tunneling (and other quantum effects) begin to dominate. Therefore, the length of the current path studied will be of molecular dimensions (< 10nm). Much effort will be extended to understand the mechanism(s) of charge transport over long distances. The recent focus of the group is to understand the role of amino acid units in charge transport for protein molecules devoid of redox centers such as BSA and HSA. Another focus is in the direction of designing and synthesizing organic molecules (Phthalocyanines) with different anchoring groups to the contact electrodes, meaning different coupling constants, so that the rectification and the charge transport properties via the organic molecules can be controlled and tuned.

A Muthukrishnan
Assistant Professor

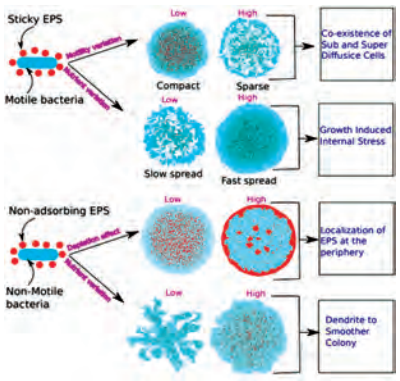
Electrocatalysis for the energy conversion and storage devices

Oxygen reduction reaction (ORR) is one of the most studied reactions in the electrocatalysis. The most abundant element oxygen is used as the oxidizing agent in the low-temperature hydrogen fuel cells. Typically, platinum-based catalysts have been used to improve the ORR kinetics, limiting large-scale commercialization of fuel cells for energy applications. Understanding the ORR mechanism and the active sites information on the NPGM or metal-free catalysts are the real bottlenecks for the development of highly active and durable Pt-free catalysts for the ORR. Despite the series of attempts to characterize the active sites and ORR mechanism, the conclusions are not clear and lead to debate.



Our research group is working on fundamental aspects of ORR, characterizing the active sites and mechanism of the Fe-N/C and N-doped carbon catalysts, via the kinetic analysis. A bottom-up approach to describe the role of various possible entities present in the heat-treated heteroatom doped Fe-containing catalysts is individually studied. The iron oxide on porous carbon support for its role in ORR was studied. Also, the mechanism of the synergistic effect on the two heteroatom-doped (boron and nitrogen) metal-free carbon catalysts. To specific, the BCN materials are studied, and its kinetic analysis reveals the mechanism of the synergistic effect. The defects on the carbon substrates towards ORR activity are analyzing 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.

Theoretical chemical and biological physics: Statistical mechanics and Nonlinear dynamics



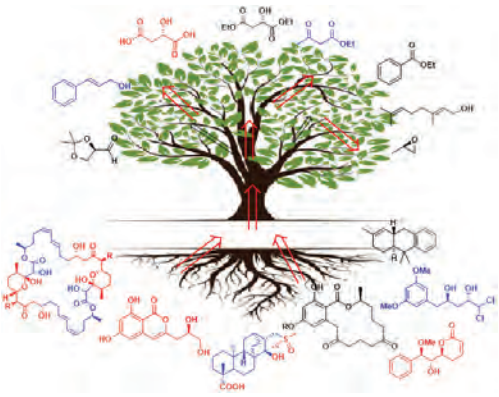
Pushpita Ghosh
Assistant Professor

In our group research efforts are carried out across two different broad areas under a common theme to explore the spatiotemporal dynamics of complex systems of chemical and biological interest. In the first area, currently, we are investigating, how external electric fields and fluctuations can create and modify self-organized spatial patterns in chemical reaction-diffusion systems. We used analytical approaches and numerical simulations to understand the spatiotemporal dynamics. The other broad area of research is focused to explore spatiotemporal dynamics of microorganism bacteria in multicellular levels. Colonization and biofilm formation is a universal trait in most bacteria and several intrinsic and extrinsic factors regulate this process. Hence, it is critically important to be able to predict the conditions under which bacteria transition from one state to the other or coexist. To address this issue, here, we develop a particle-based model to decipher the influence of motility-mediated dispersal and biofilm formation facilitated by the self-produced EPS. Using this model, we establish predicting how the biofilm formation depend collectively on non-uniform growth and heterogeneous production and the physicochemical properties of EPS, cell motility and the mechanical interactions among the components and with the surrounding. Despite its simplicity, our model thus provides a key step towards predicting and controlling spatial morphology of a growing biofilm in diverse and complex settings.

Asymmetric Total Synthesis

Goreti Rajendar
Assistant Professor

Developed new synthetic protocol for enaminones by a systematic investigation, solvents influence and mechanistic aspects were explored.



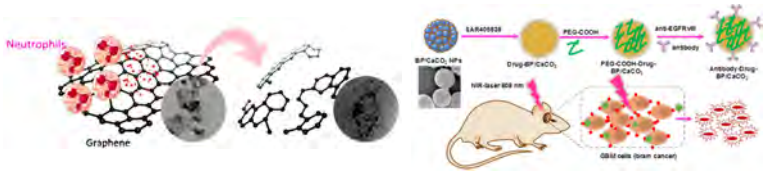
A systematic investigation on chelation effect in Julia-Kociensky reaction was studied: Quaternary salts were used as non-coordinating counter ions.

A new Proline based chiral auxiliary was developed for asymmetric acetate aldol reactions, and it was applied in the total synthesis of citreochlorols.

The aromatic polyketides like diaportinols and citreochlorols were synthesized for the first time and their absolute structures were established.

Biomaterials, Nano-Immune Interactions

Rajendra Kurapati
Assistant Professor



Our group research interests lie at the interface of Materials Chemistry, Biology and Bioengineering. Nanomaterials have revolutionarily expanded the spectrum of biomedical applications. However, the long-term fate of these nanomaterials in the organism is not understood and their inertness prevents biodegradation. Subsequently, the clinical translation of this nanomedicine is seriously hampered. Keeping the "biodegradability of the nanomaterials" as a primary objective for biomedical applications, our major research will first focus on understanding the biodegradability or biotransformation of highly studied nanomaterials.

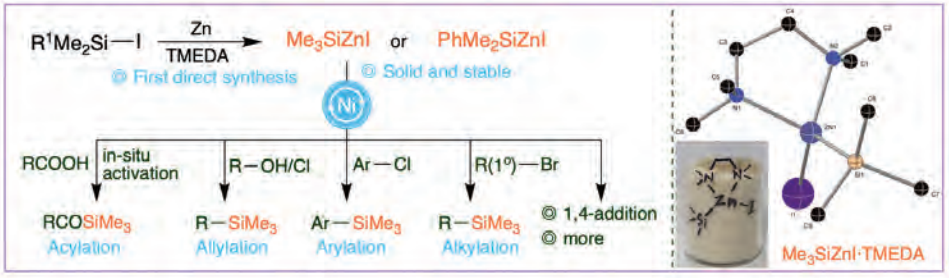
Biodegradation of Emerging 2D Nanomaterials: Biodegradability of pristine and surface-functionalized 2D materials will be carried out using neutrophils and macrophages including mouse models. The expected results could help to understand the in vivo biotransformation of 2D materials, thereby helping to design better the biomaterials for potential applications such as degradable drug delivery and photothermal theranostics systems.

Biodegradable Drug Delivery Systems: Multifunctional biodegradable drug delivery systems will be developed using the 'Safe-by-Design" approach. We currently have a project from DBT entitled "Hybrid Black Phosphorus and $CaCO_3$ Nanoparticles for Synergistic Chemo-photothermal Therapy" (through Ramalingaswami Fellowship 2021-26).

Graphene Composite Antimicrobial Coatings: Antimicrobial and antifouling coatings will be developed using the inherent antimicrobial properties of 2D materials and antimicrobial peptides or polymers.

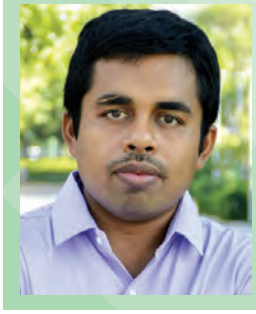
Ramesh Rasappan
Assistant Professor

Asymmetric Catalysis, Cross-coupling reactions

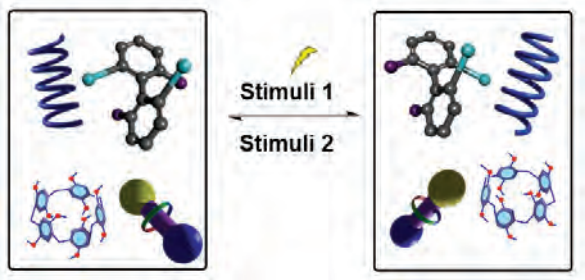


The construction of C-C bond is a fundamental process in pharmaceutical industries. The group of Dr. Ramesh Rasappan focus on nickel mediated cross-coupling reactions to forge C-C bond. Subsequently, the new methodology gets extended to the synthesis of bioactive molecules. Recently, the group introduced a new solid silylating reagent which overcomes the existing issues in handing the highly reaction silyl anions. The group also carried out a detail mechanistic study of enantiospecific silylation where it was found that the AgF attenuates the decomposition of Ni(0) species. The group also took advantage of modern C-H activation and photocatalysis: A dual catalytic nickel and photoredox catalysis was developed. A large library of alkyl aldehydes were coupled with alkyl pyridinium salts via acyl radical generation. An inexpensive tungstate catalyst was employed for the selective C-H activation.

Supramolecular Chemistry



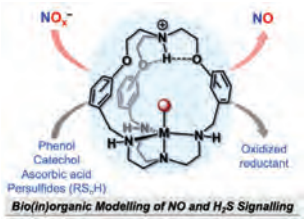
Soumen De
Assistant Professor



Our research primarily focuses on the inter-disciplinary field of dynamic supramolecular chemistry, including molecular switches and machines, abiotic foldamers and their host-guest properties, and stimuli-responsive dynamic materials. In doing so, we would like to expose essential features of dynamic systems in biology and develop know-how in the design that will be critical in realizing the potential of supramolecular systems. To control the dynamic properties of our systems, we are interested in exploring new switchable architectures. In our research, we apply methods from synthetic organic chemistry to create our building blocks and use different non-covalent interactions and dynamic covalent chemistry to decorate the suitable functional groups at the desired position. Thus, it will help expand the toolbox available for practitioners in supramolecular chemistry to control the structures and motions at various scales. We would also like to regulate the structure and motion to create new dynamic materials, discover their emergent properties, and perform valuable tasks by modulating different supra-molecular interactions.

Bioinorganic Chemistry, Reaction Mechanism Investigation

Subrata Kundu
Assistant Professor

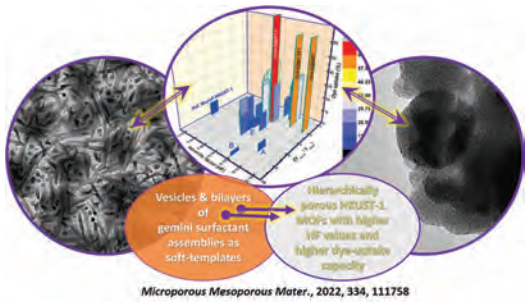


Bio(in)organic Modelling of NO and H_2S Signalling

The Bioinorganic Research Group at IISER Thiruvananthapuram, led by Dr. Subrata Kundu, explores the transformations of various reactive sulfur, oxygen, and nitrogen species (RSONs) to decode the molecular level views through which biology implements complex signalling activities. A recent article by Kundu and coworkers (*Chem. Eur. J.* **2022**, *DOI: 10.1002/chem.202200776*) employs a tripodal [Zn^{II}] complex to illustrate the potential role of a zinc(II) site in the transformations of organic polysulfides (RS_nR) including thiol persulfidation in the presence of sulfane sulfur species as the formal oxidant. Thus, this study adds a new dimension regarding the possible role of [Zn^{II}]-based coordination motifs such as carbonic anhydrase in sulfane-sulfur management in the biological systems. Another recent report published in *Eur. J. Inorg. Chem.* **2022,** *15*, e202200105, *DOI: 10.1002/ejic.202200105* illustrates that a protonated nitrito-copper(II) cryptate featuring a κ^1-O binding mode of nitrite, which is hydrogen bonded to an ammonium moiety in the second-coordination-sphere. We also demonstrate the reactivity of ene-diol antioxidants (such as L-ascorbic acid, Gallic acid, catechol) towards nitrite anion coordinated to cobalt(III) and cobalt(II) sites, thereby providing insights into two important biochemical transformations, namely NO generation from nitrite and ene-diol oxidation (published in *Inorg. Chem.* **2022,** *61*, 8477-8483).

Materials Chemistry

Thirumurugan A
Assistant Professor

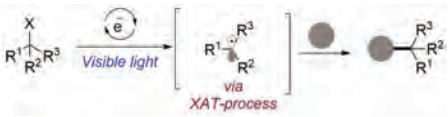


Microporous Mesoporous Mater., 2022, 334, 111758

Presence of hierarchically connected pore structures enhance the utilization of porous materials such as metal-organic frameworks (MOFs). Soft-templated synthesis has been a widely used method where surfactant based molecular self-assemblies act as templates to introduce mesopores in the intrinsically microporous MOFs and thereby generate hierarchical porosity (HP). Our investigations explore the formation of HP HKUST-1 MOFs by using two gemini surfactants, G16 and G14 as soft-templates. Depending on the relative ratio of the W:E compositions and the gemini surfactants, we have employed additional parameters such as temperature, reaction time and reactant compositions that crucially influence the nucleation and growth factors to achieve HP. Our investigations indicate the formation of a unique type of HP structures including the ones which have formed via a vesicular based soft-templation mechanism in our samples. Calculations of hierarchy factor (HF) based on the gas-sorption data and a bulky Rhodamine based dye-uptake study have been carried out to demonstrate the presence of the mesopores. A direct relation found between the HF values and the dye-uptake in our HP samples indicate that HF can be used as a quantitative marker of HP. Nanocomposites of HKUST-1, a microporous MOF and nanocellulose, NC, a biopolymer have been synthesized and explored for gas-seperation and dye-sorption applications. Copper ion pre-seeded and carboxylate anchored NC fibres, have been used as substrates in which, the MOF crystallites are further grown *in situ* for a better interfacial integration between the MOF and the polymer matrices of the formed composites HKUST-1@NC.

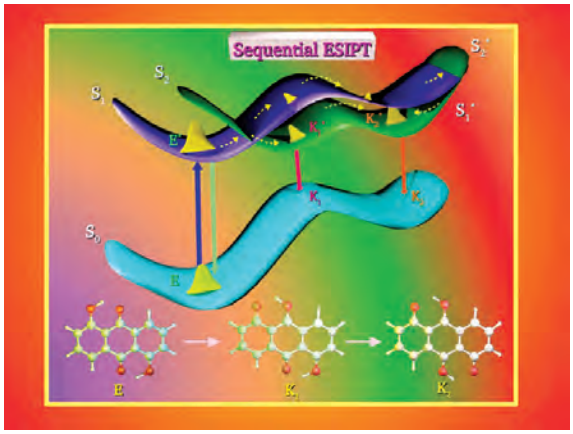
Veera Reddy Yatham
Assistant Professor

Development of new catalytic strategies in organic synthesis



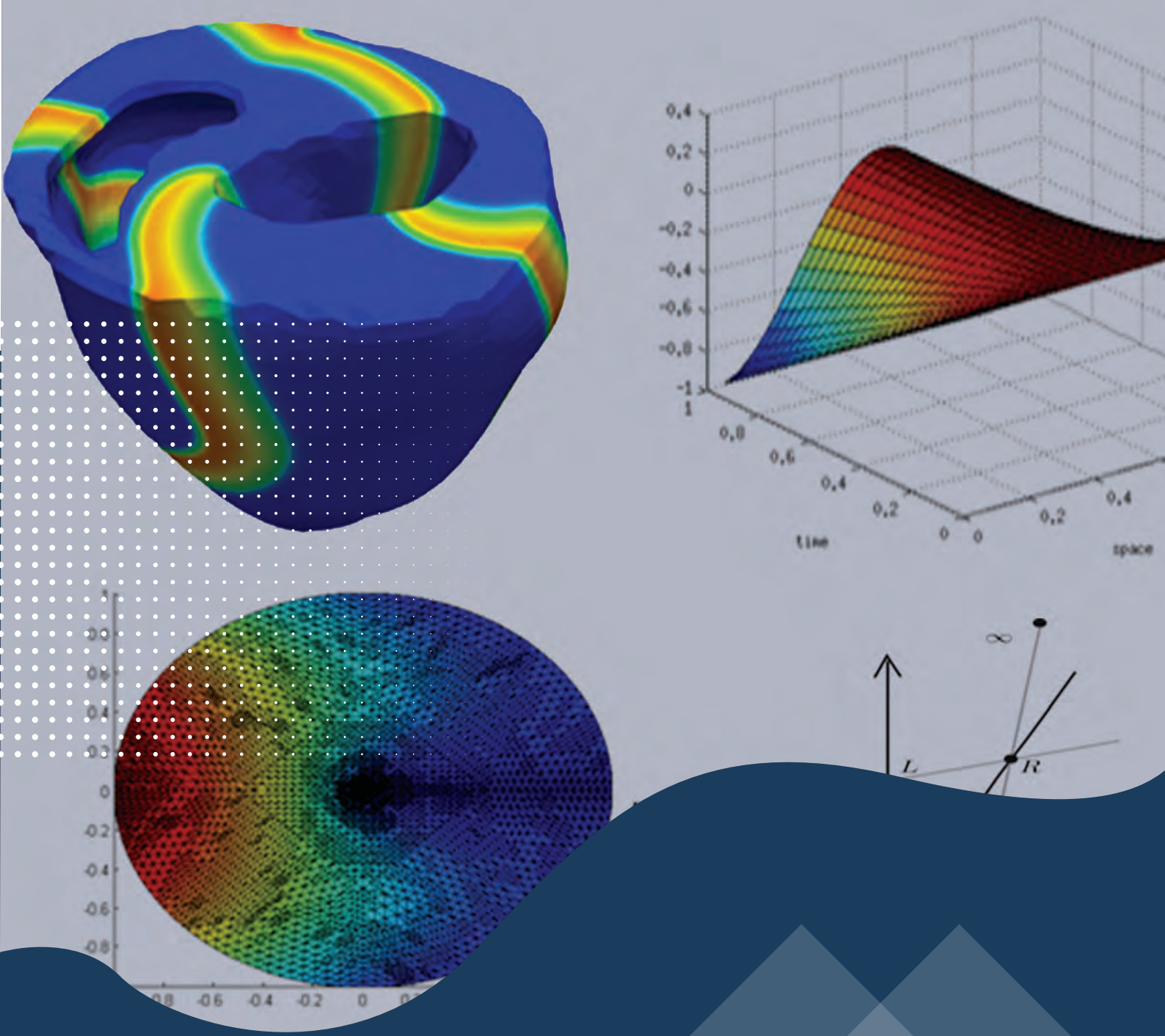
Our group mainly working on the development of new catalytic strategies for the generation of alkyl radicals from unactivated alkyl halides through photoredox catalysis. A wide variety of primary alkyl halides can be used as effective substrates in cross-coupling reactions through metal catalysis, but the secondary alkyl halides usually remain as challenging substrates because of the side reaction of β-hydride elimination and other undesired reactions. Due to the significant importance of these reactions in constructing a number of key intermediates for pharmaceutical as well as natural product synthesis, the development of novel strategies is highly attractive. In this direction, our group utilized a recently developed halogen atom transfer (XAT) strategy for the activation of unactivated alkyl halides driven by visible light photocatalysis (*Org. Biomol. Chem.* 2022, *20*, 3136–314). Furthermore, the generated carbon radicals can be combined with a metal catalyst to offer C-C bond formation without the formation of β-hydride elimination products (*J. Org. Chem.* 2022, *87*, 5442–5450).

Theoretical and Computational Chemistry



Vennapusa Sivaranjana Reddy
Assistant Professor

Dr. Sivaranjana Reddy's group investigates photoexcited molecules' ultrafast photophysical and photochemical events using model Hamiltonians and dynamics simulations. The main focus is on two events, excited-state intramolecular proton transfer and triplet state generation. Multiple pathways associated with the nonadiabatic proton transfer in 3-hydroxychrmonone derivates have been identified. Those pathways are responsible for the multiple fluorescence emission in these molecular systems. Singlet-triplet dynamics of planar and twisted perylenedimides are currently under investigation to elucidate the effect of twist angle on the triplet formation efficiency. Outcomes of these studies are of paramount interest for controlling and designing efficient lighting and display materials.



SCHOOL OF MATHEMATICS

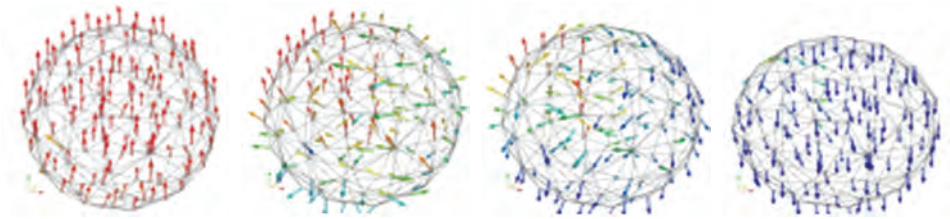
Group Theory Commutative Algebra and Homological Algebra

Viji Z. Thomas
Associate Professor & Head of Department

Group Theory, Homological Algebra and Commutative Algebra: For the last few years, we have been working on Schur's exponent conjecture and related topics. In our latest work, we use a novel approach to study the size of the Schur Multiplier by graph theoretic methods.

Utpal Manna
Professor

Stochastic Partial Differential Equations Fluid Flow Problems

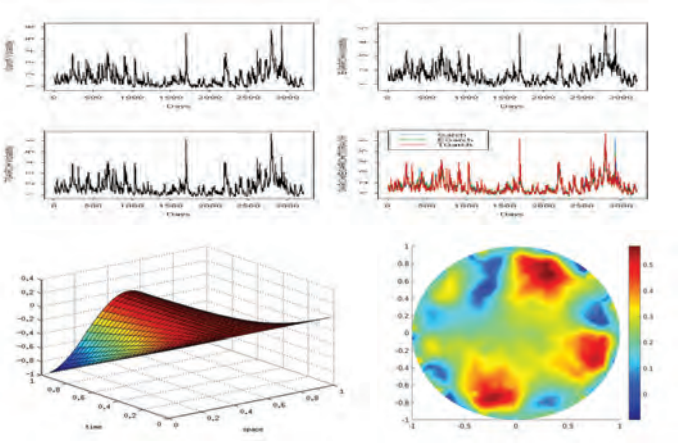


Dr. Manna works in stochastic partial differential equations arising mostly from fluid dynamics, magnetisation and other physical problems (e.g. Navier-Stokes equations, magneto-hydrodynamic systems, Landau-Lifschitz-Gilbert equations in ferromagnetism, nematic liquid crystal model, Schrodinger equation, viscoelastic fluids etc.) driven by Wiener or Levy processes. He studies 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.

Cancer Research
Financial Engineering
Inverse Problems
Data Science and Machine Learning
Numerical Functional Analysis

M. P. Rajan
Professor

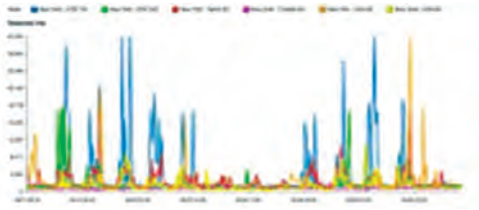
His research focuses on Inverse Problems, Numerical Functional Analysis, Financial Engineering, Mathematical Finance, Statistical and Econometric Modeling, Data Science Research, Machine Learning, Mathematical Biology (Cancer Research), Parameter Identification Problems in PDE, Singular Perturbation problems in PDE, Image processing and Tomography. He also offers consultancy work in the financial domain/ financial engineering, Data Science Research and Machine Learning.



Harmonic Analysis
Sampling and Reconstruction
Duality Principle

P. Devaraj
Associate Professor

Harmonic Analysis: The 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 main focus of the analysis has two parts namely analysing the range of such operators and providing suitable methods for reconstruction of a continuous function when its local moving averages are given.



Sampling and Reconstruction/Wavelet Analysis: This is one of the cutting edge research in Mathematics of Signal processing. In order to transmit analog message signals like voice and video signals by digital means, the signal has to be converted to a digital signal. Such process requires sampling. The research focus upon reconstruction of the analog signals from their samples (or local weighted average samples) over various signal classes like shift invariant spaces, spline spaces, wavelet spaces and multiply generated shift invariant spaces.

Sachindranath J
Associate Professor

Linear Algebra
Matrix Analysis

Sachindranath's research interests are in linear algebra and matrix analysis. His current interests are in the following topics:

(1) Structure and linear preservers of certain positivity classes of matrices: Linear preservers of copositive and completely positive matrices pose very interesting questions. A complete answer to what are called into preservers seems quite elusive. I have only been able to get an affirmative answer when n = 2.

(2) Matrix polynomials.

(3) Linear algebra and dynamical systems.

Complex Dynamics
Ergodic Theory
Analysis on Symbolic Spaces

Shrihari Sridharan
Associate Professor

Holomorphic, non-invertible dynamical systems of the Riemann sphere are surprisingly intricate and beautiful. Sridharan's research interests focus mainly on such complex dynamical systems. His work comprises of various aspects in finer analysis of Julia sets of maps: polynomials, rational functions etc., both open and closed. He also works on systems of holomorphic correspondences, correspondences generated by a finite rational semigroup and associated ergodic theory. His research interests include, but are not limited to:

Dynamics of rational maps on the Riemann sphere (open and closed);

Random dynamics in various settings;

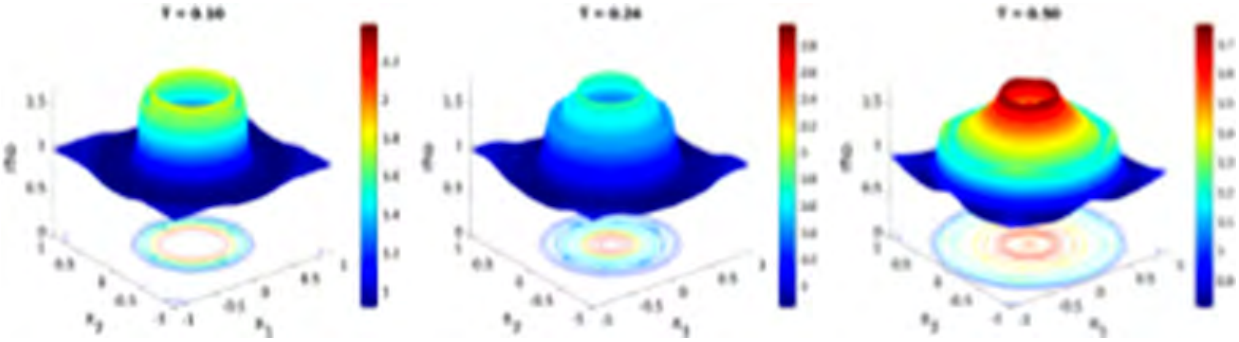
Dynamics of holomorphic correspondences;

Analysis on the symbolic space;

Ergodic theory.

K. R. Arun
Assistant Professor

Hyperbolic Systems of conservation laws
Asymptotic preserving schemes
Genuinely multidimensional numerical schemes
Nonlinear waves and shock waves



The broad area of my research is the study and numerical simulation of physical systems governed by nonlinear partial differential equations. My current research consists of the following three themes:

- Asymptotic preserving schemes for singular hydrodynamic models of fluids and plasma fluids
- Genuinely multidimensional finite volume schemes for hyperbolic systems of conservation laws
- Geometric partial differential equations for modelling evolving interfaces

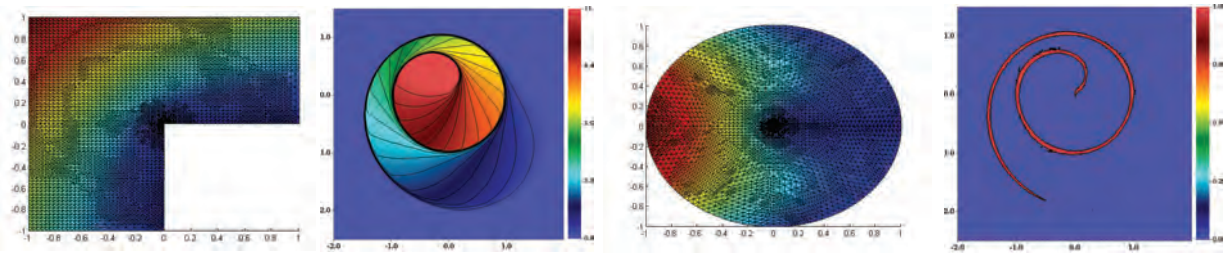
Elliptic PDE's
Non-linear Analysis

Dhanya Rajendran
Assistant Professor

Dr. Dhanya Rajendran works on the area of Elliptic PDE's focusing on the existence, uniqueness and multiplicity of solutions of nonlinear PDE's. Dr. Dhanya is also interested in the qualitative properties of the solutions of the PDE.

Numerical analysis
Adaptive FEM for PDE
Optimal Control Problems
Convergence Analysis

Dond Asha Kisan
Assistant Professor



Asha Dond interests include the study of 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.

Combinatorial representation theory
cellular algebras.
Coxeter groups and complex-reflections

Geetha Thangavelu
Assistant Professor

Representation Theory of finite groups and finite-dimensional algebras. My main focus is on Schur-Weyl of classical groups and diagram algebras and theory of cellular algebras. Recently, my interest is on the representation theory of certain class of finite groups and algebras like Ariki-Koike algebras, complex-reflection groups and alternating groups.

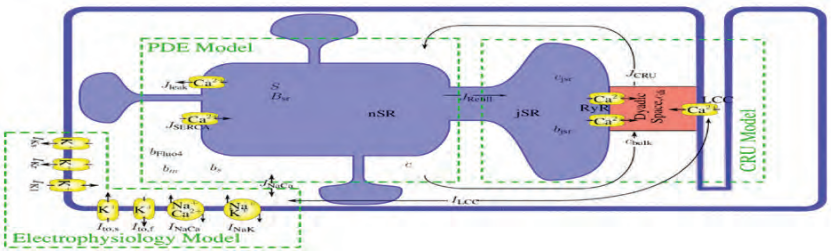
Operator Theory
Functional Analysis

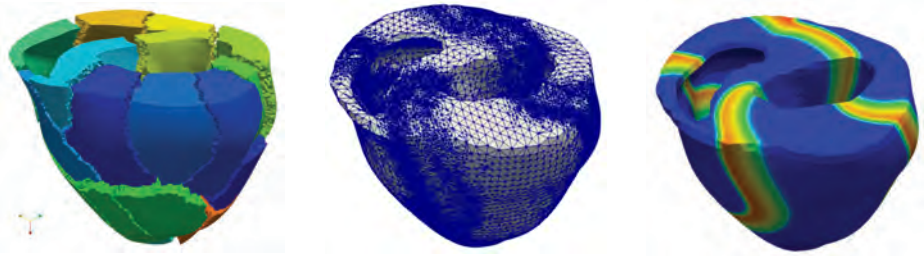
Md. Ramiz Reza
Assistant Professor

My research interests are in Operator Theory, Functional Analysis, Complex Analysis and in their interaction. More specifically, I am interested in operator theory on Hilbert spaces consist of analytic functions, Cowen-Douglas class of operators, study of Reproducing kernel Hilbert modules using tools of complex geometry, Dilation theory, study of subnormal operators, m-isometric operators, Operator Spaces, Interpolation problem.

Nagaiah Chamakuri
Assistant Professor

Numerical analysis and scientific computing
Optimal control of PDEs
Computational biology and High Performance Computing (HPC)
Computational fluid dynamics
Analysis, modeling and simulation of multiscale problems





My research group works to explore numerical tractability of bidomain equations, modeling and optimal control of electrical activity of the heart, analysis of partial differential equations (PDEs), finite element methods, multiscale modeling, and simulation of biological problems, and the development of computing technology for large scale problems. Also, our group works on the development of efficient and reliable numerical techniques for the solution of intracellular calcium dynamics, where the calcium signaling task is one of the important tasks of the cellular information processes.

Category theory
Differential geometry

My main areas of interest are differential geometry of Lie groupoids and stacks; in particular, the principal bundles over them and their connection structure.

Saikat Chatterjee
Assistant Professor

Sarbeswar Pal
Assistant Professor

Algebraic Geometry

Dr. Pal's research work and interest include various topics in algebraic geometry. Recently he is interested in investigating geometric properties of moduli space of vector bundles over surfaces, Brill Noether theory over algebraic surfaces and geometric questions on curves embedded in a surface, mainly embedded in K3 surface. Mostly he is interested in studying questions related to constancy of gonality sequence.

Partial Differential Equations, Control Theory, Game Theory, Viscosity Solution Theory, Navier Stokes' Equations/ Phase Field Models/ Fluid Flow Equations; Image Processing

Dharmatti Sheetal
Assistant Professor

Dr. Sheetal Dharmatti's 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 these works is to prove the existence of optimal control for a suitable control problem subjected to given equations. Currently we are looking at 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. Furthermore, the boundary control problem is being studied. Similar questions for the CHB system are being analyzed.

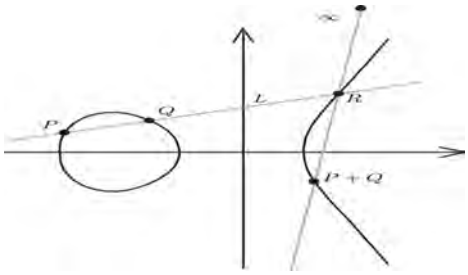
Srilakshmi K
Assistant Professor

Number Theory
Graph Theory and Combinatorics

Arithmetic Geometry: Elliptic curves, modular forms & Galois representations; Analytic, Algebraic and additive number theory; Graph Theory and combinatorics

Dr. Srilakshmi is recently interested in investigating the class numbers of certain algebraic number fields.

She is interested in the explicit version of Manin-Drinfeld theorem for some congruence subgroups of square-free level. She also studies modular degrees of elliptic curves and also the connections between the Fourier coefficients of certain new forms and the cardinality of the corresponding Shafarevich Tate groups. This has application to the Birch-Swinnerton-Dyer conjecture.



She also would like to study the sign changes of Fourier coefficients of certain modular forms by using analytic number theory techniques.

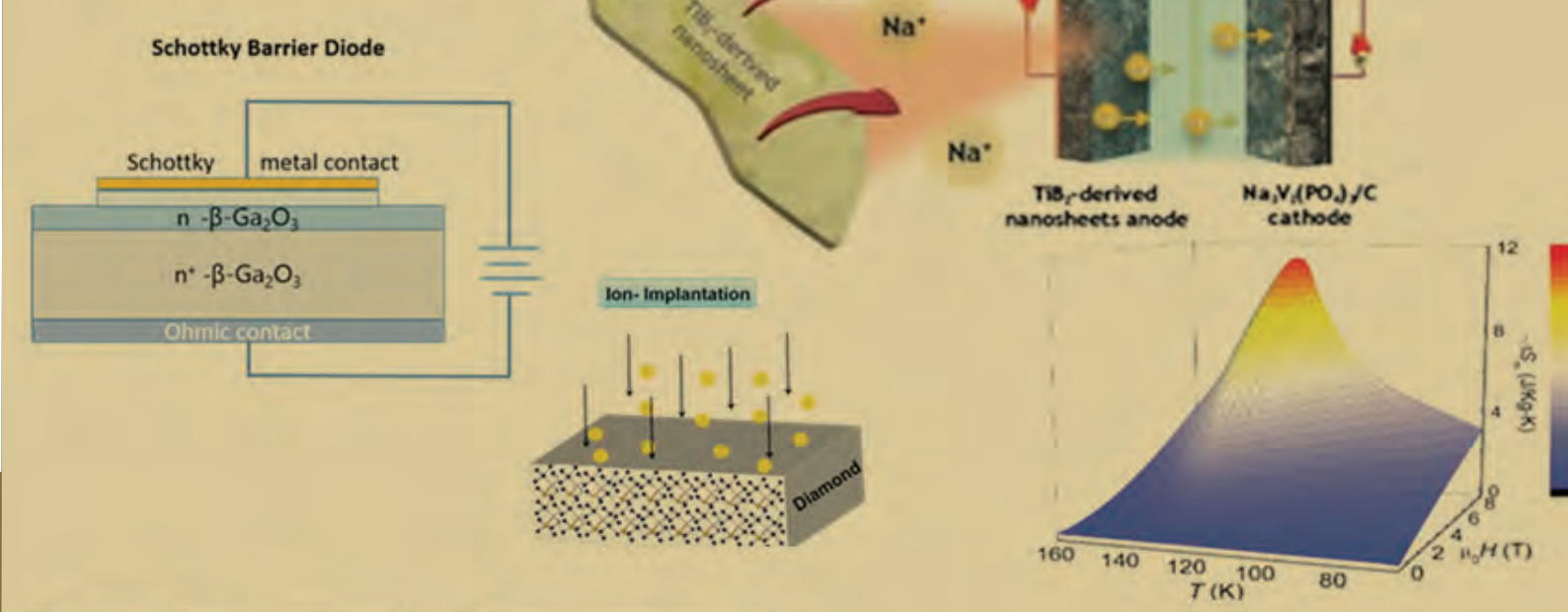
She is interested in analyzing the resistance distance of strongly connected, balanced digraphs.

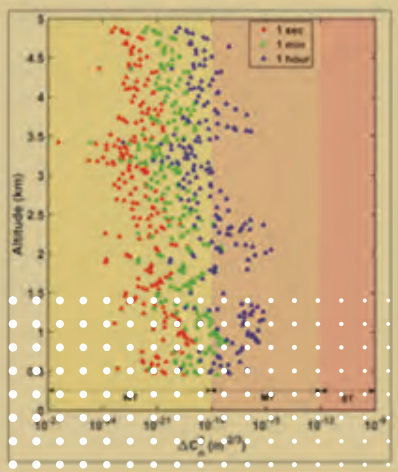
Numerical analysis & computational methods
Conservation laws with discontinuous flux
High-order methods for non-linear hyperbolic system of equations

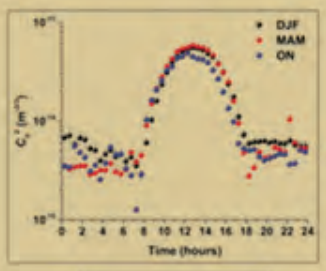
Sudarshan Kumar K
Assistant Professor

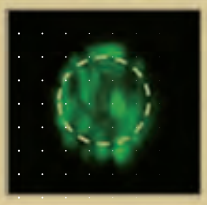
Dr. Sudarshan works in the area of partial differential equations with main focus on numerical analysis and computational methods for scalar and non-linear system of hyperbolic conservation laws. That includes:

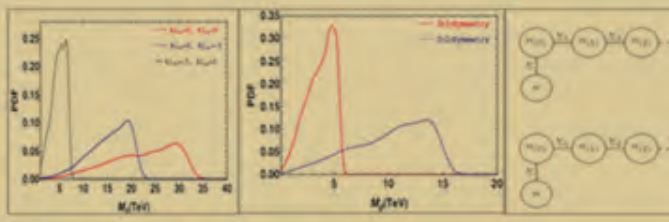
- Conservation laws with discontinuous flux
- Non-local traffic flow problems
- Enhanced oil recovery equations
- High-order numerical methods for system of equations











SCHOOL OF PHYSICS

Experimental Condensed Matter Physics

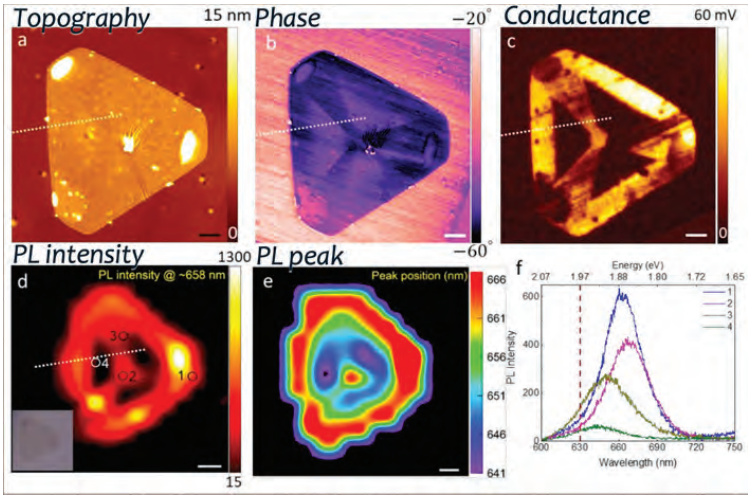


Fig 1: Spatially resolved multi-physics evidencing 3-fold symmetric phase segregation in single WS_2 flake

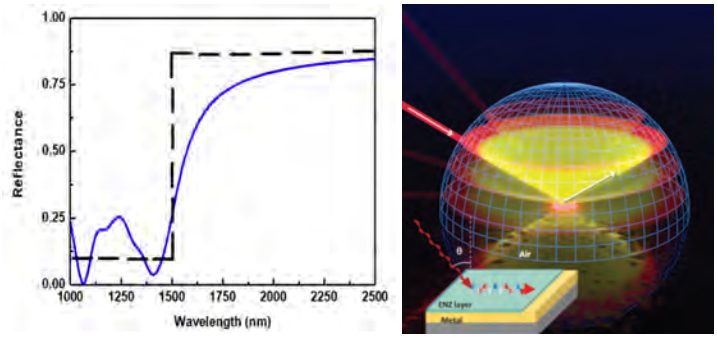


Fig 2: Control of directional and spectrally selective absorption and emission of metals using conducting oxides

Joy Mitra
Associate Professor & Head of Department

Dr Joy Mitra's Scanning Probe Microscopy and Plasmonics group primarily studies fundamental physical phenomena realised at surfaces and interfaces, and researches avenues for harnessing them for novel applications.

Multi-physics investigation of heterogeneity of spectroscopic and electrical properties in 2D quantum materials like WS_2 flakes via spatially resolved spectroscopic maps correlated with electrical, electronic and mechanical properties. These investigations provide thorough understanding of spatial heterogeneity in optoelectronic properties of 2D layered materials which are critical for device fabrication and potential applications.

Engineering optical properties of metallic surfaces using ultrathin, low loss, epsilon-near-zero films to induce direction and spectrally selective emission and absorption properties. The results show that appropriate choice of material (conducting oxides), film thickness and loss allows tailoring thin film modal dispersions, enables precise directional control and wide tunability in spectral range. Adv. Photonics Res. 2021, 2100153 (figure 2).

The group is also investigating eutectics of Ni-TiO_2 for optoelectronic applications, in collaboration with scientists from Institute of Electronic Materials Technology, Poland. 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.

Anil Shaji
Professor

Quantum Information Theory

Quantum Discord and related measures of non-classical correlations in quantum states, the dynamics of open quantum systems, molecular dynamics under strong coupling and modelling of Silicon quantum dot-based quantum computers were some of the main research areas taken up by Anil Shaji's research group during 2021-22. The group also worked on numerical modelling of coherent energy transfer between molecular system and continued work on developing machine learning based data processing algorithms for detecting pesticide residues from surface enhanced Raman spectra of vegetable and fruit extracts placed on a custom-designed plasmonic platform.

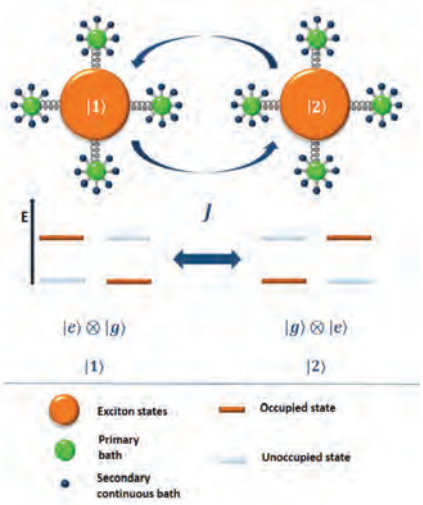


Fig 1: A structured environment of a pair of molecules can aid in preserving the quantum mechanical coherences in an exciton transfer process involving the two.

A comprehensive mathematical description of open quantum dynamics which is also computationally tractable and useful is a problem that has not been satisfactorily addressed yet when the dynamics has memory and is non-Markovian in nature. Research from the group showed that in certain types of open dynamics the trajectories of multiple initial states may intersect and at such points the traditional, first-order quantum master equations fail in describing the dynamics faithfully due to singular behavior at these points. Higher order master equations were proposed to address such scenarios effectively and this also led to a new measure of non-Markovianity in dynamics that is particularly useful when considering such singular dynamics.

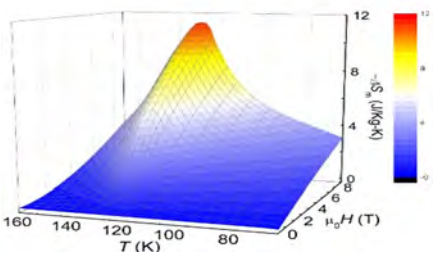
An interferometric setup with an effective nonlinear coupling between the beams of light in the device was analyzed in detail to see how robust against decoherence and noise is the quantum enhanced scaling provided by various states of light in the interferometer. An optimal state that gives quantum-enhanced measurement precision even in the presence of photon-loss noise was identified and characterized.

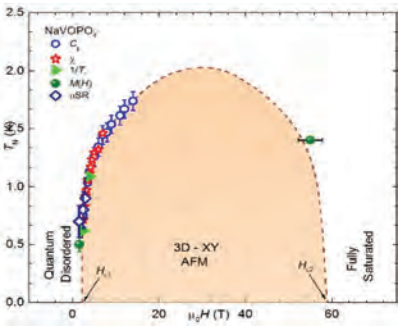
Identifying the resources that make mixed state quantum computing possible was another line of research taken up by the group. We found that in many structured quantum systems made of many qubits, the global entanglement in the states of these systems is connected to the non-classical correlations present 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.

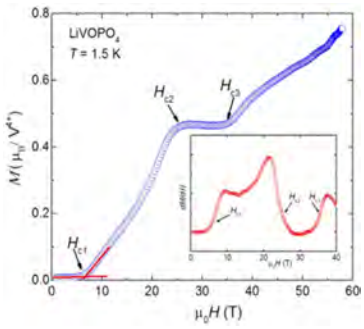
Exploring the concept of quantum Darwinism in the context of the quantum Zeno effect, looking for possible quantum advantages in distributed quantum machine learning scenarios and exploring the role of the immediate environment of a molecule in preserving quantum coherences in various energy exchange processes that it undergoes are some of the other major research directions pursued by the group in the past year.

Ramesh Chandra Nath
Professor

Experimental Condensed Matter Physics







The Quantum Materials Lab headed by Prof. Ramesh Nath 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.* in ultra high and low temperatures, under high magnetic field, and under high pressure.

His research group aims 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 found to be intertwined with each other in such a way that it leads to a variety of macroscopic properties which are having both fundamental and applied importance such as high temperature superconductors, spin liquids etc. One of the main focuses of his group is to investigate the novel quantum phases stabilized by competing exchange interactions in different low-dimensional (i.e. spin chain, spin-ladder) and frustrated lattices (i.e. triangular, kagome, pyrochlore etc.). Various experimental methods (such as magnetization, heat capacity etc.) are used to investigate the physical properties of the materials. To probe the microscopic spin-dynamics of these quantum materials, they use NMR as a powerful local tool.

They also apply various external non-thermal parameters such as high magnetic fields, chemical pressure (doping) etc to manipulate the ground state, which can eventually drive the system towards quantum critical point and in some cases even leads to exotic quantum phase transitions. They are also working on several intermetallic compounds with high temperature magnetic transitions to understand the nature of the magnetic transition and the associated magnetocaloric properties. Currently, they are also working on several rare-earth based quantum magnets. Strong competition between spin-orbit, on-site Culomb and crystalline electric field interactions, which are unique to these group of materials, can trigger various non-trivial quantum states such as Kitaev model, quantum spin-liquid state, mott-insulating state etc.

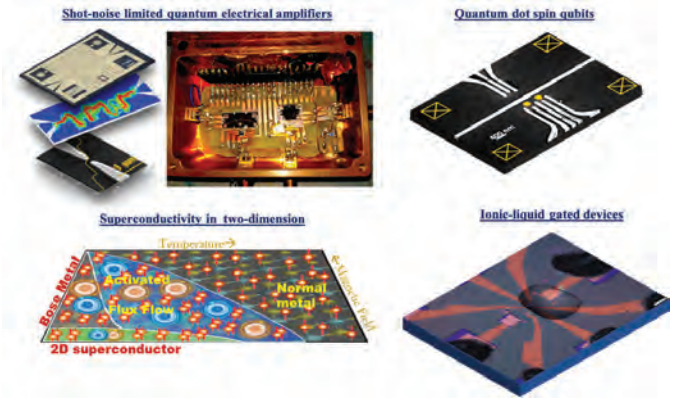
Bindusar Sahoo
Associate Professor

String Theory and Supergravity

Supergravity is a supersymmetric extension of gravity and arises as the low energy limit of string theory. For various purpose, an off-shell construction of supergravity is required which is facilitated by the formulation of conformal supergravity. Recently from the perspective of AdS-CFT correspondence, a lot of interest has arisen to study N=3 supergravity in four dimensions. In this direction, we have initiated a study of N=3 supergravity using the superconformal approach. Building on one of our earlier work, recently we have constructed the invariant action for the N=3 Weyl multiplet. In order to do that, we have used the method of covariant superforms to construct a density formula for N=3 conformal supergravity. We then embed the N=3 Weyl multiplet in this density formula to obtain an invariant action for the N=3 Weyl multiplet. This is published in JHEP 04 (2022) 001 along with my co-authors Subramanya Hegde and Madhu Mishra with the title "N=3 conformal supergravity in four dimensions"

Quantum Transport Laboratory

Madhu Thalakulam
Associate Professor



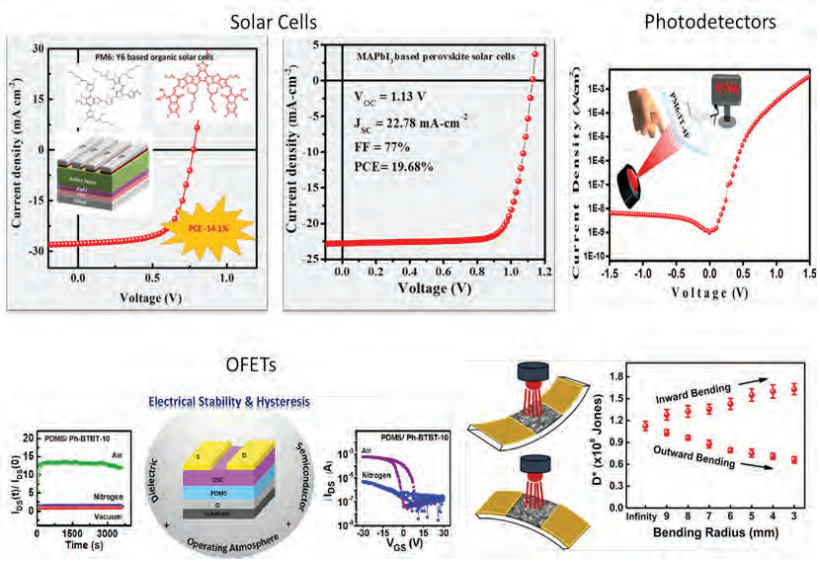
Electrical transport at quantizing dimensions is enriched by a number of exotic phenomena: quantum Hall effect, fractional quantum Hall effect, conductance quantization, flux-quantization, Aharanov-Bohm effect, single-electron tunnelling, topologically protected states, etc., are a few to mention. One important figure-of-merit of any scientific phenomena is its applicability in device technology. The outlook of our lab is to study, tailor, and utilize various quantum transport phenomena for improving our understanding of fundamental problems, pushing the limits, and revolutionizing device technology.

Major research directions

- Quantum transport: Transport in nanoscale devices such as QPCs, quantum dots, superconducting tunnel junction systems.
- High-frequency measurements: Radio-frequency reflectometry of nanoscale devices such as QPCs, Quantum dots etc.
- Solid state qubits: Single spin manipulation and detection in quantum dot qubits. Quantum measurement and back action in nanoscale devices.
- Devices on van der Waals materials and heterostructures

Manoj A. G. Namboothiry
Associate Professor

Photoinduced free carrier generation, recombination and optoelectronic properties of devices made using organic, organic-inorganic hybrid, 2D, nano and quantum materials.



Achieved an efficiency of ~ 14% for organic solar cells utilizing non-fullerene acceptors and 19.7% for perovskite solar cells. Charge carrier dynamics in organic and perovskite solar cells are studied by impedance and transient measurements.

Investigated the various factors affecting bias stress and hysteresis behaviour of an elastomeric gate dielectric based solution-processed OFETs and found that the choice of dielectric, semiconductor materials and different atmospheric conditions significantly affect bias stress and hysteresis.

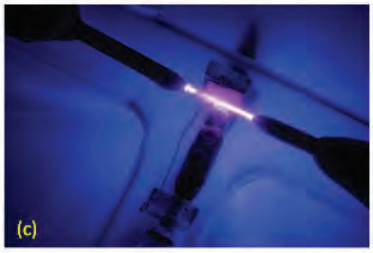
Realized the fabrication of self-powered NIR broadband photodiode with excellent photoresponse and low dark current density. The fabricated photodetector is used in photoplethysmography measurement, demonstrating its application in real-time heart-rate monitoring and pulse oximetry.

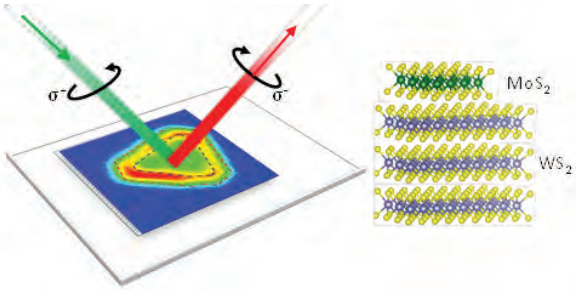
Fabricated high-performance flexible photodetector based on liquid-phase exfoliated MoS2 nanosheets, exhibiting fast and stable performance under ambient conditions. Efficient photoresponse is observed in MoS2 nanosheets based flexible photodetectors with different radii and repeated bending.

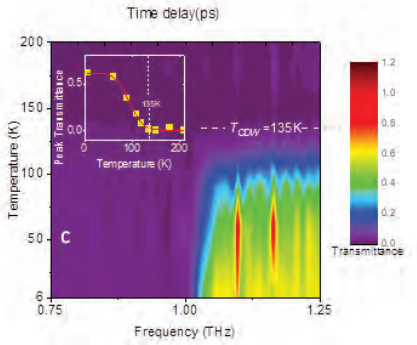
Demonstrated acetylammonium chloride as an additive to effectively control the morphology and crystal quality of the methylammonium lead iodide perovskite film and achieved better efficiency and stability in perovskite solar cells.

Rajeev N Kini
Associate Professor

Ultrafast and Terahertz Spectroscopy







Dr Kini's Ultrafast spectroscopy group focuses on Ultrafast phenomena in solids. Some of the areas that we are currently working on are:

- Ultrafast optical studies of emergent material systems (eg. TMDCs, perovskites and strongly correlated materials)
- Light-matter interaction in acoustic cavities
- Terahertz spectroscopy and imaging (for fundamental studies as well as industrial applications)

Terahertz time-domain spectroscopy (THz-TDS) provides a non-contact, non-destructive method for evaluating different materials and their properties. In a recent review article, the group discussed the commonly used numerical models for the non-destructive estimation of thickness, refractive index, surface and interface roughness of paints, thermal barrier coatings, and polymer coatings using THz-TDS in the reflection geometry. In a recent work, circularly polarised emission, with helicity opposite to the optical excitation, from a van der Waals heterostructure (HS) consisting of a monolayer MoS_2 and three-layer WS_2, was reported.

In yet another work, observation of a pseudogap behaviour in the hybrid chain-ladder compound, $Sr_{14}Cu_{24}O_{41}$ using THz spectroscopy was reported.

M M Shaijumon
Associate Professor

Hybrid nanostructures, Energy conversion and Storage

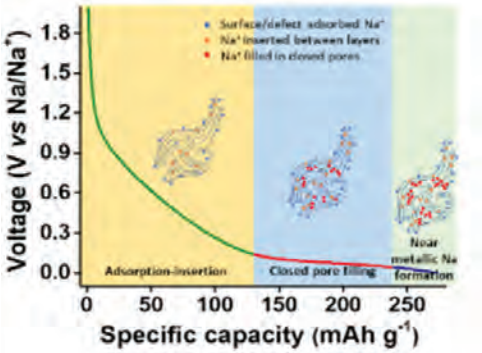


Illustration of sodium charge storage mechanism associated with different potential regions.

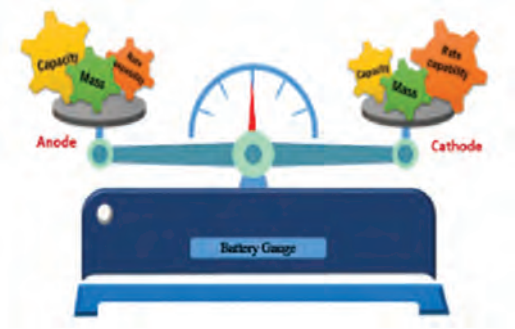
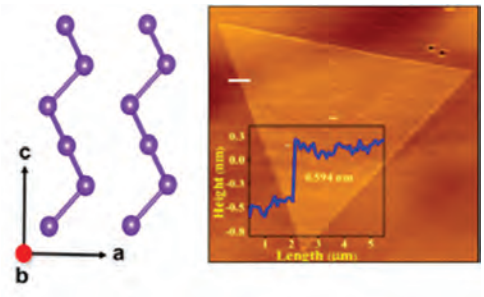
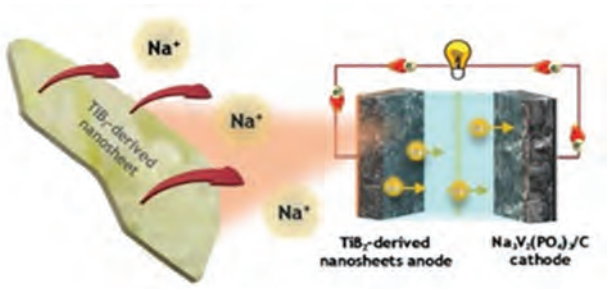


Table of contents image highlighting our recent work on electrode mass balancing studies



Ultrathin 2-dimensional Selenene

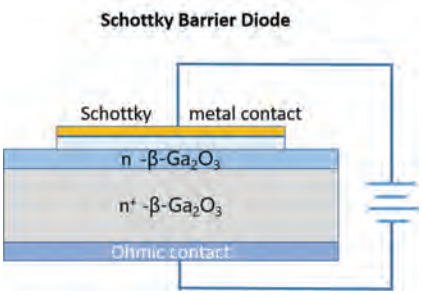


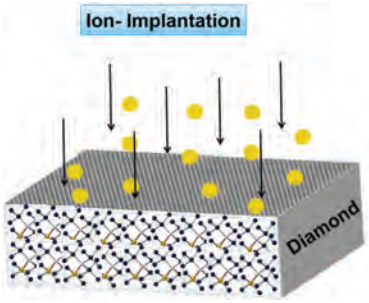
Metal boride nanosheets for Sodium ion batteries

In one of the works, we demonstrated a method to predict well-performing mass ratios of electrodes for a full-cell hybrid ion capacitor (HIC) by analysing the capacities of anode and cathode as a function of the actual current densities experienced by the individual electrodes. In another recent effort, sodium storage mechanism in hard carbon anodes is unveiled using samples with controllable open and closed pores that reveals strong correlation between plateau capacity of the sample and closed pore micropore nature. We further reported the growth of atomically thin, high crystalline 2-D selenene *via* a seed-assisted chemical vapor transport method. Density functional theory calculations support the experimental findings in establishing the structure and stability of the as-grown selenene. In another recent work on battery electrodes, titanium diboride-derived nanosheets prepared through a scalable non-classical recrystallization approach is explored as sodium-ion battery anode. The results uphold the theoretical predictions of boride-based compounds as potential anodes candidates for sodium-ion batteries. In another very recent study, we have shown a promising approach for the exfoliation of $BiSbSe_3$ nanostructures from the ball-milled $BiSbSe_3$ bulk sample using a bipolar electrochemical technique. Further, exfoliated $BiSbSe_3$ nanostructures were electrophoretically deposited onto a conducting substrate at varied applied potentials, and were explored as active electrocatalysts for HER in acidic solution.

Kumaragurubaran Somu
Associate Professor

Wide bandgap materials and Devices, Materials Informatics

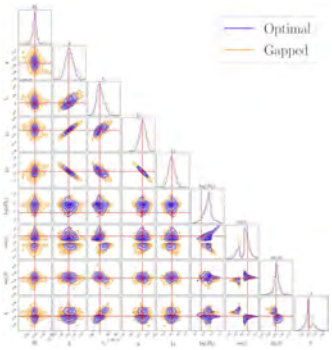




Wide bandgap materials and devices- Diamond, III-Nitrides and oxides. From the materials perspective, we address the correlation between the dopant/native defects and property and strive to improve the materials and device characteristics.

High-throughput techniques-Combinatorial synthesis: application to materials research-Materials information integration. To this end, we collaborate with international partners, to carry out preliminary work on the composition spread thinfilms. We actively collaborate with teams in various synchrotron radiation sources for our research.

Cosmology and Gravitational Waves

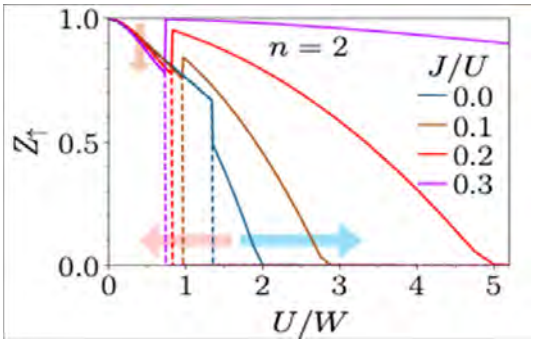


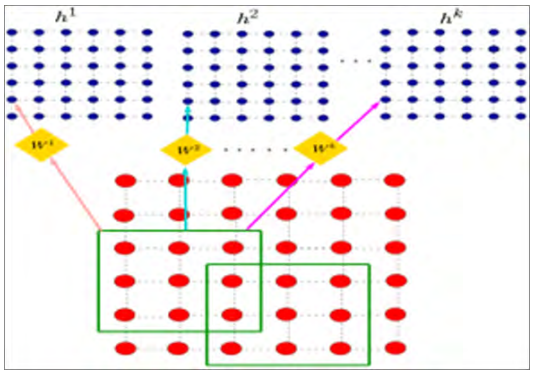
Soumen Basak
Associate Professor

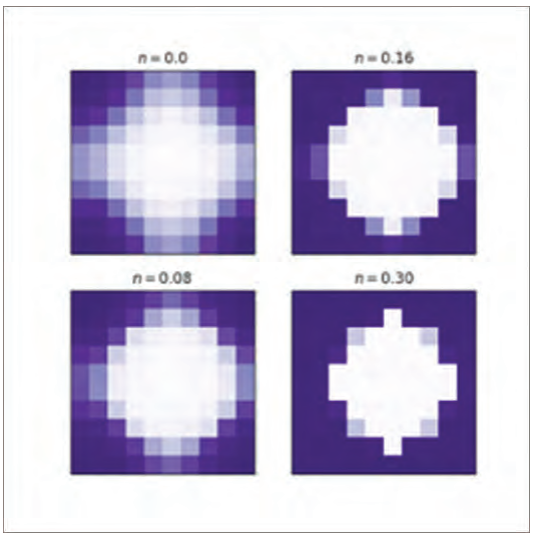
Dr. Soumen Basak's group primarily focuses on the estimation of source parameters from Massive Black Hole Binary (MBHB) signals. These signals are expected to be observed by Laser Interferometer Space Antenna (LISA), a space-based Gravitational Waves detector. One of the most challenging issues in LISA data collection and analysis is the data gaps. These are periods of time when the instruments onboard the spacecraft will not be functioning properly, either due to scheduled maintenance (scheduled gaps) or due to unforeseen issues that hamper the optimal operation of the instruments (unscheduled gaps). Using state-of-art models for astrophysical catalogs of MBHBs merging within LISA lifetime, we investigated this issue in detail. We followed this up with the calculation of Fisher Information Matrices (FIM) to investigate the effect of gaps on parameter estimation. We showed that depending on the GW signal; parameter estimation is possible using Bayesian inference even if gaps cover up a major part of the signal.

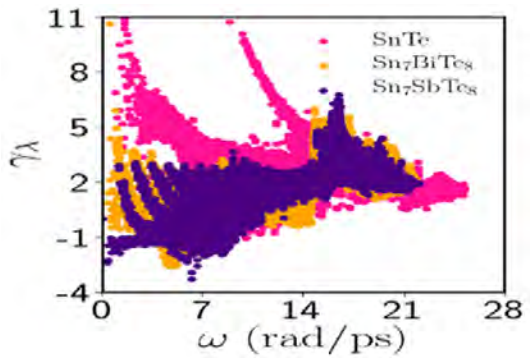
The group also focuses on the measurement of mass and radius stars. Binary stars are of particular interest in this regard, because astrometry and spectroscopy of a binary together provide the masses of both stars as well as the distance to the system, while interferometry can both improve the astrometry and measure the radii of the stars. We demonstrated by simulation parameter recovery from intensity interferometry, especially the challenge of disentangling the radii of two stars from their combined interferometry signal.

Condensed Matter Theory









Amal Medhi
Assistant Professor

Strongly correlated electron systems: How does the Hund's exchange coupling affect the electronic properties of a multi-orbital material where electron-electron correlations are strong? Can Hund's coupling lead to itinerant ferromagnetism? What happens when spin-orbit coupling is also introduced into the picture. Dr. Amal Medhi's group has addressed these questions and within multi-band Hubbard models using theories such as the slave-spin mean field theory.

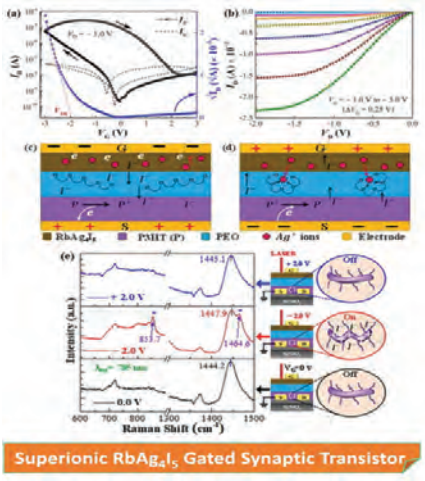
Machine Learning: The machine learning approach to learn quantum many body systems has been an exciting area. The group is studying various neural-network based wave functions to represent the ground state of the fermionic Hubbard model. Neural-network architectures, such as a feed forward neural-network, restricted Boltzmann machine (RBM) etc have been explored.

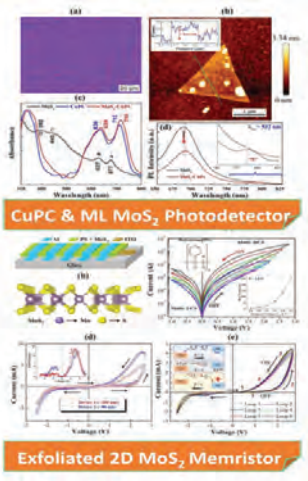
Unconventional Superconductivity: The group is studying the ground state properties of unconventional superconductors, proximity induced superconductivity etc., using the variational Monte Carlo (VMC) technique, a powerful numerical method.

Thermoelectric materials: Dr. Amal Medhi's group has explored the thermoelectric transport properties of some potentially high-efficiency thermoelectric materials using density functional theory (DFT) in conjunction with the Boltzmann transport theory. They studied the microscopic mechanisms behind various transport processes in an attempt to understand how to tweak the properties in order to enhance its thermoelectric figure of merit.

Bikas Chandra Das
Assistant Professor

Device Physics for Energy Efficient Electronic & Optoelectronic Applications





Our group explored many advanced and 2D materials for different exciting device applications in this period. The redox-exfoliated 2D MoS2 nanoflakes sample was used for the first time to fabricate thin film memristor devices following quick and easy process steps due to polar acetonitrile solvent compatibility. In that, random-access memory **(RAM)** application and emulation of synaptic actions were also demonstrated, which potentially depict information storage and data processing in a single device **(Nanotechnology 2021, 32, 35LT02).**

In another project, various artificial synaptic actions and data storage capability was demonstrated at low power using organic memtransistors using redox-polymer electrolyte or superionic RbAg4I5/PEO layer as gate dielectrics **(APL 2021, 119, 253502 & Scientific Reports 2022, 12, 3808)**. We have also developed thin film FETs using metal oxides as both the gate dielectric and active channel for ultra-low voltage operation and achieving high mobility value **(ACS Applied Nano Materials 2021, 4, 8050–8058 & Vacuum 2022, 199, 110963).** In another work, self-powered broadband photodetector operation is detected in ML 2D MoS2 flakes embedded below CuPC due to having type-II lateral heterojunctions with reasonably high figures of merit **(Applied Surface Science 2021, 568, 150818)**. In a collaboration work, we probed reversible polymorphic structural transition of crown-like nickel nanoclusters and its effect on conductivity **(Chem. Comm. 2021, 57, 2935-2938).**

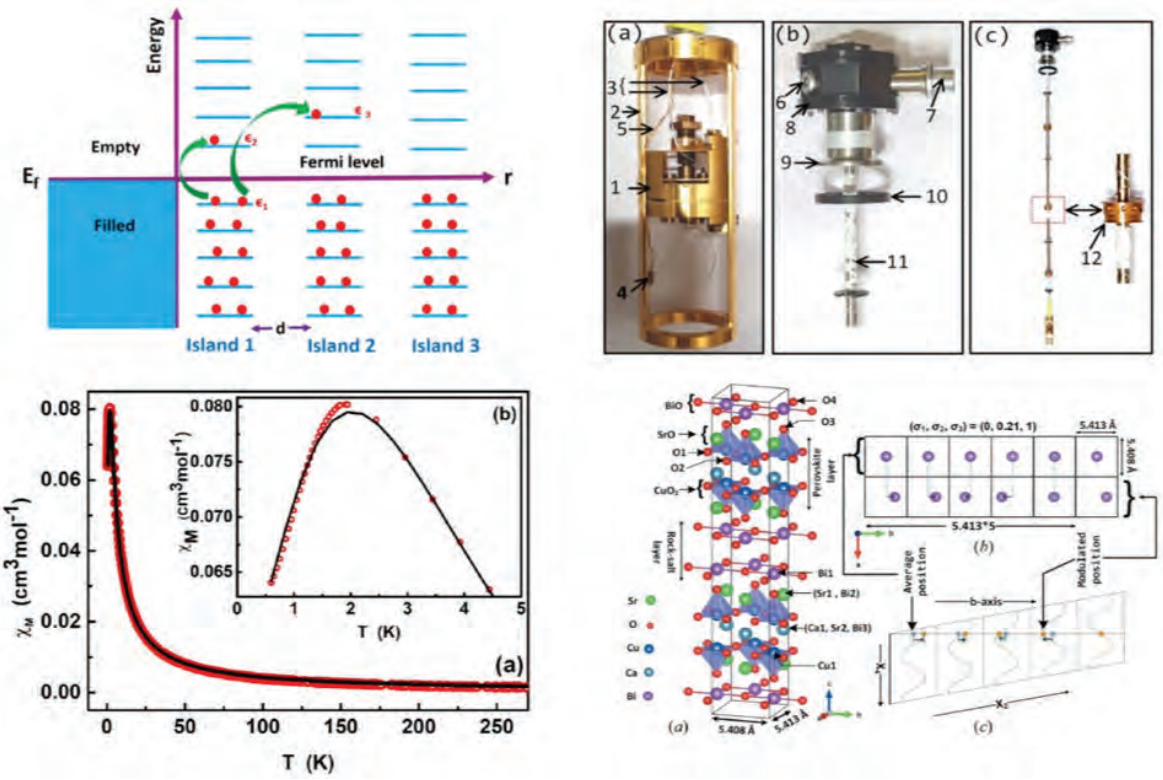
High temperature superconductivity, quantum phase transitions and charge transport at nano-scale

Deepshikha Jaiswal-Nagar
Assistant Professor

Our group has a wide-ranging research interest in different phenomena such as strongly correlated electron systems, vortex physics, quantum criticality, quantum information theory, superconductivity and physics at nanoscale. Some of our broad areas of interest include quantum phase transitions, entanglement in low dimensional spin systems, high temperature superconductivity, charge transport at nanoscales, nanocluster physics, hydrogen sensing and hydrogen storage. We 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.

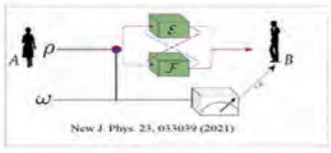
Our group is also working actively on the synthesis and characterization of green energy storage materials (nanocluster films, metal hydrides, intermetallic, and metal organic frame works) to meet up the DOE targets. Besides, high performance hydrogen gas sensors are also being developed in our lab. Recently, our group has published a high performance chemiresistive hydrogen sensor which has shown better sensitivity than the previously reported sensors.

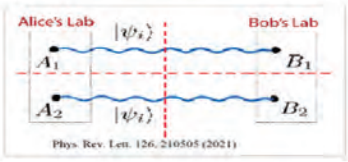
Our lab also specializes in state-of-the-art home-built set-ups like nanocluster deposition system, surface acoustic wave measurement set-ups, feedback based gas sensing set-up, capacitive dilatometry based thermal expansion measurement set-up in closed cycle refrigerators, detwinner-cum-annealing assembly etc. These projects are funded by the Department of Science and Technology and Indian Space Research Organization, Government of India.

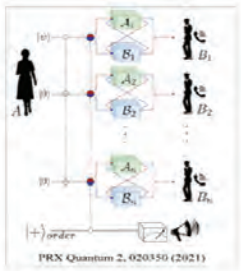


Manik Banik
Assistant Professor

Quantum Information Theory



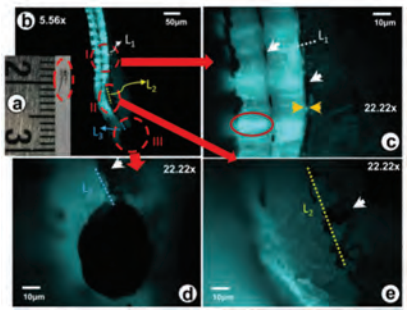


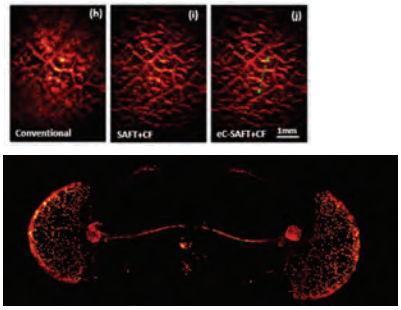


The standard model of communication in quantum Shannon theory generally assumes that the available communication channels are used in a definite configuration. In principle, however, quantum theory is compatible with scenarios where the configuration of the communication channels is in a quantum superposition. More recently, it has been observed that the superposition of channel configurations can also involve the order of the channels in time, in a scenario known as the quantum SWITCH. In a recent result we have shown that two independent instances of a noisy process can behave as a perfect quantum communication channel when used in a coherent superposition of two alternative orders [New J. Phys. **23**, 000039 (2021)]. This phenomenon occurs even if the original process has zero capacity to transmit quantum information. Quantum internet technologies aspire to enable a client to access distant computing devices (servers) using noisy channels. In recent work we report application of quantum SWITCH in s communication scenario involving one sender but multiple receiver [PRX Quantum **2**, 020350 (2021)]. Our study opens up a potential use of indefinite causal order in distributed quantum protocols, such as multipartite quantum state transfer and entanglement distribution, which are promising for the emerging technology of the quantum internet.

Ensembles of composite quantum states can exhibit nonlocal behavior in the sense that their optimal discrimination may require global operations. For this composite system, we analyze multicopy adaptive local distinguishability of orthogonal ensembles in full [Phys. Rev. Lett. **126**, 210505 (2021)]. We also come up with ensembles whose discrimination under an adaptive separable scheme require less numbers of copies than adaptive local schemes addressing a long standing open question on local distinguishability. Our construction finds important application in multipartite secret sharing tasks and indicates toward an intriguing superadditivity phenomenon for locally accessible information.

Biomedical Instrumentation and Imaging Lab. (BIIL)





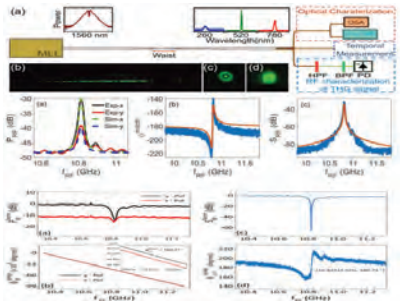
Mayanglambam Suheshkumar Singh
Assistant Professor

Our research group – Biomedical Instrumentation and Imaging Laboratory (BIIL) – 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 um-mm) to clinical tissue sample (~cms). More specifically, the research group focuses on design and development (instrumentation) of non-destructive and non-invasive (multi-dimensional) imaging system for diverse applications including Biology, clinical diagnosis, and therapeutic treatments.

Ravi Pant
Assistant Professor

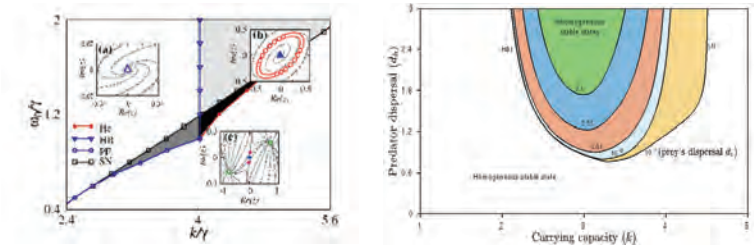
Nonlinear Optics and microwave photonics

The Laboratory of Phoxonics and Nonlinear Optics in Nanostructures is geared towards understanding of nonlinear optical phenomena in nanoscale waveguides, microresonators and exotic material platforms. Over the last year, we demonstrated cascaded optical nonlinearities in a dispersion engineered silica nanowire for realizing compact frequency combs over deep UV to NIR wavelength region. The work will enable photon-level spectroscopy, quantum interference and astrocombs in a compact platform.



In another studies, we exploited coherent Brillouin interactions between the Brillouin gain resonances in orthogonal polarizations to demonstrate a widely tunable, reconfigurable microwave photonic bandpass filter (MPBF) with high-resolution. Using the coherent interaction between the Brillouin loss resonances in orthogonal polarizations, we demonstrated a highly efficient microwave photonic notch filter (MPNF) with > 75 dB extinction using single sideband modulation and a Brillouin loss ~ 15 dB. Coherent Brillouin interaction based MPBF and MPNF find applications in Radar communications, 5G/6G mobile communications and radio-over-fiber.

Nonlinear Dynamics



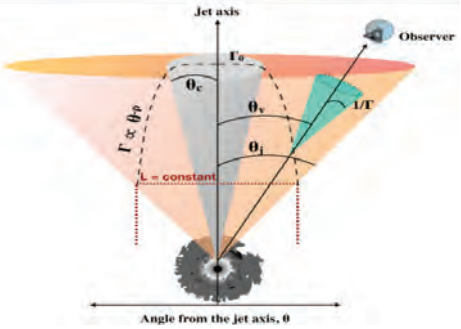
D. V. Senthilkumar
Assistant Professor

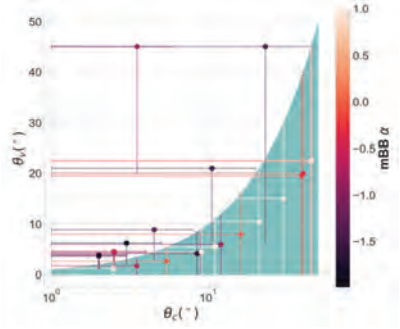
Phase diagram of population of pulse coupled Winfree model (left figure) depicting synchronous and asynchronous states. Phase diagram (right figure) of two-patch predator-prey metacommunity model illustrating homogeneous and inhomogeneous stable states for various prey's dispersal rate elucidating that the predator dispersal increases the metacommunity persistence, whereas the prey dispersal reduces it.

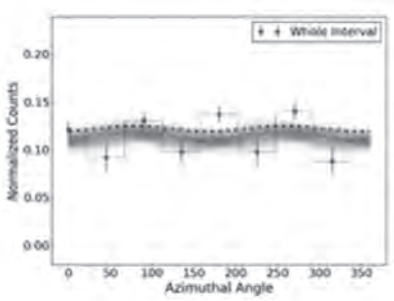
Developed various strategies to increase the dynamical robustness of coupled oscillator networks. Specifically, we have introduced a processing delay and a simple limiting factor in the coupling to develop a resilient network against local and global perturbations. These studies have resulted in publications in Nature communications, Physical Review Letters including several other articles and a review in Physics Reports. We have identified exotic types of chimera states, a hybrid state with coexisting coherent and incoherent domains emerging from an ensemble of identical nonlinear oscillators, in populations of coupled oscillators. We have also highlighted the resemblances of various chimera patterns with several neuronal patterns and neuro-pathological states in a coevolving (adaptive) network of phase oscillators. We are also working on the Prey-predator interactions to understand the persistence and extinction of the ecological communities under global environmental change and to develop strategies to improve the persistence of the ecological communities. Recently, we have reported the effect of limited prey's and predator dispersal on the metacommunicty stability. We are also working on the dynamics of epidemics on social networks and quantum manifestation of synchronization in ensemble of coupled systems and their applications.

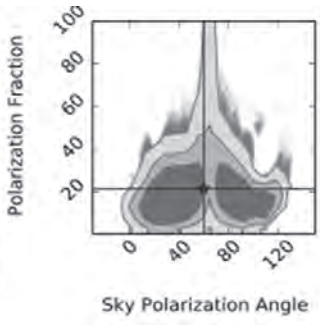
Shabnam Iyyani Syamsunder
Assistant Professor

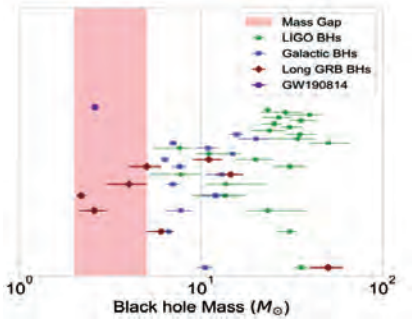
High energy gamma ray astrophysics











My expertise involves spectral analysis of the observational data in X-ray and gamma ray energy range, and modelling of the physics of the GRBs to enhance our understanding and subsequently solve the various mysteries regarding the underlying radiation process, dynamics of the outflow, where in the outflow is the radiation produced, nature of the central engine powering these powerful jets, the effect of viewing geometry on the observed radiation process.

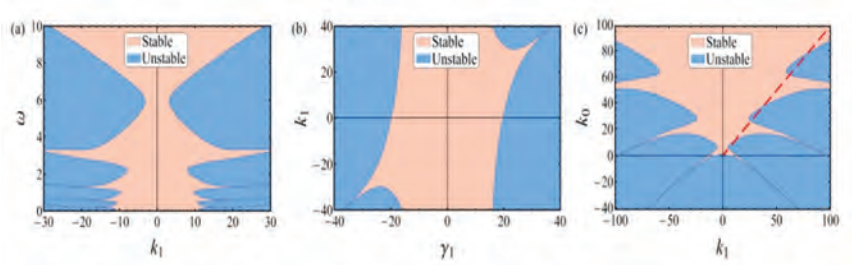
A machine learning (ML) based method for automated detection of Gamma-Ray Bursts (GRBs) in the AstroSat CZTI data was developed. We made use of dynamic time wrapping (DTW) to carry out template matching.

The prompt emission of short gamma ray bursts (sGRBs) with known redshifts are analyzed using the model of multi-color blackbody which is interpreted as the emission from a non-dissipative photosphere taking into account the structure and the viewing geometry of the jet. We predict the rate of coincident detection of bright short GRB along with gravitational waves to be around 0.19 - 2.89 events per year.

We identify 8 long GRBs with black hole as their central engine and estimate their masses to range between 2 - 60 solar masses. Particularly, we find that some of the lighter black holes formed in these catastrophic events are likely candidates to lie in the mass gap region (2-5 solar masses).

The spectroscopic measurements for the 11 bright GRBs of the first year of operation of CZTI were done and the results were found to be consistent with that of the other gamma ray missions.

Nonequilibrium Physics and Effective field theories



Sreedhar B. Dutta
Assistant Professor

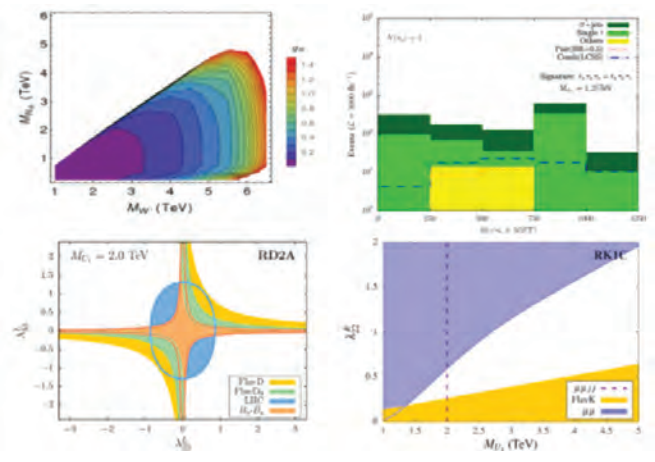
We investigated the asymptotic distributions of periodically driven anharmonic Langevin systems. Utilizing the underlying SL2 symmetry of the Langevin dynamics, we developed a perturbative scheme in which the effect of periodic driving can be treated nonperturbatively to any order of perturbation in anharmonicity. We spelled out the conditions under which the asymptotic distributions exist and are periodic, and showed that the distributions can be determined exactly in terms of the solutions of the associated Hill equations. We further found that the oscillating states of these driven systems are stable against anharmonic perturbations. The results are detailed in the publication titled "Oscillating states of periodically driven anharmonic Langevin systems" in Physical Review E 103, 062143 (2021).

Tanumoy Mandal
Assistant Professor

Particle Physics Phenomenology

[Phys. Rev. D 104, 035016 (2021)] The U1 leptoquark is known to be a suitable candidate for explaining the semileptonic B-decay anomalies. We derive precise limits on its parameter space relevant for the anomalies from the current LHC high-pT dilepton data. We consider an exhaustive list of possible B-anomalies-motivated simple scenarios with one or two new couplings that can also be used as templates for obtaining bounds on more complicated scenarios.

[Phys.Rev.D 104, 075037 (2021)] Search strategies for the third-generation leptoquarks are distinct from other leptoquark searches, especially when they decay to a top quark and a tau lepton. We investigate the cases of all TeV-scale scalar and vector leptoquarks that decay to either a top-tau pair or a top-neutrino pair.



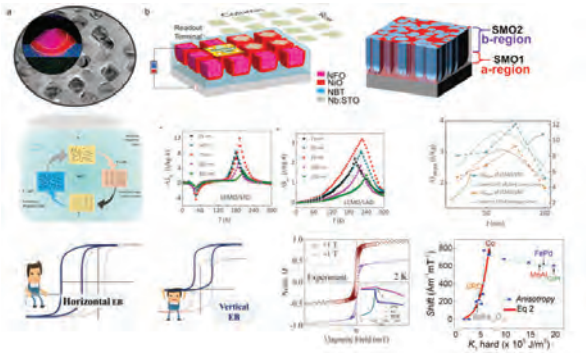
[2109.09585 (accepted in PRD)] If the neutrino masses are generated through the standard type-I seesaw mechanism, the Yukawa couplings for their decays become very small. If a different mechanism like the inverse seesaw generates the neutrino masses, a TeV-scale RHN can have large Yukawa couplings. We investigate the prospect of this unexplored process as a probe of the inverse seesaw mechanism in the left-right symmetric models at the HL-LHC.

Tuhin Subhra Maity
Assistant Professor

Materials Engineering for Sustainable Electronics

Functional Materials Engineering: We engineer nanoscale functional materials (with at least one dimension below 100 nm) for use in energy-efficient electronic, magnetic, energy storage and energy harvesting devices. We focus on manipulating metallic alloy and strongly correlated oxide materials, and their spin-ion-charge interactions at nanoscale. The materials are prepared by various state of the art deposition facilities such as DC/RF sputtering, Pulsed Laser Deposition (PLD) and thermal evaporation.

Device Applications: We are dedicated to stepping up our efforts in addressing the socio-economic technological challenges. We focus on device (Emerging Memory Devices for Neuromorphic Computing, low-power sensors, etc.) fabrication using the new materials systems we invent. These challenges are by no means an easy feat, but through cooperation and community empowerment we believe we can facilitate progress in this area. We are always striving to make a difference, and invite you to learn more and lend your support.



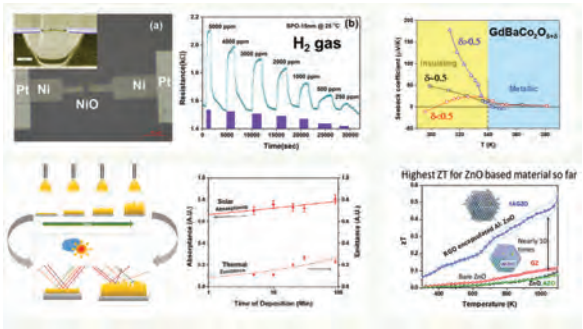
Sustainability: With this initiative, our goal is to develop a better place for mankind. We are committed to promote green technologies. With access to the right resources, people can become empowered by their own abilities and gain the confidence to fulfil their potential.

Vinayak Kamble
Assistant Professor

Smart Materials and Devices

SMaRT lab stands for Sensors, Microsystems and Renewable Technologies. Our research interest is centred on Engineering materials and interfaces for exploiting novel physical attributes of solids to turn them into smart functional materials and devices. This essentially involves Nanomaterials for Sensors and Energy conversion. In order to achieve high performance device applications beyond the existing ones, it is imperative to design novel interfaces and composite materials which are naturally inexistent. The work involves tuning the physico - chemical properties of materials to achieve technological applications such as listed below and allied areas.

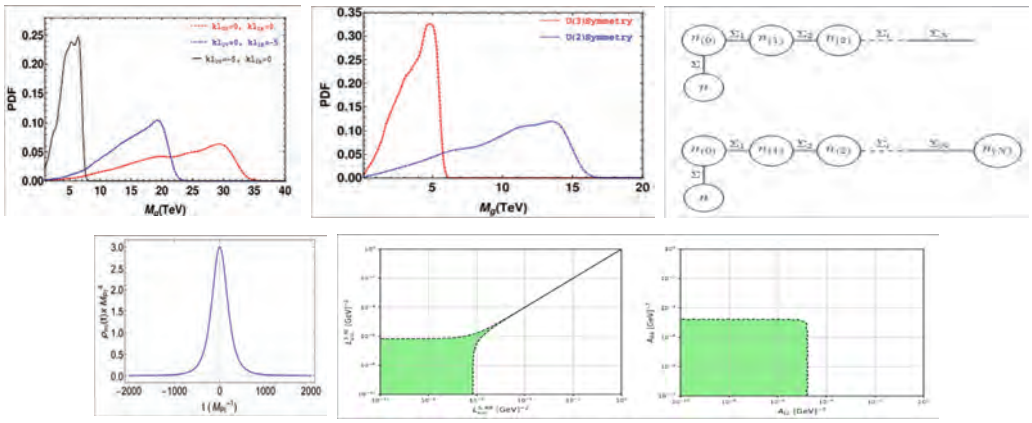
- Thermoelectric materials and Metrology: for instance, oxide-graphene core shells, oxide superlattice thin films, novel chalcogenide heterostructrues etc.
- Gas and chemical sensor devices using resistive, optical and acoustic transductions.
- Solar absorbers and spectral selectivity: multilayer absorber coating, photonic attributes, surface patterning etc.
- Defect induced transport and magnetic properties: defects are imperfections of crystal lattices.



However, their existence can be manifested in variety of electronic behaviour such as electrical transport, thermal transport, magnetism and optoelectronics.

Theoretical Particle Physics

Mathew Arun Thomas
DST Inspire Faculty



1. Neutron oscillation and Baryogenesis from six dimensions: Considering an orbifolded six-dimensional geometry, we show that the construction admits observable neutron-antineutron oscillation while naturally suppressing the proton decay rates. Consistent with other low-energy observables, the model also accommodates baryogenesis at O(10 TeV) scale (arxiv: 2205.03846)
2. Clockwork mirror neutron: Motivated by models on hidden local symmetries and moose/CFT correspondence, we study the QCD moose like lattice for a set of mirror neutrons linked together through the condensates of the new physics. This lattice generates a baryon number clockwork (bCW) potential for SM baryons and generates neutron-antineutron oscillation with time period that is within reach of current experiments, without large hierarchies. This also generate $\Delta B = 1$ process like neutron to mirror neutron transition which have interesting consequences in neutron stars and neutron lifetime experiments. (arxiv: 2204.06484)
3. Restricting Low Energy Field Theory (LEFT) operators using pion decays: we consider semileptonic lepton flavor violating operators in low energy effective theory. We match these operators to chiral perturbation theory and show that the scalar operators are significantly more constrained compared to the vector ones. We then compare the limits from muon conversion in Nuclei and evolve the LEFT operators to W-boson mass scale using RGE, and match them to the relevant Standard Model effective field theory operators. (arxiv:2204.06948)
4. Kalb-Ramond field induced cosmological bounce in generalized teleparallel gravity: Teleparallel gravity is a description of gravitation in which the tetrads are the dynamical degrees of freedom, and the torsion arising from fields with spin are accommodated naturally as field strength tensors. In order to describe the coupling prescription, we address the correct generalization of the Fock-Ivanenko derivative operator for an n-form tensor field. We study the possibility of reproducing two well-known cosmological bounce scenarios, namely, symmetric bounce and matter bounce in four-dimensional spacetime with the Friedmann-Lemaˆıtre-Robertson-Walker metric and observe that the solution requires the KR field energy density to be localized near the bounce. The crucial result in our work is that this feature also naturally explains the lack of cosmological evidence of the rank-2 field in the present day Universe for the matter-bounce scenario. Thus, among the bouncing cosmologies, latter is favored over the former. (Phys.Rev.D 105 (2022) 10, 103505)

Anand Narayana Sarma
DST Inspire Faculty

Atmospheric optics, Free-Space Optical communication, atmospheric aerosols, optical turbulence

I am doing research 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.

Publications

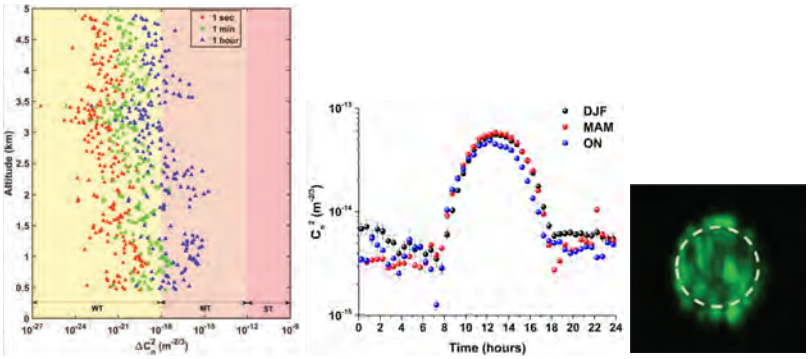
1) Optics Letters, 42(14), (2017)

2) Applied Optics, 57(25), (2018)

3) Optics Express, 27(8) (2019)

4) Applied Optics, 59(5), (2020)

5) Applied Optics, 60(31), (2021)



Economics of Healthcare and Pharmaceuticals

Harilal Madhavan
Ad-hoc Faculty, Humanities

Dr. Harilal Madhavan's primary research focus is on the interface of healthcare economics and Asian medical systems, its relations with emerging systems of innovation, intellectual property models and challenges of transnationalisation. He has been working on decentralization of health systems, local and global health production and innovation policy structures with in varied health systems in South Asia and South-East Asia. The second stream of the work is focused on non-communicable diseases and primary healthcare. The new collaborative work in 2021, with School of Advanced studies in Social Sciences (EHESS) - France, he analyses the post-Covid 19 frugal innovation frameworks - institutionally and non-institutionally supported - in the Global South.

LIST OF PUBLICATIONS

School of Biology

2021

1. Amarasinghe, P.; Joshi, S.; Page, N.; Wijedasa, L.; Merello, M.; Kathriarachchi, H.; Stone, R.; Judd, W.; Kodandaramaiah, U.; Cellinese, N. Evolution and Biogeography of Memecylon. *American Journal of Botany* **2021**, *108* (4), 628-646. DOI:10.1002/ajb2.1624

2. Anna, G.; Kannan, N. N. Post-Transcriptional Modulators and Mediators of the Circadian Clock. *Chronobiology International* **2021**, *38*, 1244–1261. DOI: 10.1080/07420528.2021.1928159

3. Arlet, M.; Balasubramaniam, K.; Saha, R.; Beisner, B.; Marty, P.; Kaburu, S.; Bliss-Moreau, E.; Kaasik, A.; Kodandaramaiah, U.; McCowan, B. Infant Survival Among Free-Living Bonnet Macaques (Macaca Radiata) In South India. *International Journal of Primatology* **2021**, *42* (2), 220-236. DOI:s10764-021-00198-3w

4. Ayyappan, S.; Dharan, P.; Krishnan, A.; Marira, R.; Lambert, M.; Manna, T.; Vijayan, V. Sxip Binding Disrupts the Constitutive Homodimer Interface of EB1 and Stabilizes EB1 Monomer. *Biophysical Journal* **2021**, *120* (10), 2019-2029. DOI: 10.1016/j.bpj.2021.03.004

5. Badarudeen, B.; Anand, U.; Mukhopadhyay, S.; Manna, T. Ubiquitin Signaling in The Control of Centriole Duplication. *The FEBS Journal* **2021**. DOI: 10.1111/febs.16069

6. Balamurali, G.; Reshnuraj, R.; Johnson, J.; Kodandaramaiah, U.; Somanathan, H. Visual Associative Learning and Olfactory Preferences of the Greater Banded Hornet, Vespa Tropica. *Insectes Sociaux* **2021**, *68* (2-3), 217-226. DOI:10.1007/s00040-021-00820-w

7. Balasubramaniam, K. N.; Kaburu, S. S.; Marty, P. R.; Beisner, B. A.; Bliss-Moreau, E.; Arlet, M. E.; Ruppert, N.; Ismail, A.; Anuar Mohd Sah, S.; Mohan, L.; et al. Implementing social network analysis to understand the socioecology of Wildlife Co-occurrence and joint interactions with humans in anthropogenic environments. *Journal of Animal Ecology* **2021**, *90* (12), 2819–2833. https://doi.org/10.1111/1365-2656.13584

8. Beleyur, T.; Murthy, T. G.; Singh, S.; Somanathan, H.; Uma, D. Web architecture, dynamics and silk investment in the social spider Stegodyphus Sarasinorum. *Animal Behaviour* **2021**, *179*, 139–146 https://doi.org/10.1016/j.anbehav.2021.06.029

9. Bondada, R.; Kulaar, D. S.; Siddiqi, I.; Maruthachalam, R. Cantil – a new organ or a morphological oddity? *New Phytologist* **2021**, *232* (5), 1904–1908. https://doi.org/10.1111/nph.17744

10. Chazot, N.; Condamine, F. L.; Dudas, G.; Peña, C.; Kodandaramaiah, U.; Matos-Maraví, P.; Aduse-Poku, K.; Elias, M.; Warren, A. D.; Lohman, D. J.; et al. Conserved ancestral tropical niche but different continental histories explain the latitudinal diversity gradient in brush-footed butterflies. *Nature Communications* **2021**, *12* (1), 5717. https://doi.org/10.1038/s41467-021-25906-8

11. Daniel, N. H.; Aravind, A.; Thakur, P. Are ion channels potential therapeutic targets for parkinson's disease? *NeuroToxicology* **2021**, *87*, 243–257. https://doi.org/10.1016/j.neuro.2021.10.008.

12. Dominoni, D. M.; Teo, D.; Branston, C. J.; Jakhar, A.; Albalawi, B. F.; Evans, N. P. Feather, but not plasma, glucocorticoid response to artificial light at night differs between urban and forest blue tit nestlings. *Integrative and Comparative Biology* **2021**, *61* (3), 1111–1121. https://doi.org/10.1093/icb/icab067

13. Halali, S.; Halali, D.; Barlow, H. S.; Molleman, F.; Kodandaramaiah, U.; Brakefield, P. M.; Brattström, O. Predictability of temporal variation in climate and the evolution of seasonal polyphenism in tropical butterfly communities. *Journal of Evolutionary Biology* **2021**, *34* (9), 1362–1375. https://doi.org/10.1111/jeb.13895

14. Jezeera, M. A.; Tichit, P.; Balamurali, G. S.; Baird, E.; Kelber, A.; Somanathan, H. Spatial resolution and sensitivity of the eyes of the Stingless Bee, tetragonula iridipennis. *Journal of Comparative Physiology A* **2021** https://doi.org/10.1007/s00359-021-01521-2

15. Joseph, J.; Karthika, T.; Das, V.; Raj, V. Epigallocatechin-3-Gallate (EGCG): A Potential Molecule for The Development of Therapeutics Against Emerging SARS-Cov-1, MERS-Cov and SARS-Cov-2 Coronaviruses. *Journal of Global Antimicrobial Resistance* **2021**, *26*, 26-28. https://doi.org/10.1016/j.jgar.2021.05.005

16. Joseph, J.; Karthika, T.; Das, V.; Raj, V. The Use of Pseudotyped Coronaviruses for The Screening of Entry Inhibitors: Green Tea Extract Inhibits the Entry of SARS-Cov-1, MERS-Cov, And SARS-Cov-2 By Blocking Receptor-Spike Interaction. *Current Pharmaceutical Biotechnology* **2021**, *22*. https://doi.org/10.2174/1389201022666210810111716

17. Karthika, T.; Joseph, J.; Das, V. R.; Nair, N.; Charulekha, P.; Roji, M. D.; Raj, V. S. SARS-COV-2 cellular entry is independent of the ACE2 cytoplasmic domain signaling. *Cells* **2021**, *10* (7), 1814 https://doi.org/10.3390/cells10071814

18. Luwang, J.; Nair, A.; Natesh, R. Stability of P53 Oligomers: Tetramerization of P53 Impinges On Its Stability. *Biochimie* **2021**, *189*, 99-107. https://doi.org/10.1016/j.biochi.2021.06.012

19. Maddi, E.; Natesh, R. Optimization Strategies for Expression and Purification of Soluble N-Terminal Domain of Human Centriolar Protein SAS-6 In Escherichia Coli. *Protein Expression and Purification* **2021**, *183*, 105856. DOI: 10.1016/j.pep.2021.105856

20. Malladi, S.; Singh, R.; Pandey, S.; Gayathri, S.; Kanjo, K.; Ahmed, S.; Khan, M.; Kalita, P.; Girish, N.; Upadhyaya, A.; Reddy, P.; Pramanick, I.; Bhasin, M.; Mani, S.; Bhattacharyya, S.; Joseph, J.; Thankamani, K.; Raj, V.; Dutta, S.; Singh, R.; Nadig, G.; Varadarajan, R. Design of A Highly Thermotolerant, Immunogenic SARS-Cov-2 Spike Fragment. *Journal of Biological Chemistry* **2021**, *296*, 100025. https://doi.org/10.1074/jbc.RA120.016284

21. Marimuthu, M. P.; Maruthachalam, R.; Bondada, R.; Kuppu, S.; Tan, E. H.; Britt, A.; Chan, S. W.; Comai, L. Epigenetically mismatched parental centromeres trigger genome elimination in hybrids. *Science Advances* **2021**, *7* (47), eabk1151. https://doi.org/10.1126/sciadv.abk1151

22. Mayekar, H. V.; Kodandaramaiah, U. Effect of density on pupal colour plasticity in the butterfly mycalesis mineus (Lepidoptera, Nymphalidae). *Journal of Zoology* **2021**, No. 00, 1–13. https://doi.org/10.1111/jzo.12950

23. Mayekar, H.; Kodandaramaiah, U. Partially Coupled Reaction Norms of Pupal Colour and Spot Size in A Butterfly. *Evolutionary Ecology* **2021**, *35* (2), 201-216. https://doi.org/10.1007/s10682-020-10090-w

24. Meena, A.; Kumar, A.; Balamurali, G.; Somanathan, H. Visual Detection Thresholds in The Asian Honeybee, Apis Cerana. *Journal of Comparative Physiology A* **2021**, *207* (4), 553-560. DOI: 10.1007/s00359-021-01496-0

25. Mehatre, S. H.; Roy, I. M.; Biswas, A.; Prit, D.; Schouteden, S.; Huelsken, J.; Verfaillie, C. M.; Khurana, S. Niche-Mediated Integrin Signaling Supports Steady-State Hematopoiesis in the Spleen. *The Journal of Immunology* **2021**, *206*, 1549–1560.DOI:10.4049/jimmunol.2001066

26. Mesnieres, M.; Böhm, A.-M.; Peredo, N.;

Trompet, D.; Valle-Tenney, R.; Bajaj, M.; Corthout, N.; Nefyodova, E.; Cardoen, R.; Baatsen, P.; *et al.* Fetal Hematopoietic Stem Cell Homing Is Controlled by VEGF Regulating the Integrity and Oxidative Status of the Stromal-Vascular Bone Marrow Niches. *Cell Reports* **2021**, *36*, 109618. DOI: 10.1016/j.celrep.2021.109618

27. Murugavel, B.; Kelber, A.; Somanathan, H. Bat Research & Conservation www. secemu. org. *Journal of Bat Research & Conservation* **2021**,*14*(1), 161.

28. Nandanan, K.; Salim, S.; Pankajam, A.; Shinohara, M.; Lin, G.; Chakraborty, P.; Farnaz, A.; Steinmetz, L.; Shinohara, A.; Nishant, K. Regulation of Msh4-Msh5 Association with Meiotic Chromosomes in Budding Yeast. *Genetics* **2021**, *219* (2). DOI: 10.1093/genetics/iyab102

29. Parthasarathy, B.; Somanathan, H.; Wright, J. Long-term behavioural syndrome in Subadult Indian social spiders but not over the short-term or in juveniles. *Ethology* **2021**, *127* (12), 1064–1073. https://doi.org/10.1111/eth.13229

30. Pathak, H.; Varghese, J. Edem1 Activity in The Fat Body Regulates Insulin Signalling and Metabolic Homeostasis in Drosophila. *Life Science Alliance* **2021**, *4* (8), e202101079. DOI: 10.26508/lsa.202101079

31. Pathak, H.; Vijaykumar Maya, A.; Tanari, A.; Sarkar, S.; Varghese, J. Lint, A Transmembrane Serine Protease, Regulates Growth and Metabolism in Drosophila. *Genetics* **2021**, *218* (1). DOI: 10.1093/genetics/iyab035

32. Radhakrishnan, D.; Shanmukhan, A.; Kareem, A.; Mathew, M.; Varaparambathu, V.; Aiyaz, M.; Radha, R.; Mekala, K.; Shaji, A.; Prasad, K. Age, Wound Size and Position of Injury – Dependent Vascular Regeneration Assay in Growing Leaves. *BIO-PROTOCOL* **2021**, *11* (9). https://doi.org/10.21769/BioProtoc.4010

33. Rahim, S.; Kodandaramaiah, U.; Kulkarni, A.; Barua, D. Striking Between-Population Floral Divergences in A Habitat Specialized Plant. *PLOS ONE* **2021**, *16* (6), e0253038. https://doi.org/10.1371/journal.pone

34. Rathinakumar, A.; Baheerathan, M.; Caspers, B. A.; Erinjery, J. J.; Kaliraj, P.; Baskaran, S.; Marimuthu, G. Male chemical signalling to recruit females in the greater short-nosed fruit bat cynopterus sphinx. *Acta Chiropterologica* **2021**, *23* (1), 81–92. https://doi.org/10.3161/15081109acc2021.23.1.007

35. Reselammal, D. S.; Pinhero, F.; Sharma, R.; Oliyantakath Hassan, M. S.; Srinivasula, S. M.; Vijayan, V. Mapping the fibril core of the prion subdomain of the mammalian CPEB3 that is involved in long term memory retention. *Journal of Molecular Biology* **2021**, *433* (15), 167084. https://doi.org/10.1016/j.jmb.2021.167084

36. Roy, I.; Nadar, P.; Khurana, S. Neutral Comet Assay to Detect and Quantitate DNA Double Strand Breaks in Hematopoietic Stem Cells. *BIO-PROTOCOL* **2021**, *11* (16). DOI: 10.21769/BioProtoc.4130

37. Shanmukhan, A.; Mathew, M.; Aiyaz, M.; Varaparambathu, V.; Kareem, A.; Radhakrishnan, D.; Prasad, K. Regulation of Touch-Stimulated De Novo Root Regeneration from Arabidopsis Leaves. *Plant Physiology* **2021**, *187*(1),52-58.DOI:10.1093/plphys/kiab286

38. Sil, M.; Basak, R.; Karanth, K. P.; Aravind, N. A. A new species of Pila (gastropoda: Ampullariidae) from Mizoram, India. *Molluscan Research* **2021**, *41* (3), 204–213. https://doi.org/10.1080/13235818.2021.1941575

39. Thondehaalmath, T.; Kulaar, D. S.; Bondada, R.; Maruthachalam, R. Understanding and Exploiting Uniparental Genome Elimination in Plants: Insights from Arabidopsis thaliana. *Journal of Experimental Botany* **2021**, *72*, 4646–4662. DOI: 10.1093/jxb/erab161

40. Yourstone, J.; Gunnarsson, J.; Smith, H.; Somanathan, H. High Dependency of Chilli Fruit Set On Wild Pollinators in Southern India. *Journal of Pollination Ecology* **2021**, *28*, 65-74. https://doi.org/10.26786/1920-7603(2021)629

41. Yumnam, T.; Banerjee, B.; Kodandaramaiah, U. Pupal colour plasticity in the butterfly catopsilia Pomona (Lepidoptera: Pieridae). *Biological Journal of the Linnean Society* **2021**, *134* (2), 331–341. https://doi.org/10.1093/biolinnean/blab087

2022

1. Allipra, S., Anirudhan, K., Shivanandan, S., Raghunathan, A. and Maruthachalam, R. **(2022)**. The kinetochore protein NNF1 has a moonlighting role in the vegetative development of Arabidopsis thaliana. Plant J. https://doi.org/10.1111/tpj.15614

2. Bhaskaran M., Jose, M. Reshma AS, Marsheena Nalleri M., Madhusoodanan UK, Singh NS# and Thomas SV# A GWAS study to find genetic basis of antiseizure medicine induced Malformations **(2022)** (under review process)

3. Fernandes, J*; Thomas, E*; Varghese, J **(2022)**. Nutrient dependent miR-184 aids in the survival of Drosophila larvae during low food conditions. microPublication Biology. 10.17912/micropub.biology.000541.

4. Fernandes, J; Varghese, J **(2022)**. A mini-screen to identify the role of microRNAs in the Drosophila Insulin-Producing cells regulating lifespan. microPublication Biology. 10.17912/micropub.biology.000536.

5. Jeswin, J.; Karthika, T.; Akshay Das, V.R.; Raj, V.S. The use of pseudotyped coronaviruses for the screening of entry inhibitors: Green tea extract inhibits the entry of SARS-CoV-1, MERS-CoV and SARS-CoV-2 by blocking receptor-spike interaction. Current Pharmaceutical Biotechnology. **2022**, 23 (8), 1118-1129. DOI: 2174/1389201022666210810111716.

6. Kachappilly, N.; Srivastava, J.; Swain; B.P.; Thakur, P. Interaction of alpha-synuclein with lipids. Methods in Cell Biology, Academic Press, **2022**, ISSN 0091-679X. https://doi.org/10.1016/bs.mcb.2021.12.002.

7. Prem Anand Murugan, Manish Kumar Gupta, T. Sabari Sankar, Sivasurender Chandran, Saravanan Matheshwaran. NaCl Triggers the Sessile-to-Motile Transition of Bacillus subtilis bioRxiv **2022**.02.15.480532; doi: https://doi.org/10.1101/2022.02.15.480532

8. Purushothaman, M.; Dhar S. K.; Natesh, R. Role of unique loops in oligomerization and ATPase function of Plasmodium falciparum gyrase B. Protein Sci. **2022**, 31(2), 323-332. DOI: 10.1002/pro.4217.

9. Rafeeka, R. S., Kurup, A., Roy, D., Nongthomba, U., Srinivasula, S. M., & Singh, M. S. **(2022)**. Design and instrumentation of simultaneous multiple-level magnification selective plane illumination microscopy: a cost-effective imaging system for biological applications. In Optical Engineering (Vol. 61, Issue 04). SPIE-Intl Soc Optical Eng. https://doi.org/10.1117/1.oe.61.4.045103

10. Ravindran, R., Velikkakath, A. K. G., Narendradev, N. D., Chandrasekharan, A., Santhoshkumar, T. R., & Srinivasula, S. M. **(2022)**. Endosomal-associated RFFL facilitates mitochondrial clearance by enhancing PRKN/parkin recruitment to mitochondria. In Autophagy (pp. 1–14). Informa UK Limited. https://doi.org/10.1080/15548627.2022.2052460

11. Salini, S.; Bhat, S. G.; Naz, S.; Natesh, R.;

Kumar, R. A.; Nandicoori, V. K.; Kurthkoti, K. The Error-Prone Polymerase DnaE2 Mediates the Evolution of Antibiotic Resistance in Persister Mycobacterial Cells. Antimicrob Agents Chemother. **2022**, 66(3), e0177321. DOI: 10.1128/AAC.01773-21.

12. Warrant, E and Somanathan, H**. (2022)**. Colour vision in nocturnal insects. Philosophical Transactions of the Royal Society B (accepted).

School of Chemistry

2021

1. Ahmed, A.; Ali, A.; Ahmed, M.; Parida, K. N.; Ahmad, M.; Ahmad, A., Construction and Topological Studies of a Three Dimensional (3D) Coordination Polymer Showing Selective Adsorption of Aromatic Hazardous Dyes. *Separation and Purification Technology* **2021**, *265*, 118482.

2. Ajay, J.; Sandra, G. M.; Ishida, M.; Sulfikarali, T.; Gokulnath, S., Lewis acid-catalyzed formation of triply S-confused hexaphyrin (1.0.1.0.1.0) and its structure-property correlations. *Journal of Porphyrins and Phthalocyanines* **2021,** *25* (10n12), 1143-1151.

3. Ajay, J.; Sulfikarali, T.; Chakravarthy, K. A.; Reddy, V. S.; Gokulnath, S., Hexathianonaphyrin (1.0.0.1.0.0.1.0.0): Synthesis, optical, redox and protonation induced antiaromaticity. *Journal of Porphyrins and Phthalocyanines* **2021,** *25* (05n06), 484-492.

4. Ankur; Kannan, R.; Chambenahalli, R.; Banerjee, S.; Yang, Y.; Maron, L.; Venugopal, A., [(Me6TREN) MgOCHPh2] [B(C6F5)4]: A Model Complex to Explore the Catalytic Activity of Magnesium Alkoxides in Ketone Hydroboration. *European Journal of Inorganic Chemistry* **2021,** *2021* (45), 4632-4638.

5. Arya Gopal, S.; Edathiparambil Poulose, A.; Sudakar, C.; Muthukrishnan, A., Kinetic Insights into the Mechanism of Oxygen Reduction Reaction on Fe2O3/C Composites. *ACS Applied Materials & Interfaces* **2021,** *13* (37), 44195-44206.

6. Ayyappan, S S.; Dharan, P. S.; Krishnan, A.; Marira, R. R.; Lambert, M.; Manna, T. K.; Vijayan, V., SxIP binding disrupts the constitutive homodimer interface of EB1 and stabilizes EB1 monomer. Biophysical Journal **2021**, 120 (10), 2019-2029

7. Bamberger, N. D.; Dyer, D.; Parida, K. N.; McGrath, D. V.; Monti, O., Grid-Based Correlation Analysis to Identify Rare Quantum Transport Behaviors, *Journal of Physical Chemistry C*, **2021**, *125*, 18297–18307.

8. Baranov, D.; Šverko, T.; Moot, T.; Keller, H. R.; Klein, M. D.; Vishnu, E. K.; Balazs, D. M.; Shulenberger, K. E., News in Nanocrystals Seminar: Self-Assembly of Early Career Researchers toward Globally Accessible Nanoscience. *ACS Nano* **2021,** *15* (7), 10743–10747.

9. Benny, A.; Ramakrishnan, R.; Hariharan, M., Mutually exclusive hole and electron transfer coupling in cross stacked acenes. *Chemical Science* **2021,** *12* (14), 5064-5072.

10. Biswas, S.; Das, A. K.; Nath, A.; Paul, S.; Suheshkumar Singh, M.; Mandal, S., Novel class of water-soluble phosphonate silver cluster assembled material for efficient photoelectric sensing and photoacoustic imaging. *Nanoscale* **2021,** *13* (41), 17325-17330.

11. Chambenahalli, R.; Bhargav, R. M.; McCabe, K.

N.; Andrews, A. P.; Ritter, F.; Okuda, J.; Maron, L.; Venugopal, A., Cationic Zinc Hydride Catalyzed Carbon Dioxide Reduction to Formate: Deciphering Elementary Reactions, Isolation of Intermediates, and Computational Investigations. *Chemistry – A European Journal* **2021,** *27* (26), 7391-7401.

12. Chandrasekaran, R.; Pulikkottil, F. T.; Elama, K. S.; Rasappan, R., Direct synthesis and applications of solid silylzinc reagents. *Chemical Science* **2021,** *12* (47), 15719-15726.

13. Chandrasekharan, S. V.; Krishnan, N.; Atchimnaidu, S.; Raj, G.; P. K, A. K.; Sagar, S.; Das, S.; Varghese, R., Blue-emissive two-component supergelator with aggregation-induced enhanced emission. *RSC Advances* **2021,** *11* (32), 19856-19863.

14. Dandia, A.; Saini, P.; Chithra, M. J.; Vennapusa, S.; Parewa, V., Catalyst- and acid-free Markovnikov hydration of alkynes in a sustainable H2O/ethyl lactate system. *Journal of Molecular Liquids* **2021,** *331*, 115758.

15. Das, A. K.; Biswas, S.; Manna, S. S.; Pathak, B.; Mandal, S., Solvent-Dependent Photophysical Properties of a Semiconducting One-Dimensional Silver Cluster-Assembled Material. *Inorganic Chemistry* **2021,** *60* (23), 18234-18241.

16. Das, A. K.; Biswas, S.; Thomas, A.; Paul, S.; Nair, A. S.; Pathak, B.; Singh, M. S.; Mandal, S., Switchable photon and phonon emission properties of an atomically precise Ag14 core-based two-dimensional silver cluster-assembled material. *Materials Chemistry Frontiers* **2021,** *5* (24), 8380-8386.

17. Das, A. K.; Mekkat, R.; Maity, S.; Nair, A. S.; Bhandary, S.; Bhowal, R.; Patra, A.; Pathak, B.; Chopra, D.; Mandal, S., Role of Ligand on Photophysical Properties of Nanoclusters with fcc Kernel: A Case Study of Ag14(SC6H4X)12(PPh3)8 (X = F, Cl, Br). *Inorganic Chemistry* **2021,** *60* (24), 19270-19277.

18. Feng, J.-J.; Mao, W.; Zhang, L.; Oestreich, M., Activation of the Si–B interelement bond related to catalysis. *Chemical Society Reviews* **2021,** *50* (3), 2010-2073.

19. Fracassi, A.; Ray, A.; Nakatsuka, N.; Passiu, C.; Tanriver, M.; Schauenburg, D.; Scherrer, S.; Ould Chaib, A.; Mandal, J.; Ramakrishna, S. N.; Bode, J. W.; Spencer, N. D.; Rossi, A.; Yamakoshi, Y., KAT Ligation for Rapid and Facile Covalent Attachment of Biomolecules to Surfaces. *ACS Applied Materials & Interfaces* **2021,** *13* (24), 29113-29121.

20. Gayathri, P.; Kanagajothi, K.; Nag, P.; Anand, N.; Reddy, V. S.; Moon, D.; Anthony, S. P.; Madhu, V., Symmetrical and unsymmetrical thiazole-based ESIPT derivatives: the highly selective fluorescence sensing of Cu2+ and structure-controlled reversible mechanofluorochromism. *CrystEngComm* **2021,** *23* (38), 6769-6777.

21. Gayathri, P.; Nag, P.; Anand, N.; Vennapusa, S. R.; Pannipara, M.; Al-Sehemi, A. G.; Moon, D.; Anthony, S. P., Molecular conformational twist-controlled wide fluorescence tuning and white light emission in a single fluorophore via halochromism. *New Journal of Chemistry* **2021,** *45* (47), 22450-22460.

22. Gmür, T. A.; Mandal, J.; Cayer-Barrioz, J.; Spencer, N. D., Towards a Polymer-Brush-Based Friction Modifier for Oil. *Tribology Letters* **2021,** *69* (4), 124.

23. Gowri, V.; Jalwal, S.; Dar, A.; S, A.; Muthukrishnan, A.; Bajaj, A.; Ali, M. E.; Govindasamy, J., A subtle change in substituent enabled multi-ways fluorine anion signals including paper-strip colorimetric detection using urea-functionalized push–pull chromophore receptor. *Journal of Photochemistry and Photobiology A: Chemistry* **2021,** *410*, 113163.

24. Gratious, S.; Nair, A. S.; Mukherjee, S.; Kachappilly, N.; Pathak, B.; Mandal, S., Gold Deassembly: From Au (44) (SPh-(t) Bu) (28) to Au (36) (SPh-(t) Bu) (24) Nanocluster through

Dynamic Surface Structure Reconstruction. *Journal of Physical Chemistry Letters* **2021,** *12* (45), 10987-10993.

25. Hariharan, M.; Hartland, G. V., Virtual Issue on Ultrafast Charge Separation in Energy Research. *The Journal of Physical Chemistry C* **2021,** *125* (39), 21317-21320.

26. Harikrishnan, K. S.; Krishnan, N.; Kumar, N. M.; Krishna, A.; Raj, G.; Perumal, D.; Kalathil, J.; Krishna, J.; Varghese, R., Galactose Grafted Two-Dimensional Nanosheets as a Scaffold for the in Situ Synthesis of Silver Nanoparticles: A Potential Catalyst for the Reduction of Nitroaromatics. *Chemistry (Weinheim an der Bergstrasse, Germany)* **2021,** *27* (56), 14100-14107.

27. Hema, K.; Ravi, A.; Raju, C.; Sureshan, K. M., Polymers with advanced structural and supramolecular features synthesized through topochemical polymerization. *Chemical Science* **2021,** *12* (15), 5361-5380.

28. Hornberger, E.; Mastronardi, V.; Brescia, R.; Pompa, P. P.; Klingenhof, M.; Dionigi, F.; Moglianetti, M.; Strasser, P., Seed-Mediated Synthesis and Catalytic ORR Reactivity of Facet-Stable, Monodisperse Platinum Nano-Octahedra. *ACS Applied Energy Materials* **2021,** *4* (9), 9542-9552.

29. Ivie, J. A.; Bamberger, N. D.; Parida, K. N.; Shepard, S.; Dyer, D.; Saraiva-Souza, A.; Himmelhuber, R.; McGrath, D. V.; Smeu, M.; Monti, O., Correlated Energy-Level Alignment Effects Determine Substituent-Tuned Single-Molecule Conductance. *ACS Applied Material Interfaces* **2021**, *13*, 4267–4277.

30. James Anto, J. C., Melekamburath Ajay, Rajeevan Megha, Swathi Rotti Srinivasamurthy, A Journey Toward the Heaven of Chemical Fidelity of Intermolecular Force Field. *Wiley Interdisciplinary Reviews: Computational Molecular Science* **2021**.

31. Jayan, P.; Vahid, A. A.; Kizhakkeduth, S. T.; Muhammed, S. O. H.; Shibina, A. B.; Vijayan, V., Direct Observation of the Self-Aggregation of R3R4 Bi-repeat of Tau Protein. *ChemBioChem* **2021,** *22* (12), 2093-2097.

32. Jinan, D.; Mondal, P. P.; Nair, A. V.; Sahoo, B., O-Protected NH-free hydroxylamines: emerging electrophilic aminating reagents for organic synthesis. *Chemical Communications* **2021,** *57* (99), 13495-13505.

33. Jindal, S.; Anjum, G.; Maka, V. K.; Moorthy, J. N., Mechanoluminescence and aggregation-enhanced emission (AEE) of an In-MOF based on a 9,9'-diphenyl-9H-fluorene tetraacid linker. *Nanoscale* **2021,** *13* (21), 9668-9677.

34. John, A. T.; Narayanasamy, A.; George, D.; Hariharan, M., Atom-Efficient Halogen–Halogen Interactions Assist One-, Two-, and Three-Dimensional Molecular Zippers. *The Journal of Physical Chemistry C* **2021,** *125* (19), 10716-10722.

35. Kakarlamudi, A. C.; Vennapusa, S. R., Intersystem crossing pathways in [5]-, [7]-, and [9] cycloparaphenylenes. *The Journal of Chemical Physics* **2021,** *155* (4), 044301.

36. Kalaiselvan, A.; Dhamija, S.; Aswathi, C.; De, A. K.; Gokulnath, S., Planar hexaphyrin-like macrocycles turning into bis-BODIPYs with box-shaped structures exhibiting excitonic coupling. *Chemical Communications* **2021,** *57* (87), 11485-11488.

37. Kalaiselvan, A.; Spergen, A.; Krishna, I. S. V.; Reddy, V. S.; Gokulnath, S., Double intramolecular hydrogen transfer assisted dual emission in a carbazole-embedded porphyrin-like macrocycle. *Chemical Communications* **2021,** *57* (36), 4420-4423.

38. Kalyanakrishnan, A. V.; Joshy, A.; Arya, A. K.; Kaliyamoorthy, A., Synthesis of Various α-Substituted Alkenyl Sulfoxides from Alkynes and β-Sulfinyl Esters. *ChemistrySelect* **2021,** *6* (48), 14054-14059.

39. Kaur, M.; U Din Reshi, N.; Patra, K.;

Bhattacherya, A.; Kunnikuruvan, S.; Bera, J. K., A Proton-Responsive Pyridyl(benzamide)-Functionalized NHC Ligand on Ir Complex for Alkylation of Ketones and Secondary Alcohols. *Chemistry – A European Journal* **2021,** *27* (41), 10737-10748.

40. Khazeber, R.; Sureshan, K. M., Topochemical Ene–Azide Cycloaddition Reaction. *Angewandte Chemie International Edition* **2021,** *60* (47), 24875-24881.

41. Krishnakumar, R.; James, A.; Swathi, R. S., Metal-Decorated Crown Ether-Embedded Graphene Nanomeshes for Enhanced Molecular Adsorption. *Advanced Theory and Simulations* **2021,** *4* (10), 2100202.

42. Kumar Hota, S.; Jinan, D.; Prakash Panda, S.; Pan, R.; Sahoo, B.; Murarka, S., Organophotoredox-Catalyzed Late-Stage Functionalization of Heterocycles. *Asian Journal of Organic Chemistry* **2021,** *10* (8), 1848-1860.

43. Kurra, N.; Uzun, S.; Valurouthu, G.; Gogotsi, Y., Mapping (Pseudo)Capacitive Charge Storage Dynamics in Titanium Carbide MXene Electrodes in Aqueous Electrolytes Using 3D Bode Analysis. *Energy Storage Materials* **2021,** *39*, 347-353.

44. Lopez-Garcia, F.; Dong, S.; Han, Y.; Cheng Lee, J. J.; Ng, P. W.; Chi, C., Cyclobis[2,5-(thiophenedimethane)-4,4'-(triphenylamine)] versus Its S, S-Dioxidized Macrocycle: Global Antiaromaticity and Intramolecular Dynamics. *Organic Letters* **2021,** *23* (16), 6382-6386.

45. M. J, C.; Nag, P.; Vennapusa, S. R., Surface hopping dynamics reveal ultrafast triplet generation promoted by S1–T2–T1 spin-vibronic coupling in 2-mercaptobenzothiazole. *Physical Chemistry Chemical Physics* **2021,** *23* (36), 20183-20192.

46. M.C. Madhusudhanan, H. Balan, D. B. Werz, K. M. Sureshan*, Azide···Oxygen Interaction: A Crystal Engineering Tool for Conformational Locking. *Angew. Chem. Int. Ed.* **2021***, 60,* 22797-22803.

47. M.J, C.; Isukapalli, S. V. K.; Vennapusa, S. R., Spin-vibronic coupling induced intersystem crossing in tetraphenylporphyrin: Relevance in the photosensitization of prolycopene. *Journal of Photochemistry and Photobiology A: Chemistry* **2021,** *412*, 113223.

48. Madhu, M.; Ramakrishnan, R.; Vijay, V.; Hariharan, M., Free Charge Carriers in Homo-Sorted π-Stacks of Donor–Acceptor Conjugates. *Chemical Reviews* **2021,** *121* (13), 8234-8284.

49. Melekamburath, A.; James, A.; Rajeevan, M.; John, C.; Swathi, R. S., In pursuit of accurate interlayer potentials for twisted bilayer graphynes. *Physical Chemistry Chemical Physics* **2021,** *23* (47), 27031-27041.

50. Mohanrao, R.; Manorama, R.; Ganguli, S.; Madhusudhanan, M. C.; Bhandari, R.; Sureshan, K. M., Novel Substrates for Kinases Involved in the Biosynthesis of Inositol Pyrophosphates and Their Enhancement of ATPase Activity of a Kinase. *Molecules* **2021,** *26* (12).

51. Mukherjee, D.; Nag, P.; Shteinman, A. A.; Vennapusa, S. R.; Mandal, U.; Mitra, M., Catechol oxidation promoted by bridging phenoxo moieties in a bis(μ-phenoxo)-bridged dicopper(ii) complex. *RSC Advances* **2021,** *11* (37), 22951-22959.

52. Mukherjee, S.; Jayakumar, D.; Mandal, S., Insight into the Size Evolution Transformation Process of the fcc-Based Au28(SR)20 Nanocluster. *The Journal of Physical Chemistry C* **2021,** *125* (22), 12149-12154.

53. Mukhopadhyay, A.; Jindal, S.; Maka, V. K.; Moorthy, J. N., Contrasting Photochromic and Acidochromic Behaviors of Pyridyl- and Pyrimidylethynylated Mono- and Bis-Benzopyrans. *ACS Omega* **2021,** *6* (32), 21113-21124.

54. Murugesan, T.; Sivarajan, C.; Jayakumari, C. M.; Singh, R. K.; Vennapusa, S. R.; Kaliyamoorthy, A., Palladium-Catalyzed Direct C2-Biarylation of Indoles. *Journal of Organic Chemistry* **2021,** *86* (15), 10838-10851.

55. Murugesan, V.; Ganguly, A.; Karthika, A.; Rasappan, R., C–H Alkylation of Aldehydes by Merging TBADT Hydrogen Atom Transfer with Nickel Catalysis. *Organic Letters* **2021,** *23* (14), 5389-5393.

56. Nag, P.; Anand, N.; Vennapusa, S. R., Ultrafast nonadiabatic excited-state intramolecular proton transfer in 3-hydroxychromone: A surface hopping approach. *The Journal of Chemical Physics* **2021,** *155* (9), 094301.

57. Nath, A.; Asha, K. S.; Mandal, S., Conductive Metal-Organic Frameworks: Electronic Structure and Electrochemical Applications. *Chemistry – A European Journal* **2021,** *27* (45), 11482-11538.

58. Nizar, N. S. S.; Sujith, M.; Swathi, K.; Sissa, C.; Painelli, A.; Thomas, K. G., Emergent chiroptical properties in supramolecular and plasmonic assemblies. *Chemical Society Reviews* **2021,** *50* (20), 11208-11226.

59. Oliyantakath Hassan, M. S.; Somasundaran, S. M.; Abdul Shukkoor, M. B.; Ayyappan, S.; Abdul Vahid, A.; Vijayan, V., Examining the Transient Dark State in Protein-Quantum Dot Interaction by Relaxation-Based Solution NMR. *Journal of Physical Chemistry B* **2021,** *125* (36), 10119-10125.

60. Pankajakshan, A.; Ravarikkandy, A.; Ratheesh, B. P.; Maman, M. P.; Mandal, S., Thiol decorated defective metal–organic frameworks embedded with palladium nanoparticles for efficient Cr(vi) reduction. *Inorganic Chemistry Frontiers* **2021,** *8* (23), 5093-5099.

61. Pathan, J. R.; Sureshan, K. M., Solvent-Free and Catalyst-Free Synthesis of Cross-Linkable Polyfumaramides via Topochemical Azide-Alkyne Cycloaddition Polymerization. *ACS Sustainable Chemistry & Engineering* **2021,** *9* (29), 9871-9878.

62. R. S, L.; Vennapusa, S. R., Formation and decay of intersystem crossing receiver triplet state in terthiophene and quaterthiophene. *International Journal of Quantum Chemistry* **2021,** *121* (15), e26677.

63. Rastogi, A.; Nag, P.; Vennapusa, S. R., Tracking the early nonadiabatic events of ESIPT process in 2-acetylindan-1,3-dione by quantum wavepacket dynamics. *Journal of Photochemistry and Photobiology A: Chemistry* **2021,** *418*, 113415.

64. Ravi, A.; Shijad, A.; Sureshan, K. M., Single-crystal-to-single-crystal synthesis of a pseudostarch via topochemical azide–alkyne cycloaddition polymerization. *Chemical Science* **2021,** *12* (35), 11652-11658.

65. Reselammal, D. S.; Pinhero, F.; Sharma, R.; Oliyantakath Hassan, M. S.; Srinivasula, S. M.; Vijayan, V., Mapping the Fibril Core of the Prion Subdomain of the Mammalian CPEB3 that is Involved in Long Term Memory Retention. *Journal of Molecular Biology* **2021,** *433* (15), 167084.

66. Roy, D.; Rajendra, R.; Gangadharan, P. K.; Pandikassala, A.; Kurungot, S.; Ballav, N., Seed-Mediated Growth of Pt on High-Index Faceted Au Nanocrystals: The Ag Lining and Implications for Electrocatalysis. *ACS Applied Nano Materials* **2021,** *4* (9), 9155-9166.

67. Roy, D.; Rajendra, R.; Tripathi, S.; Ballav, N., Controlling the Aspect Ratios of Au Nanocrystals with Ag+ Addition Time in Seed-Mediated Synthesis: Implications for Surface-Enhanced Raman Scattering. *ACS Applied Nano Materials* **2021,** *4* (7), 7426-7434.

68. S. V. Chandrasekhar, N. Krishnan, S. Atchimnaidu, G. Raj, A P. Krishna, S. Sagar, S. Das, R. Varghese, Blue emissive two-component organogel with aggregation induced enhanced emission. *RSC Adv.*, **2021**, *11*, 19856.

69. Sahana, T.; Mondal, A.; Anju, B. S.; Kundu, S., Metal-free Transformations of Nitrogen-Oxyanions to Ammonia via Oxoammonium Salt. *Angewandte Chemie International Edition* **2021,** *60* (38), 20661-20665.

70. Sahoo, D.; Benny, R.; Ks, N. K.; De, S., Stimuli-Responsive Chiroptical Switching. *ChemPlusChem* **2021**, https://doi.org/10.1002/cplu.202100322

71. Saini, H.; Srinivasan, N.; Šedajová, V.; Majumder, M.; Dubal, D. P.; Otyepka, M.; Zbořil, R.; Kurra, N.; Fischer, R. A.; Jayaramulu, K., Emerging MXene@Metal–Organic Framework Hybrids: Design Strategies toward Versatile Applications. *ACS Nano* **2021,** *15* (12), 18742-18776.

72. Sebastian, E.; Hariharan, M., Null Exciton-Coupled Chromophoric Dimer Exhibits Symmetry-Breaking Charge Separation. *Journal of the American Chemical Society* **2021,** *143* (34), 13769-13781.

73. Sharma, D.; Balasubramaniam, S.; Kumar, S.; Jemmis, E. D.; Venugopal, A., Reversing Lewis acidity from bismuth to antimony. *Chemical Communications* **2021,** *57* (71), 8889-8892.

74. Simič, R.; Mandal, J.; Zhang, K.; Spencer, N. D., Oxygen inhibition of free-radical polymerization is the dominant mechanism behind the "mold effect" on hydrogels. *Soft Matter* **2021,** *17* (26), 6394-6403.

75. Stahl, J.; Yatham, V. R.; Crespi, S.; König, B., Cesium Carbonate Catalyzed Oxa-Michael Addition of Oximes to Acrylonitrile. *ChemistrySelect* **2021,** *6* (17), 4107-4111.

76. Tripathy, A. R.; Yedase, G. S.; Yatham, V. R., Cerium photocatalyzed radical smiles rearrangement of 2-aryloxybenzoic acids. *RSC Advances* **2021,** *11* (41), 25207-25210.

77. Vijay, V.; Ramakrishnan, R.; Hariharan, M., Halogen–Halogen Bonded Donor-Acceptor Stacks Foster Orthogonal Electron and Hole Transport. *Crystal Growth & Design* **2021,** *21* (1), 200-206.

78. Vishnu, E. K.; Kumar Nair, A. A.; Thomas, K. G., Core-Size-Dependent Trapping and Detrapping Dynamics in CdSe/CdS/ZnS Quantum Dots. *The Journal of Physical Chemistry C* **2021,** *125* (46), 25706-25716.

79. Yedase, G. S.; John, M.; Yatham, V. R., Organophotoredox-Catalyzed Switchable Selective Transformation of Aromatic Aldehydes into Pinacols and Benzyl alcohols. *Asian Journal of Organic Chemistry* **2021,** *10* (11), 2916-2920.

80. Yedase, G. S.; Kumar, S.; Stahl, J.; König, B.; Yatham, V. R., Cerium-photocatalyzed aerobic oxidation of benzylic alcohols to aldehydes and ketones. *Beilstein J. Org Chem* **2021,** *17*, 1727-1732.

2022

1. Ajay, J.; Sulfikarali, T.; Sandra, G. M.; Gokulnath, S., Conformationally Distinct [26] Hetero-Rubyrins (1.1.0.1.1.0) and their Bis-BODIPYs: Synthesis, Structure and Optical Properties. Org. Lett. **2022**, 24, 1000-1004.

2. Akhil Chakravarthy Kakarlamudi, Sai Vamsi Krishna Isukapalli, Sivaranjana Reddy Vennapusa, Revealing the vibronic coupling effects in the size-dependent optical properties of cycloparaphenylene, Mol. Phys., **2022**, e2055505.

3. Anshuman, B; Nag, P; Diksha, P; Vennapusa, S. R.; Theoretical approach to modeling the early nonadiabatic events of ESIPT originating from three-state conical intersection in quinophthalone, Photochem Photobiol Sci. **2022**, 21.

4. Atlucci C, Kurapati R, Morales-Narváez E; Nanobiophotonics and Related Novel Materials

Aimed at Biosciences and Biomedicine Aimed at Biosciences and Biomedicine (Editorial), Frontiers in Bioengineering and Biotechnology **2022** (I. F. – 5.89)

5. Balakrishnan, V.; Murugesan, V.; Chindan, B.; Rasappan, R. Attenuation of Ni (0) Decomposition: Mechanistic Insights into AgF-Assisted Nickel-Mediated Silylation. Inorg Chem **2022**, 61, 1438-1446.

6. Bamberger, N. D.; Dyer, D.; Parida, K. N.; El-Assaad, T.; Pursell, D.; McGrath, D. V.; Smeu, M.; Monti, O., Beyond Simple Structure-Function Relationships: The Interplay of Geometry, Electronic Structure and Molecule/Electrode Coupling in Single Molecule Junctions., Journal of Physical Chemistry C **2022** (ASAP, 10.1021/acs.jpcc.2c00761).

7. Chithra, M. J; Nag, P; Isukapalli, S. V. K; Vennapusa, S. R; Exploring the Excited-State Nonadiabatic Effects in the Semisaturated Planar Tetracoordinated Carbon Molecule C7H4, Atoms, **2022**, 10, 10 (1-11)

8. Exciton Interactions in the Helical Crystals of Hydrogen Bonded Eumelanin Monomer, D. Sasikumar, K. Vinod, J. Sunny and M. Hariharan*, Chem. Sci. **2022**, 13, 2331-2338.

9. Ghosh, R.; Sunny, B.; Babu, M.; Thirumurugan, A., Role of crystal nucleation and growth conditions on the soft-templated preparation of HKUST-1 MOFs with hierarchical porosity involving gemini surfactants, Microporous Mesoporous Mater **2022**, 334, 111758.

10. InP-Bovine Serum Albumin Conjugates as Energy Transfer Probes, Manoj, B.; Somasundaran, S. M.; Rajan, D.; Thirunavukkuarasu, S.; Thomas K. G. Journal of Physical Chemistry B **2022**, 126, 2635–2646.

11. Isukapalli, S. V. K.; Pushparajan, P; Vennapusa, S. R.; Rationalizing the Fluorescence Behavior of Core-substituted Naphthalene Diimides, J. Phys. Chem. A **2022**, 126 (7), 1114-1122.

12. Isukapalli, S. V. K; Nag, P; Vennapusa, S. R.; Optical properties of para-oligophenylenes: a case study of electronic absorption spectrum and relaxation dynamics of terphenyl, Int. J. Quantum. Chem. **2022**, e26912.

13. John, C.; Swathi, R. S., An Anisotropic Dressed Pairwise Potential Model for the Adsorption of Noble Gases on Boron Nitride Sheets, **2022**, 24, 2554-2566.

14. Ligand-Induced Ground- and Excited-State Chirality in Silicon Nanoparticles: Surface Interactions Matter, Sujith, M.; Vishnu, E. K. Sappati, S.; Hassan, M. S. O.; Vijayan, V.; Thomas, K. G. Journal of American Chemical Society, **2022**, 144, 5074–5086.

15. Manipulating the Self-Assembly of Phenyleneethynylenes under Vibrational Strong Coupling. Sandeep, K.; Joseph, K.; Gautier, J.; Nagarajan, K.; Sujith, M.; Thomas, K. G.; Ebbesen, T. W. Journal of Physical Chemistry Letters, **2022**, 13, 1209–1214.

16. Nag, P; Vennapusa, S. R.; Unravelling the sub-100 fs ESIPT in 5-hydroxychromone using surface hopping simulations, J. Photochem. Photobiol. A, **2022**, 427, 113767(1-8)

17. Nath, A; Thomas, G. M; Hans, S; Vennapusa, S. R; Mandal, S; "Crystal Packing-Driven Selective Hg(II) Ion Sensing Using Thiazolothiazole-Based Water-Stable Zinc Metal–Organic Framework" Inorg. Chem. **2022,** *61*, 2227-2233.

18. P. S. Divya, Nair S. and Kunnikuruvan S., Identification of Crucial Intermediates in the Formation of Humins from Cellulose-Derived Platform Chemicals Under Brønsted Acid Catalyzed Reaction Conditions, ChemPhysChem, **2022**, Accepted (DOI: https://doi.org/10.1002/cphc.202200057)

19. Parida, K. N.; Moorthy, J. N., Organocatalysis with ortho-Substituted Modified IBXs. Synlett **2022**, Accepted (DOI: 10.1055/a-1813-7319).

20. R. Mintu, S. Sravya, S. Nagendra, G. Rajendar,

The influence of α-coordinating groups of aldehydes on E/Z-selectivity and the use of quaternary ammonium counter ions for enhanced E-selectivity in the Julia–Kocienski reaction. Organic & Biomolecular Chemistry **2022**, 20, 329-333.

21. R. Rai, K. M. Sureshan*, Topochemical synthesis of a heterochiral peptide polymer in different polymorphic forms from crystals and aerogels (rated as Highly Important Paper). Angew. Chem. Int. Ed., **2022**, 61, https://doi.org/10.1002/anie.202111623

22. Raju, L. A. Mathew, K. M. Sureshan*, A Biomaterial-based Porous Core-Shell Sorbent for Practical and Efficient Marine Oil Spill Recovery. Adv. Sust. Sys. **2022**, 6 (accepted)

23. Ravi, S. Z. Hassan, S. Bhandary, K. M. Sureshan*, Topochemical postulates: Are they relevant for topochemical reactions occurring at elevated temperatures? Angew. Chem. Int. Ed., **2022**, 61, https://doi.org/10.1002/anie.202200954

24. Retaining Huckel Aromaticity in Triplet Excited State of Azobenzene, P. E. Swathi Krishna, Vivek V. Dev, Remya Ramakrishnan and M. Hariharan*, ChemPhysChem, **2022**, 23, 10.1002/cphc.202200045.

25. S. Bhandari, M. C. Madhusudhanan, A. Pathigoolla, K. M. Sureshan*, Azide···alkyne interaction: A crucial attractive force for their preorganization for topochemical cycloaddition reaction. Chem. Eur. J. **2022**, https://doi.org/10.1002/chem.202200820

26. S. Ranganayakulu, Aswathi S., G. Rajendar, A Chiral Pool Approach for Total Synthesis of (+)-Diaportinol, (-)-Peniisocoumarin H and (+) & (-)-Desmethyldiaportinol; Their Structural Revision. Asian J. Org. Chem, **2022**, 11, e202100668.

27. Sulfikarali, T.; Behera, G.; Ajay, J.; Mori, S.; Akhil Chakravarthy, K.; Reddy, V. S.; Gokulnat, S., Disruption of Antiaromaticity in Structurally Related Expanded Porphyrin-Like Macrocycles with Benzene Linkers. Org. Lett. **2022**, 24, 245-249

28. Symmetry Breaking Charge Separation in Molecular Constructs for Efficient Light Energy Conversion, E. Sebastian and M. Hariharan*, ACS Energy Lett. **2022**, 7, 696-711 (Front Cover).

29. The Effect of Single Atom Substitution on Structure and Band Gap in Organic Semiconductors, A. T. John, A. Narayanasamy, D. George and M. Hariharan*, Cryst. Growth Des. **2022**, 22, 1237-1243.

30. Tripathy, A. R.; Rizwana, R. A.; Kumar, A.; Yatham, V. R., Photocatalyzed Alkylative Cyclization of 2-Isocyanobiphenyls with Unactivated Alkyl Iodides Org. Biomol. Chem. **2022**, 20, 3136 - 3144.

31. V. Athiyarath, M. C. Madhusudhanan, S. Kunnikuruvan, K. M. Sureshan*, Secondary structure tuning of a pseudoprotein between β-meander and α-helical forms in the solid-state (rated as Highly Important Paper). Angew. Chem. Int. Ed., **2022**, 61, e202113129

32. Virtual Issue on Halogen Bonding, M. Hariharan, Cryst. Growth Des. **2022**, 22, 10.1021/acs.cgd.2c00157.

33. Yedase, G. S.; Ja, A. K.; Yatham, V. R. Visible-light enabled C(Sp3)–C(Sp2) cross-electrophile coupling via synergistic halogen-atom transfer (XAT) and nickel catalysis J. Org. Chem. **2022**, (DOI: 10.1021/acs.joc.2c00251).

School of Mathematics

2021

1. Arun, K. R.; Das Gupta, A. J.; Samantaray, S. Analysis of an asymptotic preserving low Mach number accurate IMEX-RK scheme for the wave equation system. Appl. Math. Comput. 411 (2021), Paper No. 126469, 20 pp.

2. Asha K. Dond and Rakesh Kumar, Finite difference modified WENO schemes for hyperbolic conservation laws with non-convex flux, Internat. J. Numer. Methods Fluids, 93 (10) 3005-3019, 2021.

3. Bharali, Gautam and Sridharan, Shrihari, "The entropy of holomorphic correspondences: exact computations and rational semigroups", Ann. Acad. Sci. Fenn. Math., 46, 2021, (1 -20)

4. Das, Joyentanuj and Mohanty, Sumit. On the spectral radius of bi-block graphs with given independence number α. Appl. Math. Comput. 402 (2021), Paper No. 125912,8 pp.

5. Dhanya V, N. Sureshkumar and N. Chamakuri: A posteriori error estimates and an adaptive finite element solution for the system of unsteady convection-diffusion- reaction equations in fluidized beds. Applied Numerical Mathematics, Vol 163, page 108-125, 2021.

6. Joyentanuj Das and Ritabrata Jana, Proof of a conjecture on Weiner index and eccentricity of a graph due to edge contraction, Discrete, Appl. Math. (2021) Volume 307, Pages 19-21.

7. Joyentanuj Das and Sumit Mohanty, Distance matrix of weighted cactoid-type digraphs, Linear and Multilinear Algebra, (2021). https://doi.org/10.1080/03081087.2021.1916423

8. Pal, Sarbeswar; Pauly, Christian The wobbly divisors of the moduli space of rank-2 vector bundles. Adv. Geom. 21 (2021), no. 4, 473–482.

9. R. Dhanya, Sweta Tiwari; A multiparameter fractional Laplace problem with semipositone nonlinearity. *Commun. Pure Appl. Anal.* 20 (2021), no. 12, 4043–4061.

10. Sarma Abinash, On 3-divisibility of 9- and 27-regular partitions, Ramanujan Journal (2021). https://doi.org/10.1007/s11139-021-00463-2.

11. Sheetal Dharmatti and P L N Mahendranath, Nonlocal Cahn-Hilliard-Brinkman Sys-tem with regular potential: Regularity and optimal control, Journal of Dynamical and Control Systems, 27(2021) no 2, 221-246.

12. Srilakshmi Krishnamoorthy and Sunil kumar Pasupulati, Note On the p-divisibility of class numbers of an infinite family of imaginary quadratic fields, Glasgow Mathematical Journal, (2021).

13. T. Kathiravan and K. Srilakshmi, Some congruences for (s, t)-regular bipartitions modulo t, Integers, 21 (2021), A15.

14. Tania Biswas, Sheetal Dharmatti and Manil T Mohan, Second Order Optimality Conditions for Optimal Control Problems Governed by 2D Nonlocal Cahn Hilliard Navier Stokes Equation, Nonlinear Studies, 28, (2021) no 1 29-43.

15. Tania Biswas, Sheetal Dharmatti, P L N Mahendranath and Manil T Mohan, on the Stationary Nonlocal Cahn Hilliard Navier Stokes System: Existence, Uniqueness and Exponential Stabilization, Accepted for publication in Asymptotic Analysis, 125 (2021) 59–99.

16. Utpal Manna and Akash Ashirbad Panda. Well-posedness and Large Deviations for 2D Stochastic Constrained Navier-Stokes

Equations driven by Lévy Noise in the Marcus canonical form. Journal of Differential Equations, Volume 302 (2021), 64-138.

17. Utpal Manna and Debopriya Mukherjee. Weak martingale solution of stochastic critical Oldroyd-B type models perturbed by pure jump noise. Stochastic Analysis and Applications. Published online (2021): https://doi.org/10.1080/07362994.2021.1947855.

18. V. Z. Thomas, Schur's exponent property and its relation to Noether's rationality problem. Indian J Pure Appl Math. (2021) 52, 729-734.

2022

1. Amrutha P, Bakkyaraj T, Krishnan Balasubramanian and T. Geetha. Induced Representations of Dihedral Groups (Dn) from its subgroups and to the Symmetric groups (Sn): Applications to Nanotubes, Gel'fand states Tableaus and Spectroscopy, Journal of Mathematical Chemistry (**2022**) 60: 733–751.

2. Antony, A.E., Komma, P. & Thomas, V.Z. A property of p-groups of nilpotency class p + 1 related to a theorem of Schur. Isr. J. Math. (**2022**) 247, 251-267. https://doi.org/10.1007/s11856-021-2264-4.

3. Anurag Kumar, Bhavneet Kaur, Rakesh Kumar, A new fifth order finite difference WENO scheme to improve convergence rate at critical points, Wave Motion volume 109, February **2022**. https://doi.org/10.1016/j.wavemoti.2021.102859

4. Arpti Babbar, Sudarshan Kumar K., Praveen C., Lax-Wendroff flux reconstruction method for hyperbolic conservation laws. J. Comput. Phys. (**2022**) 467.

5. Arun, K. R.; Krishnan, M.; Samantaray, S. A unified asymptotic preserving and well-balanced scheme for the Euler system with multiscale relaxation. Comput. & Fluids 233 (**2022**), Paper No. 105248, 13 pp. 65M08 (35L45 35L60 35L65 35L67 76Nxx)

6. Bhattacharya, D. (2022). Geometry of certain Brill–Noether locus on a very general sextic surface and Ulrich bundles. Proc. Indian Acad. Sci. Math. Sci. 132 (**2022**), no. 1, Paper No. 22, 30 pp.

7. Chatterjee, Saikat; Chowdhury Adittya; Koushik, Praphulla; Atiyah sequence and gauge transformations of a principal 2-bundle over a Lie groupoid, J. Geom. Phys. 176 (**2022**)

8. N. Chamakuri and P. Kuegler: Parallel space-time adaptive numerical simulation of 3D cardiac electrophysiology, Applied Numerical Mathematics, Vol 173, 295-307, **2022**.

9. P. Devaraj, Ankush Kumar Garg and Yugesh Shanmugam, Average and convolution sampling over shift-invariant spaces, Complex Analysis and Operator Theory (**2022**) 16:20. https://doi.org/10.1007/s11785-021-01165-9

10. Prasanta Kumar Barik, Pooja Rai, Ankik Kumar Giri. Mass-conserving weak solutions to Oort-Hulst-Safronov coagulation equation with singular rates, J. Diff. Eq. 326 (**2022**) 164–200

11. Rakesh Kumar, Praveen Chandrashekar, Multi-level WENO Schemes with an Adaptive Characteristic-wise Reconstruction for System of Euler equations, Computers & Fluids, 239, 2022. https://doi.org/10.1016/j.compfluid.**2022**.105386

12. Sachindranath Jayaraman, Yogesh Kumar Prajapaty and Shrihari Sridharan, Dynamics of products of nonnegative matrices, Extracta Mathematicae, **2022**, accepted for publication.

13. Sameer Chavan, Soumitra Ghara, and Md. Ramiz Reza, Cauchy dual subnormality problem via de Branges–Rovnyak space, Studia Mathematica, 265 (3), (**2022**), 315–341. DOI: 10.4064/sm210419-9-12.

14. Sathish Kumar, Prashant Kumar, and P. Devaraj, Approximation of discontinuous signals by exponential signals, Results in Mathematics, (**2022**) 77:23. https://doi.org/10.1007/s00025-021-01551-x

15. Sathish Kumar, Prashant Kumar, and P. Devaraj, Approximation of discontinuous functions by Kantorovich exponential sampling series, Analysis and Mathematical Physics, (**2022**) 12:73. https://doi.org/10.1007/s13324-022-00680-y.

School of Physics

2021

1. A K, Sarder M T H, Medhi A. Mott transition, magnetic and orbital orders in the ground state of the two-band Hubbard model using variational slave-spin mean field formalism. J. Phys.: Condens. Matter 2021, 34, 055602. DOI: https://doi.org/10.1088/1361-648X/ac3452

2. A. Krishnakumar MA, Manoharan PK, Joshi BC, Girgaonkar R, Desai S, Bagchi M, et al. High precision measurements of interstellar dispersion measure with the upgraded GMRT. Astronomy & Astrophysics. 2021, 651, A5. DOI: https://doi.org/10.1051/0004-6361/202140340

3. A. Revathy R, Nair AA, Varma MR, Surendran KP. Magnetism of cobalt during oxidative ageing: A theory supported experimental investigation. Materials Science and Engineering B-Advanced Functional Solid-State Materials. 2021, 273, 115453. DOI: https://doi.org/10.1016/j.mseb.2021.115453

4. Ambrosio GD, Mathew Arun Thomas, Kushwaha A, Vempati SK. Taming epsilon(K) in little Randall-Sundrum models. Physical Review D.2021;104(5),055012. DOI:10.1103/PhysRevD.104.055012

5. Anitha, B.; Joseph, A.; Alexander, A.; Vijith, K. P.; Varun, S.; Namboothiry, M. A. G. Charge carrier dynamics and photovoltaic properties of near-infrared absorbing squaraine incorporated solution-processed additive-free PTB7: PCBM based ternary solar cells. Journal of Physics D: Applied Physics 2021, 55 (12), 125301. DOI: https://doi.org/10.1088/1361-6463/ac4135

6. Antony A, Mitra J. Refractive index-assisted UV/Vis spectrophotometry to overcome spectral interference by impurities. Analytica Chimica Acta. 2021; 1149, 238186. DOI: https://doi.org/10.1016/j.aca.2020.12.061

7. Antony CE, Gaana K, Praveen SG, Jayakumar A, Yadav A, Sivakumar NS, Niranjana Kamath, Suma M N, Vinayak D Kamble, Deepshika Jaiswal-Nagar. Polyvinylpyrrolidone-Stabilized Palladium Nanocrystals as Chemiresistive Sensors for Low-Concentration Hydrogen Gas Detection. ACS Applied Nano Materials. 2021, 4(2), 1643-53. DOI: https://doi.org/10.1021/acsanm.0c03109

8. Arumugam R, Chandrasekar V K, Senthilkumar DV. Rate-induced tipping and regime shifts in a spatial ecological system European Physical Journal-Special Topics. 2021, 230(16-17), 3221-7. DOI:10.1140/epjs/s11734-021-00139-4

9. Arumugam R, Chandrasekar V. K, Senthilkumar DV. Metacommunity persistence to environmental change: Stabilizing and destabilizing effects of individual species dispersal. Physical Review E. 2021, 104(2), 024202(1-14). DOI:10.1103/PhysRevE.104.024202

10. Awasthi S., Dutta S. B. Oscillating states of periodically driven anharmonic Langevin systems. Physical Review E 2021, 103,

062143. DOI: https://doi.org/10.1103/PhysRevE.101.042106.

11. Babu B, Shaijumon MM. Understanding How Degree of Crystallinity Affects Electrochemical Kinetics of Sodium-Ion in Brown TiO2 Nanotubes. Chemelectrochem. 2021, 8(12), 2180-2185. DOI: https://doi.org/10.1002/celc.202100047

12. Badrtdinov DI, Ding L, Ritter C, Hembacher J, Ahmed N, Skourski Y, et al. MoP3SiO11: A 4d (3) honeycomb antiferromagnet with disconnected octahedra. Physical Review B. 2021, 104(9), 094428. DOI: https://doi.org/10.1103/PhysRevB.104.094428

13. Bag P; Ahmed N.; Singh V.; Sahoo M.; Tsirlin A.A.; Nath R., Low-dimensional magnetism of BaCuTe2O6. Physical Review B. 2021, 103(13), 134410. DOI: https://doi.org/10.1103/PhysRevB.103.134410

14. Balakrishnan S, Raju SR, Barua A, Pradeep RP, Ananthasuresh GK. Two nondimensional parameters for characterizing the nuclear morphology. Biophysical Journal. 2021, 120(21), 4698-709. DOI: https://doi.org/10.1016/j.bpj.2021.09.035

15. Banik, M.; Guha, T.; Alimuddin, M.; Kar, G.; Halder, S.; Bhattacharya, S. S. Multi-copy adaptive local discrimination: Strongest possible two-qubit nonlocal bases. Physical Review Letters 2021, 126, 210505. DOI: https://doi.org/10.1103/PhysRevLett.126.210505

16. Bhaskar, A.; Das, D.; Mandal, T.; Mitra, S.; Neeraj, C. Precise limits on the charge-2/3 U1 vector leptoquark. Physical Review D 2021, 104(3), 035016. DOI: 10.1103/PhysRevD.104.035016

17. Bhaskar, A.; Mandal, T.; Mitra, S.; Sharma, M. Improving third-generation leptoquark searches with combined signals and boosted top quarks. Physical Review D 2021, 104 (7), 075037. DOI: 10.1103/PhysRevD.104.075037

18. Bhattacharya, S. S.; Maity, A. G.; Guha, T.; Chiribella, G.; Banik, M. Random-Receiver Quantum Communication. PRX Quantum 2021, 2, 020350. DOI: https://doi.org/10.1103/PRXQuantum.2.020350

19. Bhowmik, A. D.; Parashar, P.; Banik, M. Bell Nonlocality and the Reality of Quantum Wavefunction. Physical Review A 2021, 104, 022217. DOI: https://doi.org/10.1103/PhysRevA.104.022217

20. Biswas S, Das AK, Nath A, Paul S, Singh MS, Mandal S. Novel class of water-soluble phosphonate silver cluster assembled material for efficient photoelectric sensing and photoacoustic imaging. Nanoscale. 2021 13(41), 17325-30. DOI: https://doi.org/10.1039/D1NR05646H

21. Biswas S, Singh S, Chattopadhyay S, de Silva KKH, Yoshimura M, Mitra J, Kamble VB., Selective Enhancement in Phonon Scattering Leads to a High Thermoelectric Figure-of-Merit in Graphene Oxide-Encapsulated ZnO Nanocomposites. ACS Applied Materials & Interfaces. 2021, 13(20), 23771-86. https://doi.org/10.1021/acsami.1c04125

22. Biswas, S.; Dutt AS, Sebastian N, Kamble V. Simple, reversible gradient Seebeck coefficient measurement system for 300-600 K with COMSOL simulations. Review of Scientific Instruments. 2021, 92 (4), 044903. DOI: https://doi.org/10.1063/1.5124459

23. Chiribella, G.; Banik, M.; Bhattacharya, S. S.; Guha, T.; Alimuddin, M.; Roy, A.; Saha, S.; Agrawal, S.; Kar, G. Indefinite causal order enables perfect quantum communication with zero capacity channel. New J. Phys. 2021, 23, 033039. DOI: https://doi.org/10.1088/1367-2630/abe7a0

24. Das AK, Biswas S, Thomas A, Paul S, Nair AS, Pathak B, et al. Switchable photon and phonon emission properties of an atomically precise Ag-14 core-based two-dimensional silver cluster-assembled material. Materials Chemistry Frontiers. 2021, 5(24), 8380-6. DOI:

https://doi.org/10.1039/D1QM01355F

25. Devadevan MM, Krishnanand J, Shilpa KB, Kini RN. A Compact, Fast, and Efficient Plasma Cleaner. IEEE Transactions on Plasma Science. 2021, 49(11), 3576-81. DOI: 10.1109/TPS.2021.3119128

26. Dey K, Karnesis N, Toubiana A, Barausse E, Korsakova N, Baghi Q and Basak S. Effect of data gaps on the detectability and parameter estimation of massive black hole binaries with LISA. Physical Review D. 2021, 104, 044035 DOI: 10.1103/PhysRevD.104.044035

27. Dileep NP, Sarma PV, Prasannachandran R, Surendran V, Shaijumon MM. Electrostatically Coupled Nanostructured Co(OH) (2)-MoS2 Heterostructures for Enhanced Alkaline Hydrogen Evolution. ACS Applied Nano Materials. 2021, 4(7), 7206-7212. DOI: https://doi.org/10.1021/acsanm.1c01163

28. Dutta A, Chatterjee A, Sarkar T, Chowdhury S, Kamble VB, Ghosh R. Synthesis, structural characterization and variable temperature electrical conductivity of a pentanuclear Pd(II)dithiolato complex. Inorganic Chemistry Communications. 2021, 133, 108889. DOI: https://doi.org/10.1016/j.inoche.2021.108889

29. Dutta, S.; Mukherjee, D.; Neetu; Parihar, S. A unitary matrix model for q-deformed Plancherel growth, Nuclear Physics B 2021, 971, 115531. DOI: https://doi.org/10.1016/j.nuclphysb.2021.115531

30. Guchhait S., Ding Q.P.; Sahoo M.; Giri A.; Maji S.; Furukawa Y, et al., Quasi-one-dimensional uniform spin-1/2 Heisenberg antiferromagnet KNaCuP2O7 probed by 31P and 23Na NMR. Physical Review B.2021, 103(22), 224415. DOI:https://doi.org/10.1103/PhysRevB.103.224415

31. Guchhait S; Baby S; Padmanabhan M.; Medhi A.; Nath R., Quasi-two-dimensional magnetism in spin-1/2 square lattice compound CuC6H2(COO) (4) H3N-(CH2) (2)-NH3 center dot 3H(2)O. EPL 2021, 133(5), 57006. DOI: https://doi.org/10.1209/0295-5075/133/57006

32. Guha, T.; Alimuddin, M.; Rout, S.; Mukherjee, A.; Bhattacharya, S. S.; Banik, M. Quantum Advantage for Shared Randomness Generation. Quantum 2021, 5, 569. DOI: https://doi.org/10.22331/q-2021-10-27-569

33. Harikrishnan, S V; Ranjan, A.; Banik, M. State space structure of tripartite quantum systems. Physical Review A 2021, 104, 022437. DOI: https://doi.org/10.1103/PhysRevA.104.022437

34. Hazra S, Bag R, Singh S, Kini RN. Effect of doping on the pseudogap behaviour and the related terahertz modes in the hybrid chain-ladder compound, Sr14Cu24O41. Physics Letters A. 2021, 408, 127489. DOI:10.1016/j.physleta.2021.127489

35. Hazra S, Gupta N, Conibeer G, Shrestha S, Kini RN. Effect of nanostructuring on picosecond acoustics in a Zr film. Physica Scripta. 2021, 96(12), 125716. DOI:10.1088/1402-4896/ac30a3

36. Hegde AS, Athulya KP, Pathak V, Piilo J, Shaji A. Open quantum dynamics with singularities: Master equations and degree of non-Markovianity, Physical Review A, 2021, 104, 062403. DOI: 10.1103/PhysRevA.104.062403

37. Jayakumar A, Dixit V, Jose S, Kamble VB, Jaiswal-Nagar D. Charge transport variation from Bloch-Gruneisen to Mott variable range hopping and transport change due to hydrogenation in Palladium thin films. Scientific Reports. 2021; 11, 22298. DOI: https://doi.org/10.1038/s41598-021-01787-1

38. Johns, B.; Chattopadhyay, S.; Mitra, J. Tailoring Infrared Absorption and Thermal Emission with Ultrathin Film Interferences in Epsilon-Near-Zero Media. Adv. Photonics Res. 2021, 2100153, 1. DOI: https://doi.org/10.1002/

adpr.202100153

39. Kadyan A, Shaji A, George J. Boosting Self-interaction of Molecular Vibrations under Ultrastrong Coupling Condition. Journal of Physical Chemistry Letters. 2021, 12(17), 4313-8. DOI: 10.1021/acs.jpclett.1c00552

40. Kayal A, Harikrishnan G, Bandopadhyay K, Kumar A, Silva SRP, Mitra J. Controlling the macroscopic electrical properties of reduced graphene oxide by nanoscale writing of electronic channels. Nanotechnology. 2021;32(17), 175202. DOI: https://doi.org/10.1088/1361-6528/abda72

41. Keshri S P, Medhi A. Enhanced thermoelectric efficiency of monolayer InP3 under strain: a first-principles study. J. Phys.: Condens. Matter 2021, 33, 225701. DOI: https://doi.org/10.1088/1361-648X/abe799

42. Kochappan JP, Sen A, Ghosh T, Chingangbam P, Basak S. Application of the contour Minkowski tensor and D statistic to the Planck E-mode data. Physical Review D. 2021, 103, 123523. DOI: 10.1103/PhysRevD.103.123523

43. Krishnan NK, Sreedharan A, Sagar S, Manamel LT, Mukherjee A, Das BC. Self-Powered broadband photodetection of copper phthalocyanine by enhancing photogating effect with monolayer MoS2 flakes. Applied Surface Science. 2021, 568, 150818. DOI: https://doi.org/10.1016/j.apsusc.2021.150818

44. Kumbhakar P, Shanmugam A, Sharma CH, Reno JL, Thalakulam M. Quantum point contact galvanically coupled to planar superconducting resonator: a shot-noise-limited broad-band electrical amplifier. Quantum Science and Technology. 2021;6(4). DOI: https://doi.org/10.21203/rs.3.rs-145756/v1

45. Kusuma Urs MB; Kamble V. Protonic conduction induced selective room temperature hydrogen response in ZnO/NiO heterojunction surfaces. Sensors and Actuators B-Chemical. 2021, 348(12), 130605. https://doi.org/10.1016/j.snb.2021.130605

46. Manamel LT, Madam SC, Sagar S, Das BC. Electroforming-free nonvolatile resistive switching of redox-exfoliated MoS2 nanoflakes loaded polystyrene thin film with synaptic functionality. Nanotechnology. 2021, 32(35), 35LT02. DOI: https://doi.org/10.1088/1361-6528/ac056e

47. Manoranjani M, Gopal R, Senthilkumar DV, Chandrasekar V K. Role of phase-dependent influence function in the Winfree model of coupled oscillators. Physical Review E. 2021, 104, 064206(1-8). DOI:10.1103/PhysRevE.104.064206

48. Mathew BJ, Shaji A. Nonclassical states of light in a nonlinear Michelson interferometer. Physical Review A. 2021, 104, 062404. DOI:10.1103/PhysRevA.104.062604

49. Maurya A K, Sarder M T H, Medhi A. Ground state of a three-band Hubbard model with Hund's coupling: Janus-faced behavior in presence of magnetic order. J. Phys.: Condens. Matter 2021, 33, 425603. DOI: https://doi.org/10.1088/1361-648X/ac1766

50. Mishra M, Sahoo B. Curvature squared action in four dimensional N=2 supergravity using the dilaton Weyl multiplet. Journal of High Energy Physics. 2021, 27 (2021). DOI: https://doi.org/10.1007/JHEP04(2021)027

51. Mishra, A. and Pant, R. Deep UV to NIR frequency combs via cascaded harmonic generation in a silica nanowire using nanojoule pulse energies. Optica 2021, 8 (9), 1210-7. DOI: https://doi.org/10.1364/OPTICA.432053

52. Mol PR, Barman PK, Sarma PV, Kumar AS, Sahu S, Shaijumon MM, et al. Anomalously polarised emission from a MoS2/WS2 heterostructure. Nanoscale Advances. 2021, 3(19), 5676-5682, DOI: https://doi.org/10.1039/D1NA00462J

53. Mukharjee P.K.; Somesh K.; Ranjith K.M.;

Baenitz M.; Skourski Y.; Adroja D.T., et al., Quantum magnetism of ferromagnetic spin dimers in alpha-KVOPO4. Physical Review B. 2021, 104(22), 224409. DOI: https://doi.org/10.1103/PhysRevB.104.224409

54. Mukherjee A, Ottapilakkal V, Sagar S, Das BC. Ultralow-Voltage Field-Effect Transistors Using Nanometer-Thick Transparent Amorphous Indium-Gallium-Zinc Oxide Films. ACS Applied Nano Materials. 2021, 4(8), 8050-8. DOI: https://doi.org/10.1021/acsanm.1c01326

55. Mukherjee A, Sagar S, Parveen S, Das BC. Superionic rubidium silver iodide gated low voltage synaptic transistor. Applied Physics Letters. 2021, 119(25), 253502. DOI: https://doi.org/10.1063/5.0069478

56. Naik S.; Kalaiarasan S.; Nath R.C.; Sarangi S.N.; Sahu A.K.; Samal D., et al., Nominal Effect of Mg Intercalation on the Superconducting Properties of 2H-NbSe2. Inorganic Chemistry. 2021, 60(7), 4588-4598. DOI: https://doi.org/10.1021/acs.inorgchem.0c03545

57. Nair, A.; Kamble, V. Large area coverage and Controlled Photoluminescence from vertically aligned ZnO nanorods on Cu substrates, Materials Today proceedings, 2021, 47, 5223-5227. DOI: https://doi.org/10.1016/j.matpr.2021.05.559.

58. Naveen K.; Rom T.; Islam S.S.; Reehuis M.; Adler P.; Felser C., et al. Evolution of transition metal charge states in correlation with the structural and magnetic properties in disordered double perovskites Ca2-xLaxFeRuO6(0.5<=x<=2). Physical Chemistry Chemical Physics. 2021, 23(38), 21769-21783. DOI: https://doi.org/10.1039/D1CP02318G

59. P Riya Mol, Prahalad Kanti Barman, Prasad V Sarma, Abhishek S Kumar, Satyam Sahu, Manikoth M Shaijumon and Rajeev N Kini,* Anomalously polarised emission from MoS2/WS2 heterostructure, Nanoscale Advances, 3, 5676-5682 (2021) DOI: https://doi.org/10.1039/D1NA00462J

60. Paul S, Mandal S, Singh MS. Noise Adaptive Beamforming for Linear Array Photoacoustic Imaging. IEEE Transactions on Instrumentation and Measurement. 2021, 70, 4006511. DOI: 10.1109/TIM.2021.3103260

61. Paul S, Thomas A, Singh MS. Delay-and-sum-to-delay-standard-deviation factor: a promising adaptive beamformer. Optics Letters. 2021, 46(18), 4662-5. DOI: https://doi.org/10.1364/OL.437394

62. Prahalad Kanti Barman*, Prasad V. Sarma, Manikoth M. Shaijumon, Rajeev N. Kini*, Resonant-Raman study of Fröhlich exciton-phonon interaction in WS2 nanostructures, Eur. Phys. J. Spec. Top (2021) DOI:https://doi.org/10.1140/epjs/s11734-021-00389-2

63. Prasanta Kumbhakar, Anusha Shanmugam, Chithra H Sharma, J L Reno and Madhu Thalakulam Quantum point contact galvanically coupled to planar superconducting resonator: a shot-noise-limited broad-band electrical amplifier, Prasanta Kumbhakar, *Quantum Sci. Technol.* **6** 045006 (2021). DOI:https://doi.org/10.1088/2058-9565/ac107f

64. Radhakrishnan D, Shanmukhan AP, Kareem A, Mathew MM, Varaparambathu1 V, Aiyaz1 M, Radha RK, Mekala KR, Shaji A, Prasad K. Age, Wound Size, and Position of Injury – Dependent Vascular Regeneration Assay in Growing Leaves. Bio-protocol. 2021, 11(09), e4010. DOI: 10.21769/BioProtoc.4010

65. Rai B, Sarma PV, Srinivasan V, Shaijumon MM, Ramamurthy SS. Engineering of Exciton-Plasmon Coupling Using 2D-WS2 Nanosheets for 1000-Fold Fluorescence Enhancement in Surface Plasmon-Coupled Emission Platforms. Langmuir. 2021, 37(5), 1954-1960. DOI: https://doi.org/10.1021/acs.langmuir.0c03465

66. Rai KN, Basak S, Saha P. Radius measurement in binary stars: simulations of intensity

interferometry. Monthly Notices of the Royal Astronomical Society. 2021, 507(2), 2813 24. DOI:10.1093/mnras/stab2391

67. Rai, A.; Pivoluska, M.; Plesch, M.; Sasmal, S.; Banik, M.; Ghosh, S. Device-independent bound for Cabello's nonlocality argument. Physical Review A 2021, 103, 062219. DOI: https://doi.org/10.1103/PhysRevA.103.062219

68. Rajak NK, Kondedan N, Jan H, Dilshah MU, S. D. Navya, Kaipamangalath A, Ramavarma M, Bansal C, Jaiswal-Nagar D. Setup of high resolution thermal expansion measurements in closed cycle cryostats using capacitive dilatometers. Journal of Physics Communications 2021, 5, 125004. DOI: https://doi.org/10.1088/2399-6528/ac3a44

69. Rajak NK, Mohan A, Jaiswal-Nagar D. Quantitative phase analysis of Bi2Sr2CaCu2O8+x and competing intergrowth and co-crystallizing phases via a Rietveld refinement study. Journal of Applied Crystallography. 2021, 54, 1158-72. DOI: https://doi.org/10.1107/S160057672100621X

70. Rout, S.; Maity, A. G.; Mukherjee, A.; Halder, S.; Banik, M. Multiparty orthogonal product states with minimal genuine nonlocality. Physical Review A 2021, 104, 052433. DOI: https://doi.org/10.1103/PhysRevA.104.052433

71. S Giri, W Akram, M Bansal, T Maity. Tuning magnetocaloric effect by optimizing thickness induced 3D strain state. Physical Review B 2021, 104 (22), 224432. DOI: https://doi.org/10.1103/PhysRevB.104.224432

72. Sahoo M, Arsha N, Baral PR, Klumpp S. Accuracy and speed of elongation in a minimal model of DNA replication. Physical Review E. 2021, 104, 034417. DOI: https://doi.org/10.1103/PhysRevE.104.034417

73. Samir Kumar Giri, Wasim Akram, Manisha Bansal, and Tuhin Maity; Tuning the magnetocaloric effect by optimizing thickness-induced three-dimensional strain states, Phys. Rev. B 104, 224432 (2021) DOI:https://doi.org/10.1103/PhysRevB.104.224432

74. Shakthi, SA.; Varun MK; and Pant, R. Dynamic Dispersion-Compensation for Wideband Microwave Photonic Notch Filter With High Rejection and High-Resolution. IEEE Journal of Selected Topics in Quantum Electronics 2021, 27 (6), 1-13. DOI:10.1109/JSTQE.2021.3095903

75. Singh U, Raina A, Chandrasekar V K, Senthilkumar D V. Nontrivial amplitude death in coupled parity-time-symmetric Lienard oscillators. Physical Review E. 2021, 104, 054204(1-8). DOI:10.1103/PhysRevE.104.054204

76. Singh V.; Nath R, Negative thermal expansion and itinerant ferromagnetism in Mn1.4Fe3.6Si3. Journal of Applied Physics. 2021, 130(3), 033902. DOI: https://doi.org/10.1063/5.0055695

77. Singha D.K.; Islam S.S.; Das C.; Kc N.A.; Nath R.C.; Mahata P., Synthesis and Investigation of Magnetic Properties of Rod Shaped Micron Sized Ni-4 and Co2Ni2 Cluster based MOFs. Zeitschrift Fur Anorganische Und Allgemeine Chemie. 2021, 647(20-21), 1939-1946. DOI: https://doi.org/10.1002/zaac.202100225.

78. Singha J, Surnis MP, Joshi BC, Tarafdar P, Rana P, Susobhanan A, et al. Evidence for profile changes in PSR J1713+0747 using the uGMRT. Monthly Notices of the Royal Astronomical Society. 2021, 507(1), L57-L61. DOI: https://doi.org/10.1093/mnrasl/slab098

79. Somesh K, Furukawa Y, Simutis G, Bert F, Prinz-Zwick M, Buttgen N, et al. Universal fluctuating regime in triangular chromate antiferromagnets. Physical Review B. 2021, 104(10), 104422. DOI: https://doi.org/10.1103/PhysRevB.104.104422.

80. Soniya N, Aswathy S, Anagha GS, Alee

KS. Asymmetric coupling coefficients induced amplified spontaneous emission in planar coupled waveguides. Journal of Optics. 2021;23(8), 085401. https://doi.org/10.1088/2040-8986/ac1957

81. Surendran V, Lal A, Shaijumon MM. Mass Balancing of Hybrid Ion Capacitor Electrodes: A Simple and Generalized Semiempirical Approach. ACS Applied Materials & Interfaces. 2021, 13(44), 52610-52619, Doi: https://doi.org/10.1021/acsami.1c14731q

82. Suvankar Dutta, Debangshu Mukherjee, Neetu and Sanhita Parihar; A unitary matrix model for q-deformed Plancherel growth, Nucl.Phys. B 971 (2021). DOI: https://doi.org/10.1016/j.nuclphysb.2021.115531

83. Vaisakh, M; Patra, R. K.; Janpandit, M.; Sen, S.; Banik, M.; Chaturvedi, A. Mutually Unbiased Balanced Functions & Generalized Random Access Codes. Physical Review A 2021, 104, 012420. DOI: https://doi.org/10.1103/PhysRevA.104.012420

84. Varun, M. K.; and Pant, R. Efficient Microwave Photonic Bandpass Filter With Large Out-of-Band Rejection, High-Resolution and Low Loss up to 40 GHz. Journal of Lightwave Technology 2021, 39 (21), 6724-32. DOI: 10.1109/JLT.2021.3108769

85. Varun, M. K.; and Pant, R. Electromagnetically-Induced-Absorption-Mediated Ultrahigh-Rejection Microwave Photonic Notch Filter Using Single-Sideband Modulation. Physical Review Applied 2021, 16 (2), 024053. DOI: https://doi.org/10.1103/PhysRevApplied.16.024053

86. Vinod G, Shaji A, Finding Solutions to the Integer Case Constraint Satisfiability Problem Using Grover's Algorithm. IEEE Transactions on Quantum Engineering. 2021, 2, 3104013. DOI: 10.1109/TQE.2021.3120449

87. Vishnulal C, Basak S, Das S. Hawking radiation of anyons. Physical Review D. 2021, 104, 104011. DOI: 10.1103/PhysRevD.104.104011.

88. Wu R, Zhang D, Maity T, Lu P, Yang J, Gao XY, et al. Self-biased magnetoelectric switching at room temperature in three-phase ferroelectric-antiferromagnetic-ferrimagnetic nanocomposites. Nature Electronics. 2021, 4(5), 333-41. DOI: https://doi.org/10.1038/s41928-021-00584-y

89. Zou W.; Senthilkumar D. V.; Zhan M.; Kurths J. Quenching, aging, and reviving in coupled dynamical networks. Physics Reports-Review Section of Physics Letters. 2021, 931, 1-72. DOI: 10.1016/j.physrep.2021.07.004

2022

1. Akhil Alexander, Varun Srivastava, Poovannan Ravichandran, K. P. Vijith, B. Anitha, Alvin Joseph, Manoj A. G. Namboothiry, Acetylammonium chloride as an additive for crystallization control and defect passivation in MAPbI3 based perovskite solar cells, Journal of Physics D: Applied Physics, 55, 265501 (**2022**) https://doi.org/10.1088/1361-6463/ac6239

2. Alvin Joseph, Anitha B Pillai, Vijith K Pulikodan, Akhil Alexander, Raees Muhammed, Manoj A. G. Namboothiry, Solution-processed self-powered panchromatic organic photodiode and its application in biomedical devices, ACS Applied Electronic Materials (**2022**) https://doi.org/10.1021/acsaelm.1c01248

3. Arulkumar S, Parthiban S, Kwon JY, Uraoka Y, Bermundo JPS, Mukherjee A, Das BC. High mobility silicon indium oxide thin-film transistor fabrication by sputtering process. **2022**, 199, 110963. https://doi.org/10.1016/j.vacuum.

4. Basak S, Bhattacharya S, Gangopadhyay M R, Jaman N, Rangarajan R and M. Sami M, The paradigm of warm quintessential inflation and spontaneous baryogenesis, Journal of

Cosmology and Astroparticle Physics, 2022, 063 (**2022**) https://doi.org/10.1088/1475-7516/2022/03/063

5. Krishnanand K. Nair, Mathew Arun Thomas, Kalb-Ramoind field induced cosmological bounce in generalised teleparallel gravity, *Phys. Rev. D* 105 (**2022**) 10, 103505 DOI: https://doi.org/10.1103/PhysRevD.105.103505

6. M. Manoranjani, R. Gopal, D. V. Senthilkumar, V. K. Chandrasekar and M. Lakshmanan, Influence of asymmetric parameters in higher-order coupling with bimodal frequency distribution, Phys. Rev. E, **2022,** 105, 034307(1-10). DOI: https://doi.org/10.1103/PhysRevE.105.034307

7. Rahul Gupta, S Gupta, T Chattopadhyay, V Lipunov, A J Castro-Tirado, D Bhattacharya, S B Pandey, S R Oates, Amit Kumar, Y-D Hu, A F Valeev, P Yu Minaev, H Kumar, J Vinko, Dimple, V Sharma, A Aryan, A Castellón, A Gabovich, A Moskvitin, A Ordasi, A Pál, A Pozanenko, B-B Zhang et al., Probing into emission mechanisms of GRB 190530A using time-resolved spectra and polarization studies: synchrotron origin?, Monthly Notices of Royal Astronomical Society, 511, 1694–1713 (**2022**) https://doi.org/10.1093/mnras/stac015

8. Reshma Raveendran and Manoj A. G. Namboothiry, Bias stress stability and hysteresis in elastomeric dielectric based solution processed OFETs, Materials Research Bulletin, 146, 111596 (**2022**) https://doi.org/10.1016/j.materresbull.2021.111596

9. Rinsa S R, Kripa Chitre, Aditya Kurup, Upendra Nongthomba, Srinivasa Murty Srinivasula, and Mayanglambam Suheshkumar Singh, Simultaneous multiple-level magnification selective plane illumination microscopy (sMx-SPIM) imaging system, J. Opts. 24, 024010 (13pp) (**2022**) (IF: 2.753) https://doi.org/10.1088/2040-8986/ac4670

10. Rinsa S R, Kripa Chitre, Upendra Nongthomba, Srinivasa Murty Srinivasula, and Mayanglambam Suheshkumar Singh, Design and instrumentation of simultaneous multiple-level magnification selective plane illumination microscopy: a cost-effective imaging system for biological applications, SPIE Optical Engineering 61(4), 045103 (**2022**). (IF: 1.08) https://doi.org/10.1117/1.OE.61.4.045103

11. S D Siv Sachin, Vivek Vijayan, and Rajeev N Kini, Non-destructive evaluation of coatings using terahertz reflection spectroscopy, J Opt, 24, 044014 (**2022**) DOI: https://doi.org/10.1088/2040-8986/ac54ea

12. S. G. Naik, E. P. Lobo, S. Sen, R. K. Patra, M. Alimuddin, T. Guha, S. S. Bhattacharya, M. Banik; Composition of multipartite quantum systems: perspective from time-like paradigm; Physical Review Letters 128, 140401 (**2022**). DOI: https://doi.org/10.1103/PhysRevLett.128.140401

13. S. Sen, E. P. Lobo, S. G. Naik, R. K. Patra, T. Gupta, S. B. Ghosh, S. Saha, M. Alimuddin, T. Guha, S. S. Bhattacharya, and M. Banik; Local quantum state marking, Phys. Rev. A 105, 032407 (**2022**) DOI: https://doi.org/10.1103/PhysRevA.105.032407

14. S. Thamizharasan, V. K. Chandrasekar, M. Senthilvelan, Rico Berner, Eckehard Schoell, and D. V. Senthilkumar, Exotic states induced by coevolving connection weights and phases in complex networks, Phys. Rev. E, **2022**, 105, 034312(1-11). DOI: https://doi.org/10.1103/PhysRevE.105.034312

15. Sagar S, Mohanan K U, Cho S, Majewski LA, Das BC. Emulation of synaptic functions with low voltage organic memtransistor for hardware oriented neuromorphic computing. Scientific Reports. **2022**, 12 (1), 3808. https://doi.org/10.1038/s41598-022-07505-9

16. Snehasish Roy Chowdhury, Ramesh Arumugam, Wei Zou, V. K. Chandrasekar and D. V. Senthilkumar, Role of limiting dispersal on metacommunity stability and persistence, Phys. Rev. E, **2022**, 105,

034309(1-14). DOI: https://doi.org/10.1103/PhysRevE.105.034309

17. Subramanya Hegde, Madhu Mishra and Bindusar Sahoo; N=3 Conformal Supergravity in four dimensions, JHEP 04 (**2022**) 001. DOI: https://doi.org/10.1007/JHEP04(2022)001

18. Varun Srivastava, Akhil Alexander, B Anitha and Manoj A. G. Namboothiry, Impedance spectroscopy study of defect/ion mediated electric field and its effect on the photovoltaic performance of perovskite solar cells based on different active layers, Solar Energy Materials and Solar Cells, 237, 111548 (**2022**) https://doi.org/10.1016/j.solmat.2021.111548

19. Vijith K Pulikodan, Raees Muhammed, Alvin Joseph, Akhil Alexander, B. Anitha, Manoj A. G. Namboothiry, Flexible thin-film photodetectors based on solution-processed molybdenum disulphide nanosheets, Journal of Materials Research, 37, 1246-1255 (**2022**) https://doi.org/10.1557/s43578-022-00531-3

20. Wei Zou, Yuxuan Chen, D. V. Senthilkumar, and J. Kurths, Oscillation quenching in diffusively coupled dynamical networks with inertial effects, Chaos, **2022**, 32, 041102(1-8). DOI: https://doi.org/10.1063/5.0087839

Humanities

1. Madhavan, H. & Soman, S (2021) "Industry Dynamics and Clustering in Ayurvedic Pharmaceuticals in South India" in Kloos, S. and Blaikie, C. (eds.) Asian Medical Industries: Contemporary Perspectives on Traditional Pharmaceuticals, New York: Routledge.

2. Madhavan, H. (2021) La pandémie de Covid-19 en Inde: peut-on encore parler du modèle Kerala?, MOUVEMENTS, 78-91. (in French)

3. Sainul Abideen P, Information Management in e-Governance: Role of Metadata, RBU Journal of Library and Information Science, 2021 (23) pp 37-43.

DEPARTMENTAL ACTIVITIES

School of BIOLOGY

SEMINARS AND TALKS - Talks by National Experts	
February 11, 2022 *(Proteus – Panel Discussion)*	• **Strides of Women in Science** • This panel discussion was in celebration of the International day of Women and Girls in Science. The panelists included women faculty members from the School of Biology, IISER TVM
October 23, 2021	• **Drosophila: A versatile model organism in biology** • Dr. Nisha N Kannan, IISER TVM
October 08, 2021	• **Regulating pluripotency in stem cells through the action of intracellular trafficking pathways** • Dr. Deepa Subramanyam, Nation Centre for Cell Science
June 05, 2021 *(Proteus – Faculty Talk Series)*	• **Elimination of single-use plastic and efficient ways of managing wastes** • Amita Deshpande, reChakra EcoSocial
April 09, 2021	• **Gene-diet interactions in longevity assurance** • Dr. Arnab Mukopadhyay, National Institute of Immunology.
SEMINARS AND TALKS - Talks by International Experts	
March 22, 2022	• **Engineering approaches to studying protein machines and biological systems** • Dr. Ajit Joglekar, University of Michigan
March 22, 2022	• **Multiscale studies of membrane traffic from molecules to tissues** • Dr. Mara Duncan, University of Michigan
March 14, 2022 *(Proteus – Faculty Talk Series)*	• **Transposons-Molecular parasites tamed for genome engineering** • Talk by Prof. Zoltan Ivics, Paul Ehrlich Institute, Germany
January 27, 2022 *(Proteus – Faculty Talk Series)*	• **Evolution-guided study of host- Viral arms race** • Talk by, Prof. Harmit Malik, Fred Hutchinson Cancer Research Centre, Seattle, USA
November 25, 2021	• **Interactive session on HFSP postdoctoral fellowships** • The mandate of HFSP is fundamental interdisciplinary research across Biology, Mathematics, Physics, Chemistry, and Computer Science to address biological questions. HFSP supports competitive postdoctoral fellows across disciplines. This interactive session with Dr. Barbara Pauly, Director of Fellowships, Human Frontier Science Program (HFSP) was organized by IISER TVM, and benefitted students and postdocs from across IISERs.

COLLOQUIUM AND SYMPOSIA – National

August 20, 2021	• **Biology across kingdoms - How dispersal evolves and why we should care** • Prof. Sutirth Dey, IISER Pune
August 06, 2021	• **Biology across kingdoms – Symposium** • **Structure function and modulation of G Protein-coupled receptors** • Dr. Arun Shukla, Associate Professor, IIT Kanpur

COLLOQUIUM AND SYMPOSIA – International

December 3-4, 2021	• **Synapse 2021 – A Neuroscience Symposium** • This online symposium was organized in collaboration with IISER Tirupati on December 3 & 4, 2021. More than 600 participants registered for this symposium. A total of 16 Lightning talks were presented during the symposium, that included speakers from both national and international institutes. The best six presentations (1 first prize, 2 second prizes and 3 third prizes) received cash awards that was sponsored by Authorcafé and a Certificate from the organizers of the symposium.
August 10 – 18, 2021	• **Synbio Conclave** • The Synbio Conclave, an initiative by iGEM IISER TVM, brought together expert exposition on current trends, techniques, and applications in the field of Synthetic Biology. The event consisted of a series of five talks in Synthetic Biology by academicians from Harvard, MIT, Stanford and University of South California.
July 19 – 23, 2021 (Proteus)	• **Rhetor 2.0 The Symposium, interdisciplinary Biology** • The Biology Club of IISER TVM, Proteus, organized this interdisciplinary symposium, Rhetor 2.0. It included a series of ten talks covering a range of topics from quantum effects, therapeutic benefits of dance, wiggle and shape-shift in proteins, use of nano fertilizers for revolutionizing agriculture, animals in crime detection, ethical issues of biomedical research and NMR. Subject matter specialists, provided an insight into the world of interdisciplinary sciences.

WORKSHOPS

March 21-25, 2022	• **Genome Biology Workshop (2nd edition)** • The 2nd edition of the Genome Biology Workshop on computational analysis of whole genome sequence data, jointly organized by IISER Thiruvananthapuram and Heidelberg University, Germany, under the SPARC program was held as an online course. The course content included, computational analysis of genetic differences among yeast genomes sequenced using Oxford Nanopore and Illumina Technology. Students who attended the course learnt how to perform genome sequence alignment, variant calling, annotation and interpretation of variant data.

School of CHEMISTRY

SEMINARS AND TALKS - Talks by National Experts

May 4-5, 2021	• RSC-IISER Desktop Seminar with PCCP • This virtual event was the first of the RSC-IISER Desktop Seminar series and was organised jointly by PCCP and IISER TVM. This event brought together eminent scholars in the field of Physical Chemistry to discuss, share, collaborate and present their latest research questions and findings. In addition to the presentations by eminent scientists from IITs, IISc, IISERs, JNCASR, IACS and University of Hyderabad, the Chair and Deputy Chair, PCCP made presentations during this online event and actively interacted with the participants.

CAMPS & WORKSHOPS

Sep 27 - Oct 01, 2021	• Karyashala Online Workshop in Structural Methods • The School of Chemistry, IISER Thiruvananthapuram, under the accelerated Vigyan scheme from SERB conducted Karyashala, an intense, high-end workshop training for scientific instruments such as Electron microscopes, NMR spectrometers, X-ray diffractometers and different mass instruments. The Karyashala was conducted online due to the prevailing pandemic situation. Experienced faculty members from the Chemistry department of IISER TVM carried through the program to its completion.
Sep 03, 2021	• Inauguration: 500mhz Solid-State NMR • The 500MHz Bruker solid-state NMR, funded by DST-FIST was installed in the CIF and inaugurated by Prof. J. N. Moorthy, Director, IISER TVM. The 500 MHz has the latest console with three RF channels, capable of double and triple resonance solid-state NMR experiments. The probes can be tuned to multiple heteronuclei, including 13C,15N,31P, 29Si, 51V etc.

School of MATHEMATICS

WORKSHOPS

August 16-17, 2021	• International Workshop on High-Performance Computing in Science and Engineering • The Center for HPC, IISER TVM organized an online "International workshop on High-Performance Computing in Science and Engineering" that brought together computational and life sciences research communities, enabling sharing of knowledge on HPC technologies. Prof. J. N. Moorthy, Director, IISER TVM delivered the opening address which was followed by presentations from six globally renowned HPC specialists, who also explored the current challenges, and future opportunities for HPC applications in science and engineering. The second day was completely devoted to a hands-on session organized by industry experts HPE and NVIDIA

CONFERENCES – International

December 07-10, 2021	• 4th BRICS Mathematical Conference • The BRICS Mathematical Conference was launched in 2016 to strengthen cooperation and exchanges in the field of Mathematics among these five countries – Brazil, Russia, India, China and South Africa. The Conference provides an excellent platform for international academic collaboration. IISER TVM along with Co-organizers - BML Munjal University, Gurgaon, hosted the 4th BRICS Conference in hybrid mode (both online and offline) in the IISER TVM campus. The program was designed to include 15 Plenary talks, 16 Invited talks and 37 Contributed talks. The Conference was inaugurated by Prof. J. N. Moorthy, Director IISER TVM on December 07, 2021. The plenary talks were underway immediately after the inaugural function.

School of PHYSICS

COLLABORATIVE MEETINGS & CONFERENCES – National

August 2-6, 2021	• **Resonance Lecture Series** • To celebrate the silver jubilee of the premier science education journal Resonance, the Indian Academy of Sciences, Bengaluru, organized the Resonance Lecture Series in association with IISER Mohali and IISER TVM. This was aimed at students from higher secondary schools and undergraduate students interested in pursuing science as a specialised field of study. The program was inaugurated by Prof. Partha Majumdar, president IASc and Prof. J. Gowrishankar, Director, IISER Mohali. The lectures scheduled on these 2 days benefitted higher secondary school students. The program scheduled from August 4th to 6th was inaugurated by Prof. Partha Majumdar, president IASc and Prof. J. N. Moorthy, Director, IISER TVM. The lectures scheduled on these 3 days were primarily intended for undergraduate students. There were 23 lectures spread across 5 days. Speakers at the event included faculty members from IITs, IISc, TIFR, IISERs, JNU, RRI, IIM, IUST, Panjab University, Krea University, CMI, ICTS, Rishi Valley School and UNESCO MGIEP.

AWARDS AND RECOGNITIONS

School of

BIOLOGY

Faculty Awards and Recognitions

Sl. No.	Faculty Name	Award / Recognition
1	**Prof. M R N Murthy**	***SASTRA – G. N. Ramachandran award*** of SASTRA University for the year 2022 for his work on viral protein crystallography. (Feb 2022)
2	**Dr. Sandhya Ganesan**	***Member of the Editorial Board*** for the journal ***Infection and Immunity (IAI).*** Infection and Immunity publishes studies on various pathogens, their interaction with host, host immune response and vaccine development. (Jan 2022)
3	**Dr. Ramanathan Natesh**	• ***'Distinguished Alumni Award'*** in recognition of outstanding achievements and contribution to the field of science and research. (Oct. 21) • Elected as ***President of Biological cryoEM CEM3DIP Society of India.*** (May 2021) • EMBO Practical course 2022 (Grant awarded 2021, Co-Organiser) • Reviewer for Core Research Grant scheme of Science and Engineering Research Board (SERB) • Reviewer for Journals Protein Science, Protein Expression and Purification.
4	**Dr. Nishant K.T**	Appointed to the Editorial board of the journal ***YEAST*** (Publishers: John Wiley & Sons Ltd, USA). The journal publishes original articles covering the most significant research developments with unicellular fungi. (July 21)
5	**Prof. Hema Somanathan**	***Mercator Fellowship*** by Deutsche Forschungsgemeinschaft (DFG), Germany. As Mercator Fellow, Prof. Hema will be a visiting professor at the Biocentrum, University of Würzburg for three years. (June 21)
6	**Dr. Nisha N Kannan**	Appointed to the ***Editorial board of Frontiers in Physiology*** a leading journal that publishes rigorously peer-reviewed research on the physiology of living systems, from the subcellular and molecular domains to the intact organism, and its interaction with the environment.
7	**Dr. Satish Khurana**	***Haryana Yuva Vigyan Ratna Award-2020 from Science & Technology Department, Govt. of Haryana.***

School of
CHEMISTRY

Faculty Awards and Recognitions

Sl. No.	Faculty Name	Award / Recognition
1	**Prof. Mahesh Hariharan**	Admitted to the ***Fellowship of the Indian Academy of Sciences, Bangalore*** effective from January 01, 2022. Prof. Mahesh Hariharan is one among 30 distinguished scientists to be awarded this prestigious fellowship in recognition of his outstanding research and contribution to chemical sciences. (Jan 22)
2	**Prof. Kana M Sureshan**	Selected as an advisory member of the International Advisory Board (IAB) of ***Angewandte Chemie***. In the redefined IAB, Prof. Sureshan is the only representative from India, and he stands alongside the most renowned chemists of the world. (July 21) Awarded the prestigious ***Rajib Goyal Prizes for Young Scientists*** for Chemical Sciences. The award carries a citation and cash prize of INR. 100,000.00. Prof. Sureshan has received this award as acknowledgement of his contribution in many areas of organic and material chemistry that have the potential for wider industrial applications. (Dec 21)
3	**Dr. Basudev Sahoo**	Awarded the ***Thieme Chemistry Journals Award***. This award is presented every year to up-and-coming researchers worldwide who are in the early stages of their independent academic career as assistant or junior professors. The awardees are selected exclusively by the editorial board members of SYNTHESIS, SYNLETT, and SYNFACTS who constantly watch out for promising, young individuals working in chemical synthesis and catalysis or closely related areas of organic chemistry. (Dec 21)

School of

PHYSICS

Faculty Awards and Recognitions

Sl. No.	Faculty Name	Award / Recognition
1	**Dr Ravi Pant**	Selected as a ***Senior member of Optica*** earlier called The Optical Society of America.
2	**Dr M M Shaijumon**	Editorial Board Member of the ***Indian Journal of Pure and Applied Physics (IJPAP). (Jan 2022).*** This journal publishes Original Research Contribution as full papers, notes and reviews on a variety of subjects in pure, applied and cross-disciplinary physics.
3	**Dr Senthilkumar**	Review article published in the prestigious review journal ***Physics Reports.*** The review provides an exhaustive overview on the most important aspects of quenching, aging, and reviving in coupled dynamical networks ranging from theories to experiments and applications. (July 21)
4	**Dr Manik Banik**	Recent work published in the prestigious journal ***Physical Review Letters***. The work analyzed multi-copy local indistinguishability of two-qubit orthogonal bases and show that one can assign varying hardness of local indistinguishability to these bases. During the process, the research team addressed a question asked 20 years back in a seminal work by Charles H. Bennett et al (May 21)
5	**Dr Tuhin Maity**	Work published in the journal ***Nature Electronics***. Dr. Tuhin Maity, along with other researchers, has been able to fabricate self-assembled vertically aligned triple composite which can be used to fabricate ultra-low-power electronics. (May 21)
6	**Dr Anand Narayana Sarma (Inspire Fellow)**	***"Best Ph. D. Thesis Award"*** from the ***Optical Society of India (OSI)*** during the Frontiers in Optics and Photonics 2021 (FOP21) organized by Indian Institute of Technology, Delhi (IITD).

School of
BIOLOGY

Student Awards and Recognitions

Sl. No.	Student Name	Award / Recognition
1	**Mr. Jeswin Joseph**	Ph. D. student from the Virology Scientific Research Laboratory, School of Biology received the ***Best Oral Presentation award,*** in the session on ***Microbiology,*** at the International Conference on Advanced Biology 2022. The conference was organized by the Inter University Centre for Evolutionary and Integrative Biology, University of Kerala, Thiruvananthapuram, February 23-25, 2022**.**
2	**Mr. Jervis Fernandes**	Ph. D. student from Dr. Jishy Varghese's lab won the ***2nd prize for the best Lightning Talk*** in the Neuroscience Symposium – Synapse 2021 that was hosted by IISER TVM in collaboration with IISER Tirupati, December 03-04, 2021. This symposium brought together neuroscientists from India, Germany and Australia and researches from different national and international institutes.
3	**Mr. Tejas**	Ph. D. student of Dr. Ravi Maruthachalam, awarded the ***CII-SERB Prime Minister's Fellowship*** for Doctoral research.
4	**iGEM Team**	Students from the School of Biology participated in the prestigious 'International Genetically Engineered Machine' (iGEM) international competition in Synthetic Biology and won the Silver medal for 2021 for developing Moldemort - a novel class of eco-friendly antifungal therapeutics against Invasive Fungal Infections. The IISER TVM iGEM team is the first team from Kerala to participate in this competition.

School of
CHEMISTRY

Student Awards and Recognitions

Sl. No.	Student Name	Award / Recognition
1	**Dr Raju Chambenahalli**	Graduate from the School of Chemistry, received the prestigious ***Marie Curie Fellowship*** to work with Prof. Jennifer Garden at the ***University of Edinburgh***. Dr Raju worked in Dr Ajay Venugopal's lab in the School of Chemistry
2	**Ms. Revathi Chandrasekaran**	Graduate student in Dr. Ramesh Rasappan's research group, awarded the ***best poster presentation*** at the Chemical Science Symposium 2021 on Leaders in Organic Chemistry, which was held in JNCASR Bangalore in association with the Chemical Science journal, December 13-15, 2021.
3	**Mr. Anto James**	Graduate student of Dr. R. S. Swathi's research group received the ***best poster presentation award*** at the DAE Symposium on Current Trends in Theoretical Chemistry organized by BARC, Mumbai, September 23-25, 2021.
4	**Ms. Sayani Mukherjee**	Graduate student of Dr. Sukhendu Mandal's research group awarded the best ***"Inorganic Chemistry and Catalysis" poster award*** sponsored by ACS Organometallics at the 27th CRSI National Symposium in Chemistry hosted by IISER Kolkata.

School of
PHYSICS

Student Awards and Recognitions

Sl. No.	Student Name	Award / Recognition
1	**Ms. Manisha Bansal**	2nd year Ph. D. Student of Dr. Tuhin Maity selected as a ***Best Poster Winner for the 2022 Joint MMM-Intermag Conference.*** She is one of the 7 winners worldwide and the only one from Indian institutes. The conference is organized by AIP Publishing, LLC, and The IEEE Magnetics Society every year, and is the most attended conference in the field of magnetism.
2	**Ms. Anjusree Sreedharan**	Ph. D. student of Dr. Bikas C. Das's research group, awarded the ***Best Oral Presentation Award in the joint 3rd Indian Materials Conclave (IndMac) and the 32nd Annual General Meeting of the Materials Research Society of India (MRSI-AGM 2021),*** hosted by the Indian Institute of Technology Madras, December 20-23, 2021.
3	**Mr. Sebin Joseph Sebastian**	Ph. D. student in Prof Ramesh Chandra Nath's group selected for the prestigious ***Prime Minister's Research Fellowship (PMRF)***.
4	**Mr. Snehasish Roy Chowdhury**	Ph. D. student of Dr. Senthilkumar's research group, awarded the ***Best Oral Presentation Award*** in the 13th Conference on Nonlinear Science and Dynamics (CNSD-2021) hosted by CeNSE, SASTRA University, December 17-22, 2021.

STUDENT ACADEMIC CLUBS

PARSEC – ASTRONOMY CLUB OF IISER TVM

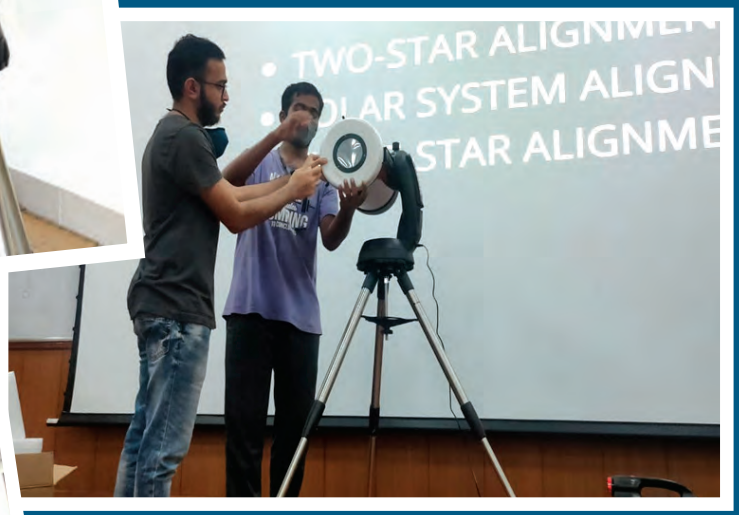
PARSEC is the Astronomy Club of IISER TVM and is mentored by the School of Physics. The Club has come together as a formal entity to stimulate discussions on astronomy and astrophysics and to ignite the minds of young physicists towards these two exciting and specialized branches of physics. These two subjects are gaining popularity as an interdisciplinary science and opening up exciting opportunities for talented and interested researchers. The Club organizes a variety of events that includes talks by students/faculty/eminent experts, challenging competitions, and screening of movies and documentaries. The Club has an open structure and physics students from all batches generally use this space to get together, learn from one another and socialize.

Date & Event	Details
Competitions	
June 15, 2021 Writing competition	PARSEC and the Ecological Society of IISER TVM hosted an exciting event – 'A Message from Humanity'. The event required participants to describe how they would communicate to extraterrestrials, the story of our world, its people, its diversity, the environment and our science. This provided students a unique chance to recreate the 'Golden Records'.
January 31, 2022 Writing competition	PARSEC, The Astronomy Club hosted a story writing competition named 'Cosmic Fables', themed on ancient galactic lore around the world. Participants were asked to spin their own stories with a mixture of creative freedom and realistic elements of celestial mechanics.
Lecture Series	
November 20, 2021	Cosmic Tales, Session 6 of the Astronomy Series by Dr. Rajaram Nityananda (this is a collaborative series involving 14 different clubs, including other IISERs) ***Topic:*** *The Physics, Astronomy, and Optics of Gravitational Lenses*
Talks/Peer discussions	
November 10, 2021	Astrophysics talk by Dr. Shabnam Iyyani ***Topic:*** *High Energy Universe in the Era of Multi-messenger Astronomy*

Date & Event	Details
December 14, 2021	Astro talk by Dr. Anil Bhardwaj ***Topic:*** *Indian Planetary Missions*
December 24, 2021	Astro talk by Dr. Vineeth Valsan (in collaboration with School of Physics) ***Topic:*** *James Webb Space Telescope: An Eye that looks back in Time*
March 26, 2022	Peer Discussion ***Topic:*** *1) Drafting E-Mails, CV/Resume, and Internships* *2) Basic Data Analysis techniques for Telescopic observational data*
Screening Sessions	
September 2, 2021	"Mangalyaan: India's Mission to Mars"
September 9, 2021	Cosmos: Possible Worlds (2020)
September 30, 2021	Interstellar
October 21, 2021	Arrival
November 11, 2021	Hidden Figures
November 25, 2021	Life (2017)
December 2, 2021	The Spacewalker (2017)
December 16, 2021	Hubble's Amazing Universe (2016)
December 23, 2021	The Hitchhiker's Guide to the Galaxy
December 25, 2021	***Live Launch*** of the ***James Webb Space Telescope***
March 17, 2022	Einstein and Eddington
Telescope Sessions	
March 2, 2022	Procurement of ***Celestron Nexstar 8SE Computerised Telescope*** by the Science and Technology Council
April 11, 2022	Inaugural Telescope session (Indoors) Agenda: Demonstration of the entire setup procedure along with a student usage protocol (Telescope Charter)


IISER


ANESH
EPSDB -7
Parsec.
Astronomy Club


• TWO-STAR ALIGNME
STAR ALIGNME


ALIGNMENT
• TWO-STAR ALIGNMENT
• SOLAR SYSTEM ALIGNMENT
• THREE-STAR ALIGNMENT

PROTEUS - THE BIOLOGY CLUB OF IISER TVM

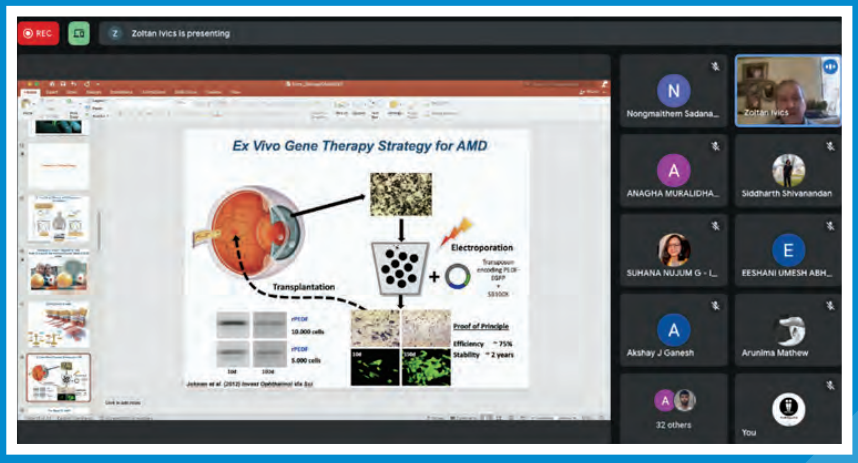
Proteus, the Biology Club of IISER TVM brings together young enthusiastic researchers and seasoned professionals to engage in outside-the-classroom learning. The Club provides students an opportunity to engage with and learn directly from scientists involved in cutting edge trailblazing science. It also throws open several possibilities for discussions on interdisciplinary research, sharing of knowledge and promoting a culture of scientific temper among students and the wider community.

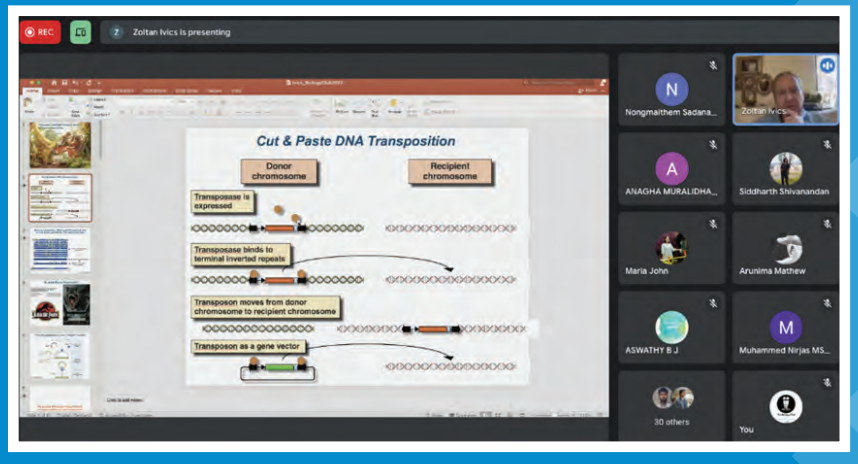
Date & Event	Details
Faculty talk series	
February 11, 2022 Panel Discussion	***Panelists*** Prof. Hema Somanathan (IISER TVM) Dr. Poonam Thakur (IISER TVM) Dr. Nisha N Kannan (IISER TVM) Dr. Sandrea Maureen Francis (IISER TVM) ***Topic:*** *Strides of Women in Science*
June 05, 2021 Faculty Talk Series	Amita Deshpande, reChakra EcoSocial ***Topic:*** *Elimination of single-use plastic and efficient ways of managing wastes*
Seminars and talks by International experts	
March 14, 2022 Faculty Talk Series	Prof. Zoltan Ivics, Paul Ehrlich Institute, Germany ***Topic:*** *Transposons-Molecular parasites tamed for genome engineering*
January 27, 2022 Faculty Talk Series	Prof. Harmit Malik, Fred Hutchinson Cancer Research Centre, Seattle, USA ***Topic:*** *Evolution-guided study of host- Viral arms race*
Colloquium and Symposia – International	
July 19 – 23, 2021	Rhetor 2.0 The Symposium, interdisciplinary Biology The Biology Club of IISER TVM, Proteus, organized this interdisciplinary symposium, Rhetor 2.0. It included a series of ten talks covering a range of topics from quantum effects, therapeutic benefits of dance, wiggle and shape-shift in proteins, use of nano fertilizers for revolutionizing agriculture, animals in crime detection, ethical issues of biomedical research and NMR. Subject matter specialists, provided an insight into the world of interdisciplinary sciences.

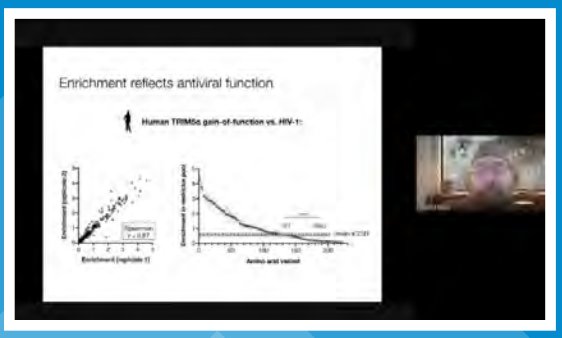

Panelists
PROF. HEMA SOMANATHAN
DR. POONAM THAKUR
DR. NISHA N KANNAN
DR. SANDREA M FRANCIS


IISER THIRUVANANTHAPURAM
PANEL DISCUSSION:
STRIDES OF WOMEN IN SCIENCE
11TH FEBRUARY 7PM
Celebrating the International day of Women and Girls in Science


IISER THIRUVANANTHAPURAM
FACULTY TALK SERIES
EVOLUTION-GUIDED STUDY OF HOST-VIRAL ARMS RACES
27TH January, 2022
Join in at 10:30 PM (IST)
PROF. HARMIT MALIK
FRED HUTCHINSON CANCER RESEARCH CENTER


REC
Zoltan Ivics is presenting
Ex Vivo Gene Therapy Strategy for AMD
Transplantation
Electroporation
Proof of Principle
Efficiency ~ 75%
Stability > 2 years
Nongmaithem Sadana...
Zoltan Ivics
ANAGHA MURALIDHA...
Siddharth Shivanandan
SUHANA NUJUM G - I...
EESHANI UMESH ABH...
Akshay J Ganesh
Arunima Mathew
32 others
You


REC
Zoltan Ivics is presenting
Cut & Paste DNA Transposition
Donor chromosome
Recipient chromosome
Transposase is expressed
Transposase binds to terminal inverted repeats
Transposon moves from donor chromosome to recipient chromosome
Transposon as a gene vector
Nongmaithem Sadana...
Zoltan Ivics
ANAGHA MURALIDHA...
Siddharth Shivanandan
Maria John
Arunima Mathew
ASWATHY B J
Muhammed Nirjas MS...
30 others
You


Enrichment reflects antiviral function
Human TRIMSα gain-of-function vs. HIV-1

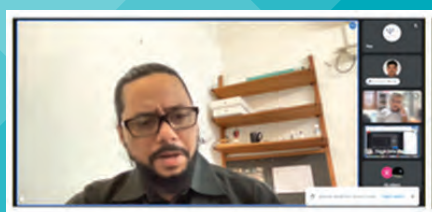
PHYSICS SOCIETY OF IISER TVM - PSI(T)

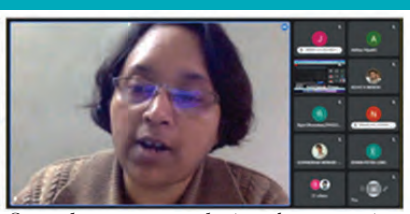
The Physics Society of IISER Thiruvananthapuram - PSI(T) receives guidance from the School of Physics and is an open body that has students from BS-MS, I-Ph. D. and Ph.D. coming together to have group discussions on physics topics that are intriguing and thought-provoking. This is a platform where learning happens collectively and in a relaxed, informal social setting. Due to the pandemic, most of the club's activities were held online. The club started preparing for the second foundation week celebrations right from December 2021. An exciting range of activities were drawn up for the event that was held in January 2022.

Date & Event	Details
	Peer Discussions
December 09, 2021 Peer Discussions	Peer discussion as an activity allows for students to engage with one another and share exciting problems, new topics, ideas and doubts. An open group activity such as this encourages students to learn and motivate one another, and develops close understanding and friendships among members from different years of study. The club does not have a rigid agenda and discussions are open to all members. The first of the Peer Discussions was held on December 09, 2021, and attended by over 50 students from all years of study, where elementary concepts in the standard model were discussed. The club has decided to host one peer discussion every week.
	Social Media and Outreach
All year Social Media	The club has an active social media presence on Instagram and Facebook with more than 1400 followers. Content is curated and shared regularly to make physics learning more enjoyable and accessible to everyone. Through these social media platforms, the club attempts to help people understand concepts of physics in fun ways, how it is used in everyday life, in research, movies, cutting edge technologies and appreciate concrete topics in physics
	Personality Quiz
July 05, 2021 Quiz	The club curated a fun online open quiz that focused on the personalities of famous physicists. Based on the responses of the participants, their personality was matched with the personality of a famous physicist. This event was a roaring success and saw participation of students from science institutes spread across the country.

Date & Event	Details
	Anvesha
October 14, 2021 Aficionados - Physics Expo at ANVESHA	The club coordinated with the Science and Technology Council in organizing the physics expo during the annual science fest-Anvesha 2021. Around ten experiments and demonstrations were set up that encompassed varied domains of physics, including piezoelectric crystals, radio telescopes, a classical analogy of quantum tunneling, Leiden-Frost effect, superconductivity and levitation, plasma, and quantum computing.
	Screening Sessions
November 21, 2021 Screening sessions	"The Theory of Everything", the biography of Prof Stephen Hawking, was screened for students of the PSI(T). More than 50 students watched the movie. The club has planned to screen movies showcasing physicists, and physics-related topics on a regular basis.
	Foundation Week 2022
January 23 - 31, 2022	The Foundation Week 2022 was celebrated to mark the second anniversary of the Physics Society of IISER TVM. Several events and a symposium were conducted throughout the week. The activities reached more than about 6,500 people through social media with a total of 26.4 thousand impressions, and around 320 participants from different institutes actively took part in the various activities.
	Symposium
January 25 - 30, 2022	• Three awardees of the Shanti Swaroop Bhatnagar Prize delivered online webinars spanning broad domains of physics. More than 200 participants, including faculty from IISER TVM, attended the lectures. • On 25th January 2022, **Dr Kanak Saha** spoke about the extreme-UV photons from the AstroSat UV Deep Field. He also reported the first discovery of a high-redshift galaxy emitting extreme UV photons. • On 27th January 2022, **Dr Aninda Sinha** delivered a webinar about quantum field theory without Feynman diagrams. He spoke about the bootstrap approach that was formulated in the 1960s, which has been popularized over the last decade. • **Dr Aditi Sen De** presented the third webinar held on 30th January 2022. She spoke about recent developments in quantum technology, and revolutionary inventions in the field of quantum communication and computation.
	Race to Duna - Esports
January 21 - 24, 2022 E sports competition	In the game, players directed a nascent space program, staffed and crewed by green humanoid aliens known as "Kerbals". Each team had to build a spacecraft and fly it to a planet named DUNA, representing real-life Mars. The game featured a realistic orbital physics engine, allowing for various real-life orbital maneuvers. A total of 41 teams registered for the contest, of which 13 teams were able to land their spacecraft successfully. Two teams with the least cost were chosen as winners and runners-up.

Date & Event	Details
Boltzmann Brains 3.0	
January 26, 2022 Physics based quiz	This event was the third iteration of the PSI(T) quizzing competition. It was held on 26 January 2022 and hosted by Rohit V Menon and Shivam Bhargava. Seventy-eight people joined the quiz and submitted answers via Google Forms.
Hackathon	
January 29, 2022 Climate science and programming	A hackathon based on atmospheric and climate science was organized on 29th January 2022, under the guidance of Dr Anand Narayan Sarma. The questions involved predicting carbon dioxide levels throughout 2022, calculating the average ocean temperature, and finding correlations between different climate markers using real-world data. It required very basic programming skills to participate and consisted of questions that could be solved with a preliminary understanding of Data Science. A total of 30 teams from across India registered for the hackathon. The best five teams were asked to present and defend their solution to Dr. Sarma and all the participants. The top three teams received special mention.
Club Merchandise	
February 11 - March 29, 2022 Merchandise Release	The club announced and put forth its first merchandise release with a set of T-shirts, badges and stickers.
Introduction Session	
March 30, 2022 Offline interaction session	An informal offline interaction was organized for Batch 21 students, to introduce them to the club and to the student volunteers of the club. The discussions that followed included topics such as club activities, subject matter interests and club structure.





Some key moments during the symposium

CHEMICAL SOCIETY OF IISER TVM – (CSIT)

The Chemical Society of IISER Thiruvananthapuram (CSIT), was launched on January 08, 2021. Faculty, alumni and all students of the School of Chemistry, Ph. D., I-PH. D., M.Sc., BS-MS (from 3rd to 5th year) are members of the CSIT. The society is a cohesive group of ardent chemistry enthusiasts who like to share, discuss and learn about recent advances in chemical sciences, and stay connected with other research institutes, labs and top-end scientists. The activities of the CSIT are broadly classified into Faculty Talk series, Student Talk Series and Alumni Talk Series. Additionally, fun social events like the farewell for graduating students were also organized by the CSIT. Most events had to be conducted online in adherence to the precautionary guidelines in place at the Institute, to prevent the spread of COVID 19. The students' farewell meet, however, was conducted offline following strict COVID 19 protocols.

Date & Events	Details
	Faculty talk series
June 25, 2021	Dr. Chandra M. R. Volla, Associate Professor of Chemistry, IIT Bombay *Topic: Catalytic C-H activation with Allenes*
September 29, 2021	Prof. Ramamoorthy Boomi Shankar, Professor, Department of Chemistry and Centre for Energy Science, IISER Pune *Topic: Metal-Organic and Hybrid Ferroelectrics for Mechanical Energy Harvesting Applications*
	Alumni talk series
April 24, 2021	Vinayak Bhat, (Batch 13, IISER TVM) *Topic: My journey from BSMS to PhD candidate: Expectation vs. Reality*
June 19, 2021	Syed Bilal, (Batch 11, IISER TVM) *Topic: Career Options in Chemistry after BS-MS*
July 16, 2021	Dr. Sreeganesh Balasubramani, (Batch 09, IISER TVM) *Topic: Molecular properties within generalized Kohn-Sham random phase approximation*
November 13, 2021	Dr. Jayakrishna Shenoy, (Batch 12, IISER TVM) *Topic: On his postdoctoral research and opportunities for higher studies in Europe and the USA.*

Date & Events	Details
	Special events
April 09, 2021 "Hasta la Vista" (Farewell programme for outgoing BS-MS (majors) and Ph. D. students)	"Hasta la Vista," the farewell party for Chemistry Majors (Batch 16) and outgoing Ph. D., was held at the Students' Lounge in IISER TVM campus, strictly following all Covid-19 protocols. Prof. J. N. Moorthy, Director, IISER TVM and an Organic Chemist by training, addressed the gathering. The fun-filled music and dance evening also had a dash of nostalgia added in, as students recounted past experiences/events/adventures during their stay at IISER TVM. The memories from this evening would not be easily forgotten by anybody who was a part of this celebration. Mementos were awarded to students by the faculty of the School of Chemistry and bid them farewell with wishes for success in all their future endeavors.
June 12, 2021 "Getting Yourself Published" (Interactive Session)	Science and Technology Council of IISER TVM, in association with CSIT, organized an interactive session on article writing through the Cisco WebEx platform. Ms. Neha Agrawal, an Academic communication expert and the founder of WiseUp Communications discussed the techniques of scientific presentation and nuances of article writing, that could help young researchers write articles and papers that would be accepted and published by reputed journals. Ms. Agrawal informed students about the workshops organized by WiseUp Communication and encouraged them to participate in a few of them.
November 20, 2021 "Q-Chemy' 21" (Quiz Competition)	Student representatives from the BS-MS Batch-20, Aaron Shibu and Ashwin T. Shaji hosted the first fun-filled online Chemistry quiz competition of the CSIT, "Q-Chemy' 21". Students from all disciplines were invited to participate in teams of two, or as lone wolves. The 2-hour long quiz competition was fiercely contested and was completed in three rounds. Winners were declared based on the total number of points scored. Cash prizes of Rs.500, Rs.300 and Rs.200 were awarded to the teams that bagged the first, second, and third positions.
February 19, 2022 "Insight"	Mr. Debaditya Sinha, Chemistry major, Batch-17 conducted, via Google Meet, a guidance session on CV making, internships, and Ph.D. application procedures.
March 1, 2022 "Quiz-ion" (Quiz Competition)	As part of National Science Day celebrations, a quiz competition based on general chemistry trivia was conducted by quizmasters Ishaani R Kamath and Ananthakrishna P of BSMS batch 21.
	Anniversary special events – Research Talks
January 8, 2022 Research Talk- 1	Dr. Saranya Pullanchery, Postdoctoral fellow at EPFL, Switzerland and IISER TVM Alumnus *Topic: Chemistry at the hydrophobic/ water interface: Insights from sum-frequency scattering*

Date & Events	Details
January 19, 2022 Research Talk- 2	Dr. Chandramouli Subramanian, Associate Professor, Department of Chemistry, IIT Bombay *Topic: Energy, energy everywhere: realizing solar-thermal conversion using hard-carbon nanostructures*
January 22, 2022 Research Talk- 3	Ms. Shwetha Srinivasan, Ph. D. scholar at Massachusetts Institute of Technology (MIT) *Topic: Action at the nanoscale: Single-molecule studies of membrane protein motion.*
January 28, 2022 Research Talk- 4	Dr. Biplab Maji, Associate Professor, IISER Kolkata *Topic: Multifunctionality in Manganese Catalysed Hydrogen Transfer Reactions.*
Memefied (Online Competition)	Meme making competition Theme: Myself as a chemist This event was conducted exclusively for IISER TVM students, each participant was allowed to submit two entries. The entries were shared as Instagram stories with voting bars, memes with the highest number of votes were declared winners of this competition.
Magnum Opus (Online Competition)	Chem-Art competition Theme: Chemistry and Mankind (Digital and Hand-drawn categories) This event was open to all colleges, with a cash prize of Rs. 200 for the first position in each category. The entries were judged by Rafeeque Mavoor of IISER Pune.
Fantasia (Online Competition)	Sci-fi short story writing competition Theme: World of Chemistry The story writing competition was judged by Prof. Suresh Das and Dr. Harilal Madhavan. A cash award of Rs. 300 was announced for the first position and Rs.150 for the second position.

Merchandise release:

In the month of February, CSIT launched its first official line of merchandise as part of the first-year anniversary.

The exclusive brand line included t-shirts and mugs, priced at Rs. 350 and Rs. 200 respectively. CSIT acknowledges **Ashley Roby** of Batch 18 for the design of the t-shirt and **Sreyas R** of Batch 19 for the design of the mug. A total of 63 orders were placed for T-shirts and 28 for Mugs.

Social Media:

The Chemical Society of IISER Thiruvananthapuram is active across most social media platforms, Twitter / Instagram / Facebook / LinkedIn / YouTube / Discord. These social media handles are continuously updated with information that are of specific interest to students of chemistry as well as with information and news for anyone with an interest in chemical sciences.

Twitter : https://twitter.com/csit_iisertvm?t=z2mkCN-cexNrwN8fzFnhLA&s=09

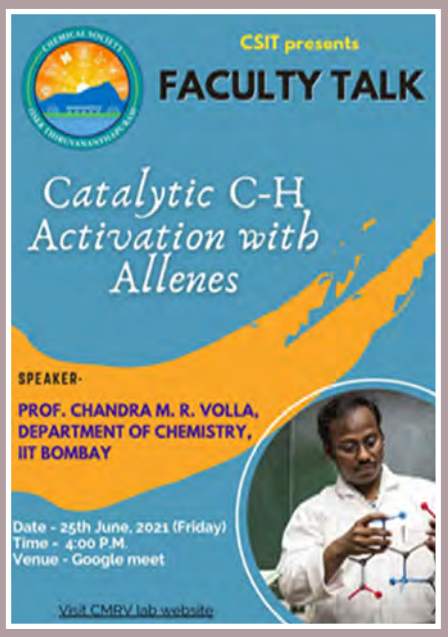
Facebook : https://www.facebook.com/Chemical-Society-of-IISER-Thiruvananthapuram-104994191543163/

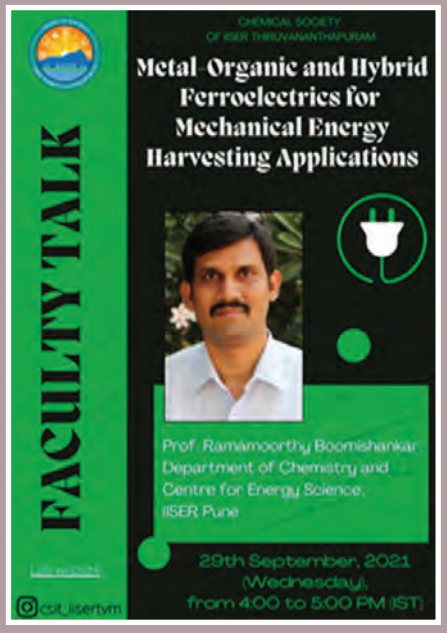
Instagram : https://instagram.com/csit_iisertvm?utm_medium=copy_link

LinkedIn : https://www.linkedin.com/in/chemical-society-of-iiser-thiruvananthapuram-csit-0284b7203

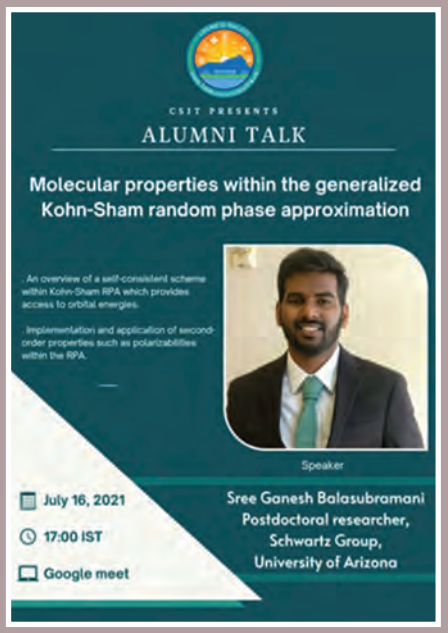
YouTube : https://youtube.com/channel/UCgHjXttavtCJSwvsQp8M6-Q

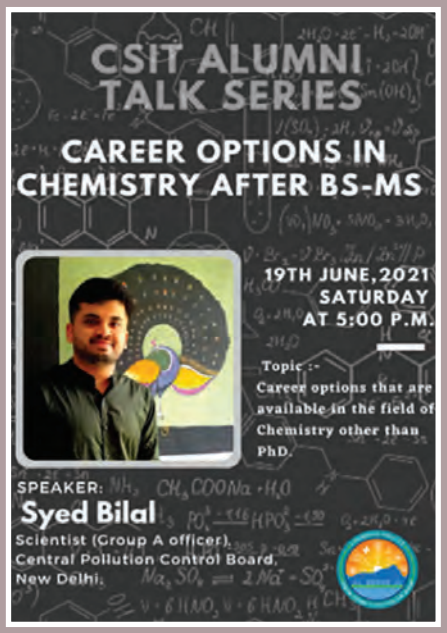
Discord : https://discord.gg/pwmAJJDxUj

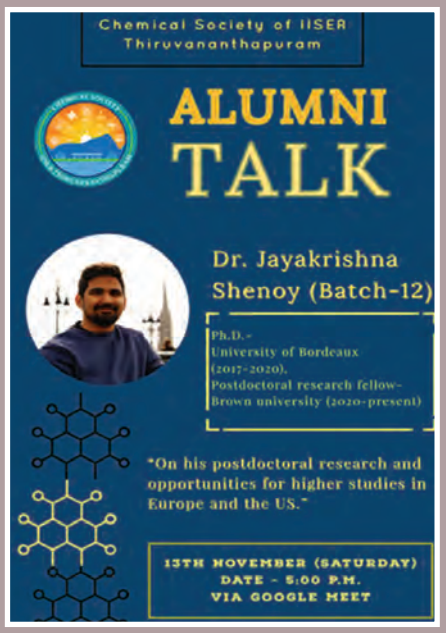

CSIT presents
FACULTY TALK
Catalytic C-H Activation with Allenes
SPEAKER-
PROF. CHANDRA M. R. VOLLA, DEPARTMENT OF CHEMISTRY, IIT BOMBAY
Date - 25th June, 2021 (Friday)
Time - 4:00 P.M.
Venue - Google meet
Visit CMRV lab website

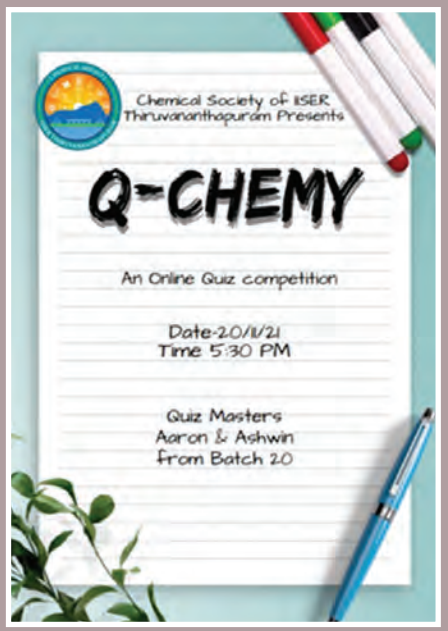

CHEMICAL SOCIETY OF IISER THIRUVANANTHAPURAM
FACULTY TALK
Metal-Organic and Hybrid Ferroelectrics for Mechanical Energy Harvesting Applications
Prof. Ramamoorthy Boomishankar
Department of Chemistry and Centre for Energy Science,
IISER Pune
29th September, 2021 (Wednesday), from 4:00 to 5:00 PM (IST)
csit_iisertvm

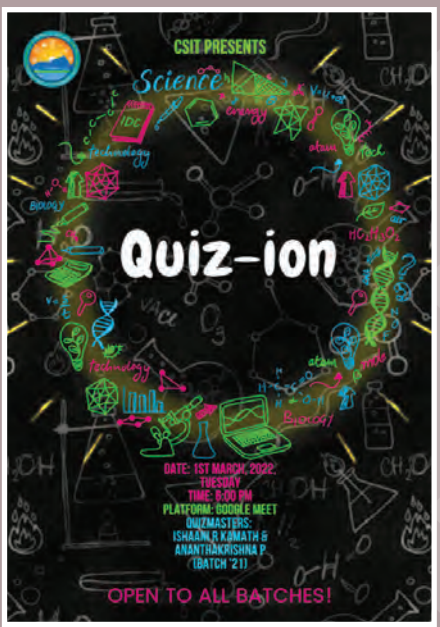

Chemical Society of IISER Thiruvananthapuram presents
Alumni Talk
"On my journey from BS-MS to PhD"
About the speaker:
Vinayak Bhat
Department of Chemistry,
University of Kentucky,
Lexington, USA.
Date- 24/04/2021
Time-4:30pm
Venue- Google meet

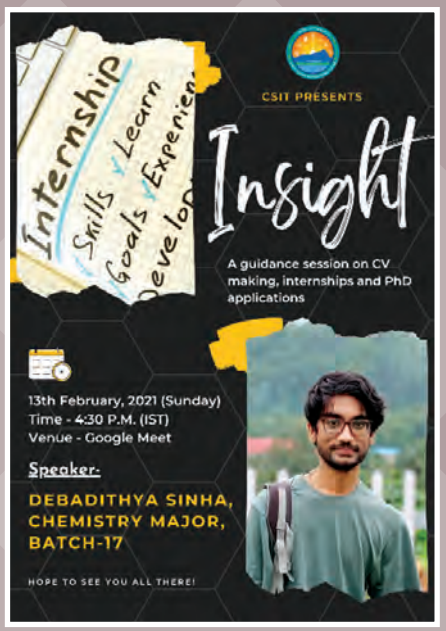

CSIT PRESENTS
ALUMNI TALK
Molecular properties within the generalized Kohn-Sham random phase approximation
An overview of a self-consistent scheme within Kohn-Sham RPA which provides access to orbital energies.
Implementation and application of second-order properties such as polarizabilities within the RPA.
Speaker
July 16, 2021
17:00 IST
Google meet
Sree Ganesh Balasubramani
Postdoctoral researcher,
Schwartz Group,
University of Arizona


CSIT ALUMNI TALK SERIES
CAREER OPTIONS IN CHEMISTRY AFTER BS-MS
19TH JUNE, 2021 SATURDAY AT 5:00 P.M.
Topic :-
Career options that are available in the field of Chemistry other than PhD.
SPEAKER:
Syed Bilal
Scientist (Group A officer),
Central Pollution Control Board,
New Delhi.


Chemical Society of IISER Thiruvananthapuram
ALUMNI TALK
Dr. Jayakrishna Shenoy (Batch-12)
Ph.D.-
University of Bordeaux (2017-2020).
Postdoctoral research fellow-
Brown university (2020-present)
"On his postdoctoral research and opportunities for higher studies in Europe and the US."
13TH NOVEMBER (SATURDAY)
DATE - 5:00 P.M.
VIA GOOGLE MEET


Chemical Society of IISER Thiruvananthapuram Presents
Q-CHEMY
An Online Quiz competition
Date-20/1/21
Time 5:30 PM
Quiz Masters
Aaron & Ashwin
from Batch 20


CSIT PRESENTS
Quiz-ion
DATE: 1ST MARCH, 2022
TUESDAY
TIME: 8:00 PM
PLATFORM: GOOGLE MEET
QUIZMASTERS:
ISHAAN R KAMATH &
ANANTHAKRISHNA P
(BATCH '21)
OPEN TO ALL BATCHES!


CSIT PRESENTS
Insight
A guidance session on CV making, internships and PhD applications
13th February, 2021 (Sunday)
Time - 4:30 P.M. (IST)
Venue - Google Meet
Speaker-
DEBADITHYA SINHA,
CHEMISTRY MAJOR,
BATCH-17
HOPE TO SEE YOU ALL THERE!


CHEMICAL SOCIETY OF
IISER THIRUVANANTHAPURAM
PRESENTS
RESEARCH
TALK
"Chemistry at the hydrophobic/water interface: Insights from sum frequency scattering"
Dr. Saranya Pullanchery,
Postdoctoral fellow,
LBP, STI-IBI, EPFL,
Switzerland
On Jan 8, 2022 (Saturday)
At 5:00 PM (IST)
Through Google Meet
ANNIVERSARY SPECIAL


CHEMICAL SOCIETY OF
IISER THIRUVANANTHAPURAM
PRESENTS
RESEARCH
TALK
Energy, energy everywhere
-realizing solar-thermal conversion using hard-carbon nanostructures
Dr. C Subramaniam,
Associate Professor,
Department of Chemistry,
IIT Bombay
On Jan 19, 2022 (Wednesday)
At 4:30 PM (IST)
Through Google Meet
ANNIVERSARY SPECIAL


CHEMICAL SOCIETY OF
IISER THIRUVANANTHAPURAM
PRESENTS
RESEARCH
TALK
MULTIFUNCTIONALITY IN MANGANESE CATALYZED HYDROGEN TRANSFER REACTIONS
Dr. Biplab Maji
Associate Professor,
Department of Chemistry
IISER Kolkata
ON JAN 28, 2022 (FRIDAY)
AT 4:30 PM (IST)
THROUGH GOOGLE MEET
ANNIVERSARY SPECIAL


IISER
WiseUp
CSIT in association with Anvesha and WiseUp Communications
presents
Getting Yourself Published
AN INTERACTIVE SESSION
ON
WRITING A RESEARCH ARTICLE
Speaker:
NEHA AGRAWAL
Founder, WiseUp Communications
(Alumnus, NTU Singapore)
Learn:
> Importance of scientific writing.
> Organizing a research article.
> Writing an abstract.
> All about plagiarism and how to prevent it.
> Preparing scientific presentations.
SATURDAY,
12th JUNE, 2021
5:00 PM - 6:00 PM
At Cisco Webex platform
Registration is mandatory!
www.wiseupcommunications.com
wiseup_communications


OPEN TO ALL
ANNIVERSARY SPECIAL
Sci-Fi short story writing competition
FANTASIA
Theme - World of Chemistry
Cash prizes for winning entries!


For IISER TVM students
ANNIVERSARY SPECIAL
Meme making competition
MEMEFIED !
Theme - Myself as a chemist


OPEN TO ALL
ANNIVERSARY SPECIAL
Chem-Art competition
MAGNUM OPUS
Theme - Chemistry and Mankind
Cash prizes for winning entries!

CLUB OF MATHEMATICS IISER TVM (CMIT)

The Club of Mathematics, IISER Thiruvananthapuram (CMIT), was founded on September 28, 2018 as a platform where students from all batches of the School of Mathematics could intermingle, discuss and openly express their views on any mathematical topic. CMIT organized a series of activities throughout the year, including talks by experts, student talks, peer discussions, contests, quiz, and participated in the annual science fest of the Institute. The details of the activities are summarized below.

Date & Event	Details
Conferences & Symposia	
Dec. 07-10, 2021 4th BRICS Mathematics Conference	The School of Mathematics, IISER TVM and the BML Munjal University organized this international Conference in the campus of IISER TVM in hybrid mode. As part of the organizing team, CMIT provided complete support at all times - before, during and after the conference.
Oct. 09, 2021 Online Mini Symposium	Talk by Dr. Manil T. Mohan, Dept. of Mathematics, IIT Roorkee ***Topic:*** *Navier-Stokes equations: Existence, Uniqueness and Smoothness Problem*
Oct. 06, 2021 Online Mini Symposium	Talk by Dr. Saikat Chatterjee, School of Mathematics, IISER TVM ***Topic:*** *Semi-direct product of categories and a Schur's lemma for categorical representations*
Two-part Lecture series	
April 1, 2022 Two-part Lecture Series	Lecture by Prof. Sudhir Ghorpade, Department of Mathematics, IIT Bombay ***Topic:*** *Polynomials, Matrices, and Linear Recurrences over Galois Fields.*
March 30, 2022 Two-part Lecture Series	Lecture by Prof. Sudhir Ghorpade, Department of Mathematics, IIT Bombay ***Topic:*** *Development of the Theory of Equations from Shreedharacharya to Galois.*
Oct. 27, 2021 Two-part Lecture Series	Lecture by Prof. Siddhartha Pratim Chakrabarty, Department of Mathematics, IIT Guwahati ***Topic:*** *Transitioning to a Decarbonized Economy: Quantifying the Carbon Transition Risk.*

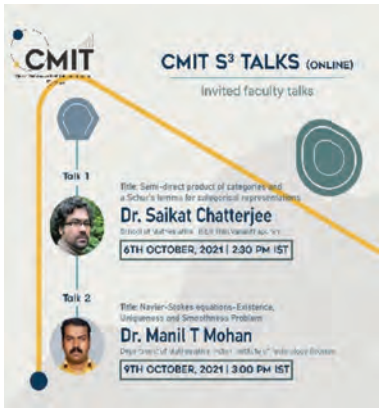
Date & Event	Details
Oct. 25, 2021 Two-part Lecture Series	Lecture by Prof. Siddhartha Pratim Chakrabarty, Finance, Data Science and Mathematics, IIT Guwahati ***Topic:*** *Financial Risk Management: A Commentary in the Paradigm of Basel Regulations*
Sep. 29, 2021 Two-part Lecture Series	Lecture by Dr. D. Yogeshwaran, Indian Statistical Institute, Bangalore ***Topic:*** *Extremal Morse critical points of a random distance function*
Sep. 27, 2021 Two-part Lecture Series	Lecture by Dr. D. Yogeshwaran, Indian Statistical Institute, Bangalore ***Topic:*** *Topology of a space from a random data sample*
Sep. 15, 2021 Two-part Lecture Series	Lecture by Dr. Ratna Pal, IISER Berhampur ***Topic:*** *Short C^2C2 and their automorphism groups*
Sep. 13, 2021 Two-part Lecture Series	Lecture by Dr. Ratna Pal, IISER Berhampur ***Topic:*** *Short C^2C2 and their automorphism groups*
Aug. 25, 2021 Two-part Lecture Series	Lecture by Dr. Jayanta Manoharmayum, School of Mathematics and Statistics, University of Sheffield ***Topic:*** *The foray into Non-Associativity*
Aug. 23, 2021 Two-part Lecture Series	Lecture by Dr. Jayanta Manoharmayum, School of Mathematics and Statistics, University of Sheffield ***Topic:*** *Euler, Heuristics and Zeta*
Aug. 05, 2021 Two-part Lecture Series	Lecture by Dr. R. Venkatesh, Dept. of Mathematics, IISc, Bangalore ***Topic:*** *Graph Polynomials from Lie Algebras*
Aug. 02, 2021 Two-part Lecture Series	Lecture by Dr. R. Venkatesh, Dept. of Mathematics, IISc, Bangalore ***Topic:*** *Graph Polynomials*
CMIT Talks	
March 18, 2022 CMIT π Week Talk	Talk by Dr. Prem Prakash Pandey ***Topic:*** *Introducing some famous problems of number theory.*
March 17, 2022 CMIT π Week Talk	Talk by Anand Chavan ***Topic:*** *Several Complex Variables Vs Single Complex Variables: A Jugalbandi.*
March 16, 2022 CMIT π Week Talk	Talk by Joyentanuj ***Topic:*** *Financialization of Savings.*
March 15, 2022 CMIT π Week Talk	Talk by Dr. Sudarshan Kumar K., School of Mathematics, IISER Thiruvananthapuram ***Topic:*** *An introduction to conservation laws.*

Date & Event	Details
Nov. 03, 2021	Talk by Dr. Manjil Saikia, Postdoctoral Research Associate, Cardiff University
CMIT Talks	***Topic:*** *An introduction to q-analysis*
Sep. 06, 2021	Talk by Kalin Krishna
CMIT Talks	***Topic:*** *Some (Co)concepts in Category Theory*
Aug. 28, 2021	Talk by Chaitanya Joglekar
CMIT Talks	***Topic:*** *A Proof of Tychonoff Theorem*
Aug. 16, 2021	Talk by Dr. Prasanta Kumar Barik
CMIT Talks	***Topic:*** *A Mathematical Study to the Continuous Coagulation-Fragmentation Models*
Aug. 13, 2021	Talk by Dr. Arati Shashi
CMIT Talks	***Topic:*** *Orthonormality of wavelet system on the Heisenberg group*
Aug. 10, 2021	Talk by Ramkrishna Biswas
CMIT Talks	***Topic:*** *Prime numbers and Irreducible polynomials*
Jul. 30, 2021	Talk by Aakash Gupta
CMIT Talks	***Topic:*** *A Glimpse of Nets*
Jun. 12, 2021	Talk by Aakash Gupta
CMIT Talks	***Topic:*** *An introduction to Real Dynamics*
Jun 05, 2021	Talk by Manika Bag
CMIT Talks	***Topic:*** *Necessary condition for an extremum of functional*
May 26, 2021	Talk by Kalin Krishna
CMIT Talks	***Topic:*** *Category theory for beginners: Yoneda Lemma*
Peer Discussions/ Review Series	
March 31, 2022	Review Series (Real Analysis) session 1 for BSMS Batch 21 by Aakash Gupta, Adithya Pillai, Joel Sleeba and Bharath Krishna S.
Aug. 13, 2021	Linear Algebra sessions for first years by Aakash Gupta
Aug. 11, 2021	Linear Algebra sessions for first years by Sathasivam
Aug. 10, 2021	Linear Algebra sessions for first years by Soundarya and Sangeeta
ANVESHA & CMIT Celebrations	
December 22, 2021	CMIT celebrated the National Mathematics Day and 134th birth anniversary of Srinivasa Ramanujan.
Oct. 17, 2021	CMIT organized Integration Bee (for real and complex functions) at Anvesha
Oct. 14, 2021	CMIT organized Aficionados, the math exhibition event of Anvesha

Date & Event	Details
Oct. 03, 2021 CMIT S^3S3 Celebrations: Unveiling of CMIT's new website and newsletter	Shivam Bhargava and Rohit Menon hosted CMIT \piπ-uiz 2.0 as an online event.
Epiphany	
March 19, 2022 CMIT Week	Organized intercollegiate Math treasure hunt, Epiphany 2.0 in an online mode.
Newsletter	
Oct. 03, 2021 CMIT S3	First edition of newsletter, Donut, and unveiled CMIT's new website.
Feb. 21, 2022	Second edition of newsletter, Donut
π-UIZ, Math-themed Quiz	
March 14, 2022 CMIT π Week	Anitha Valliappan, Bharath Krishna S. and Joel Sleeba hosted π-uiz 3.0 as an online event.
Oct. 03, 2021 CMIT S3	Shivam Bhargava and Rohit Menon hosted π-uiz 2.0 as an online event.
Strokes, Math-themed art contest	
March 14, 2022 CMIT π Week	Organized online Math-themed Art contest, Strokes, as part of π week celebrations.
Screening sessions	
Dec. 20, 2021 CMIT Screening	The Man who knew Infinity (2015 film)
Nov. 30, 2021 CMIT Screening	21 (2008 film)
Nov. 15, 2021 CMIT Screening	Good Will Hunting (1997 film)
Nov. 01, 2021 CMIT Screening	A Beautiful Mind (2001 film)
Oct. 12, 2021 CMIT Screening	The Imitation Game (2014 film)
Oct. 05, 2021 CMIT S3 Screening	The Great Math Mystery (2015 film)
Oct. 04, 2021 CMIT S3 Screening	Gifted (2017 film)


Insane Puzzle
Conditions:


BRICS


CMIT
CMIT S³ TALKS (ONLINE)
Invited faculty talks
Talk 1
Dr. Saikat Chatterjee
6TH OCTOBER, 2021 | 2:30 PM IST
Talk 2
Dr. Manil T Mohan
9TH OCTOBER, 2021 | 3:00 PM IST


CMIT
TWO - PART
LECTURE SERIES
PART-1
TOPOLOGY OF A SPACE FROM A RANDOM DATA SAMPLE
27TH SEPTEMBER 2021 | 2:40 PM IST
PART-2
EXTREMAL MORSE CRITICAL POINTS OF A RANDOM DISTANCE FUNCTION
29TH SEPTEMBER 2021 | 2:40 PM IST
Prof. Yogeshwaran Dhandapani


TWO - PART
LECTURE SERIES
CMIT
PART-1
FINANCIAL RISK MANAGEMENT: A COMMENTARY IN THE PARADIGM OF BASEL REGULATIONS
25TH OCTOBER 2021 | 2:40 PM IST
PART-2
TRANSITIONING TO A DECARBONIZED ECONOMY: QUANTIFYING THE CARBON TRANSITION RISK
27TH OCTOBER 2021 | 2:40 PM IST
Prof. Siddhartha Pratim Chakrabarty


CMIT
CMIT
TALK SERIES
An introduction to q-analysis
Dr. Manjil Saikia
3RD NOVEMBER, 2021 | 2:30 PM IST


CMIT
π
π-UIZ 2.0
A fun math-themed general quiz
3RD OCTOBER, 2021 | 5:00 PM IST
Host:
&


Welcome to CMIT's Official Website!
CMIT


CMIT
S3
THIRD FOUNDATION ANNIVERSARY
2021


CMIT
TWO - PART
LECTURE SERIES
PART-1
DEVELOPMENT OF THE THEORY OF EQUATIONS FROM SHREEDHARACHARYA TO GALOIS
30TH MARCH 2022 | 5:00 PM IST
PART-2
POLYNOMIALS, MATRICES, AND LINEAR RECURRENCES OVER GALOIS FIELDS
1ST APRIL 2022 | 11:30 AM IST
Prof. Sudhir R. Ghorpade


CMIT
&
EπPHANY
Math Treasure Hunt
19TH MARCH, 2022 | 2:00 PM IST


CMIT
TT - UIZ 3.0
A fun math-themed general quiz
14TH MARCH, 2022
Host:


DONUT
02/22
ISSUE 02
CMIT


CMIT
CELEBRATING
π-day
4
=

ACADEMIC PROGRAMS

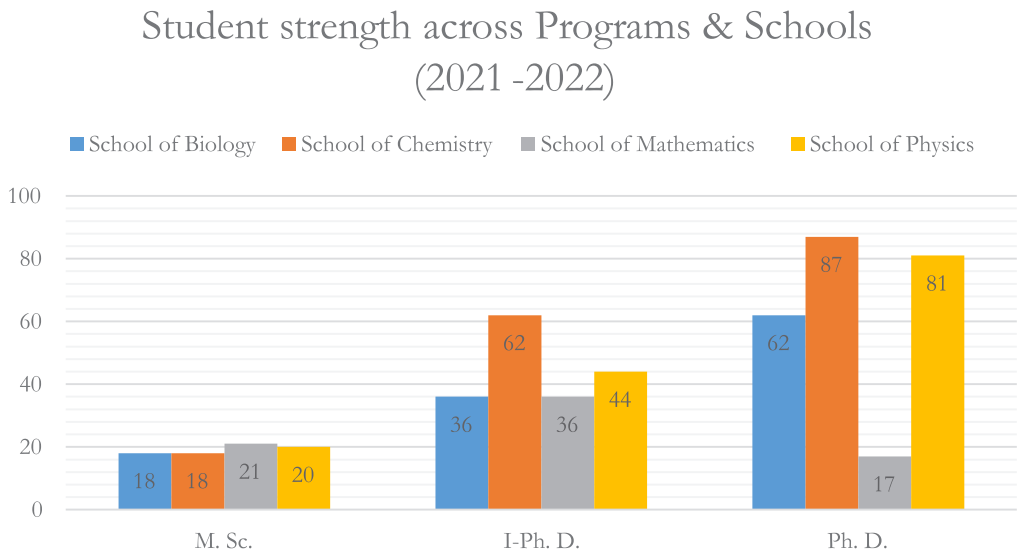
ACADEMIC PROGRAMS 2021- 2022

Student Strength - 2021

Table 1 - Total Student Strength in IISER TVM - 2021

BS-MS	M. Sc.	I-Ph. D.	Ph. D
1103	77	178	247
		Total =	1605

Student Strength Across Programs & Schools - 2021



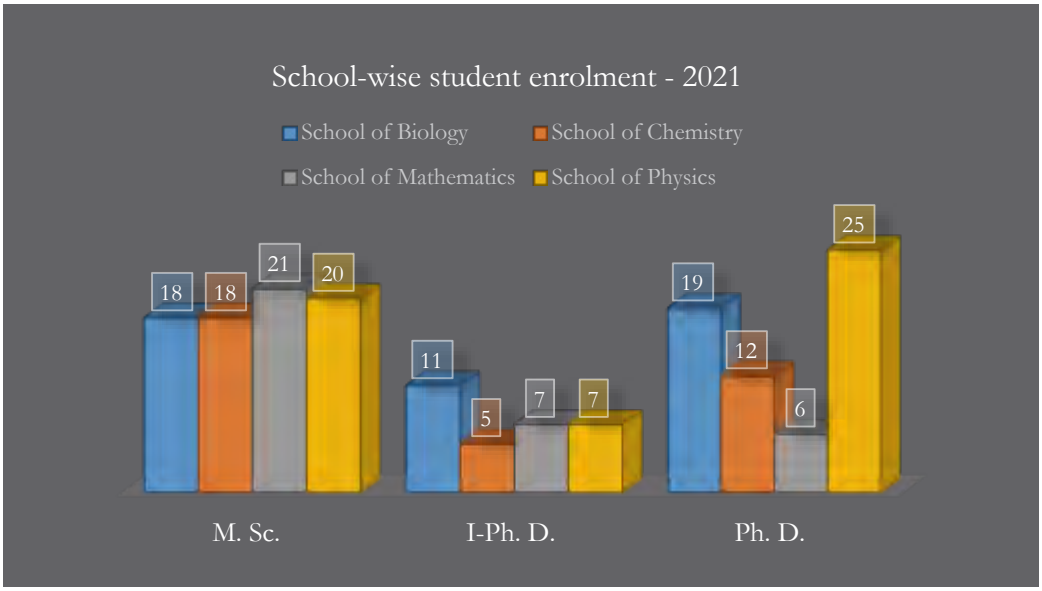
Student Enrolment - 2021

Table 2 - Enrolled students - 2021

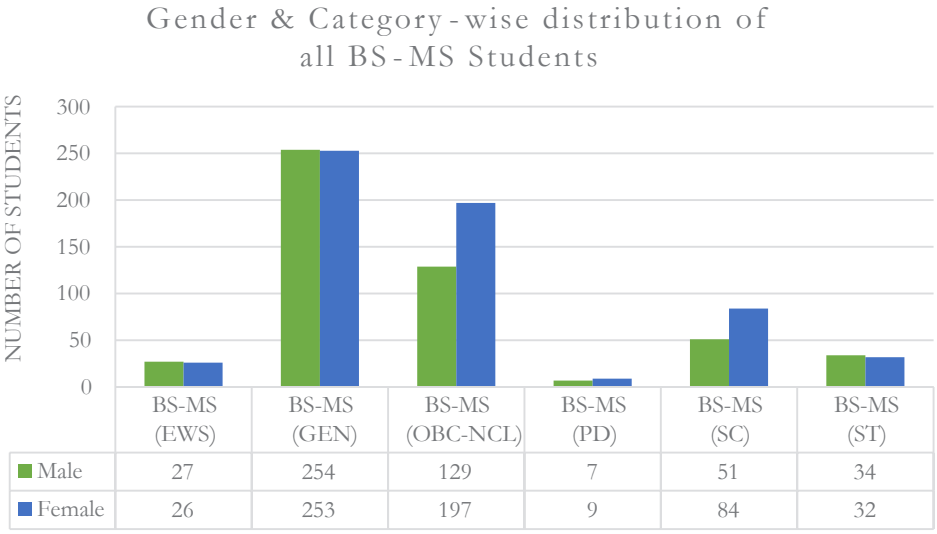
BS-MS	M. Sc.	I-Ph. D.	Ph. D
248	77	30	62
		Total =	417

A total of 291 students enrolled for the BS-MS program in 2021, however, subsequent to seeking admission, forty-three students discontinued from the BS-MS program taking the final number of enrolled students in this program to 248. From the 2021 batch, 37 students were found eligible to receive the DST-INSPIRE scholarship, no student qualified for the KVPY scholarship.

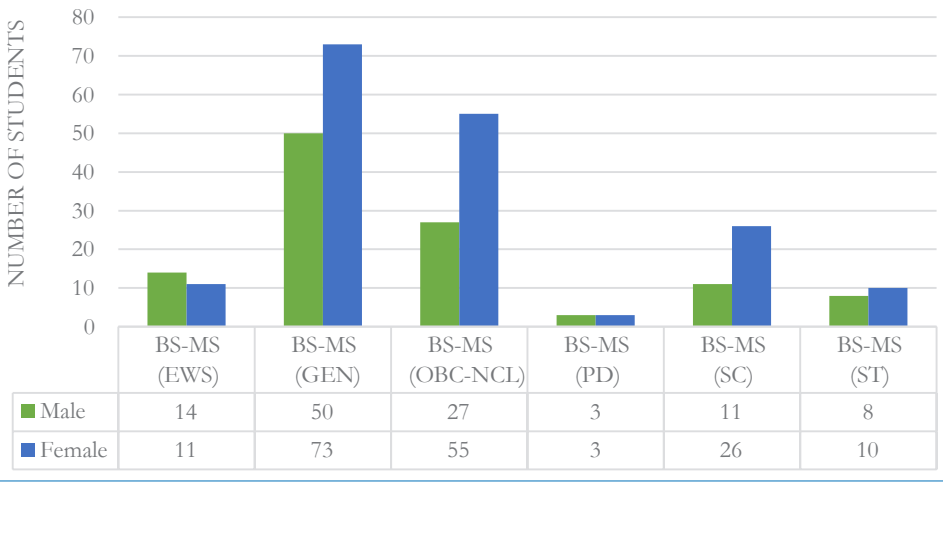
School-wise Student Enrolment - 2021



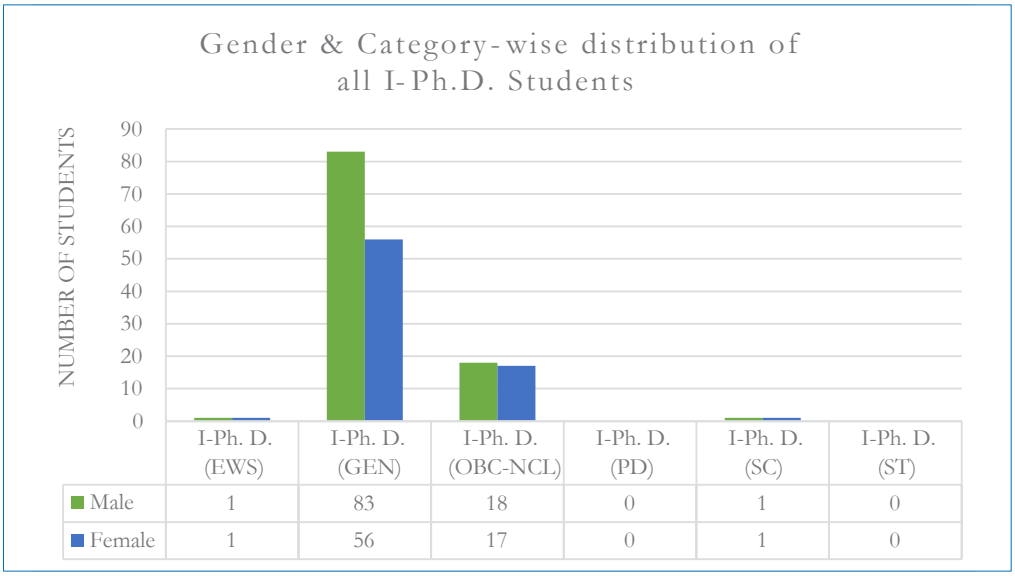
Gender & Category-wise distribution of BS-MS, I-Ph. D., Ph. D. and M. Sc. students



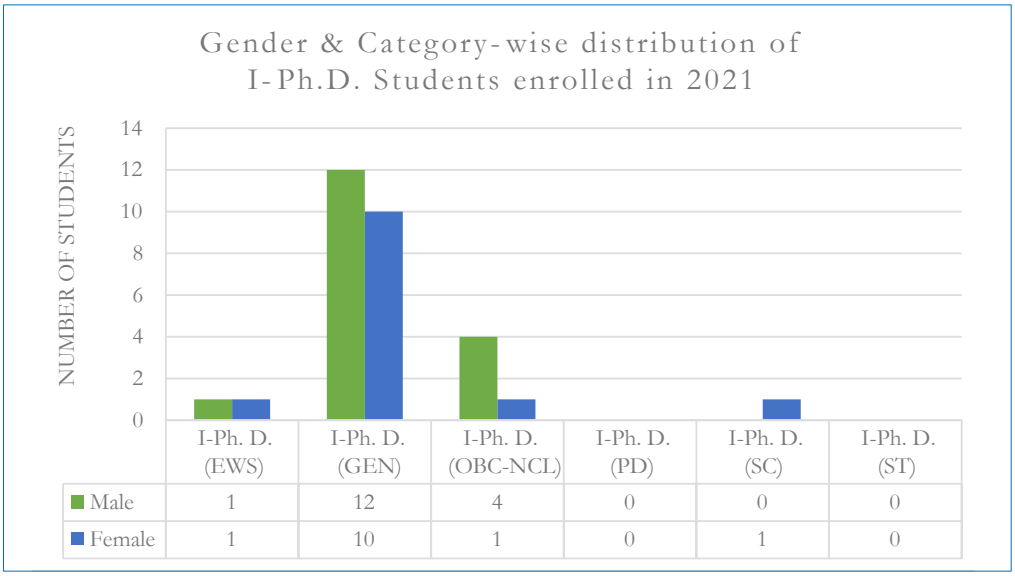
	BS-MS (EWS)	BS-MS (GEN)	BS-MS (OBC-NCL)	BS-MS (PD)	BS-MS (SC)	BS-MS (ST)
Male	27	254	129	7	51	34
Female	26	253	197	9	84	32



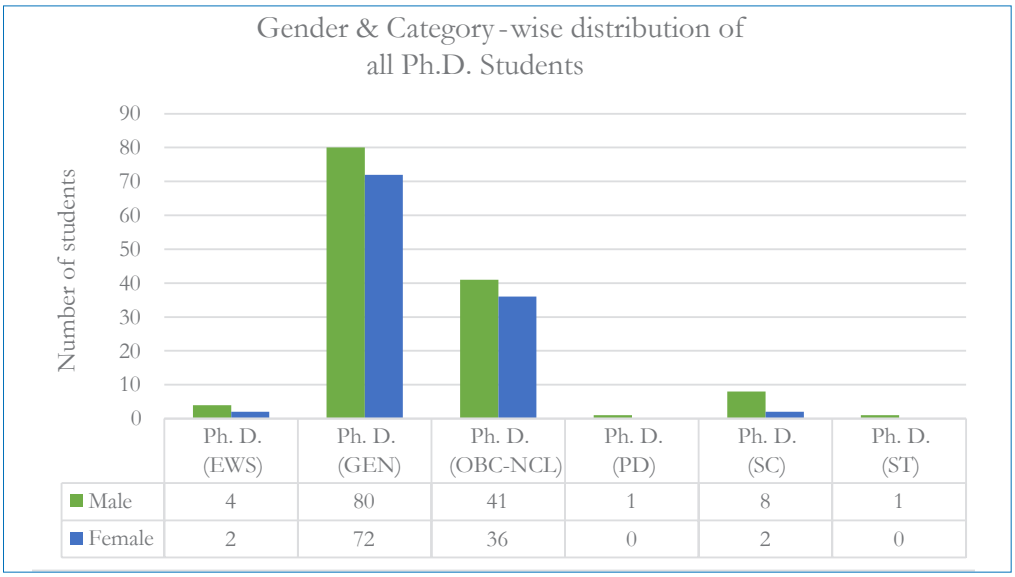
	BS-MS (EWS)	BS-MS (GEN)	BS-MS (OBC-NCL)	BS-MS (PD)	BS-MS (SC)	BS-MS (ST)
Male	14	50	27	3	11	8
Female	11	73	55	3	26	10



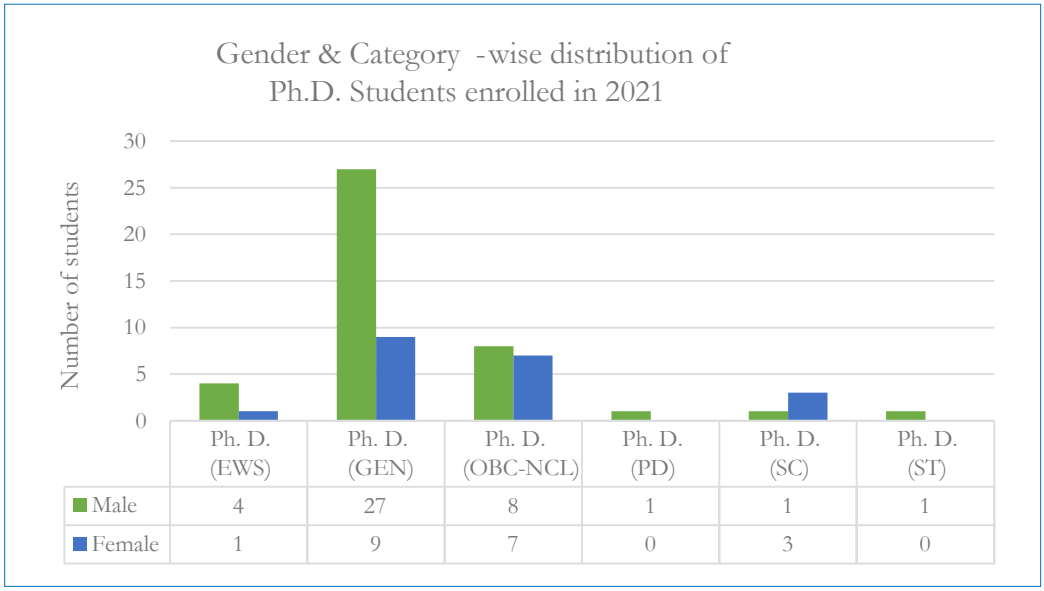
	I-Ph. D. (EWS)	I-Ph. D. (GEN)	I-Ph. D. (OBC-NCL)	I-Ph. D. (PD)	I-Ph. D. (SC)	I-Ph. D. (ST)
Male	1	83	18	0	1	0
Female	1	56	17	0	1	0

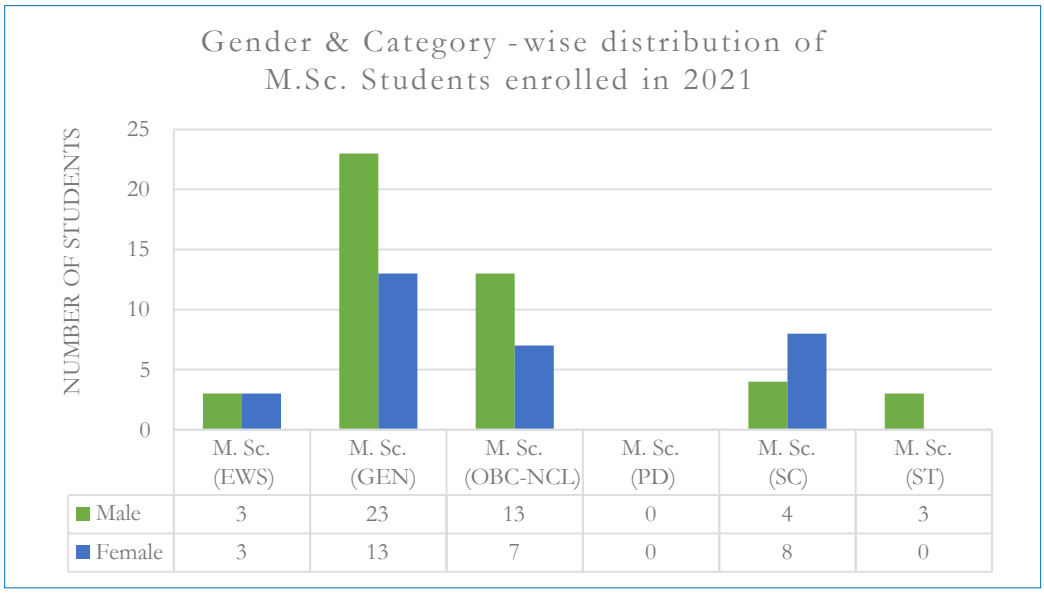


	I-Ph. D. (EWS)	I-Ph. D. (GEN)	I-Ph. D. (OBC-NCL)	I-Ph. D. (PD)	I-Ph. D. (SC)	I-Ph. D. (ST)
Male	1	12	4	0	0	0
Female	1	10	1	0	1	0



	Ph. D. (EWS)	Ph. D. (GEN)	Ph. D. (OBC-NCL)	Ph. D. (PD)	Ph. D. (SC)	Ph. D. (ST)
Male	4	80	41	1	8	1
Female	2	72	36	0	2	0


Gender & Category -wise distribution of
Ph.D. Students enrolled in 2021
Number of students
30
25
20
15
10
5
0
Ph. D. (EWS)
Ph. D. (GEN)
Ph. D. (OBC-NCL)
Ph. D. (PD)
Ph. D. (SC)
Ph. D. (ST)
Male 4 27 8 1 1 1
Female 1 9 7 0 3 0


Gender & Category -wise distribution of
M.Sc. Students enrolled in 2021
NUMBER OF STUDENTS
25
20
15
10
5
0
M. Sc. (EWS)
M. Sc. (GEN)
M. Sc. (OBC-NCL)
M. Sc. (PD)
M. Sc. (SC)
M. Sc. (ST)
Male 3 23 13 0 4 3
Female 3 13 7 0 8 0

Sources of Scholarship /Fellowship for BS-MS, I-Ph. D. and Ph. D. Students

BS-MS Scholarship	• DST-INSPIRE - 279 • KVPY - 41
I-Ph. D. Fellowship	• CSIR - 01 • Institute - 169 • PMRF - 07 • SERB 01
Ph. D. Fellowship	• CSIR - 45 • DBT - 06 • ICMR - 02 • INSPIRE - 22 • Institute - 130 • PMRF - 09 • Sponsored Project - 01 • UGC - 32

PMRF Awardees in 2021

I-Ph. D.	• Ms. Amamah Farzlin Farnaz • Ms. S Aswini • Mr. Sebin Joseph Sebastian
Ph. D.	• Mr. Amit Pal • Ms. Deepthi Ann Thomas • Mr. Girish Suresh Yedase • Ms. Manisha Bansal • Mr. Ram Krishna Patra • Mr. Ritabrata Jana • Mr. Vipin Yadav

Ten students of IISER TVM received the prestigious PMRF in 2021. This includes seven Ph. D. students (3 from School of Physics, 2 from school of Chemistry and 1 each from the School of Biology and School of Mathematics), and three I-Ph. D. students (1 each from the School of Biology, School of Chemistry and School of Physics).

BS-MS – Fifth-year Project Work details

In the academic session 2021-22, 162 students were awarded the BS and MS dual degree. The details of the fifth-year projects carried out by the outgoing batch of BS-MS students during 2021-22 are provided in Table 3.

Table 3 – BS-MS project details

Sl. No.	Roll Number Name of Student Major	Title of Project work
1.	IMS15038 **Arindam Biswas** SOM	On Classification of Principal Bundles
2.	IMS15086 **Maitreyee M Moon** SOB	New Strategy for Genetic Insertion using Cas9 and Transposon and Delivery of these Components into Mammalian Cells.
3.	IMS15106 **Pavithra M** SOB	Influence of feeding state on prey capture behavior in the Indian social spider, *Stegodyphus sarasinorum*
4.	IMS15114 **Rajeswari M C** SOC	Lewis Acidity and Molecular Orbital Analysis of Cationic Organoantimony and Bismuth Compounds: A Computational Study
5.	IMS16001 **Benjamin David Tariang** SOB	Elucidating the role of Caffeine Consumption on Circadian Rhythm, Development, and Metabolism in *Drosophila melanogaster*
6.	IMS16002 **A B Navaneeth** SOB	Biological Activity of Proline Imidazolidinones
7.	IMS16003 **Abhay Kumar Arya** SOC	Cu(II)-Catalyzed Cross-Coupling of Alkyne with in situ Generated Sulfenate Anion from β-Sulfinylesters and Synthesis of Various β-Sulfinylester Derivatives

Sl. No.	Roll Number Name of Student Major	Title of Project work
8.	IMS16004 **Abhaya Seetaram Hegde** SOP	Quantum Master Equations for Singular Non-Markovian Processes and the Degree of Non-Markovianity
9.	IMS16006 **Anuroop. E. P** SOC	Effect of Boron Incorporation in Fe-N-C Electrocatalysts towards Oxygen Reduction Reaction
10.	IMS16007 **Annapurve Abhinandan Babanrao** SOM	Signal Classification using Extreme Learning Machine
11.	IMS16009 **Abhishek S Kumar** SOP	Purcell Effect in GaAs-AlAs Acoustic Phonon Cavity with a Tunable two-level system
12.	IMS16010 **Abhishek Sahoo** SOP	Synthesis and Magnetic Properties of S=1/2 Frustrated Square Lattice Compound NaZnVOPO4(HPO4)
13.	IMS16011 **Adarsh Jojo Thomas** SOP	Collective Dynamics in Coupled Systems with Anti-Pt Symmetry
14.	IMS16012 **Adithya S** SOP	Correlated Study of W' boson and Right Handed Neutrino in Left Right Model
15.	IMS16013 **Hatekar Aishwarya Raju** SOB	Development of Assays to study T-cell Responses in Influenza Virus Vaccinated Ferret
16.	IMS16014 **Ajay M K** SOC	Theoretical Modelling of Twisted Bilayer Graphynes
17.	IMS16016 **Akanksha Bhat** SOB	The Role of Replication-Transcription Conflicts in the Evolution of Gene-Strand Bias in Bacteria
18.	IMS16017 **Aksha G P** SOP	Influence of 2D Layered Materials and Hybrids on Photoelectrocatalytic Hydrogen Evolution Reaction

Sl. No.	Roll Number Name of Student Major	Title of Project work
19.	IMS16018 **Akshai Krishnan T** SOM	Adaptive Finite Element Methods
20.	IMS16019 **Kaslod Akshay Irappa** SOB	Identification of Genes Involved in Doxorubicin Induced Cytoxicity
21.	IMS16020 **Akshay Kannan Sairam** SOP	Efficient Classical Simulation of the DQC1 Circuit with Zero Quantum Discord
22.	IMS16021 **Akshay Mohan K** SOB	Trade-offs in the Life History Traits of *Melanitis leda* with respect to different Host Plants
23.	IMS16022 **Albert Mathew** SOP	Non-Linear Optical Response in Type-II Weyl Semimetal
24.	IMS16023 **Alfy Benny** SOC	Mutually Exclusive Hole and Electron Transfer Coupling in Greek Cross (+) Stacked Acenes
25.	IMS16024 **Alok Kujur** SOB	Role of Social Information and Individual Learning in the Giant Honey Bee, *Apis dorsata*
26.	IMS16025 **Amal Reji** SOB	Factors affecting Pupal Color Plasticity in *Ypthima huebneri*
27.	IMS16026 **Amalu S** SOC	Exploring Alkylidenecyclopropanes (ACPS) and N-Hydroxyphthalimide Esters (Nhpi Esters) in Organic Synthesis
28.	IMS16027 **Aman Rastogi** SOC	Excited State Intramolecular Proton Transfer of 2-acetylindan-1,3-dione
29.	IMS16028 **Amith. C. S** SOB	Pupal Colour Plasticity in *Catopsilia pomona, Catopsilia pyranthe* and *Eurema blanda*

Sl. No.	Roll Number Name of Student Major	Title of Project work
30.	IMS16029 **Amitha A Jayan** SOC	Investigating the Early Events in Photosensitization of Chlorin and Bacteriochlorin
31.	IMS16030 **Anagha Prabhan** SOB	Role of GreA in Spontaneous Mutagenesis in *Bacillus subtilis*
32.	IMS16031 **Anagha Sivadas P** SOC	Thiazolothiazole-Based Zn(II) Metal-Organic Framework with Inter-ligand Energy Transfer
33.	IMS16032 **Anand P C** SOM	Eisenstein Elements of Modular Symbols for $\Gamma_0(pq)$
34.	IMS16034 **Anjana R** SOB	Influence of Social Learning on Foraging Decisions in the Giant Honey Bee, *Apis dorsata*
35.	IMS16036 **Anju Maria Jose** SOB	Understanding the effects of different Carbohydrates and their Concentrations on the Metabolism and Development of *Drosophila melanogaster*
36.	IMS16037 **Ankit Kumar Pradhan** SOB	Understanding the Signal Transduction Cascade in Integrin mediated Regulation of Sdf-1a expression in HSC niche
37.	IMS16038 **Ankit Raina** SOP	Collective Dynamical State in PT-symmetric Coupled Li´enard Oscillators
38.	IMS16039 **Ankur** SOC	Cationic Alkoxomagnesium and Hydridomagnesium Complexes: Application in Hydroboration of Ketones
39.	IMS16041 **Anna Elizabeth George** SOB	Molecular Regulation of Spindle Kinetochore associated Protein- Ska1
40.	IMS16042 **Anoop A Nair** SOP	A Deep Learning-based Approach for Detecting and Analysing Hexagonal Structures in Optical Microscope Images

Sl. No.	Roll Number Name of Student Major	Title of Project work
41.	IMS16043 **Anusha D Bhatt** SOB	Studying the Significance and the Cellular Localization of Aggresome-Like Induced Structures (ALIS).
42.	IMS16044 **Pradhan Anwesh** SOM	Analysis of a Non-Local Cahn-Hilliard Equation using Finite Element Methods
43.	IMS16045 **Aravind M. Giri** SOB	Understanding the Role of Integrin Signaling in Regulation of Cxcl12 Expression in Bone Marrow Stromal Cells
44.	IMS16046 **Ardra K** SOC	Ni Catalyzed Cross Coupling of Aldehydes and Acid Chlorides with Triphenyl Pyridinium Salts
45.	IMS16047 **Chythra P** SOB	Analyzing the Mechanistic Basis of Adaptive Alteration of Energy Reserves in Response to Intermittent Starvation Stress in *Drosophila melanogaster*
46.	IMS16048 **Aromal Sajeev** SOM	Crossed Product Algebras Attached to Weight one Forms
47.	IMS16049 **Arpan Chatterjee** SOP	A Correlated study of the Heavy, Neutral Z0 Boson and the RH Neutrinos in the U(1) extension of the Standard Model
48.	IMS16051 **Arun Joshy** SOC	Synthesis of Disubstituted Sulfones by Employing K_2S2O_5 as SO_2 Source & Synthesis of Various Alkenyl Sulfoxides through Thermolysis of β-Sulfinyl Esters
49.	IMS16053 **Arya Gayathri M** SOM	Cohomology Ring of Projective Stiefel manifold
50.	IMS16054 **Arya M V Kumar** SOB	Response of *Apis dorsata* to the Artificial Simulation of Shimmering Behavior
51.	IMS16056 **Ashique Lal** SOP	Metal Nitride Decorated Carbon Matrix for Electrocatalytic Applications

Sl. No.	Roll Number Name of Student Major	Title of Project work
52.	IMS16057 **Ashish Ranjan** SOP	Quantum Randomness and Tripartite State Space
53.	IMS16058 **Athira T M** SOB	Elucidating the role of microRNAs in the regulation of circadian rhythm in *Drosophila melanogaster*
54.	IMS16059 **Athul. S. B** SOC	Non-Covalent Interactions between Aerogen Oxides and Graphene Crown Ethers
55.	IMS16060 **Avinas N Shaji** SOP	Probing the Optoelectronic Properties of MoS_2 QDs Thin Film
56.	IMS16061 **Balu P Ratheesh** SOC	Encapsulation of $Ag_4M_2(DMSA)_4$ (M= Ni,Pd,Pt) in ZIF-8 For Electrocatalytic Hydrogen Evolution Reaction
57.	IMS16062 **Bejoy Manoj** SOB	Inducible CRISPR/CAS9 Genome Editing to modulate the cell-wall associated Gene in regenerating progenitor during de novo shoot organogenesis
58.	IMS16064 **G Bethu Raj** SOP	Electromagnetic Field in the Neighbourhood of the Focal point of a Spherical lens
59.	IMS16065 **Bharat Joshi** SOB	Analysis of Gene Inversions in Bacteria
60.	IMS16066 **Charutha K** SOC	Design and Synthesis of near and ShortWave InfraRed (SWIR) Fluorophores for Bioimaging
61.	IMS16067 **Temkar Chetan Dattatray** SOM	Iterative Algorithms for Tensor Singular Value Problems
62.	IMS16069 **Deepthi Ann Thomas** SOB	Alpha-synuclein - Overexpression in *E. coli,* Purification, Aggregation and Characterization

Sl. No.	Roll Number Name of Student Major	Title of Project work
63.	IMS16070 **Deepu George** SOC	Impact of Halogenation in the Structural and Electronic Properties of Supramolecular Assemblies
64.	IMS16071 **Devi Krishna M** SOB	Optimization of Immunohistochemical Assays to Validate Influenza Vaccine in Ferret Tissues
65.	IMS16072 **Devila Prit** SOB	Understanding the Role of Integrin Signaling in Extramedullary Hematopoiesis
66.	IMS16073 **Divya P S** SOC	Chiral Semiconductor Nanoplatelets with Tunable Ground and Excited-State Chiroptical Responses
67.	IMS16077 **Govindarajan P** SOP	Symmetry reorientation transition in the vortex lattice and flux jumps in single crystals of V3Si Superconductor and Synthesis and Optimization of Barium Zirconate nanoparticles by sol-gel auto Combustion method
68.	IMS16079 **Gayathri M Kartha** SOB	Understanding the role of Postn- integrin avβ3 axis in endothelial-tohematopoietic transition of murine AGM
69.	IMS16080 **Girish M** SOC	Functional Zinc Hydrolase Models for Catalytic H_2S Generation
70.	IMS16083 **Jonnalagadda Gowtham Nirmal** SOC	Theoretical studies of the optical properties of linear para phenylenes
71.	IMS16084 **Greeshma Suresh** SOC	Influence on $[Au_{23}(SR)_{16}]^-$ Nanocluster Transformation by Tuning the Bulkiness of the Incoming Ligand
72.	IMS16085 **Govind Krishna** SOP	Quantum Transport in Electrostatically Gated Devices on Bilayer Graphene
73.	IMS16086 **Harikrishnan S V** SOP	Quantum Foundations: On Causality and Tripartite Systems

Sl. No.	Roll Number Name of Student Major	Title of Project work
74.	IMS16087 **Jyothirmayi U G** SOC	Investigation of Binding and Kinetics of seed-induced aggregation of TAU construct R1R3 using NMR
75.	IMS16088 **Hitha P R** SOM	Sudoku Squares
76.	IMS16089 **Jishnu.V** SOP	TiZrCrVNi High Entropy Alloy Nanoparticles Decorated MoS_2 Gas Sensor Devices
77.	IMS16090 **Jithin. S** SOM	Some Congruences for l-regular Partitions modulo 13, 17 and 23
78.	IMS16091 **Joel G Reji** SOC	Metal Enhanced Fluorescence in Quantum Dots: Role of Intrinsic Quantum Yield and Spectral Overlap
79.	IMS16092 **Kalin Krishna** SOM	On Higher Lie Groupoids and Associated Stacks
80.	IMS16093 **Kavya K H** SOM	Stabilized Finite Element Methods for Convection-Diffusion Equations
81.	IMS16094 **Kavyasree M** SOC	Dual Stimuli-Responsive Nanocontainers for Controlled Drug Delivery Applications
82.	IMS16095 **Keerthi Vijayan** SOC	Graphene Derivatives and their Vanadium formate composites for Electrochemical Energy Storage Applications
83.	IMS16096 **Keshav Singh** SOP	Electromagnetic Fluctuations in Non-Equilibrium Matter
84.	IMS16097 **Khaganshu R Khobragade** SOB	RNA-Seq Analysis of Genotypes Representing intermediate Stages of Regeneration to identify Novel regulators of de novo shoot Regeneration.

Sl. No.	Roll Number Name of Student Major	Title of Project work
85.	IMS16098 **Mahadeviya Khalak Rajeshkumar** SOP	Micromagnetic study of Exchange-Coupled $Ni_{80}fe_{20}$/CoPt Nano-Modulated Systems
86.	IMS16099 **Iyer Kishore Narayanan** SOP	How to Define Complexity in a Quantum Field Theory?
87.	IMS16100 **Krishna Nivedita G** SOP	New Probe for Heavy Neutral Z' Boson at the LHC
88.	IMS16101 **Krishna Prasad** SOC	Multichromophoric Systems to explore the underlying Photophysics
89.	IMS16102 **E Krishna Suresh** SOC	Synthesis of Carboxylic Acid and its Derivaties for Cross-Coupling Reactions and Synthesis of β-Disubstituted Ketones by Ligand-Free Nickel Catalyzed Efficient Alkylation of Ketones with Alcohols followed by β- Arylation
90.	IMS16103 **Krishnakavya T M** SOC	Triazole-linked Analogue of Deoxyribonucleic Acid through Topochemical Polymerization
91.	IMS16104 **Krishnanand K Nair** SOP	A New Multiplet in N = 2 Conformal Supergravity
92.	IMS16106 **Lakshmi Priya Sreelatha Pramod** SOP	A New Probe for heavy charged gauge Boson, W', at the Large Hadron Collider (LHC)
93.	IMS16107 **Lithin M B** SOP	Studies on Catalysts for Electro and Photo-Catalytic Water Splitting Applications
94.	IMS16108 **Maby Johns** SOP	Bio-Sensing Field-Effect Transistors for Efficient and Quick Detection of Viral Infection
95.	IMS16109 **Kesiya Sunny** SOC	Synthesis and Characterization of an Atom Precise Gold-Copper Alloy Nanocluster

Sl. No.	Roll Number Name of Student Major	Title of Project work
96.	IMS16110 **MANU PRASAD K** SOB	To Study the Role of IRC20 in the modulation of Recombination Rate in *Saccharomyces cerevisiae*
97.	IMS16112 **Meenakshi Krishnan** SOM	Asymptotic Preserving and Structure Invariant Schemes for Hyperbolic Systems with Multiscale Relaxation
98.	IMS16114 **Michael Thomas** SOM	A Study on Primitive Roots Modulo Primes and Primes Squared
99.	IMS16115 **Midhun Krishna** SOP	Reduced Dynamics and Projection Operator Formalism
100.	IMS16117 **Miliya K M** SOP	Scanning Tunnelling Microscopy: A Tool for Investigating Molecular Electronics
101.	IMS16118 **Minu S** SOC	Towards Pyrene Incorporated Porphyrin Conjugates
102.	IMS16119 **Minu Saji** SOC	High Fluorine Content DNA-Based Nanoparticle: A Universal "Off/On" 19F NMR Probe for the Detection of Various Biomarkers
103.	IMS16120 **Mithun C Madhusudhanan** SOC	Azide···Oxygen Interactions: A Crystal Engineering Tool for Conformational Locking
104.	IMS16121 **Mudit Bhatia** SOB	A Search for the regulators of PCSK9 at Transcriptional and Translational level
105.	IMS16122 **Muhammed Naseem. K** SOB	Deciphering the role of miR-184 in growth and development of *Drosophila melanogaster*
106.	IMS16123 **Mukta Janpandit** SOP	Mutually Unbiased Balanced Functions and Generalized Random Access Codes

Sl. No.	Roll Number Name of Student Major	Title of Project work
107.	IMS16124 **Naipunnya Raj** SOP	Spin Orbit Coupling: Graphene-Bi2S e3 van derWaals heterostructure
108.	IMS16125 **Nandakishor K** SOM	Game-Theoretic Approach to Epidemiological Modelling & Optimal Control of a Hybrid System with Multiscale Dynamics
109.	IMS16126 **Kandregula Naveen Vardhan** SOM	Cryptanalysis on Lattice Cryptography, Digital Signature and an RSA variant with moduli N = prql
110.	IMS16127 **Neethu B** SOB	Significance of Conserved Ska1 Loop Region Amino Acids in Kinetochore Localization of Ska Complex and Stabilization of Kinetochore-Microtubule Interactions
111.	IMS16128 **Neha Kachappilly** SOB	Effect of Oxidizing Conditions on a-Synuclein Fibril Formation And ImageJ Macro Code Development for Semiautomatic Stereological Estimation
112.	IMS16131 **Nidhin R H** SOP	Determination of the Miscalibrated Polarization Angle and the Cosmic Birefringence angle from CMB Experiments
113.	IMS16132 **Nihal M** SOP	Hydrodynamics from Gravity - An Application of Holography
114.	IMS16133 **Nikhil U S** SOP	Superconductivity in Infinite Layer Nickelates
115.	IMS16134 **Nilesh Suryawanshi** SOM	Stochastic Phenomena in Pattern Formation for Distributed Nonlinear Systems
116.	IMS16135 **S Numash Rajan** SOM	Mathematical Modelling of Infectious Diseases
117.	IMS16138 **P Kiran Reddy** SOC	Hydroxylamine Oxidation Coupled to Nitrate Reduction at Mononuclear Cu(II) Site

Sl. No.	Roll Number Name of Student Major	Title of Project work
118.	IMS16139 **Pallavi P** SOB	Exploring the Role of zeitgeber on triglyceride Metabolism in *Drosophila melanogaster* - Studies on the effect of Constant light
119.	IMS16140 **Parvathy Anupkumar** SOC	Analytical Approaches for Modelling the Plasmonic Resonances in Bimetallic Core-Shell Nanostructures
120.	IMS16141 **Parvathy Gireesan** SOP	Voltage-controlled van der Waals Josephson Junction in MoS_2
121.	IMS16142 **Patoju Sai Dilip** SOC	Designing Perylene Polyimdes as High-Voltage N-Type Organic Cathodes
122.	IMS16143 **Phulung Basumatary** SOC	Tetraphenyl-21, 23-dideazaporphyrin as a Potential Photosensitizer – A Theoretical Study
123.	IMS16144 **Poovannan R** SOC	Synthetic Studies towards Artificial Switchable Catalysts
124.	IMS16146 **Pranav Kumar** SOC	Lewis Acid Promoted Intramolecular Proton Initiated Annulations towards the Synthesis of Aromatic Phenalene Diterpenoids
125.	IMS16149 **Radhika Krishna H** SOC	Role of Intrinsic Defects in Carbon-based ORR Catalysts
126.	IMS16151 **Ravi Prakash Pankaj** SOB	Into the wild: the Exploration of Numerical and Segmental Aneuploidy in the wild Yeast strain CPC using Next-generation sequencing Approach
127.	IMS16153 **Renuka M** SOP	Investigation of Brillouin based True Random Number Generation
128.	IMS16154 **Reshma Ramesh** SOC	Study of Zinc Induced Phase Separation Of Tau Protein

Sl. No.	Roll Number Name of Student Major	Title of Project work
129.	IMS16155 **Reshma Sanal** SOC	Towards the Topochemical Synthesis of Linear and Network Polymers
130.	IMS16156 **Rithwik P Nambiar** SOB	Elucidating the Role of CARP2 in Regulating Parkin Recruitment to Mitochondria
131.	IMS16159 **Rohin H** SOM	Diffusion Limit of the Goldstein-Taylor Model
132.	IMS16161 **S Jayakrishnan** SOP	A Study of the Applications of Tapered Optical Fibers
133.	IMS16162 **Sabuj Mondal** SOP	ZnO Nanorod Coated Tapered Optical Fibre for Sensing Application
134.	IMS16164 **Sai Chaitanya Susarla** SOP	Cosmic Microwave Background (CMB) Analysis for Incomplete Sky Cover
135.	IMS16166 **Sanchit Srivastava** SOP	Non-Classical Correlations as Indicators of Quantum Features in Inaccessible Systems
136.	IMS16167 **Salini R** SOP	Quantum Electrodynamics of Linear Tri-Atomic Molecules Trapped in Cavities
137.	IMS16168 **Sandra Mariya George** SOC	Towards the Synthesis of [26]Oxa and Thia Rubyrin and its bis-BODIPY Complex
138.	IMS16170 **Sanjay Sunny** SOP	Vertically Aligned MoS_2 on Electrodeposited Copper Nanorods for Energy Applications
139.	IMS16171 **Santra Santhosh** SOC	A pH-Responsive DNA Hydrogel for the Inhibition of Cancer Growth

Sl. No.	Roll Number Name of Student Major	Title of Project work
140.	IMS16172 **Sarath Jose** SOP	Charge Transport in Pd nanoclusters and its Relevance in H_2 Sensing
141.	IMS16173 **Satyam Sahu** SOP	Photoluminescence and Raman Spectroscopic Studies of $MoSe_2$ and $MoWSe_2$
142.	IMS16175 **More Saurabh Bharat** SOB	Genetic Recombination Analysis of Mieotic Mutants in a Natural Hybrid of *S. cerevisiae*
143.	IMS16176 **Sebastian Francis** SOC	Functionalized Graphynes as Receptors for Ions
144.	IMS16178 **H Sharanya** SOB	Bioinformatic and experimental studies of miRNAs possibly involved in the regulation of *Drosophila melanogaster* lifespan and growth
145.	IMS16179 **Shilpa P Raj** SOC	Synthesis of Key Building Block for Making Integrated Di-m-Benziporphyrin
146.	IMS16180 **Mehta Shrey Chandresh** SOP	Towards a Dynamically Tunable Dispersion Device Using Indium-Tin-Oxide (ITO) & Tapered Optical Fibers
147.	IMS16182 **Snehal Neware** SOB	Spontaneous Colour Preferences in Satyrine Butterfly *Ypthima huebneri*
148.	IMS16183 **Sreehari S** SOM	Minimal Free Resolutions and Geometry
149.	IMS16184 **Sreelekshmi V** SOC	Photophysical Landscape of Emitter in Plasmonic Field: How Interaction Energy Matters
150.	IMS16186 **Sreya N** SOC	Synthesis of C8-C20 fragment of Tartrolon D

Sl. No.	Roll Number Name of Student Major	Title of Project work
151.	IMS16187 **N Srikrishna** SOB	Trade-off in Life History Traits with respect to Host Plant in *Mycalesis mineus*
152.	IMS16188 **Sanke Sujan Kumar** SOB	Characterisation of ΔNNF1 mutant in *Arabidopsis thaliana*
153.	IMS16189 **Sumit Kumar** SOC	Cerium Photocatalyzed Aerobic Oxidation of Benzylic Alcohols to Aldehydes and Ketones
154.	IMS16192 **Swarali Patil** SOP	Study of Weak Gravitational Lensing of the Cosmic Microwave Background
155.	IMS16193 **Swathy Vijayan** SOC	Reduction of Cobalt Nitrite Complex by Biologically Relevant Reducing Agents
156.	IMS16194 **T N Arjun Raj** SOP	Carbon Nanodots for Novel Photodetection and Photovoltaic Applications
157.	IMS16195 **Tabassum Sood** SOB	Towards targeting the globular C-terminal domain of *Mycobacterium smegmatis* Gre factor (Ms5263)
158.	IMS16197 **Tina Jacob** SOC	Phase Separation Studies of RRM2Q Construct of TIA1 protein and to Study the Kinetics and Dynamics of Tau Protein within the Bio Condensate of RRM2Q
159.	IMS16198 **Vaisakh M** SOP	Mutually Unbiased Balanced Functions and Generalized Random Access Codes
160.	IMS16200 **Vivek Cherian David** SOP	Chemical Pressure Effects on a d7 Kitaev Honeycomb Magnet $Na_3Co_2SbO_6$
161.	IMS16201 **Vivek G Pillai** SOC	Transition Metal Mediated N-O Bond Activation
162.	IMS16203 **Yashas R** SOB	Analysing the Role of Insulin Signalling in Adaptive Starvation Stress Response in *Drosophila melanogaster*

I-Ph. D. Student and Thesis details

Three I-Ph. D. students, whose details are given in Table 4, have completed the requirements for the award of the Masters and Ph. D. degrees in the year 2021. They have been awarded both the degrees.

Table 4 – I-Ph. D. Thesis details

Sl. No.	Roll Number. Name of student School - Research Supervisor	Thesis Title
1	IPHD13010 **Owais C. H** SOC - Dr. R S Swathi	Amalgamating Continuum Approximation and Particle Swarm Optimization to Unravel Interactions of Lennard-Jones Clusters with Carbon Nanostructures
2	IPHD12003 **Vignesh A** SOC - Prof. K M Sureshan	Synthesis of Topologically Defined Pseudoproteins by TAAC Reaction and the Synthesis of Seven Membered Carbasugars
3	IPHD13012 **Saurav Samantaray** SOM - Dr. K R Arun	Asymptotic Preserving IMEX Time Integration for Low Mach Number Hydrodynamics and Quasineutral Plasma

One I-Ph. D. student, whose details are given in Table 4a, has successfully completed his thesis defense on or before March 31, 2021, a requirement for the award of the Masters and Ph. D. degree.

Table 4a – Thesis defense of I-Ph. D. completed

Sl. No.	Roll Number. Name of student School - Research Supervisor	Thesis Title
1	IPHD14004 **Tikekar Sharvari Neetin** SOM - Dr. Shrihari Sridharan	Analysis on a Unilateral Full Shift Space over Finite Symbols

Ph. D. Student and Thesis details

In 2021, twenty-three students completed the requirements for award of Ph. D. degree. Table 5 gives the details of students who were conferred with a Ph. D. degree in 2021

Table 5 – Graduating Ph. D. scholars

Sl. No.	Roll Number Name of Student School - Research Supervisor	Thesis Title
1.	PHD131016 **Sreesha R Sudhakar** SOB - Dr. Jishy Varghese	The Role of Insulin Producing Cells (IPCs) in Hunger Induced Feeding and Nutrient Sensing in *Drosophila melanogaster*
2.	PHD132012 **Sreeja. V. Nair** SOB - Prof. S. Srinivasula Murty	Functional Characterization of RNF167 and its variants in lysosomal positioning, ubiquitin ligase functions, and NF-kB Signalling
3.	PHD151005 **Dhanya Radhakrishnan** SOB - Dr. Kalika Prasad	Mechanisms of Regeneration in Plants
4.	PHD142006 **Binshad B** SOB - Dr. Tapas K. Manna	Regulation of Centriole Biogenesis by E3 Ubiquitin Ligase FBXW7
5.	PHD141001 **Ajith. V. P** SOB - Dr. Nishant K T	High Through-put Analysis of Genomic Instability in the budding Yeast
6.	PHD132004 **Eswar Reddy Maddi** SOB - Dr. Ramanathan Natesh	Structural and Functional Insights into the Proteins involved in NHEJ DNA Repair and Genome Stability
7.	PHD131009 **M N Ramesh Bondada** SOB - Dr. Ravi Maruthachalam	Understanding the Genetic Basis of Uniparental Genome Elimination (UGE) and its Exploitation in *Arabidopsis thaliana*

Sl. No.	Roll Number Name of Student School - Research Supervisor	Thesis Title
8.	PHD151027 **Raju** SOC - Dr. Ajay Venugopal	Cationic Zinc Hydrides for Carbon Dioxide Reduction
9.	PHD142011 **Siriki Atchimnaidu** SOC - Dr. Reji Varghese	Design and Synthesis of Functional DNA Nanostructures: Applications in Cancer Therapy and for the capture of Micropollutants from Water
10.	PHD142008 **Hemna Fathima** SOC - Prof. K. George Thomas	Plasmonic Substrates for Surface-Enhanced Raman Scattering Based Sensing
11.	PHD152002 **Asha P** SOC - Dr. Sukhendu Mandal	Metal-Organic Frameworks as Remedy for Water Pollution - Sensing and Removal
12.	PHD151023 **Neethu Anand** SOC - Dr. V Sivanranjana Reddy	Nonadiabatic Excited-State Intramolecular Proton Transfer in Hydroxypyrone Analogs
13.	PHD131003 **Anjana. P. K.** SOC - Dr. A. Thirumurugan	Exploration of a few Vanadium based Hybrid Compounds as Active Anode Materials in Lithium-Ion Batteries
14.	PHD131004 **Ashby Philip John** SOP - Dr. Madhu Thalakulam	Electrical Contacts on MoS2: Influence of Strain and Gating
15.	PHD151016 **Ranjith. P** SOP - Dr. M. M. Shaijumon	Controllable Synthesis of Phosphorene Nanostructures and their Hybrids for Efficient Electrocatalysis
16.	PHD132009 **Manju. P** SOP - Dr. Deepshikha J Nagar	BaZrO3 ceramic Production, Single Crystal Growth and Vortex Phase Diagram of YBa2Cu3-xAlxO6+ high Tc Superconductor
17.	PHD141012 **Prahalad Kanti Barman** SOP - Dr. Rajeev Kini	Valleytronics in 2D Transition Metal Dichalcogenides
18.	PHD131015 **Soumitra Hazra** SOP - Dr. Rajeev Kini	Terahertz and Pump-Probe Spectroscopy of Spin Ladder Compounds
19.	PHD141008 **Lakshmi. K. P** SOP - Dr. M. M. Shaijumon	Investigation of Antimony Based Electrodes for Rechargeable Batteries

Sl. No.	Roll Number Name of Student School - Research Supervisor	Thesis Title
20.	PHD162008 **Prashanta Kumar Mukharjee** SOP - Prof. Ramesh Chandra Nath	Quasi-one-dimensional Spin-1/2 Alternate Chains and their Field Induced Effects
21.	PHD141010 **Neeraj Kumar Rajak** SOP - Dr. Deepshikha J Nagar	Flux growth of high quality $Bi_2Sr_2CaCu_2O_{8+x}$ single crystals, Rietveld refinement study, and sub-angstroms resolution thermal expansion measurement
22.	PHD141007 **Krishna Nand Prajapati** SOP - Dr. Joy Mitra	ZnO emission : From Photoluminescence to Surface Enhanced Raman Spectroscopy
23.	PHD141017 **Varun Srivastava** SOP - Dr. Manoj Namboothiry	The Role of Defects in the Anomalous Behaviour of Perovskite Solar Cells: Probing the Defects Dynamics from steady to transient states via Optoelectronic Characterisations

In 2021, thirteen students have completed their thesis defense, a requirement for the award of the Ph. D. degree, on or before March 31, 2021. Details of these students are given in Table 5a

Table 5a – Ph. D. Thesis defense completed

Sl. No.	Roll Number Name of Student School - Research Supervisor	Thesis Title
1.	D152014 **Himani Pathak** SOB - Dr. Jishy Varghese	Functional Characterization of Novel Genes Regulating Nutrient Homeostasis in *Drosophila melanogaster*
2.	PHD141005 **D. Perumal** SOC - Dr. Reji Varghese	Design and Synthesis of DNA-Based Amphiphiles for Cancer Diagnosis and Therapy
3.	PHD162005 **Kalaiselvan A** SOC - Dr. Gokulnath Sabapathi	Carbazole-based Macrocycles: Synthesis, Structure, Sensing and Photophysical Properties
4.	PHD162003 **Feba Thomas P** SOC - Dr. Ramesh Rasappan	Transition-Metal Catalysis: Radical Cyclization of Alkyl Halides and Cross-Coupling Reactions via C-N Bond Cleavage

Sl. No.	Roll Number Name of Student School - Research Supervisor	Thesis Title
5.	PHD151025 **Perisetti Lakshmi Naga Mahendranath** SOM - Dr. Sheetal Dharmatti & Prof. Utpal Manna	Control Problems for Phasefield System
6.	PHD161016 **MCR Praphulla Kumar Koushik** SOM - Dr. Saikat Chatterjee	Geometric structures on Lie groupoids and differentiable stacks
7.	PHD141014 **Siva Shakthi Radhalakshmi A** SOP - Dr. Ravi Pant	Coherent Brillouin Interactions in the Microwave Domain: Physics and Applications
8.	PHD142007 **Niyas Rehman** SOB - Dr. Jishy Varghese	Larval diet affects adult metabolic status in *Drosophila melanogaster*
9.	PHD151006 **Dhanya S R** SOC - Dr. Vinesh Vijayan	Structural studies on the prion domain of CPEB3, responsible for long-term memory retention in mammals
10.	PHD151007 **Elizabeth Mariam Thomas** SOC - Prof. K George Thomas	Semiconductor Quantum Dots: Blinking and Plasmon-Enhanced Photoluminescence
11.	PHD131014 **Rajesh Ghosh** SOC - Dr. A. Thirumurugan	Use of Gemini surfactants as Soft-templates in the synthesis of hierarchically porous HKUST-1 MOFs
12.	PHD162006 **Lekshmi R S** SOC - Dr. V. Sivaranjana Reddy	Intersystem crossing via higher triplet states in organic aromatic molecules
13.	PHD141011 **Parvathy Jayan** SOC - Dr. Vinesh Vijayan	Structural and functional studies of VDAC and microtubule domain of Tau protein


NOT ENTER

STUDENT ACTIVITIES

ACTIVITIES OF THE SCIENCE AND TECHNOLOGY COUNCIL (STC)

As part of the student activities at IISER TVM, the Science and Technology Council (STC), hosted Anvesha 2021, the official Science Fest of the Institute, in offline mode for students of the Institute. This was a welcome change from the previous year, where almost all student activities had to be conducted online due to the COVID-19 pandemic. Under normal circumstances, Anvesha is a social event, with invitations sent to several schools and colleges in and around Thiruvananthapuram, to participate in the event. This year however, the offline events were restricted to IISER TVM students and was conducted with strict COVID-19 protocols in place. The online events had participation from teams spread across the country and a couple of foreign teams as well.

The event was inaugurated by Prof. J. N. Moorthy, Director, IISER TVM on October 14, 2021. The exciting array of events conducted during Anvesha 2021 is listed in the table. Eight of the ten events were intercollegiate events and had participation from across the country. The remaining two were open only to students of IISER TVM. In addition there was the Aficionados – Science Expo, Integration Bee contest, the Ruthberg Gold Machine and Treasure Hunt.

INTERCOLLEGIATE EVENTS
• Code Battle
• Crime Scene Investigation
• Entanglement – Public Lecture Series
• Inquisito 2.0
• JIGYASA
• Nobel Lecture series
• Resenseo
• Science in Canvas
• UTSUK – School Quiz

INTRA EVENTS
• BahFest
• Potpourri

Code Battle

The Coding Competition of IISER TVM was open to educational institutions from all over India. This year we received registration form other IISERs, IITs, NITs, and engineering colleges from within Kerala and other states. The event was conducted on Hackerrank as there were about 75 registrations for this event. IIT BHU won all the prizes at this event.

Crime Scene Investigation (CSI 10.0)

This event has been a crowd puller and this year, the preliminary round saw about 100 teams, from across India, and one team from outside the country, registering for the event. Competition was intense and only the best teams qualified to enter the final round. The winners walked away with a prize money of INR. 10,000.00. The winning teams were

- Team #31 AANA (IISER TVM);
- Team #33 Bonks and Boops (IISER TVM)
- Team #86 Mu id sa (IISER TVM).

Two teams that played exceptionally well and need special mention are

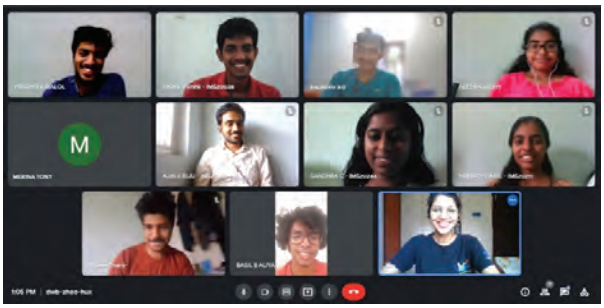
- Team #8 Theja and comrades (IISER TVM)
- Team #80 Catscradle (IISER Kolkata).

Entanglement – Public Lecture Series

This event consists of a series of four lectures, one each in Biology, Chemistry, Mathematics and Physics, by IISER faculty, aimed at providing school students a peep into the alluring and intriguing world of research and the range of opportunities for innovation and exploration in the sciences. About 250+ school students from all over India registered for this interactive online program and listened attentively to the interesting line up of talks in different emerging areas of science. There was enthusiastic and spontaneous interaction between students and IISER faculty during this event.

- **Biology – Prof. Hema Somanathan** – *"Exploring the science behind animal behaviours"*
- **Chemistry – Dr. R. S. Swathi –** *"(De)mystifying quantum interference"*
- **Mathematics – Dr. Shrihari Sridharan –** *"Geometry – Thou art a mystery"*
- **Physics – Dr. Vinayak Kamble –** *"Seeing is believing"*

INQUISITO 3.0



What started as Alchemist – the Chemistry Treasure hunt, has over the years, grown to include all disciplines and is now known as Inquisito - the Treasure Hunt. There were about 100 participants in this year's event. This much sought after event had participants delight in unravelling the clues to complete the challenge. All participants were genuinely excited about the event and very appreciative of the efforts that went into organizing this event.

JIGYASA

The Open General Quiz competition of Anvesha 2021 was hosted by none other than the quizzing sensation – Major Chandrakant Nair, famously known as 'CAPTAIN'. There were about 30 odd contestants from all across the country who participated in this online event. The first place went to a team from IIM Bangalore, the second place to a lone wolf from South Asian University, New Delhi and the third place to a team from IIT Madras. Winners took home cash prizes worth INR. 10,000.00

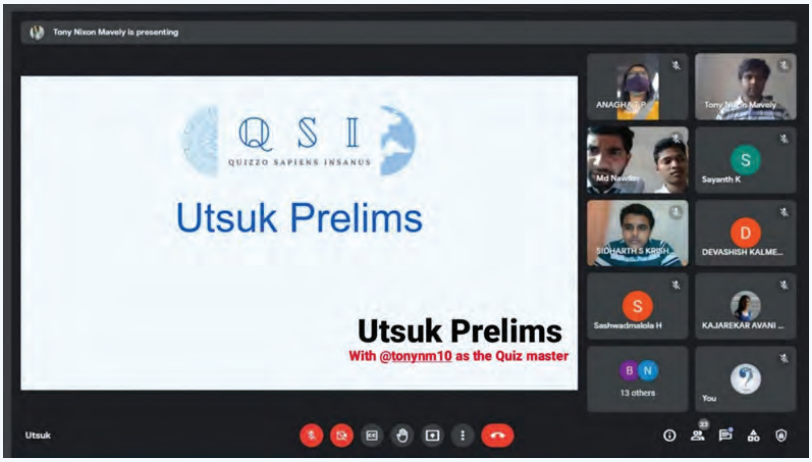
Nobel Lecture Series – Explaining the cutting edge research of Nobel laureates

This year, Dr. Poonam Thakur, Prof. Kana M Sureshan, Dr. Harilal Madhavan and Prof. Juergen Kurths provided a comprehensive description of the ground breaking research of scientists awarded the Nobel Prize for Biology, Chemistry, Economics and Physics respectively. This event, as in previous years, drew huge audiences from both, the students and faculty of IISER TVM and was also opened to students and faculty from other colleges and universities.

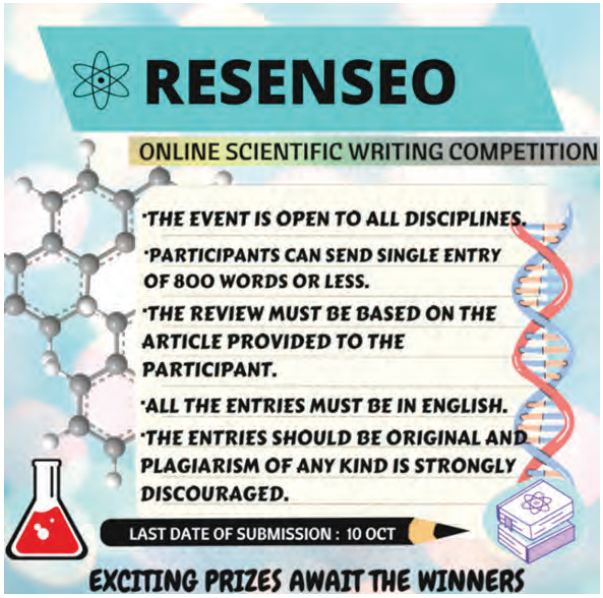
School Quiz

UTSUK

Around 30+ schools from all over India registered for this quiz that was conducted by two students of IISER TVM - Tony Nixon and Bharat Krishnan. The event was conducted online in two rounds – a preliminary round to select the best teams who would compete in the final round. The winning team was from Tamil Nadu, while the 2nd and 3rd place went to teams from Kerala. Prize money worth INR. 10,000.00 was distributed among the winners.



Resenseo



This is the scientific writing competition of IISER TVM and is open to research students across disciplines, cutting across geographical boundaries. This year's event had 63 registrations. Contestants were allowed to choose the discipline and the paper they want to review. The following 3 requirements were, however, mandatory for all submissions - review must be completed in 800 or less words, must be submitted only in English and lastly, must be original entries, free of plagiarism.

Science in Canvas

Students of IISER TVM believe that "Art evokes mystery and science unleashes its pathway." The theme for this year's 'Science in Canvas' event was "……..tion". This platform encourages participants to express science through comics, posters, infographics, and photographs.

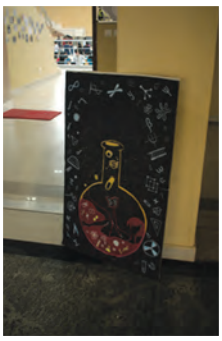
The entries were judged by Rafeeq, an alumnus of IISER TVM and a notable science illustrator.

BAHfest:

This event, the 'Bad Ad-hoc Hypothesis Festival", was conducted on October 14, 2021. Participants in this event defended vague non-sensical scientific theories with the same rigor and thorough research as any serious scientific study. They argued and presented unproven funny scientific theories with charts, statistics, data, citations and other aids, to an audience that kept grilling the participants with difficult queries. The event was judged by Alwin, a student of IISER TVM

Aficionados
Science Expo

The Expo is the creative space for students of the Institute to display their zeal and enthusiasm for science projects and is co-hosted by Anvesha and the various student's clubs of the Institute - CMIT, CSIT ESI, Parsec, Proteus and PSIT. The wide array of projects on display at the Expo usually has the audiences bedazzled and awestruck at the science and techniques used to explain both simple and highly complicated scientific theories and facts to the audience.



The department-wise winners

Biology Expo

- Gene editing Lab
- Establishing relationship between smell and taste

Chemistry Expo

- Belousov Zhabottinsky reaction
- Preparation of biodiesel

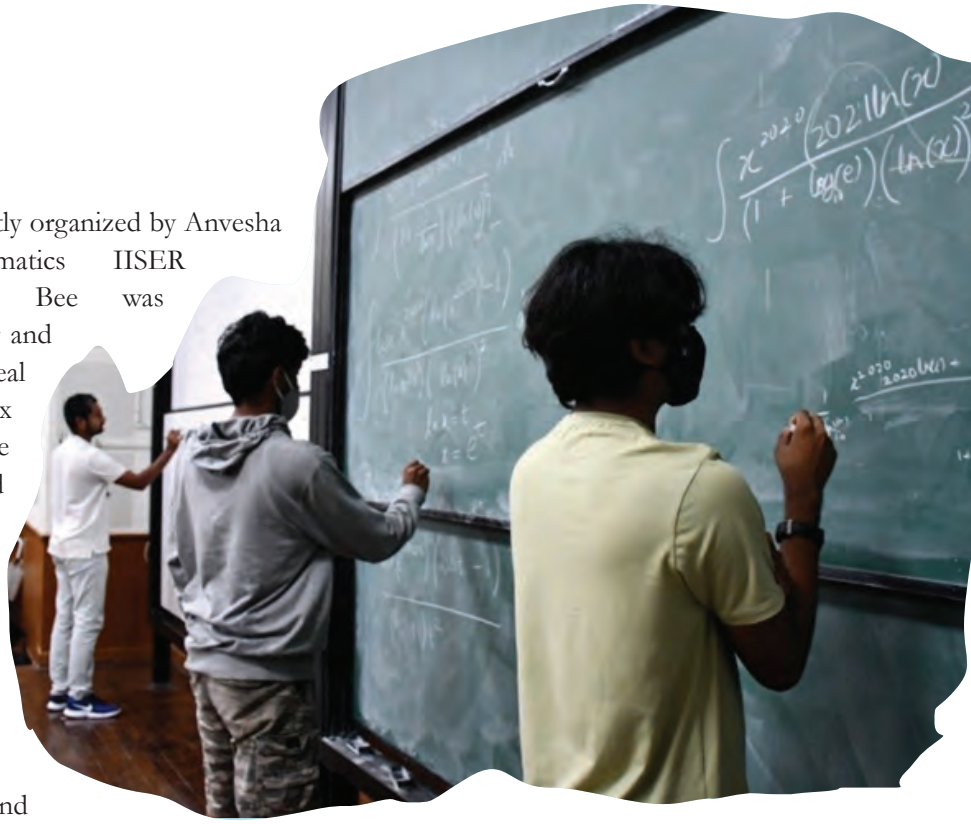
Mathematics Expo

- Instant insanity problem
- Birthday paradox

Physics Expo

- Auto Titrator
- Quantum Tunneling

Integration Bee



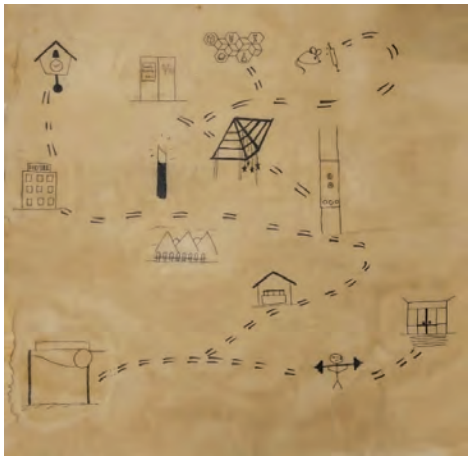
The Integration Bee contest was jointly organized by Anvesha and the Club of Mathematics IISER Thiruvananthapuram. Integration Bee was conducted in a new format this year and included two competitions – "Real Integration Bee" and "Complex Integration Bee". Contestants were challenged to solve complicated and completely overwhelming integrals.

Pranit Sai of BSMS-20 won the "Real Integration Bee", solving the final Integral in his mind without the use of any accessories. Joshy K Oommen of BSMS-20 came second. Anand Chavan of BSMS-17 and Sahil Naik of I-Ph. D. 19, won the first and second place respectively in the "Complex Integration Bee".

Ruthberg Gold machine

A team of highly motivated students from the BSMS-20 batch took on the responsibility of building the Ruthberg Gold machine. Even though there were a few minor glitches in the operation of the contraption, that lasted for about 2.5 minutes, it was a very enjoyable experience and drew a lot of audience especially on the last day of the science fest. Undoubtedly, an extremely praiseworthy and impressive show by the students of BSMS-20 batch.

Treasure Hunt:



The first round of this two-round event was conducted online on October 12, 2021. Participants were given a treasure map along with a series of clues, puzzles and riddles that needed to be decoded and associated to a specific place on the map. The top 5 teams of the first round qualified to the second round, that was held offline on October 17, 2021.

The hunt for the treasure started at the indoor stadium, with clues and directions hidden in various locations in the campus. The road to the hidden treasure was disguised with obstacles and with each advancement, the clues became more cryptic and difficult to unravel.

"Team ABC" consisting of Anis and, Akshay Jithu unraveled the mysteries to reach the treasure first. The runners-up at this event were "Team Toppers are like this only" consisting of S Goureesankar and Jacob Cherry Sam.

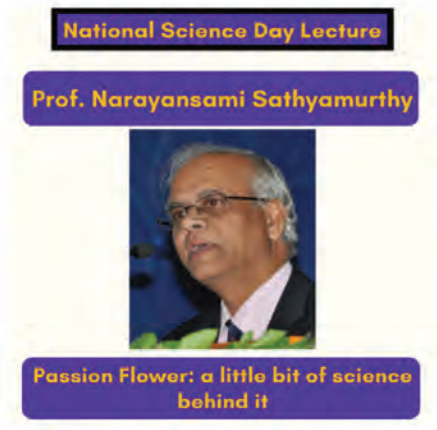
The Science of POLICY MAKING

February 26, 2022

As part of National Science Day celebrations, the STC presented a fresh and exciting challenge to the students of IISER TVM, and an opportunity to win exciting prizes by participating in the competition. Students participating in the competition were allowed to amend existing policies and/or draft new policies and present it to the judges and audience. All participants were given between 2-5 minutes each, to explain the proposed amendments/new policies, discuss the implementation process focusing on the strengths and weaknesses of the proposed policies.

The National Science Day 2022 Lecture

February 28, 2022



Prof. N. Sathyamurthy, Founder Director of IISER Mohali and the Chief Guest for the National Science Day celebrations at IISER TVM, delivered, online, the National Science Day Lecture – **"Passion Flower: A little bit of Science behind it"**.

Exhibit A

March 2022

Exhibit A, previously known as the Science Newsletter has transformed into an online publication. The articles included an illustrated comic about the life of Prof. Hema Somanathan, IISER TVM which was republished by The Wire Science. It also included research highlights of December 2021 and an insightful book review of "The Dawn of Science"

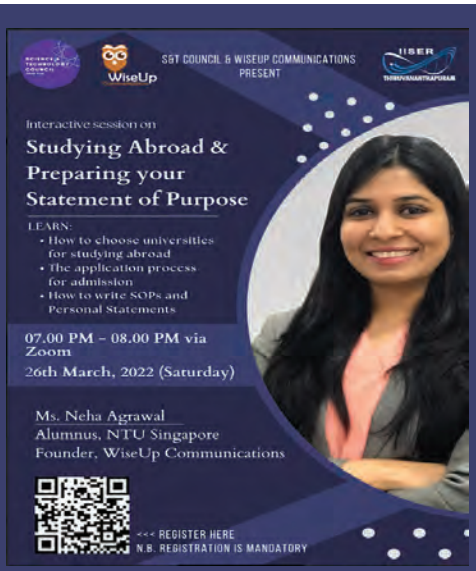
Session by WiseUp Communications

March 26, 2022

The SWC hosted an interactive session presented by Ms. Neha Agrawal, an Academic Communication Expert and the founder of WiseUp Communications. The session focused on "Studying Abroad & Preparing your Statement of Purpose"

At the end of the session, students had a better understanding of

- how to choose universities for overseas study
- the application process for admission
- how to write SOPs and Personal Statements



ACTIVITIES OF THE QUIZZING SOCIETY OF IISER TVM (QSI)

QSI believes that quizzing is not about merely memorizing facts. It is in fact a sport that requires presence of mind, ability to find connections between completely unrelated things and the skill to decipher cryptic clues to arrive at the answer, all within a very tight time frame

Science - Tech Quiz

November 30, 2021

As a part of the QSI activities, a Sci-tech Quiz was hosted by Tony Maveli and John

Sports Quiz

March 18, 2022

QSI marked their return to offline quizzing with the Sports Quiz, hosted by Bharath Krishna S (IPHD Batch '21).

General Quiz

March 25, 2022

One other offline General quiz, was hosted by a first-time quiz master, Nikhil Alex Verghese.

ACTIVITIES OF THE ECOLOGICAL SOCIETY OF IISER TVM (ESI)

ESI Weekly Documentary Screening

ESI documentary screenings happen every Friday in the PSB seminar hall and includes a range of documentaries, series and animated movies that picture different habitats, ecosystems with a special focus on the need and importance of conservation.

The following series and documentaries were screened this year

- Night on Earth series
- Flight of butterflies (documentary)
- On the brink series
- Madagascar 2 (movie)
- SWOP (Seven Worlds One Planet) series

Essay Writing Competition

June 05, 2021

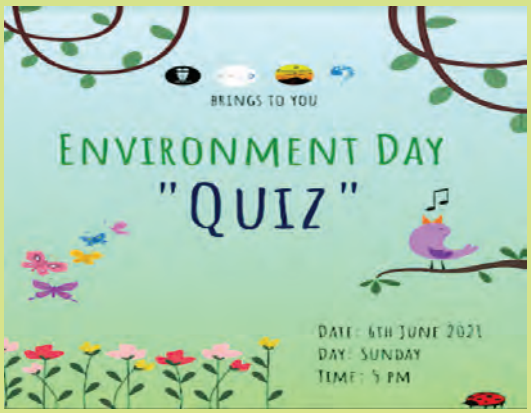
The ESI, Proteus and Anvesha organized an essay writing competition to celebrate World Environment Day.

Topic: Elimination of single-use plastic
Word Limit: 1000

Oh damn, I forgot this Existed

(Online Quiz competition)

June 06, 2021



QSI (Quizzo Sapiens Insanus of IISER TVM), ESI (The Ecological Society of IISER TVM), and Proteus (The Biology club of IISER TVM) organized ***'Oh damn, I forgot this existed'*** an environmental quiz.

The quiz was hosted by Vidyarashmi Hanehalli (Batch 19), Shreya Venkatesan (Batch 19), and Naveen Balachandran (Batch 19) at 5 pm on the 6th of June (Sunday), 2021.

Message from
HUMANITY

June 30, 2021

Parsec - the Astronomy Club of IISER TVM and ESI organized this event together. Participants were asked to draft a message (video/ image files) to communicate with the extraterrestrials.

Butterfly Talk

September 25, 2021

September is celebrated in India as Big Butterfly Month, and to mark the occasion, ESI organized a talk by Mr. Tarunkishwor Yumnam, a Ph. D. student from Vanasiri lab headed by Dr. Ullasa Kodandaramaiah.

Inter IISER Panel discussion

July 11, 2021

The All-IISER Conservation Committee, (ESI is a member of the committee) organized a panel discussion on Status of the North-east Biodiversity. The session was moderated by Dr. Nandini Rajamani, Department of Biology, IISER Tirupati.

The invited panelists included:

- Dr. Sarala Khaling, Regional Director, Eastern Himalaya/ Northeast India at Ashoka Trust for Research in Ecology and the Environment (ATREE)
- Dr. Robert John Chandran, Department of Biological Sciences, IISER Kolkata
- Dr. Dipankar Lahkar from the Tiger Research & Conservation Division, Aaranyak
- Dr. Vinita Gowda, Department of Biological Sciences, IISER Bhopal

Wildlife Week

December 10, 2021

Wildlife Week is the ESI's annual fest to celebrate the incredible wilderness around the campus. As part of the Wildlife Week celebrations, ESI organized the following events

- Origami Workshop
- Photography contest
- Nature Writing contest
- Quiz
- Treasure Hunt
- Talks

How Low Waste Lifestyle brings you closer to Nature - Ms. Mrudula Joshi (8 February 2022

Folklore Medicines and Forest Wealth of Karnataka - Mr. Sachin Bhaskar (11 February 2022)

Freshwater Turtles and Tortoises of South India: Ecology and Conservation - Ms. Sneha Dharwadkar and Ms. Jyotsna Nag (13 February 2022)

Sustainable Trekking: Green Trails, an initiative by India Hikes - Mr. Dushyant Sharma (14 February 2022)

Spider walk

December 10, 2021

ESI organized a spider walk around the campus, to walk people through the numerous species of spiders found in the campus.

Campus bird count

February 18 & 19, 2022

A short bird counting session was conducted on February 18 & 19, 2022 where bird enthusiasts walked through the campus counting and documenting birdlife within the campus.

CULTURAL COUNCIL

Dance Society

The Dance Society is a forum for people who like to start dancing and grooving to the slightest rhythm, anytime, anywhere. The society conducted a 'Story challenge' which provided a platform for many enthusiastic dancers to showcase their talent. A 'dance bingo' was organized through the social media platform where students shared their dance experiences at IISER TVM.

Online dance sessions were conducted throughout the lockdown period. Once back on the campus, offline fitness workout sessions were also organized. All the passionate dancers in Batch 20 came up with a loop video to showcase their talent, which was shared through the social media handle.

A 'Thiruvathira' special performance was done as part of the Onam celebration and was posted as a reel on Instagram. Besides this, a 'Diwali Week' was held where many participants came up with different dance styles. External collaboration with 'Tribe vibe' was hosted, and many of the participating members won prizes.

A 'year-round theme challenge' was introduced through the page where a theme was given for each month, and students were asked to perform to the theme. 'Hoof it with a celeb'; an online dance competition was also successfully organized. The Dance society also released a video for the ISHYA 22 promo.

MUSIC CLUB

The Music Club offers a place for music enthusiasts of all genres and styles, be it Western pop, Indian classical or Folk songs. 'Jamming sessions' were regularly conducted during the months of September, October and November. The society regularly worked towards putting out 'Video Covers' sung by its members. A beautiful video cover of the song 'Antha Nalil Anthi Neram' made by the society members was posted on the official Instagram page, which was well received and much appreciated. As a part of the Christmas celebration, a video cover was uploaded to the official Instagram page, and a group video cover of the song 'Devadoothar Padi' was also posted. Video covers of the songs 'Akalayo Ni Akalayo' and 'Dil Ko Karar Aaya' was also released. At the Republic Day celebrations, members of the Music society gave three performances - the National anthem, Maa Tujhe Salam and Bharat Amar Bharatbarsho. As a tribute to the to the nightingale of India, Lata Mangeshkar, the Music Club presented a beautiful rendition of the song 'Apki Nazron Ne Samjha'.

Movie *Club*

The Movie Club draws all movie lovers into its fold. The central attraction of the club is its weekly screening of movies, including classics, blockbusters, indie films. The core committee of the Club takes extra caution to include movies from around the world without any restrictions on language or themes. Unfortunately, due to COVID 19 restrictions, screening was temporarily halted from April to August. As the COVID situation improved, the weekly screening of movies resumed, following all COVID safety guidelines.

Gandhi Jayanti was celebrated as a week- long event 'Gandhi Week' in the first week of October, Gandhian movies were screened as part of the celebrations, in collaboration with EBSB activities. In addition, the club also conducted various activities like 'Mal Explique' via its Instagram page - an online fun event to give a humorous plot explanation for a movie of choice.

Literature and Fine Arts Society

The Literature and Fine Arts society brought out an exquisite flavor of art and literature alike. Between the months of July and September, regular art tutorials were conducted through the Instagram page. A video celebrating India's 'unity in diversity' was specially made by the students on the occasion of Independence Day.

"Inktober@IISER" was conducted in the month of October, where every day, a theme related to the campus was given to the students and they were encouraged to send in their illustrations and drawings. All submissions were curated and uploaded as an Instagram story on ISLA's official page.

The book club was officially launched, and many events were conducted in conjunction with it, most popular being, 'Book of the Month', 'Libro Preferito' and 'Histoires Tordes'. Few other informal activities were also planned for the student community.

Media Society

The Media Club is an extensive community of creative minds enthusiastic about photography, video production, and design thinking. In September, the society conducted a first of its kind month-long Photography event, 'Clicktember'. Students were encouraged to send photographs taken by them on daily prompts (related to IISER TVM life) and these pictures were shared on the society's Instagram page.

A Food Photography Competition titled 'Snap Cafe' was conducted in collaboration with i-Cafe, IISER TVM, in the month of December 2021. Students had to take pictures of delicacies served by i-Cafe, which were posted on both the Instagram handles, and winning entries received prizes from i-Cafe.

Sopanam, The Magazine

Sopanam, the Magazine Club, continuing with its aim of celebrating literature, introduced IISER TVM's first journalistic endeavor, the 'Campus Chronicles'**.** The newsletter covers the highlights of every month, complete with facts, perspectives, and interesting anecdotes. The club also releases monthly book reviews, movie reviews and Magazine Covers.

In June 2021, as part of Pride Month celebrations, the club organized 'Stories of Pride!' in collaboration with Queerythm, Trivandrum and the Movie Club. The event included a talk by Prijith PK, the President of Queerythm LGBTIQ+ Community, Kerala on June 26, 2021. Prijith is also a Researcher and SOGIESC Trainer on 'Rights of the Queer Community & Journey of Queerythm. A discussion session on two award-winning LGBTQIA+ movies, 'Moonlight' (2016) and 'Nagarkirtan' (2017) - from two distant parts of the world, focusing on the themes explored in these movies was also held as part of the celebrations.

Sopanam, in collaboration with the Internal Committee (IC), conducted a survey to assess issues of safety, gender discrimination, and sexual harassment in the Institute. The survey allowed respondents to openly express their concerns and hostile experiences. This process has provided insights to the IC and the Institute administration on measures and procedures that need to be in place to ensure a safer and more inclusive campus environment. In November 2021, in the spirit of Halloween, Sopanam conducted 'Trick O' Tale', an online Ghost Story Writing Competition. Syaahi (Literary Competition) and Mushiara (Poetry Slam Competition) were organized by the club as part of ISHYA 2022.

Humanities Collective

The Collective initially began in August 2021, as an informal group of students with a shared interest in discussions outside the scientific domain. The first event was an online talk on October 15, 2021, on the topic "Gender, Science and Academia", delivered by Dr. J Devika, a renowned historian, feminist, social critic, and academician from Kerala. The Collective officially started functioning as a sub-society under the Cultural Council on March 01, 2022. Dr. Harilal Madhavan, a Humanities faculty member at the Institute, provides guidance and support to the Collective in organizing its events.

The first offline event was held on March 19, 2022 at the Students' Lounge. The session titled 'Students' Discussion Forum' discussed and debated the ongoing war between Russia and Ukraine.

Theatrics Society

The Theatrics Society was established to nurture theatric skills among the talented minds of IISER TVM. The society launched its Instagram page on August 27, 2021 with the logo reveal and actively conducted various online events. The Theatrics Society has carved a niche for itself among the student community.

A reel competition titled 'To Reel or Not to Reel' was conducted in the month of September 2021, where students were asked to recreate famous movie scenes. Prizes were awarded in two categories, "Judge's Choice" and "People's Choice".

A weekly 'Drama Review Series' was organized on the social media platform of the Society all through the months of November 2021 to February 2022. A total of 6 Shakespearean dramas and 3 Indian dramas, particularly those written by Kalidasa, were reviewed by the Society.

An online bi-weekly Quiz series titled 'Smarticus' was also conducted in March 2022 to engage with audience through questions based on the dramas reviewed.

EK Bharat Shreshtha Bharath (EBSB)

The EBSB program for 2021-22 was resumed entirely online. Various events were conducted every month collaborating with different sub-societies under the Cultural Council.

EBSB collaborated with ISLA to put out a video celebrating India's unity in diversity that the students specially made on the occasion of Independence Day.

During the month of October, special screenings of Gandhian movies were carried out by collaborating with the movie club. Similarly, a special documentary screening was held on the occasion of the birth anniversary of Sardar Vallabhai Patel, the Iron Man of India.

ISHYA '22

After a long wait of 3 years, ISHYA, the annual cultural fest of IISER TVM was officially announced on February 14, 2022, The ISHYA week was launched on 28th March by Subrabalan M, the Secretary of the Cultural Council, along with an open mic event. ISHYA 22 was completely organized by students and included on stage shows, online events, pro shows and ISHYA merchandise. Most of the festivities continued into April 2022.

SPORTS COUNCIL

GYM *Graffiti*

The interior design of the new Gymnasium of IISER TVM was done by a group of students led by Arunima Mathew of Batch 18. All students involved in this creative activity were awarded Certificate of Appreciation for their creativity, and for their time and effort.

Futsal Court Inauguration

The first Futsal court at IISER TVM was inaugurated by the honorable Director Prof. J. N. Moorthy. The inaugural session was presided over by the Registrar, Col. Robinson George (Retd.), Prof. S. Murty Srinivasula, Prof. Utpal Manna, Dr. Sudarshan Kumar K, Dr. Viji Z. Thomas, Dr. Ullasa Kodandaramaiah and Arun Raj J R. The inaugural session concluded with a fiercely contested match between Phoenix All Stars and Storm Riders, with Storm Riders emerging victorious.

Freedom Run 2.0

Freedom Run 2.0 held on 13th August 2021 was open to all residents of IISER TVM, including students, staff, and faculty.

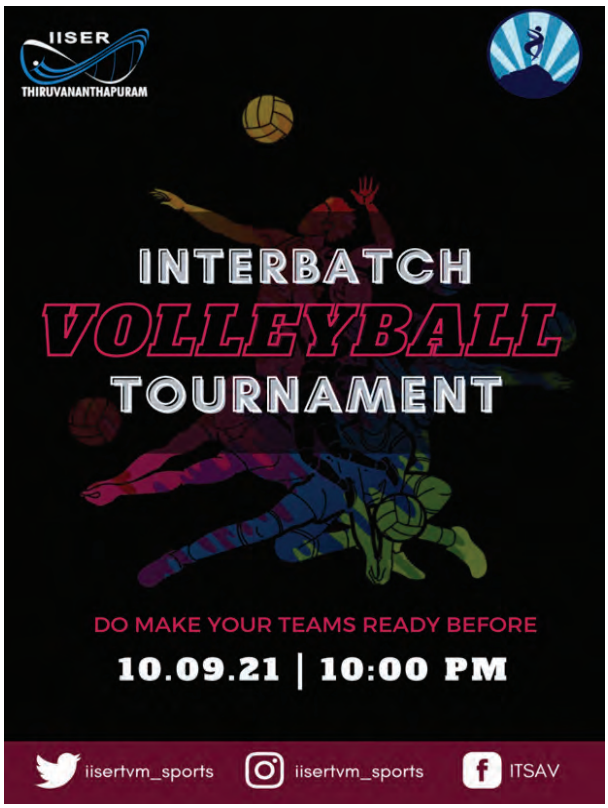
The route map for the marathon was shared with all participants a day in advance of the event. Several members of the IISER TVM community participated in this event.

Kabaddi Welcome Tournament

As part of welcoming the latest batch of BS-MS students, the Sports Council hosted a Welcome Kabaddi Tournament on 25th August 2021. The council received 23 responses from the student community. The respondents were assigned to one of the three teams - Team A, Team B, and Team C, by the four-membered Decision Making Council of the Kabaddi club. Jatoth Naveen Chandra, Akshay Baloso Parit, and Vaishnav V Prem captained Teams A, B, and C, respectively. By winning two matches (most number of matches), Team C won two matches and were declared winners of the tournament. Team B and Team A were the first and second runner-ups, respectively. The council also proposed the setting up a Women's Kabaddi Team for the Institute

Inter-Batch Volleyball Tournament

The inter-batch volleyball tournament held from 17th September to 6th October 2021 marked the first event dedicated to Volleyball for Varsha 2022. The tournament was conducted in an all-play-all fashion for six teams in two distinct categories: Women and Men. The event amassed a vast audience and there was fierce competition among the participants. Batch 17, captained by Samrudhi Thakar and PhD, headed by Varun M K, were crowned winners of the Women's and Men's categories, respectively.



3X3 Basketball Open Tournament

The first of its kind at IISER Thiruvananthapuram, the 3x3 open basketball tournament witnessed enormous participation of 15 teams (in two categories: Men and Women) from the student community. Zack's Team and DP^2 topped the tournament's Men's and Women's categories. The tournament took place from 20th September to 3rd October 2021.

Inter-Batch Football Tournament

This event commenced on 19th September 2021, and gathered participation from all batches alike. The tournament was conducted in an all-play-all fashion for five teams in two distinct categories: Women and Men. Batch '17 won the Men's tournament

Inter-Batch Cricket Tournament

The tournament consisted of 2 rounds - the group stage and the knockouts. With a grand showdown between Batch '17 and Ph. D., the final match concluded on 31st October 2021, crowning Ph. D. as champions and Batch '17 as runner up.

Badminton Welcome Tournament

Commencing on 30th August 2021, and coordinated by Sanchu P Thomas, Janardana Babu, and Varun C P, the Sports Council hosted a welcome tournament for all Badminton enthusiasts on campus. The tournament was conducted in three categories: Mixed Doubles, Men's Doubles, and Women's Doubles.

Results of the tournament

Mixed-Doubles

Winners: Sanchu P Thomas and Akhila S Kumar
Runners up: Raees and Rithika Sankar

Women's Doubles

Winners: Akhila S Kumar and Tessy Paul
Runners up: Marian and Rithika Sankar

Men's Doubles

Winners: Varun C P and Sanchu P Thomas
Runners up: Jeswin Joseph and Akhil Alexander

Open Table Tennis Tournament

The Open Table Tennis Tournament for Men's and Women's category began on September 30, 2021. The games were played on a knock-out basis, in accordance with the rules of TTFI & ITTF.

Results of the tournament

Men's Singles
Champion: Vaishnav V Prem
Runner up: Uday Singh

Men's Doubles
Champions: Uday Singh and Shankdeep Mondal
Runners up: Vaishnav V Prem and Ramkrishna

Women's Singles
Champion: Sayani Mukherjee
Runner up: Sharon Siby

Women's Doubles:
Champions: Sayani Mukherjee and Diksha Pandey
Runners up: Hariny R and Diti Gaikwad

STUDENT COOPERATIVE MESS (SCoM)

The student cooperative mess of IISER TVM, is a completely student run mess. Established in 2013, it is one of the most successful student endeavors of IISER TVM. The SCoM operates in two fully functional dining halls, CDH 1 and CDH 2, with a staff strength of 41. Currently, the SCoM takes care of dining facilities for close to 1600 students on campus. The SCoM also takes care of two cafes, i-Café 1 and i-Café 2. The two Cafes provide students with light snacks, beverages and meals.

PLACEMENT AND ALUMNI AFFAIRS

The process of streamlining the activities of the Placement and Career Promotion Cell (PCPC) of IISER TVM started in the last quarter of 2021. The PCPC is assisted by a committee of student representatives consisting of two student coordinators and a team of about 10 student volunteers who have been actively involved in designing the PCPC Brochure and website.

The PCPC is working towards establishing links with Industry, R&D organizations, scientific establishments and other research institutes where students can find opportunities for internships/ training and graduating students can find meaningful and fulfilling employment. The SWC also promotes student-alumni interaction and updates the alumni database periodically.

MEDICAL CENTRE, IISER TVM

SWC promotes healthy living initiatives by working alongside the institute's Health Centre and Counseling Centre. The SWC provided extensive support to the Health Centre, during both the COVID-19 vaccination drives that were conducted in the Institute, to ensure that all members of the IISER TVM community received both the first and second dose of the COVID-19 vaccine. The SWC made certain that all COVID 19 protocols were followed during the vaccination drives by allotting specific time slots to all members of the IISER TVM fraternity.

Two blood donation camps are organized annually at IISER TVM, members of the SWC actively participate in these camps and encourage students, faculty and staff to participate in this noble activity.

HOSTELS AT IISER TVM

IISER TVM is a residential institute, and provides gender segregated hostel accommodation to all students - BS-MS, M. Sc., I-Ph. D., Ph. D., SRF, JRF, Project Assistants, Post-Doctoral researchers, Research Associate/Research Scientific Staff. At present, there are eleven hostel blocks, named after peaks in the Western Ghats – Ponmudi, Agasthya, Mukurti, Pushpagiri, Sispara, Eravimala, Anamudi A, B, C, D and E Blocks. The hostel affairs come directly under the Dean of Student Affairs, who is assisted by the Chief Warden (a senior faculty member), Wardens (one faculty member for every hostel) and the Hostel Council, consisting of student secretaries. Each hostel also has a matron who looks after the daily activities of the hostels. There are two dining halls, CDH-1 near the Ponmudi cluster of hostels and CDH-2 in the Anamudi hostel complex.

Some features of the hostels:

- Each floor in the hostel has water purifiers that provide both hot and cold water.
- All hostels are enabled with high-speed Wi-Fi.
- Every hostel has a solar heater that provides hot water.
- Separate recreational rooms in all hostels.
- Laundry rooms for washing and hanging clothes.

INSTITUTE EVENTS

INSTITUTE EVENTS
April 01, 2021 To March 31, 2022

Sl. No.	Date	Institute Event
1	***Jun 21, 2021***	**International Day of Yoga 2021** This year too, the International Day of Yoga was celebrated in online mode on June 21, 2021. The general theme for the event was "Yoga at home and Yoga with family". There were yoga demonstrations and a yoga competition. A Yoga Action Plan for 2021-22 was drawn up with specific themes for each month of the academic year.
2	***Jul 28, 2021***	**Joint 8th and 9th Convocation** IISER TVM successfully conducted the 8th and 9th Convocation of the Institute, in an innovative virtual setting on July 28, 2021. The celebrations commenced at 11:00 am with the traditional academic procession of the Senate members in digital mode. Prof. Arvind A. Natu, Chairperson of the Board of Governors, addressed the gathering. Prof. J. N. Moorthy, Director, IISER TVM presented the Director's Report. Students appeared in virtual mode and received their degrees and medals from Prof. J. N. Moorthy, Director, IISER TVM. Dr. Soumya Swaminathan, Chief Scientist, WHO, the Chief Guest for the event delivered the Convocation address and congratulated all the graduating students and wished them an exciting career ahead.
3	***Jul 29, 2021***	**Prime Minister's Address on Completion of One Year of NEP 2020** The Prime Minister Shri Narendra Modi addressed the nation on July 29, 2021 at 4.30 pm to celebrate the completion of one-year of the transformational reforms introduced under the National Education policy 2020. The PM highlighted the efforts of the government in implementing the policy and stressed on further measures to be undertaken, to successfully roll out the policy in a phased manner. PM, Modi launched the National Digital Education Architecture (NDEAR) and National Education Technology Forum (NETF) and multiple other initiatives in the education sector, including the academic bank of credit that will provide multiple entries and exit options for students in higher education.

Sl. No.	Date	Institute Event
4	***Aug 13, 2021***	**Azadi Ka Amrit Mahotsav 2021- Fit India Freedom Run 2.0 IISER TVM** The Fit India freedom Run 2.0 was organized on August 13, 2021. Prof. J.N. Moorthy, Director IISER TVM, flagged off the race that had enthusiastic participation from students, faculty and staff. The winners of the race were awarded prizes and certificates on August 15, 2021, the 75th Independence Day celebrations.
5	***Aug 15, 2021***	**Independence Day Celebrations** The 75th Independence Day of India was celebrated with a lot of reverence. Prof. J.N. Moorthy, Director, IISER TVM, hoisted the National Flag and addressed the IISER Community that had assembled in the courtyard between the SOC and SOP. A short cultural program was organized by the students. This was followed by a prize distribution ceremony for sporting events conducted earlier in the year.
6	***Sep 03, 2021***	**Inauguration: 500mhz Solid-State NMR** The 500MHz Bruker Solid-State NMR, funded by DST-FIST was installed in the CIF. This was inaugurated by Prof. J. N. Moorthy, Director, IISER TVM on September 03, 2021. The 500 MHz has the latest console with three RF channels, capable of double and triple resonance solid-state NMR experiments. The probes can be tuned to multiple heteronuclei, including 13C,15N,31P, 29Si, 51V etc.
7	***Sep 05, 2021***	**Teachers' Day Celebrations** This Teacher's day was celebrated in the midst of a much celebrated dignitary, Dr. V. P. Joy, IAS, Chief Secretary of Kerala. Dr. Joy, an academician at heart and an administrator by profession had all the faculty of the Institute listening in rapt attention as he spoke at length about education, philosophy and the need for integrating philosophy into education. Faculty and Ph. D. students were delighted to interact with the dignitary.
8	***Sep 22-28, 2021***	**Hindi Week Celebrations** IISER Thiruvananthapuram celebrated Hindi Week from September 22 to September 28, 2021. As part of the Hindi Week Celebrations the Central Library and Official Language Implementation Committee jointly organized a Hindi Book Exhibition on September 24 & 25, 2021 that was inaugurated by Prof. J. N. Moorthy, Director, IISER TVM. A number of competitions were conducted from September 22, 2021 for staff and students of the institute and prizes awarded during the valedictory function that was held on September 28, 2021. The renowned Hindi writer and journalist, Shri Urmilesh, was the Chief Guest of the evening and delivered a speech "Hindi Lekhan aur Hindi Samaaj: Aaj ka Paridishya". The week-long celebrations ended with a speech and vote of thanks by Prof. Srinivasa Murty Srinivasula, Prof. In-charge of Administration.

Sl. No.	Date	Institute Event
9	***Oct 26– Nov 01, 2021***	**Vigilance Awareness Week** "Independent India @ 75: Self-reliance with Integrity" was the theme of the Vigilance Awareness Week 2021. The inaugural session was conducted in the Seminar Hall at CSB, following COVID protocols. Prof. Tapas Manna, CVC, IISER TVM invited Prof. Moorthy to inaugurate the event and administer the Integrity Pledge to all faculty and staff. Prof. Moorthy addressed the gathering and reiterated the need for probity in public and personal life. Prof. Srinivasa Murty Srinivasula, Professor In-Charge of Administration, in his address to the gathering, stressed on the need for accountability and transparency in public affairs and to lead by example. Programs were organized for vendors and for all members of the IISER community on October 27 and 29 respectively. Shri. J S Emmanuel, Additional Superintendent of Police (Training), CBI, was the Chief Guest of the program conducted on November 01, 2021. Shri. Emmanuel, presented an informative and interesting talk about preventive vigilance and explained in detail the procedure for lodging PIDPI complaints.
10	***Nov 15, 2021***	**Institute Colloquium – Prof. Sourav Pal, Director, IISER Kolkata** Prof. Sourav Pal, a distinguished theoretical chemist, who has contributed immensely to computational materials science and methodological and conceptual developments in many-body electronic structure theory and density-based chemical reactivity, was invited to deliver the Institute Colloquium Lecture. In his lecture titled "Innovation in Research and Education: Challenges and Opportunities" Prof. Pal emphasized the need for science education to become inter-disciplinary and emphasized why research must focus on developing practical applications/solutions for use by society and industry.
11	***Dec 24, 2021***	**The Professor M. V. George Memorial Endowment Lecture 2021** Prof. Srinivasan Chandrasekharan, was invited to IISER TVM to deliver the second lecture of the Endowment Lecture Series instituted by Prof. CNR Rao and Smt. Indumati Rao. Prof. J. N. Moorthy, Director IISER TVM, extended a warm welcome to Prof. Chandrasekharan and handed over the podium to Prof. Chandrasekharan, who set forth to deliver a fascinating and absorbing lecture on ***"Organic Chemistry Research in India: A Glorious Past, A Vibrant Present and A Promising Future".*** The event concluded with an expression of gratitude by Prof. J.N. Moorthy.
12	***Jan 26, 2022***	**Republic day Celebrations** The Institute celebrated the 73rd Republic Day strictly following all the COVId-19 protocols set for the Institute. Prof. J. N. Moorthy, Director, IISER TVM unfurled the national flag in the presence of senior faculty members, and addressed the faculty, staff and students of IISER TVM. The celebrations ended with a short cultural program.

Sl. No.	Date	Institute Event
13	***Feb 03, 2022***	**Institute Lecture by Prof. Pulickel M. Ajayan** Prof. Pulickel Ajayan, a pioneer in the area of nanotechnology and an authority on nanomaterials, is a Professor at Rice University, Houston, USA. He is also the Benjamin M. and Mary Greenwood Anderson Professor in Engineering and the founding chair of Rice University's Materials Science and NanoEngineering department. Prof. J. N. Moorthy, Director IISER TVM extended a warm welcome to Prof. Ajayan who delivered an invigorating and inspiring talk ***"Striving for Excellence in Academic Research: A Case for Nanomaterials"*** that highlighted the spectacular discoveries in the field of nanotechnology. The meeting concluded with a formal expression of thanks by Prof. J. N. Moorthy.
14	***February 21-22, 2022***	**Matribhasha Diwas Celebrations** Matribhasha Diwas was celebrated as an online event on February 21, 2022. Prof. S. Murty Srinivasula – Professor In-Charge of Administration inaugurated the event and in his inaugural address spoke about the significance of language not merely as a means of communication, but as a medium that represents cultural identity and acknowledges the different traditions, structures and practices of people. The hour-long cultural program included 11 presentations from students, in 10 different languages - Bengali, Bhojpuri, Gaddi boli, Hindi, Kannada, Malayalam, Marathi, Punjabi, Sanskrit and Tamil. The presentations included poems, dance performances, jugalbandi music, semi-classical and regional songs. The "Bharat Bharati Bhasha Mahotsav" celebrations of February 22, 2022 was livestreamed from 11.00 am at the Seminar Hall in the School of Chemistry.
15	***February 28, 2022***	**National Science Day Celebrations** Sharang Iyer, Science and Technology Council, IISER TVM, welcomed Prof. N. Sathyamurthy, Founder Director of IISER Mohali and the Chief Guest for the National Science Day celebrations at IISER TVM, and invited Prof. Satyamurty to deliver, online, the National Science Day Lecture – ***"Passion Flower: A little bit of Science behind it"***. The National Science Day Celebration ended with a formal expression of gratitude by Prof. Srinivasa Murty Srinivasula, Professor In-Charge of Administration, IISER TVM.

Sl. No.	Date	Institute Event
16	***March 08, 2022***	**Women's Day Celebrations** The Organizing Committee of the IWD 2022 lined up an interesting set of activities involving all IISER fraternity. The program was inaugurated by Prof. J. N. Moorthy, Director IISER TVM. In his inaugural address, Prof. Moorthy spoke about the need for breaking all bias that continues to keep women confined to traditional roles. He stressed on the need to create an environment that supported women as they moved on to take roles that were earlier male dominated. Prof. Moorthy assured IISER TVM fraternity that the campus would be made equally safe for men and women. As part of the celebrations, interesting anecdotes and experiences were shared by students, staff and faculty. This was followed by a musical performance by students. A Certificate of Excellence was awarded to one outstanding girl student from each School for their impressive academic performance. Prof. Hema Somanathan, HOD, Biology and Ms. Divya V J, Technical Officer, were felicitated in recognition of their selfless service to IISER TVM. The meeting formally ended with closing remarks by Prof. S. Murty Srinivasula, Prof. In-Charge of Administration, IISER TVM.

SUPPORT SERVICES

COUNSELLING CENTRE

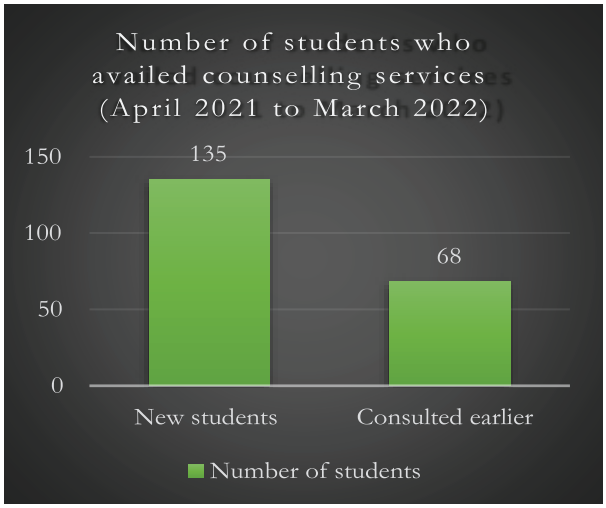
Student mental health services are not only needed to support the psychological well-being of students, they are also an important aspect of academic success and retention. Mental health continues to be an increasingly urgent issue that needs to be addressed in the wake of COVID-19 pandemic. The IISER TVM Counselling Centre, offers mental health services to students to reduce the burden of psychological problems and distress, and enhance their mental health, well-being, and quality of life. The Centre consists of a Psychologist (Dr. Neelima Gopinath) and Psychiatrist (Dr. Mary P R), who provide effective counselling services to all students who come to them with a wide range of problems.

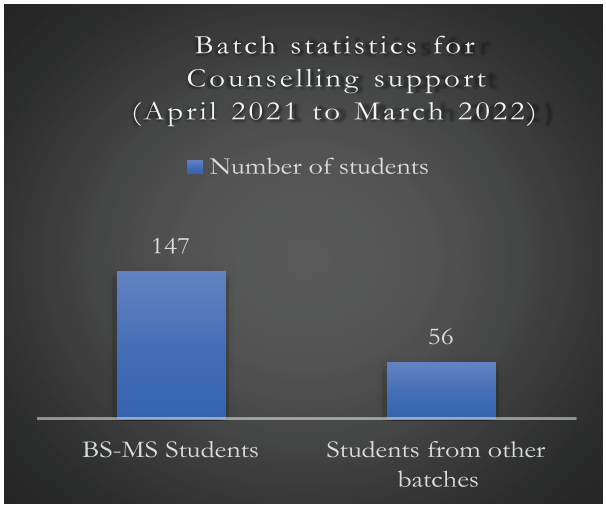
The lockdown imposed to prevent the spread of COVID-19, did not allow some batches of students to come to the campus. Counselling sessions were therefore conducted in hybrid mode, both online and in-person. Student turn over and student response to the Counselling Centre has been adequate despite the lockdown. The overall functioning of the Counselling centre in the last year was good. Student satisfaction seems to be adequate as students continued to contact the Centre for help irrespective of them being on campus or not. Majority of the students were regular in attending the scheduled follow-up sessions. Compared to the previous year, there has been a substantial increase in the number of students who sought counselling, and in the number of sessions conducted. Undoubtedly, more students are aware of the Centre and there is a marked shift in student attitude towards seeking professional help for issues related to mental health.

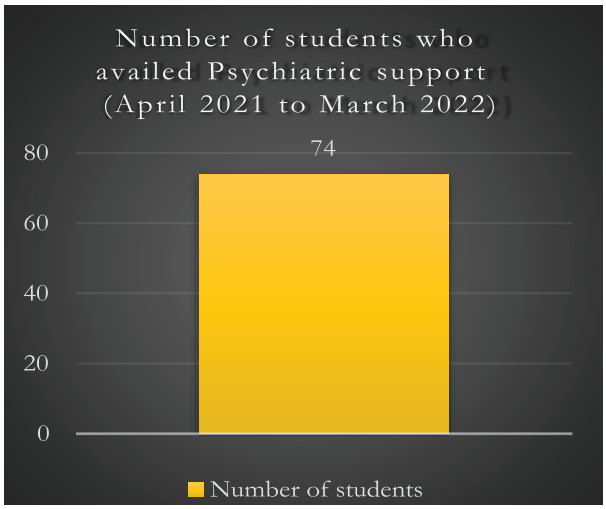
In total, 203 students came for counselling between April 01, 2021 to March 31, 2022. This included 135 new students and 68 students who had come before, and had to be seen again. Some students required multiple sessions, based on the severity of their condition. Of the total 135 new students, 22 were referred to the psychiatrist for further evaluation and treatment. Number of students seeking counselling support were higher from the BS-MS batches. Of the total 203 students who sought counselling, 147 (72%) were BS-MS students and the remaining 56 (28%) included Ph. D./ I-Ph. D./ Post Docs/ M. Sc. and Project students. This past year 694 counselling/ psychotherapy sessions were conducted.

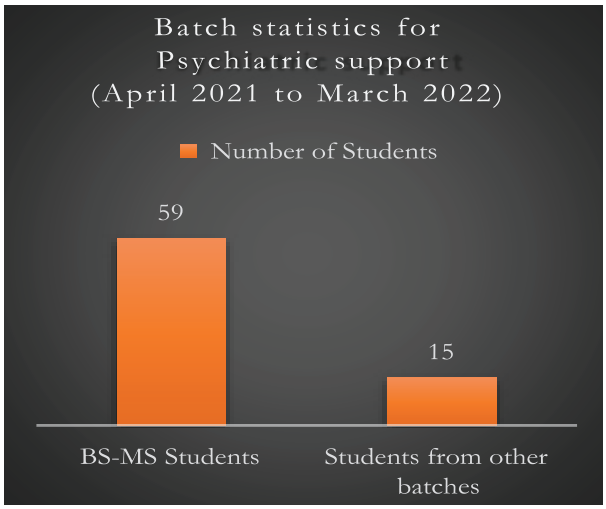
Between April 01, 2021 to March 31, 2022, there were 74 students who consulted the psychiatrist, which included 260 sessions. Of the total number of students seeking psychiatric consultation, 80% (59 students) were from the BS-MS program. The remaining 20% (15 students) included students from Ph. D./ I-Ph. D./ Post Docs/ M. Sc. and Project streams. The Centre maintains, with utmost confidentiality, detailed case files of all students who seek counselling/ psychiatric consultation.

The predominant problem faced by students included, stress related to academic issues, as well as non-academic ones, like relationship issues, family issues and personal problems. This year, there was an increase in individual cases reporting multiple issues, possibly an indirect consequence of COVID-19. Primary psychiatric illnesses have also been detected in a few students. Of the total number of students who sought psychiatric support, about 37% of them









presented anxiety, stress and adjustment problems, 16% were reported to have mood disorders, and Borderline Personality traits were noticed in 16% of the students. The treatment procedure differed from case to case and included supportive counselling, psychotherapy, stress management programs as well as medication in indicated cases.

An orientation program that stressed the importance of counselling was conducted in the beginning of the semester for the benefit of all new students. A brochure containing detailed information on the functioning, activities and facilities available at the Counselling Centre, and how students can avail the facilities provided by the Centre, was sent to the new batch of students. Emails on how to handle stress, exam anxiety, and other material relevant to mental health are regularly sent to all students.

The counselling centre conducted an online talk titled, "Setting healthy boundaries in relationships" by Dr. Arun B Nair, Associate Professor of Psychiatry, Medical College, Thiruvananthapuram, on 26th October 2021. The talk was well received by students and they actively participated in the discussions that followed the presentation.

The Counselling Centre of the Institute is on social media and has a Facebook page where information related to mental health is shared. This has been well received by the student community and has helped to raise awareness about the importance of mental health, and the need to seek professional help, if necessary, without any fear of being stigmatized.

■

COVID-19 PREVENTION ON IISER TVM CAMPUS

Measures taken for controlling COVID-19 cases on campus:

A careful strategy of testing, tracing and quarantining was in place in the campus from the start of the COVID-19 pandemic. A COVID-19 Primary Response Team (CRT) was formed, with several associated teams for Primary Medical Care, Contact Tracing, Quarantine Facility Management, Sanitization and Disinfection. Each team included faculty, staff and student members, all of who worked untiringly to effectively manage the COVID situation on campus.

Strict COVID-19 safety guidelines were implemented in the campus and all students, faculty and staff of the Institute diligently adhered to these set guidelines. Email reminders were also circulated from time to time, with updates on the COVID-19 cases on campus. Posters on COVID-19 awareness and various guidelines to be followed on campus were displayed at various locations in the campus. All academic, research, administrative and extracurricular activities on campus strictly adhered to the safety guidelines and protocols issued by the Institute administration.

Quarantine facility:

The D-block hostel with a capacity of 150 rooms was converted into a quarantine center for isolating COVID-19 positive persons, and all those identified as high risk contacts by the contact tracing team. It was made mandatory for students returning to the campus, after a period of stay outside the campus, to undergo quarantine, in the quarantine block. Approximately, 3000 personnel have so far been quarantined in the D block facility.

COVID-19 Testing center:

In association with ICMR and the State Health Department, a state of the art COVID-19 Testing center, including a Biosafety Level-2+ facility, has been functional in IISER TVM campus from October 2020 till March 31, 2022. The Centre has tested an average of 300 samples every day, that included samples from within the Institute and samples from other localities of Nedumangad taluk in Thiruvananthapuram district.

Vaccination drive on campus:

The Institute administration implemented further measures to ensure that the campus remained insulated from the onslaught of the second wave of the corona virus by vaccinating all eligible persons. The CRT, Health Centre and the Institute management coordinated with the state health department and other government agencies/ government appointed private establishments, to conduct vaccination drives in the campus that was successfully implemented in June and September-2021. At present all eligible persons on campus are vaccinated by both doses of COVID-19 vaccine.

Prior to the Omicron wave we have had only a few confirmed positive cases of Corona in the campus, despite being a residential campus with about 1600 members. Certainly, this is an interesting testimony to the advantages of full concurrence to the COVID protocols recommended by health officials.

Undoubtedly, these measures helped to keep the COVID-19 cases on campus in check, saved lives, and ensured that research and academic activities continued right through the pandemic.

Steps taken for continuing the academic activities during COVID-19:

Teaching for theory courses was held in normal classroom mode for students who had returned to the campus. For batches who could not return to the campus theory classes were conducted in online mode, with additional tutorials to help these students. Four state of the art studios were set up for recording high quality lectures. All practical courses and final exams were conducted following COVID-19 protocols once the students returned to the campus. Currently all students who are enrolled in various programs are back on campus.

Research and extension work related to COVID-19:

Groups at IISER TVM are in the process of establishing a state-of-the-art virus characterization platform to define relevant molecular targets of COVID-19, for the rapid development and evaluation of diagnostics and vaccines. A DST SERB grant was awarded on "Development and Evaluation of diagnostics and Candidate Vaccines for emerging SARS-Coronavirus-2 (DEC-VAC SARS). Several papers were published by research groups at IISER TVM on COVID-19 in reputed international journals.

Steps taken to create awareness on COVID-19 in terms of outreach among students and general public:

The Director of the Institute, Prof. J. N. Moorthy, along with the key functionaries of the Institute, held multiple online meetings with students to create awareness about the COVID 19 pandemic, and help them cope with the uncertainties and hardships imposed on them by the pandemic. Students received regular emails with guidelines and precautions to be followed to manage COVID-19. The Counselling Centre sent out regular updates and information on mental wellness to students. As a part of the COVID-19 Response activities on campus, awareness brochures and posters were printed and distributed throughout the campus. A special interview series "Into their minds" organized by Science and Technology Council (STC) IISER TVM interviewed several key scientists and policymakers in the country on the COVID pandemic. These interviews are available on the institute YouTube channel. Several online lectures/talks were given by faculty members on COVID-19 to other institutes/colleges and also on Doordarshan, the National television channel. Several outreach campaigns were also organized in the nearby tribal villages.

■

HEALTH CENTRE AT IISER TVM

The Health Centre at IISER TVM is committed to providing health care to students, faculty and staff of the Institute. It is centrally located within the campus and is easily accessible from the academic block, student hostels and staff quarters. The Centre is open 24x7 providing both in-patient and out-patient services and is equipped to deal with routine medical treatment, and render emergency and primary level medical/surgical care to patients. For specialised treatment, the Institute has established working alliance with a few multi-speciality medical centres in Nedumangad and Thiruvananthapuram city.

Facilities

The Centre is staffed with 2 qualified modern medicine doctors, who are assisted by 4 nurses and 5 nursing assistants. The facility has a *'General Ward'* consisting of 4 rooms with 5 beds each, it also has 2 *'Isolation Wards'* with 2 beds each, and a *'Casualty Ward'* with 2 beds. The wards are gender separated. Most of the essential medical equipment needed for treatment of common ailments are available at the Centre including apparatus for nebulization, suction, diathermy, oxygen concentrator, ECG, defibrillator, infusion pumps, pulse oximeters, glucometers and patient monitors. Medicines required for common ailments are stocked and dispensed at the Health Centre. An equipped ambulance remains ready 24x7 for any emergency situation. In addition to providing routine medical care, the Health Centre currently is equipped to provide care to COVID-19 patients with mild symptoms. A first-line treatment centre for COVID patients is available at the Health Centre.

IISER TVM also has a COVID Testing Centre that has been functioning since August 2020, to aid in the efforts of the Central Health Ministry and State Health Department in the fight against the pandemic. The Testing Centre has been actively involved in COVID testing process, and is equipped for sample collection, RT-PCR testing and Rapid Antigen Testing. While helping the local health authorities, the Testing Centre has also proven to be effective in containing the COVID situation on campus.

Activities of the Health Centre

This year was also overshadowed by COVID-19 and the Health Centre stepped up its support to the Institute administration to contain the spread of the corona virus inside the campus. One of the major focus of the Health Centre was in creating awareness on COVID-19 and its prevention. The Centre was continuously engaged in the process of identifying, testing, treating/quarantining and counselling confirmed COVID-19 patients, as well as primary and secondary contacts of confirmed cases. The Health Centre issued individual COVID advisories to COVID positive patients and provided a continuum of care right through to recovery, and whenever necessary, even during the post recovery period.

The Health Centre, together with the COVID Response Team (CRT) and the User Committee for Health Centre, facilitated two COVID-19 vaccination camps (in June and September 2021) in the campus, with the cooperation of KIMSHEALTH, Trivandrum. At present, all eligible persons on

Health Centre at IISER TVM

campus are vaccinated by both doses of COVID-19 vaccine.

Two blood donation camps were conducted by the Centre, one in association with the Government Medical College, Thiruvananthapuram and the other in association with Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum. Based on the instruction of the Ministry of Health and Family Welfare, the Health Centre also conducted an awareness class on "END TB by 2025" for the students and staff of the Institute.

The Health Centre continued to provide regular medical services and treatment, for a range of illnesses, to all members of the IISER community, all through the year. Patients requiring specialised treatment were referred to higher centres. The Centre also provided medical cover to all Institute events.

■

IISER TVM 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 successful in providing most of the resources in electronic format which facilitate 24X7 e-library.

The library's extensive online collection from more than 50 international scientific publishers and societies includes full-text e-journal databases, e-journal archives, video journals, e-books, bibliographic and review databases, etc. Major online full-text databases including AACR, ACS Web Edition, AIP, AMS, Annual Reviews, APS, JSTOR, Nature, OpticsInfobase, OUP, Science Online, ScienceDirect, SIAM etc. are notable among them.

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

The library provided 'Ouriginal' web-based plagiarism detection and originality checking service during this period. Library also provided access to the 'Grammarly' 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.

Membership and affiliations:

IISER Thiruvananthapuram library has membership/ affiliation in major library consortium/ network including e-Shod Sindhu Consortium, IISER Library Consortium, and the Developing Library Network (DELNET).

Library orientation programs, Webinars and several group-wise training to students on online/offline library services were organized during this period.

An Exhibition of Hindi Books was jointly organized by the central library and the Official Language Implementation Committee of the institute during 24-25 September 2021. The exhibition was held as part of the Hindi Week celebrations organized by the institute.

Central Library, IISER Thiruvananthapuram has been awarded the "Highest Usage Award-2021" for the American Chemical Society Journals in the IISERs category. Award was announced in the ACS South India Virtual Summit held on 24th November 2021.

Bibliographic data of the Ph. D. thesis were integrated with the library OPAC during this period. Member's photo integration in Evergreen ILS was also undertaken during 2021-22.

Prof. J. N. Moorthy, Director IISER Thiruvananthapuram, inaugurating the Hindi Book Exhibition.

In order to give researchers a way to reliably, unambiguously and permanently connect their name(s) with their work throughout their research career, including publications, grants, education, employment and other biographical information, etc. library has initiated academic profiling of the research scholars using ORCID ID.

Dr. Sainul Abideen P, Asst. Librarian attended the IISER Library Consortium meeting, DELNET Annual Meeting, NACLIN 2021 and the Awareness Programme on PDS-ShodhShuddhi in Kerala & Tamil Nadu organized by the INFLIBNET. Dr. Sainul Abideen, Asst. Librarian served as a resource person in the webinar on 'Intellectual Property Right and Plagiarism' organized by the Newman College, Thodupuzha on 29th Sept. 2021.

Publication: Sainul Abideen P, Information Management in e-Governance: Role of Metadata, RBU Journal of Library and Information Science, 2021 (23) pp 37-43. ■

PROJECT ENGINEERING OFFICE

The primary function of the Project Engineering Office of IISER TVM is construction and maintenance of all infrastructure facilities within the campus, and ensure hindrance-free functioning of all facilities. Between April 2021 and March 2022, this Office has taken over the major buildings constructed by CPWD and is responsible for the maintenance of these buildings. In addition to routine maintenance of the facilities, several minor works were also executed.

Roads and pathways

The project office supervised the laying of top coat to the roads of the academic and hostel area and ensured that the work was completed on priority. This has resulted in improved quality of internal roads within the campus. A pedestrian pathway has been laid connecting the Central Library and the Academic area, ensuring quicker and safer movement of pedestrians across these two zones.

Facilities for students

A futsal court with synthetic turf and fencing around the court has been constructed in the Phase 2 hostel area. A well-equipped gymnasium for students has been set up in the Indoor stadium. The Project Office completed all the necessary civil and electrical works to ensure trouble-free functioning of this facility.

Energy Use and Campus development

IISER TVM embraces sustainability as a core value and activities of the Institute are geared to 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. Streetlights in the academic and hostel areas have been fitted with energy efficient LED lights. The student's park near the recharge lounge and the waiting sheds in the staff residential area and near the hostels have solar lighting now. These energy saving measures have contributed to lesser power consumption in the campus.

A new paved car park has been constructed near the Biological Sciences Building to ensure sufficient parking space for vehicles. The parking area at the Shopping complex has been covered with paver blocks.

As part of campus beautification, different varieties of flowering plants have been procured and planted all across the campus. Appropriate plant species for slope stabilization and soil and water conservation have also been planted. The area in front of the CIF has been aesthetically developed without disturbing the natural terrain.

New Infrastructure

The Central Instrumentation Facility (CIF) of IISER TVM houses state-of-art instrumentation for advanced characterization of molecular compounds and materials. The Centre for Advanced Materials Research with International Engagement (CAMRIE), is a new international centre that has been constructed in the CIF.

The VFR now has a well-equipped gymnasium for use by visitors, staff and faculty of the Institute. The necessary civil and electrical works were taken up and completed by the Project Office. ■

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 main objective of the RTI Act is to empower citizens, promote transparency and accountability in the working of the Government, and make democracy work for people in the real sense.

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 TVM 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 systematically implemented the proactive suo-moto disclosure, as per the guidelines under Section 4 of the RTI Act 2005, issued by the Government of India, Ministry of Personnel, Public Grievances and Pensions, Department of Personnel and Training, vide O.M. No. 1/6/2011-IR, dated 15.04.2013. This is available on the Institute website under the link https://www.iisertvm.ac.in/pages/rti_act. Training Institutes under each Ministry/ Department/ Public Authority are authorised to conduct third-party Transparency Audits of proactive suo-moto disclosures of Public Authorities. The Third-party transparency audit of the proactive suo-moto disclosure of IISER TVM was conducted by Indian Institute of Mass Communication.

IISER TVM, received a total of 119 RTI queries in the financial year 2021-22, of which 115 queries were resolved in the first instance, and the remaining 4 were resolved after the first appeal.

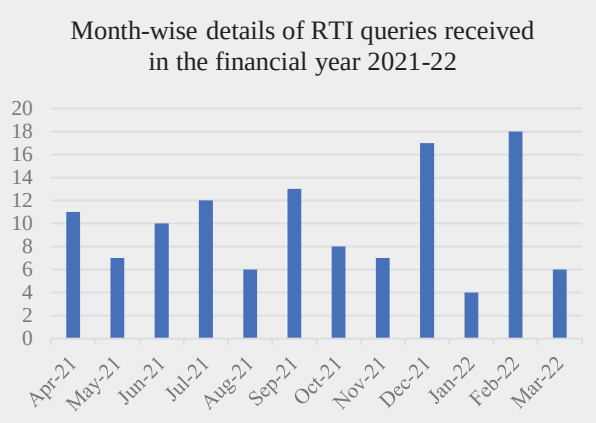
Table I - Month-wise details of RTI queries received in the financial year 2021-22

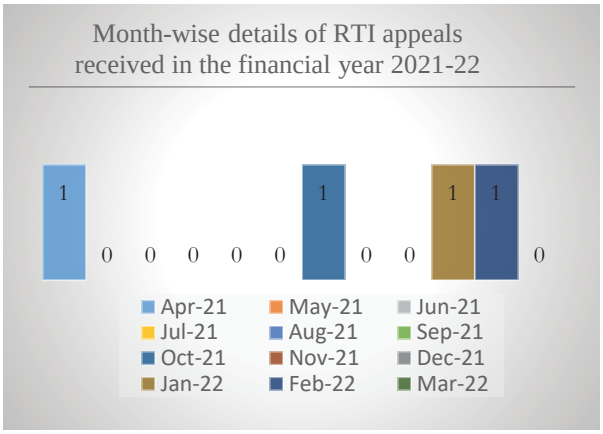
Section	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022	Mar 2022	Total
Academics	2	1	1	-	-	2	-	-	5	1	2	1	15
Academics/ DOFA	-	-	-	-	-	-	-	-	-	1	1	-	2
HR	3	4	6	6	4	8	5	6	4	1	8	4	59
DOFA	1	-	2	2	-	1	3	-	7	-	-	1	17

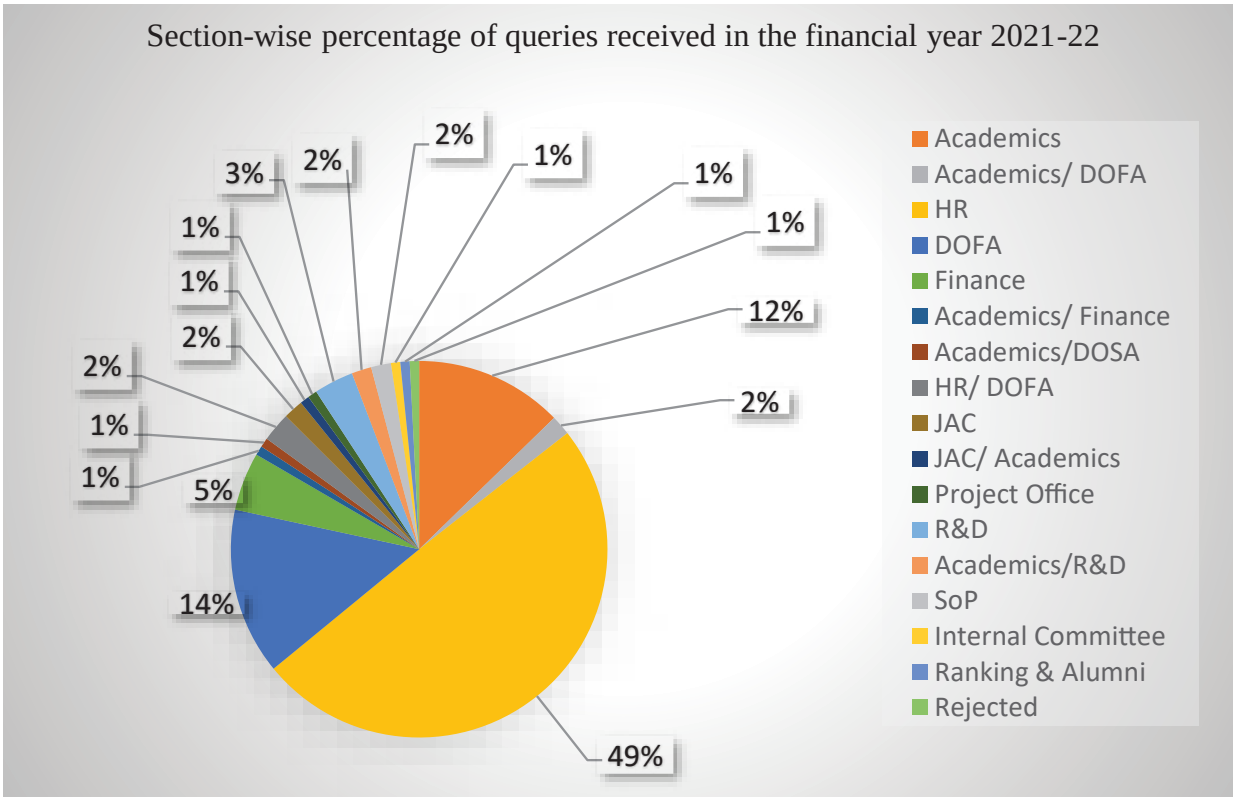
Section	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022	Mar 2022	Total
Finance	1	-	-	1	1	-	-	-	1	-	2	-	6
Academics/ Finance	-	-	-	-	-	-	-	-	-	1	-	-	1
Academics/ DOSA	-	-	-	-	-	-	-	-	-	-	1	-	1
HR/ DOFA	3	-	-	-	-	-	-	-	-	-	-	-	3
JAC	-	-	1	1	-	-	-	-	-	-	-	-	2
JAC/ Academics	-	-	-	-	-	-	-	1	-	-	-	-	1
Project Office	-	-	-	-	-	1	-	-	-	-	-	-	1
R&D	-	1	-	2	-	-	-	-	-	-	1	-	4
Academics/ R&D	-	-	-	-	1	-	-	-	-	-	1	-	2
SoP	-	-	-	-	-	1	-	-	-	-	1	-	2
Internal Committee	1	-	-	-	-	-	-	-	-	-	-	-	1
Ranking & Alumni	-	-	-	-	-	-	-	-	-	-	1	-	1
Rejected	-	1	-	-	-	-	-	-	-	-	-	-	1
Total	11	7	10	12	6	13	8	7	17	4	18	6	119
Grand Total	119												

Table II - Month-wise details of RTI appeals received in the financial year 2021-22

Section	Apr 2021	May 2021	Jun 2021	Jul 2021	Aug 2021	Sep 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022	Mar 2022	Total
DOFA	-	-	-	-	-	-	-	-	-	1	1	-	2
Project Office	1	-	-	-	-	-	1	-	-	-	-	-	2
Total	1	-	-	-	-	-	1	-	-	1	1	-	4
Grand Total	4												


Month-wise details of RTI queries received in the financial year 2021-22
20
18
16
14
12
10
8
6
4
2
0
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22


Month-wise details of RTI appeals received in the financial year 2021-22
1
0
0
0
0
0
1
0
0
1
1
0
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22


Section-wise percentage of queries received in the financial year 2021-22
2%
1%
1%
1%
12%
2%
49%
14%
5%
1%
1%
2%
2%
1%
3%
2%
Academics
Academics/ DOFA
HR
DOFA
Finance
Academics/ Finance
Academics/DOSA
HR/ DOFA
JAC
JAC/ Academics
Project Office
R&D
Academics/R&D
SoP
Internal Committee
Ranking & Alumni
Rejected

IT SECTION

All class rooms in the institute are provided with state of the art audio visual equipment. The Institute has a fully functional virtual classroom funded by the NKN project. The classroom has been in use for course exchange between IISER Thiruvananthapuram, IISER Pune, IISER Bhopal, NCBS Bengaluru and TIFR Centre for Applicable Mathematics in Bengaluru as well as allowing for the streaming of research talks and colloquia from the premier institutes in the country. The virtual classroom facility also allows for the recording and storage of lectures and seminars organized by the institute.

Padmanabha, the high performance computing cluster with a peak computing power of 141 Teraflops provides the computing power required for teaching and research. The cluster is being used for computations involving Gaussian, Quantum Expresso, GROMACS, MATLAB, Bio informatics freeware, Intel Parallel Studio XE, Python, Perl etc.

The NKN provides 1Gbps Internet connection to the Institute. The secondary Internet connection of 1Gbps is provided by M/s BSNL. The IT Section manages the dual Internet connections, Firewall, LAN, campus wide wireless network, Email Service, DNS, ADS and related network services in addition to the management of the Padmanabha cluster. The IT personnel of the Institute provide both hardware and software support to the faculty, staff and students and manages the computer labs. The IT Section also manages IP Phones and IP Cameras installed throughout the campus. ■

HUMAN RESOURCES

FACULTY STRENGTH

	Mode of Engagement	Numbers
Faculty	Regular Faculty	79
	Emeritus Professor	2
	Visiting Professor	8
	Adjunct Professor	5
	Ad Hoc Faculty	2

Faculty Positions

Position	Departments	Numbers
Professors	School of Biology	3
	School of Chemistry	3
	School of Mathematics	2
	School of Physics	2
Associate Professors	School of Biology	4
	School of Chemistry	5
	School of Mathematics	4
	School of Physics	8
Assistant Professor – Grade I	School of Biology	9
	School of Chemistry	16
	School of Mathematics	11
	School of Physics	12

School of Biology

Sl. No.	Name of Faculty	Designation
1	Prof. Hema Somanathan	Professor
2	Prof. S Murthy Srinivasula	Professor
3	Prof. Tapas Manna	Professor
4	Dr. Nishant K T	Associate Professor
5	Dr. Ullasa Kodandaramaiah	Associate Professor
6	Dr. V Stalin Raj	Associate Professor
7	Dr. Kalika Prasad	Associate Professor (Resigned on 18.6.2021)
8	Dr. Ramanathan Natesh	Assistant Professor (Grade I)
9	Dr. Ravi Maruthachalam	Assistant Professor (Grade I)
10	Dr. Jishy Varghese	Assistant Professor (Grade I)
11	Dr. Satish Khurana	Assistant Professor (Grade I)
12	Dr. N Sadananda Singh	Assistant Professor (Grade I)
13	Dr. Sabari Shankar Thirupathy	Assistant Professor (Grade I)
14	Dr. Nisha N Kannan	Assistant Professor (Grade I)
15	Dr. Poonam Thakur	Assistant Professor (Grade I)
16	Dr. Sandhya Ganesan	Assistant Professor (Grade I)

School of Chemistry

Sl. No.	Name of Faculty	Designation
1	Prof. K George Thomas	Professor
2	Prof. Kana M Sureshan	Professor
3	Prof. Mahesh Hariharan	Professor
4	Dr. Vinesh Vijayan	Associate Professor
5	Dr. R S Swathi	Associate Professor
6	Dr. Reji Varghese	Associate Professor
7	Dr. Sukhendu Mandal	Associate Professor
8	Dr. Ajay Venugopal	Associate Professor
9	Dr. A Thirumurugan	Assistant Professor (Grade I)
10	Dr. Alagiri Kaliyamoorthy	Assistant Professor (Grade I)
11	Dr. Ramesh Rasappan	Assistant Professor (Grade I)
12	Dr. Gokulnath Sabapati	Assistant Professor (Grade I)

Sl. No.	Name of Faculty	Designation
13	Dr. V. Sivaranjana Reddy	Assistant Professor (Grade I)
14	Dr. Rajendra Goreti	Assistant Professor (Grade I)
15	Dr. Subrata Kundu	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. Narendra Kurra	Assistant Professor (Grade I) Resigned on 08.10.2021
21	Dr. Y. Adithya Lakshmanna	Assistant Professor (Grade I) Joined on 06.09.2021
22	Dr. Rajendra Kurapati	Assistant Professor (Grade I) Joined on 09.09.2021
23	Dr. Pushpita Ghosh	Assistant Professor (Grade I) Joined on 10.09.2021
24	Dr. Jerry Alfred Fereiro	Assistant Professor (Grade I) Joined on 15.12.2021

School of Mathematics

Sl. No.	Name of Faculty	Designation
1	Prof. M.P. Rajan	Professor
2	Prof. Utpal Manna	Professor
3	Dr. P. Devaraj	Associate Professor (Grade I)
4	Dr. Sachindranath Jayaraman	Associate Professor (Grade I)
5	Dr. Shrihari Sridharan	Associate Professor (Grade I)
6	Dr. Viji Z Thomas	Associate Professor (Grade I)
7	Dr. Dharmatti Sheetal	Assistant Professor (Grade I)
8	Dr. K R Arun	Assistant Professor (Grade I)
9	Dr. Saikat Chatterjee	Assistant Professor (Grade I)
10	Dr. Sarbeswar Pal	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) Joined on 10.01.2022

School of Physics

Sl. No.	Name of Faculty	Designation
1	Prof. Anil Shaji	Professor
2	Prof. R. C. Nath	Professor
3	Dr. Joy Mitra	Associate Professor
4	Dr. M M Shaijumon	Associate Professor
5	Dr. Manoj A G Namboothiry	Associate 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. Sreedhar B Dutta	Assistant Professor (Grade I)
12	Dr. Deepshika Jaiswal Nagar	Assistant Professor (Grade I)
13	Dr. Amal Medhi	Assistant Professor (Grade I)
14	Dr. Ravi Pant	Assistant Professor (Grade I)
15	Dr. Bikas C. Das	Assistant Professor (Grade I)
16	Dr. M Suheshkumar Singh	Assistant Professor (Grade I)
17	Dr. D V Senthilkumar	Assistant Professor (Grade I)
18	Dr. Manik Banik	Assistant Professor (Grade I)
19	Dr. Tuhin Subhra Maity	Assistant Professor (Grade I)
20	Dr. Tanumoy Mandal	Assistant Professor (Grade I)
21	Dr. Vinayak B. Kamble	Assistant Professor (Grade I)
22	Dr. Shabnam Iyyani Syamsunder	Assistant Professor (Grade I) Joined on 30.08.2021

Emeritus/ Visiting/Adjunct Faculty

Sl. No.	Name of Faculty	Designation	Department
1	Prof. Anil Kumar	Visiting Professor	School of Biology
2	Prof. M.R.N. Murthy	Visiting Professor	School of Biology
3	Prof. M.K. Mathew	Visiting Professor	School of Biology
4	Prof. Suresh Das	Emeritus Professor	School of Chemistry
5	Prof. Y.D. Vankar	Emeritus Professor	School of Chemistry

Sl. No.	Name of Faculty	Designation	Department
6	Prof. Ajayan Vinu	Visiting Professor	School of Chemistry
7	Prof. Narayanasami Satyamurthy	Visiting Professor	School of Chemistry
8	Prof. R.B. Sunoj	Adjunct Professor	School of Chemistry
9	Prof. Michael Gromiha	Adjunct Professor	School of Data Sciences
10	Prof. Vinay Namboodiri	Adjunct Professor	School of Data Sciences
11	Dr. Ajith Kumar	Ad Hoc Faculty	School of Data Sciences
12	Prof. Amit Mitra	Adjunct Professor	School of Mathematics
13	Prof. G.D.V. Gowda	Visiting Professor	School of Mathematics
14	Prof. Shantanu Godbole	Visiting Professor	School of Mathematics
15	Prof. Somasekharan Pillai	Visiting Professor	School of Mathematics
16	Dr. Harilal Madhavan	Ad-hoc Faculty	Humanities
17	Prof. Thomas Kuruvilla	Adjunct Professor	Humanities

ADMINISTRATIVE & SUPPORT PERSONNEL

Sl. No	Name of the Official	Designation
01	Col. Robinson George	Registrar
02	Shri. Siva Dutt V K	Superintending Engineer
03	Shri. B V Ramesh	Deputy Registrar (Finance & Accounts)
04	Shri. Hariharakrishnan S	Deputy Registrar (Administration)
05	Shri. Sudin B Babu	Deputy Registrar (Purchase, Stores & Faculty Affairs)
06	Dr. Sainul Abideen P	Assistant Librarian
07	Shri. Priji E Moses	Assistant Executive Engineer (Civil)
08	Shri. Sreehari S	Assistant Executive Engineer (Electrical)
09	Shri. Manoj Kumar S	Assistant Registrar (Academics)
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
24	Smt. Nafeesa C K	Library Information Assistant

Sl. No	Name of the Official	Designation
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	Shri. Sarath Kumar R	Junior Engineer (Electrical)
39	Smt. Mini Philip	Personal Assistant
40	Smt. Veena P	Personal Assistant
41	Shri. Ajith Prabha	Superintendent
42	Shri. Satheesh Raghavan	Superintendent
43	Shri. Arun Raghunath	Superintendent
44	Shri. Manoj M T	Accountant
45	Smt. Sruthi U.A	Junior Hindi Translator
46	Smt. Suja V R	Office Assistant (Multi Skill)
47	Smt. Vidya Senan I	Office Assistant (Multi Skill)
48	Smt. Archana P R	Office Assistant (Multi Skill)
49	Smt. Beena N K	Office Assistant (Multi Skill)
50	Shri. Muruganandam A	Office Assistant (Multi Skill)
51	Shri. Rajesh A P	Office Assistant (Multi Skill)
52	Shri. Rakesh M V	Office Assistant (Multi Skill)
53	Smt. Sruthi R Balu	Office Assistant (Multi Skill)
54	Shri. Anil Prakash M	Office Assistant (Multi Skill)
55	Shri. Pradeep Kumar C	Office Assistant (Multi Skill)
56	Shri. Santhosh B S	Office Assistant (Multi Skill)
57	Shri. Nagarjuna Paidisetty	Office Assistant (Multi Skill)
58	Shri. Anas A Z	Office Assistant (Multi Skill)

Sl. No	Name of the Official	Designation
59	Smt. Sarika Mohan	Junior Technical Assistant
60	Shri. Vivek V G	Junior Technical Assistant
61	Shri. Pradeep Kumar G T	Junior Technical Assistant
62	Shri. Nibith Kumar K P	Junior Technical Assistant
63	Ms. Lakshmi C	Junior Technical Assistant
64	Shri. Packiya Rajan	Junior Technical Assistant
65	Shri. Muthukumaran A	Junior Technical Assistant
66	Ms. Amritha Sivan	Junior Technical Assistant
67	Smt. Lincy Varghese	Junior Technical Assistant
68	Ms. Aathira S	Junior Technical Assistant
69	Shri. Subin S	Junior Technical Assistant
70	Shri. Arun Kumar M	Attendant –Electrical
71	Shri. Ratheesh C	Attendant –Plumber

Consultants and Contractual Officers

Sl. No	Name of the Official	Designation
01	Shri. Gopakumaran Nair	Assistant Security Officer
02	Shri. Jayan V	Assistant Security Officer

ACCOUNTS

NEW EXTRAMURAL GRANTS 2021-2022

Sl. No.	Name of the Project Project Leader Project Code Funding Agency	Period From	Period to	Funds received during the year (Amount in Lakhs)	Remarks
1	*Neural-network quantum state (NQS) based variational wave function for strongly correlated* electron systems **DR. AMAL MEDHI** **SERB-CRG / 2021 / 005792** **SERB**	19.03.2022	18.03.2025	15.93	
2	*INSPIRE FACULTY FELLOWSHIP* **DR. ANAND NARAYANA SARMA** **DST-INSPIRE FACULTY FELLOWSHIP / BATCH-17 / 2020-DST / INSPIRE / 04 / 2020 / 001237** **DST**	22.10.2021	21.10.2026	22.00	
3	*Post-doctoral Fellowship* **DR. ARATI SHASHI** **NBHM** **DAE**	01.05.2021	30.04.2023	6.94	
4	*Functionality Shuttling via Catalytic Isodesmic Reaction and Its Application in Organic Synthesis* **DR. BASUDEV SAHOO** **SERB-SRG / 2021 / 000572** **SERB**	15.12.2021	14.12.2023	22.79	
5	*Exploring 2D Atomic Crystals for Resistive Switching Based Emerging Artificial Neuromorphic Devices* **DR. BIKAS C DAS** **SERB-CRG / 2021 / 000567** **SERB**	02.03.2022	01.03.2025	26.13	
6	*Energy-Efficient Synaptic Transistors of Two-Dimensional Layered Material* **DR. BIKAS C DAS** **SERB-EEQ / 2021 / 000810** **SERB**	14.03.2022	13.03.2025	44.80	

Sl. No.	Name of the Project Project Leader Project Code Funding Agency	Period From	Period to	Funds received during the year (Amount in Lakhs)	Remarks
7	*Thermal Expansion Measurements in a spin ½ Heisenberg antiferromagnet C12H14CuN4O5* **DR. DEEPSHIKHA JAISWAL NAGAR** **SERB-CRG / 2021 / 001262** **SERB**	14.03.2022	13.03.2025	74.06	
8	*Asymptotic preserving IMEX-DG schemes on adaptive grids for multiscale compressible flows* **DR. K R ARUN** **SERB-CRG / 2021 / 004078** **SERB**	24.02.2022	23.02.2025	10.87	
9	*Non-volatile resistance switching memory on SiC for harsh environment applications* **DR. KUMARAGURUBARAN SOMU** **SERB-CRG / 2021 / 000935** **SERB**	16.03.2022	15.03.2025	26.40	
10	*Lithium Battery Testing* **DR. M M SHAIJUMON** **MOMENTIVE PERFORMANCE MATERAILS (INDIA) PVT LTD** **OTHERS**	01.02.2022	31.01.2023	15.59	
11	*DST-Storage MAP* **DR. M M SHAIJUMON** **DST / TMD / IC-MAP / 2K20 / 01** **DST**	14.02.2022	13.02.2025	65.25	
12	*Design and fabrication of electrocatalytic microcells using elemental 2-dimensional materials* **DR. M M SHAIJUMON** **SERB-CRG / 2021 / 006246** **SERB**	22.03.2022	21.03.2025	35.02	
13	*Efficient means of zero-error communication through coherent controlling of noisy quantum channels* DR. MANIK BANIK SERB-SRG / 2021 / 000267 SERB	29.12.2021	28.12.2023	7.94	
14	*Devising practically implementable enhanced means of communication with the aid of quantum resources* **DR. MANIK BANIK** **Chanakya Post-Doctoral Fellowship** **DST**	01.04.2022	31.03.2023	12.60	
15	*Transparent solar cells: A perspective for bifacial solar cells* **DR. MANOJ A G NAMBOOTHIRY** **SERB-CRG / 2021 / 003874** **SERB**	24.02.2022	23.02.2025	56.24	

Sl. No.	Name of the Project Project Leader Project Code Funding Agency	Period From	Period to	Funds received during the year (Amount in Lakhs)	Remarks
16	*IISER TVM-KLDB COLLABORATIVE PROJECT* **DR. N SADANANDA SINGH** **KLDB COLLABORATIVE PROJECT** **KLDB**	24.09.2021	23.09.2026	31.00	
17	*Engineering a site-specific synthetic chromatin remodeler for genome editing and gene expression* **DR. NISHANT K T** **SERB-SUPRA-SPR / 2020 / 000427** **SERB**	31.08.2021	30.08.2024	7.25	
18	*Bheja Fry* **DR. POONAM THAKUR** **NCBS-INDIABIOSCIENCE OUTREACH GRANTS** **NCBS**	01.12.2021	30.11.2022	0.70	
19	*Autophagy upregulation as a therapeutic approach for Parkinson's disease* **DR. POONAM THAKUR** **SERB-SRG / 2021 / 000981** **SERB**	28.12.2021	27.12.2023	21.40	
20	*Post-doctoral Fellowship* **DR. PRASANTA KUMAR BARIK** **NBHM** **DAE**	02.08.2021	31.07.2022	8.02	
21	*Multifunctional Biodegradable Hybrid Black phosphorous-CaCO3 Nanoparticles as a Synergistic Targeted Chemo-photothermal Therapy for Glioblastoma Multiforme* DR. RAJENDRA KURAPATI DBT-BT / RLF / Re-entry / 24 / 2020 DBT	05.04.2021	04.04.2026	18.14	Project transferred from University of Hyderabad
22	*Characterization of network structure and homogeneity of N-Doped Graphene activated Natural Rubber Sulfur Vulcanizate* **DR. RANI ALPHONSA JOSE** **SERB-TAR / 2021 / 000384** **SERB**	10.12.2021	09.12.2024	3.35	
23	*Nickel mediated cross-coupling reactions of a - SILYLOXYALKYL - Zinc reagents* **DR. RAMESH RASAPPAN** **CSIR-02(0409) / 21 / EMR-II** **CSIR**	02.09.2021	01.09.2024	8.00	
24	*Decoding Neuronal States using Chimera Patterns* **DR. SENTHILKUMAR D.V** **SERB-CRG / 2021 / 000816** **SERB**	08.03.2022	07.03.2025	12.52	

Sl. No.	Name of the Project Project Leader Project Code Funding Agency	Period From	Period to	Funds received during the year (Amount in Lakhs)	Remarks
25	*INSPIRE FACULTY FELLOWSHIP* **DR. SHABNAM IYYANI** **DST-INSPIRE FACULTY FELLOWSHIP / 2019 / 00540** **DST**	01.10.2020	30.09.2025	11.97	Project transferred from IUCAA,PUNE
26	*Control and Finite Element Analysis of Cahn-Hilliard-Navier-Stokes system* **DR. SHEETAL DHARMATTI** **SERB-CRG / 2021 / 008278** **SERB**	02.03.2022	01.03.2025	7.23	
27	*Unrevealing the entry mechanism of Tick-borne Kyasanur Forest diseases Virus* DR. STALIN RAJ VICTOR DBT-BT / PR32565 / MED / 29 / 1554 / 2020 DBT	20.07.2021	19.07.2023	22.35	
28	*Chemistry of Reactive Sulfur and Selenium Species: Elucidating the Routes in Bio(in) organic Signaling and Toxicology* **DR. SUBRATA KUNDU** **SERB-CRG / 2021 / 001174** **SERB**	15.12.2021	14.12.2024	19.43	
29	*Blockade of CXCL-3—CXCR-2 axis normalises tumor vasculature and enhances immune surveillance in triple negative breast cancer* **DR. SUBOJ BABYKUTTY** **SERB-TAR / 2021 / 000147** **SERB**	13.12.2021	12.12.2024	3.35	
30	*National Post-Doctoral Fellowship* **DR. SUJAY KUMAR NANDI** **SERB-PDF / 2021 / 002015** **SERB**			10.66	Refunded the Grant as the NPDF did not join.
31	*Conductive inorganic-organic hybrid materials for electrochemical applications* **DR. SUKHENDU MANDAL** **CSIR-01(3024) / 21 / EMR-II** **CSIR**	09.02.2022	08.02.2025	2.00	
32	*Plasmonic Chromatography for Multiresidue Pesticide Detection in Spices* **DR. T SHYAMALA** **DST / WOS-B / AFE-20 / 2021(G)** **DST**	07.01.2022	06.01.2025	11.43	
33	*Efficient Neuromorphic Memory via Nano-engineered Composite Film* **DR. TUHIN SUBHRA MAITY** **SERB-SRG / 2021 / 000423-DR.TUHIN SUBHRA MAITY** **SERB**	28.12.2021	27.12.2023	28.50	

Sl. No.	Name of the Project Project Leader Project Code Funding Agency	Period From	Period to	Funds received during the year (Amount in Lakhs)	Remarks
34	*Activation of Alkyl Chlorides Driven by Visible Light Titanium Photoredox Catalysis* **DR. VEERA REDDY YATHAM** **SERB-SRG / 2021 / 000834** **SERB**	15.12.2021	14.12.2023	24.91	
35	*Unraveling the conformational changes during photocyclization of o-arenes by femtosecond time-resolved circular dichorism* **DR. Y ADITHYA LAKSHMANNA** **SERB-CRG / 2020 / 000321** **SERB**	18.12.2020	17.12.2023	61.39	Project transferred from IISER BHOPAL
36	*Photochemical and Electrochemical Processes in Assembled Molecules and Nanomaterials: Implications Field and Coherence in Photovoltaics* **PROF. K GEORGE THOMAS** **DST / NM / TUE / EE-01 / 2019** **DST**	15.11.2021	14.11.2025	169.00	

ON-GOING EXTRAMURAL GRANTS 2021-2022

Sl. No.	Name of the Project Project Leader Project Code Funding Agency	Period From	Period to	Funds received during the year (Amount in Lakhs)	Remarks
1	*Exploring the active sites of nitrogen and boron containing / doped materials: N2-C-B type active sites for electrocatalytic 4-electron oxygen reduction reaction* **DR. A MUTHUKRISHNAN** **DST / TMD / HFC / 2K18 / 24[C] & [G]** **DST**	17.09.2019	16.09.2022	9.74	
2	*Al(I) / Al(III) Lewis Pairs for the Activation of Inert Chemical Bonds* **DR. AJAY VENUGOPAL** **CRG / 2019 / 005040** **SERB**	01.01.2020	31.12.2022	6.00	
3	*Electrophilic Aluminium Compounds for Catalytic CO2 Hydrosilylation* **DR. AJAY VENUGOPAL** **STARS / APR2019 / CS / 250 / FS** **MHRD**	31.12.2019	30.12.2022	2.46	
4	*Directed Site-Selective C-H Functionaization of Aromatic and Heteroaromatic Precursors* **DR. ALAGIRI KALIYAMOORTHY** **EEQ / 2016 / 000231** **SERB**	11.05.2017	10.05.2021	-	
5	*Quasi-optimality of adaptive finite element methods for elliptic optimal control problems* **DR. ASHA KISAN DOND** **SRG / 2020 / 001027** **SERB**	23.12.2020	22.12.2022	-	
6	*Conformal approach to supergravity: New Perspectives and Applications* **DR. BINDUSAR SAHOO** **CRG / 2018 / 002373** **SERB**	27.03.2019	26.09.2022	7.00	

Sl. No.	Name of the Project Project Leader Project Code Funding Agency	Period From	Period to	Funds received during the year (Amount in Lakhs)	Remarks
7	*Development of solid state hybrid hydrogen using Palladium and Magnesium nanoclusters* **DR. DEEPSHIKHA JAISWAL NAGAR** **ISRO-DS-2B-13012 (2) / 42 / 2017** **ISRO**	01.03.2018	08.12.2021	2.47	
8	*Palladium and Magnesium based hybrid nanocluster structures for high gravimetric capacity hydrogen storage* **DR. DEEPSHIKHA JAISWAL NAGAR** **DST / TMD / HFC / 2K18 / 37 (C) & (G)** **DST**	17.09.2019	16.09.2022	12.22	
9	*Study of Convolution Operators on Topological Groups* **DR. DEVARAJ PONNAIAN** **MTR / 2018 / 000559** **SERB**	14.03.2019	13.03.2022	1.80	
10	*INSPIRE FACULTY AWARD* **DR. DHANYA RAJENDRAN** **INSPIRE FACULTY AWARD-IFA-15-MA72** **DST**	20.04.2016	19.04.2022	-	
11	*On certain class of diagram algebras arising from Schur-Weyl duality* **DR. GEETHA T** **MTR / 2017 / 000424** **SERB**	06.06.2018	05.06.2021	-	
12	*Design and Synthesis of Pie Extended and Ring- Extended Bis-Macrocycle and Investigating their Photophysical Properties for Optoelectronic Applications* DR. GOKULNATH SABAPATHI CRG / 2019 / 006303 SERB	05.02.2020	04.02.2023	10.00	
13	*Infrared Plasmonics of Nanostructured Conducting Oxides for communication and spectroscopic applications* **DR. JOY MITRA** **CRG / 2019 / 004965** **SERB**	07.02.2020	06.02.2023	7.50	
14	*Ramanujan Fellowship* **DR. JOYDEB MANDAL** **RJF / 2020 / 000103** **SERB**	08.03.2021	07.03.2026	25.34	
15	*Functional Characterization of Genetic and Epigenetic Regulatory Networks Involved in the Reproductive Development in Rice* **DR. KALIKA PRASAD** **BT / PR12394 / AGIII / 103 / 891 / 2014** **DBT**	20.11.2015	19.11.2021	6.50	

Sl. No.	Name of the Project Project Leader Project Code Funding Agency	Period From	Period to	Funds received during the year (Amount in Lakhs)	Remarks
16	*Control of stem cell heterogeneity during shoot regeneration in Arabidopsis - a functional and mechanistic analysis of is epigenetic regulators* **DR. KALIKA PRASAD** **EMR / 2017 / 002503** **SERB**	21.05.2019	20.05.2022	9.00	
17	*Noble-Metal free Advanced Catalysts for Hydrogen Generation and Fuel Cell Applications* **DR. M M SHAIJUMON** **DST / TMD / HFC / 2K18 / 136 (C) & (G)** **DST**	23.10.2019	22.10.2022	10.00	
18	*Multi-wavelength Selective Plane Illumination Microscope - with simultaneous magnification at multiple levels: A promising imaging technology for molecular and cellular biology* **DR. M SUHESH KUMAR SINGH** **BT / PR30005 / MED / 32 / 657 / 2018** **DBT**	13.09.2019	12.09.2022	1.50	
19	*Van Der Waals superconducting circuits operating at elevated temperatures & magnetic fields* **DR. MADHU THALAKULAM** **CRG / 2018 / 004213** **SERB**	20.03.2019	19.03.2022	9.00	
20	*Quantum point contract charge amplifiers embedded in a planar superconducting microwave resonator: Quantum-limited charge sensing and counting* **DR. MADHU THALAKULAM** **STARS / APR2019 / PS / 363 / FS** **MHRD**	31.12.2019	30.12.2022	1.62	
21	*Realizing distributed quantum computing with silicon- based spin qubits* **DR. MADHU THALAKULAM** **DST / ICPS / QuST / Theme-4 / 2019 / General** **DST**	24.02.2020	23.02.2023	-	
22	*INSPIRE FACULTY AWARD* **DR. MANIK BANIK** **INSPIRE FACULTY AWARD-DST / INSPIRE / 04 / 2017 / 002288** **DST**	18.04.2018	17.04.2023	5.44	
23	*Integration of 2D materials in organic and organic-inorganic hybrid solar cells: Insights into charge extraction and transport* **DR. MANOJ A G NAMBOOTHIRY** **STARS / APR2019 / PS / 308 / FS** **MHRD**	31.12.2019	30.12.2022	6.39	

Sl. No.	Name of the Project Project Leader Project Code Funding Agency	Period From	Period to	Funds received during the year (Amount in Lakhs)	Remarks
24	*INSPIRE FACULTY FELLOWSHIP* **DR. MATHEW ARUN THOMAS** **INSPIRE FACULTY FELLOWSHIP / BATCH-16 / 2020-DST / INSPIRE / 04 / 2019 / 002507** **DST**	20.10.2020	19.10.2025	36.95	
25	*Application-development of genome editing tools for gene target discovery and understanding regulation of cholesterol metabolism genes* **DR. N SADANANDA SINGH** **BT / RLF / Re-entry17 / 2015-DR. N SADANANDA SINGH** **DBT**	01.08.2017	31.07.2022	5.00	
26	*CRISPR / CAS9 based whole genome screening for response to drug treatment* **DR. N SADANANDA SINGH** **ECR / 2016 / 000979** **SERB**	17.07.2018	16.07.2021	-	
27	*Development of New and Utilization of Existing Crispr-Cas Tools to Understand Genetic Regulators of Cytoskeleton in Cardiomyocyte* **DR. N SADANANDA SINGH** **EEQ / 2018 / 001090** **SERB**	22.03.2019	21.03.2022	7.50	
28	*Mathematical analysis for an optimal control of reaction-diffusion equations in cardiac defibrillation* **DR. NAGAIAH CHAMAKURI** **EMR / 2017 / 000664** **SERB**	01.11.2018	31.10.2021	-	
29	*Numerical analysis and simulation of state constrained optimization for multiscale problems* **DR. NAGAIAH CHAMAKURI** **MTR / 2017 / 000598** **SERB**	01.06.2018	31.05.2021	-	
30	*HPC technologies and large simulation of the electromechanics for the heart function* **DR. NAGAIAH CHAMAKURI** **DST / NSM / R&D_HPC_APPLICATIONS / 2021 / 03.28** **DST**	23.03.2021	22.03.2023	39.98	
31	*Elucidating post-transcriptional regulation of circadian behavior in Drosophila* **DR. NISHA N KANNAN** **WELLCOME TRUST-IA / I / 15 / 2 / 502329** **DBT**	01.12.2016	31.12.2022	9.51	
32	*Mechanism of meiotic crossing over through the Msh4-Msh5 dependent pathway* **DR. NISHANT K T** **CRG / 2018 / 000916** **SERB**	22.03.2019	21.03.2022	6.00	

Sl. No.	Name of the Project Project Leader Project Code Funding Agency	Period From	Period to	Funds received during the year (Amount in Lakhs)	Remarks
33	*Scheme for Promotion of Academic and Research Collaboration (SPARC)* **DR. NISHANT K T** **SPARC-SPARC / 2018-2019 / 58 / SL (IN)** **MHRD**	15.03.2019	30.09.2022	-	
34	*Identifying the effect of a-synuclein induced alterations on electrophysiological homeostasis of dopaminergic neurons in Parkinson's disease progression* **DR. POONAM THAKUR** **WELLCOME TRUST-IA / E / 17 / 1 / 503664** **DBT**	01.09.2019	31.08.2024	19.02	
35	*Metal decorated graphynes for molecular absorption* **DR. R S SWATHI** **1640 / 2017 / KSCSTE** **KSCSTE**	01.10.2018	31.03.2022	1.01	
36	*Investigation of the interaction of acoustic phonons with electrons in semiconductor nanostructures* **DR. RAJEEV N KINI** **KSCSTE / 431 / 2018-KSYSA-RG** **KSCSTE**	01.06.2018	31.05.2021	-	
37	*Terahertz spectroscopic studies of layered 2-D materials* **DR. RAJEEV N KINI** **CRG / 2019 / 004865** **SERB**	18.01.2020	17.01.2023	4.50	
38	*Twistronics with transition metal dichalcogenides* **DR. RAJEEV N KINI** **IPA / 2020 / 000021** **SERB**	26.03.2020	26.03.2025	-	
39	*Stereoselective Total Synthesis of Atisan Based Diterpenoids Antiquorpenes* **DR. RAJENDAR GORETI** **CRG / 2020 / 003737** **SERB**	18.12.2020	17.12.2023	8.00	
40	*Ramanujan Fellowship* **DR. RAJENDAR GORETI** **SB / S2 / RJN-071 / 2015** **DST**	31.10.2016	30.10.2021	-	
41	*Targeted Editing of Potato Genome to Develop Variety Specific True Potato Seed (TPS)* **DR. RAVI MARUTHACHALAM** **ICAR-NASF / GT-7024 / 2018-1** **ICAR**	01.11.2018	31.10.2022	1.60	

Sl. No.	Name of the Project Project Leader Project Code Funding Agency	Period From	Period to	Funds received during the year (Amount in Lakhs)	Remarks
42	*Epigenetic modulation of centromeres to produce in vivo haploids by triggering uniparental genome elimination in plants* **DR. RAVI MARUTHACHALAM** **STARS / APR2019 / BS / 818 / FS** **MHRD**	31.12.2019	30.12.2022	3.54	
43	*Microresonator frequency combs in visible: A path to ultrashort pulse generation and spectroscopy* **DR. RAVI PANT** **CRG / 2019 / 000993** **SERB**	15.01.2020	14.01.2023	5.00	
44	*Structure, function and molecular mechanism of transcription regulators in Mycobacterium spp.* **DR. RAMANATHAN NATESH** **STARS / APR2019 / BS / 729 / FS** **MHRD**	15.05.2020	04.05.2023	4.90	
45	*High fluorine content DNA micelle: A Universal "OFF / ON" 19F-NMR-based probe for the detection of miRNA and Telomerase for cancer diagnosis* **DR. REJI VARGHESE** **BT / PR30172 / NNT / 28 / 1593 / 2018** **DBT**	11.02.2019	10.08.2022	14.34	
46	*Olfactory cues used in stingless bee foraging-recruitment behavior: behavioral and neuronal perspectives* DR. RESHMA BASAK PDF / 2020 / 000943 SERB	04.02.2021	03.02.2023	-	
47	*Conflict between Replication and Transcription accelerates Mutagenesis and drives Antibiotic Resistance* **DR. SABARI SANKAR THIRUPATHI** **WELLCOME TRUST-IA / I / 18 / 2 / 504037** **DBT**	01.10.2019	30.09.2024	38.97	
48	*Guage theory of categorical principal bundles* **DR. SAIKAT CHATTERJEE** **MTR / 2018 / 000528** **SERB**	12.03.2019	11.03.2022	1.00	
49	*Moduli Space of Vector Bundles Over Smooth Projective Surfaces and ACM Bundles* **DR. SARBESWAR PAL** **EMR / 2015 / 002172** **SERB**	15.05.2018	14.05.2021	-	
50	*Understanding the role of Periostin-Itgav interactions in adult and fetal hematopoiesis* **DR. SATISH KHURANA** **WELLCOME TRUST-IA / I / 15 / 2 / 502061** **DBT**	01.12.2016	30.12.2022	25.13	

Sl. No.	Name of the Project Project Leader Project Code Funding Agency	Period From	Period to	Funds received during the year (Amount in Lakhs)	Remarks
51	*Structural elucidation of the bacterial transcription elongation complex with Gre factors: focus on Mycobacterium tuberculosis RNA polymerase* **DR. SANDREA MAUREEN FRANCIS** **KSCSTE / 264 / 2021-BLP** **KSCSTE**	26.04.2021	25.04.2024	-	
52	*Development of next generation all-solid-state sodium-sulfur batteries for lighting and consumer electronic applications* **DR. SHRUTI SURIYAKUMAR** **PDF / 2020 / 000209** **SERB**	12.01.2021	11.01.2023	9.27	
53	*Combinatorial exploration and property control of oxide based power semiconductors* **DR. SOMU KUMARAGURUBARAN** **DST / INT / JSPS / P-288 / 2019** **DST**	26.06.2019	25.06.2022	-	
54	*INSPIRE FACULTY FELLOWSHIP* DR. SOORAJ K DST-INSPIRE FACULTY FELLOWSHIP / BATCH-16 / 2020-DST / INSPIRE / 04 / 2019 / 001843 DST	13.10.2020	12.10.2025	37.24	
55	*Design of chiral self-sorting and stimuli-responsive dynamic chiral cages and host-guest chemistry* ***DR. SOUMEN DE*** **SRG / 2020 / 001486** **SERB**	23.12.2020	22.12.2022	4.00	
56	*Utilization of Oleophilic Atomically Precise Metal Nanocluster in Aqueous Medium Through Host-Guest Self-Assembly Approach* **DR. SOURAV BISWAS** **PDF / 2020 / 001085** **SERB**	22.12.2020	21.12.2022	9.00	
57	*Investigating post-transcriptional regulation of steroidogenic genes during development* **DR. SMITHA VISHNU** **SR / WOS-A / LS-457 / 2017 (G)** **DST**	04.03.2019	04.09.2022	9.00	
58	*Development and Evaluation of diagnostics and Candidate Vaccines for emerging SARS-Coronavirus-2 (Dec-VAC-SARS)* **DR. STALIN RAJ VICTOR** **IPA / 2020 / 000070** **SERB**	23.12.2020	22.12.2023	26.00	
59	*ENDFLU - Evaluation of Rationally Designed Influenza Vaccines* **DR. STALIN RAJ VICTOR** **BT / IN / EU-INF / 15 / RV / 19-20** **DBT**	31.12.2020	30.12.2025	35.02	

Sl. No.	Name of the Project Project Leader Project Code Funding Agency	Period From	Period to	Funds received during the year (Amount in Lakhs)	Remarks
60	*Insights into the Interplay of H2S and NO at Redox Active Metal sites* **DR. SUBRATA KUNDU** **ECR / 2017 / 003200** **SERB**	20.07.2018	19.07.2021	-	
61	*Numerical analysis and computational methods for hyperbolic conservation laws* **DR. SUDASHAN KUMAR** **MTR / 2017 / 000649** **SERB**	13.06.2018	12.06.2021	-	
62	*Tailoring the Catalytic Properties of Atom-Precise Metal Nanoclusters* DR. SUKHENDU MANDAL EMR / 2016 / 007501 SERB	09.07.2018	08.07.2021	-	
63	*Atomically precise alloy nanocluster as promising electro-catalyst for carbon dioxide and nitrogen reduction* **DR. SUKHENDU MANDAL** **DST / INT / JSPS / P-285 / 2019** **DST**	26.06.2019	25.06.2021	-	
64	*Efficient Neuromorphic Memory via Nano-engineered Composite Film* DR. TUHIN SUBHRA MAITY SRG / 2021 / 000423 SERB	28.12.2021	27.12.2023	-	
65	*Understanding diversification of Impatiens species in the Northern Western Ghats* **DR. ULLASA KODANDARAMIAH** **BT / PR27535 / NDB / 39 / 600 / 2018** **DBT**	24.09.2018	23.03.2022	-	
66	*Inspire Faculty Award - Development of Novel metal oxide-graphene based nanocomposite Materials for Microsensors and Nano electronics device applications* **DR. VINAYAK B KAMBLE** **DST-INSPIRE-DST / INSPIRE Faculty Award / 2016 / DST / INSPIRE / 04 / 2015 / 002111** **DST**	28.07.2016	27.07.2022	-	
67	*Junction Barrier modulation study in engineered core-shell oxide heterostructure Gas sensor device* **DR. VINAYAK B KAMBLE** **DST / NM / NT / 2018 / 124 (C) & (G)** **DST**	30.10.2018	30.04.2022	4.95	

Sl. No.	Name of the Project Project Leader Project Code Funding Agency	Period From	Period to	Funds received during the year (Amount in Lakhs)	Remarks
68	*Study of Novel Oxide and Graphene Core Shell nanoarchitectures for High Temperature Thermoelectric Power Generations* **DR. VINAYAK B KAMBLE** **EEQ / 2018 / 000769** **SERB**	16.03.2019	15.03.2022	4.00	
69	*Structural and thermodynamic study of the phase separation of TIA1 in the presence of Tau protein and the influence of the phase separation on protein aggregation* DR. VINESH VIJAYAN CRG / 2019 / 004880 SERB	05.02.2020	04.02.2023	7.00	
70	*Structural characterization of functional prion domain of mammalian cytoplasmic polyadenylation element-binding protein 3 (CPEB3)* **DR. VINESH VIJAYAN** **STARS / APR2019 / BS / 708 / FS** **MHRD**	31.12.2019	30.12.2022	7.51	
71	*Schurs Exponent Conjecture* **DR. VIJI Z THOMAS** **MTR / 2020 / 000483** **SERB**	10.02.2021	09.02.2024	1.50	
72	*FIST Program* **HOD, SOC** **FIST-SR / FST / CSII-042 / 2016 [C]** **DST**	07.03.2017	06.03.2022	-	
73	*FIST PROGRAM* **HOD, SOP** **SR / FST / CSII-042 / 2016 C** **DST**	22.07.2019	21.07.2024	-	
74	*FIST PROGRAM* **HOD, SOB** **SR / FST / LS-II / 2018 / 217 [C]** **DST**	27.08.2019	26.08.2024	-	
75	*Localization and flow of information in quantum computing and open quantum dynamics* **PROF. ANIL SHAJI** **EMR / 2016 / 007221** **SERB**	13.07.2017	31.07.2021	-	
76	*Open quantum systems - Non Markovian dynamics and Not Completely Positive Maps* **PROF. ANIL SHAJI** **DST / ICPS / QuST / Theme-4 / 2019 / General** **DST**	24.02.2020	23.02.2023	-	

Sl. No.	Name of the Project Project Leader Project Code Funding Agency	Period From	Period to	Funds received during the year (Amount in Lakhs)	Remarks
77	*Organisation of Summer Schools* **PROF. ANIL SHAJI** **DST / ICPS / QuST / Theme-4 / 2019 / General-Organisation of Summer Schools** **DST**	24.02.2020	23.02.2023	-	
78	*Integrating collective behaviour with biomechanics of social spider webs* **PROF. HEMA SOMANATHAN** **CRG / 2019 / 003805** **SERB**	19.03.2020	18.03.2023	1.37	
79	*Design of a Surface-Enhanced Spectroscopy Based Device for the Rapid Detection of Organophosphate Pesticides and Pyrethroid Insecticides in Fruits and Vegetables* **PROF. K GEORGE THOMAS** **SR / S9 / Z-05 / 2015** **SERB**	19.08.2017	31.03.2022	-	
80	*JC BOSE FELLOWSHIP* **PROF. K GEORGE THOMAS** **SB / S2 / JCB-64 / 2013** **SERB**	01.06.2019	31.05.2024	16.00	
81	*Synthesis of Pseudoprotiens by Topochemical Azide-Alkyne Cycloaddition Reactions* **PROF. K M SURESHAN** **CRG / 2018 / 000577** **SERB**	30.03.2019	29.03.2022	11.00	
82	*Development of porous titania supported Lithium Hydroxide for efficient capture of carbon-di-oxide* ***PROF. K M SURESHAN*** **ISRO / RES / 3 / 861 / 20-21** **ISRO**	16.11.2020	15.11.2022	11.67	
83	*Unravelling the interplay of reorganization energy, driving force and electronic coupling on the rate of electron transfer* **PROF. MAHESH HARIHARAN** **CRG / 2019 / 002119** **SERB**	06.02.2020	05.02.2023	3.50	
84	*Study of Exotic Ground States in Frustrated Triangular Lattice Antiferromagnets* **PROF. RAMESH CHANDRA NATH** **CRG / 2019 / 000960** **SERB**	20.12.2019	19.12.2022	12.00	
85	*Identification and Characterization of Molecular Pathways involved in Immune –related Autophagy* PROF. SRINIVASA MURTY SRINIVASULA BT / PR21325 / BRB / 10 / 1554 / 2016 DBT	15.03.2018	14.03.2022	18.84	

Sl. No.	Name of the Project Project Leader Project Code Funding Agency	Period From	Period to	Funds received during the year (Amount in Lakhs)	Remarks
86	*RNF 167, an ubiquitin E3 ligase with several reported mutations in diverse cancers, controls NF-kB activation* **PROF. SRINIVASA MURTY SRINIVASULA** **EMR / 2016 / 008048** **SERB**	22.06.2018	21.06.2021	-	
87	*Identification and characterization of the molecular factors for the quality-control of kinetochore size and fidelity of spindle-chromosome attachment* **PROF. TAPAS KUMAR MANNA** **BT / PR30271 / BRB / 10 / 1740 / 2018** **DBT**	29.07.2019	28.07.2022	19.47	
88	*Understanding the regulation of kinetochore protein phosphorylation for the activation of spindle assembly check-point* **PROF. TAPAS KUMAR MANNA** **CRG / 2020 / 002452** **SERB**	11.03.2021	10.03.2024	-	
89	*The role of colonic hepatic Tumor Over-expressed Gene (chTOG) in regulation of kinetochore size and fidelity of mitotic chromosome segregation* **PROF. TAPAS KUMAR MANNA** **BT / HRD-NBA-NWB / 38 / 2019-20(7)** **DBT**	19.02.2020	18.02.2023	10.00	
90	*Study of Stochastic Nematic Liquid Crystal Models and Related Constrained Physical Problems* **PROF. UTPAL MANNA** **MTR / 2018 / 000034** **SERB**	14.03.2019	13.03.2022	2.00	
91	*Modelling, Analysis and Prediction for SARS-CoV-2 Infections* **PROF. UTPAL MANNA** **MSC / 2020 / 000029** **SERB**	30.06.2020	29.06.2021	-	

BALANCE SHEET AS AT 31st MARCH 2022

Amount in ₹

SOURCES OF FUNDS	Schedule No	2021-22	2020-21
UNRESTRICTED FUND			
CORPUS/ CAPITAL FUND	1	8,80,36,63,253	7,36,42,65,317
DESIGNATED/ EARMARKED FUNDS	2		
CURRENT LIABILITIES AND PROVISIONS	3	65,26,42,806	62,70,46,961
UNSPENT BALANCE OF EXTERNAL PROJECTS	3A	26,39,34,172	25,50,99,594
SPONSORED FELLOWSHIPS & SCHOLARSHIPS	3B	1,08,91,278	1,61,48,389
UNSPENT BALANCE OF GRANT - MHRD	3C	28,79,73,245	1,49,28,01,786
TOTAL		10,01,91,04,754	9,75,53,62,047
APPLICATION OF FUNDS			
FIXED ASSETS	4		
TANGIBLE ASSETS		7,81,89,41,611	3,82,47,69,155
INTANGIBLE ASSETS		1,91,29,004	2,66,93,243
CAPITAL WORK-IN-PROGRESS		2,02,12,476	2,64,19,33,435
INVESTMENTS FROM EARMARKED / ENDOWENT FUNDS	5		
LONG TERM INVESTMENT			
SHORT TERM INVESTMENT			
INVESTMENT - OTHERS	6		
CURRENT ASSETS	7	1,30,75,56,476	97,40,71,079
LOANS, ADVANCES & DEPOSITS	8	85,32,65,187	2,28,78,95,135
TOTAL		10,01,91,04,754	9,75,53,62,047
SIGNIFICANT ACCOUNTING POLICIES	23		
CONTINGENT LIABILITIES AND NOTES TO ACCOUNTS	24		

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

Col.Robinson George (Retd.)
Registrar

(Prof.Srinivasa Murty Srinivasula)
Deputy Director

(Prof. Jarugu Narasimha Moorthy)
Director

INCOME AND EXPENDITURE ACCOUNT
FOR THE YEAR ENDED 31st MARCH 2022

Amount in ₹

PARTICULARS	Schedule	2021-22	2020-21
INCOME			
Academic Receipts	9	8,70,28,238	5,79,86,463
Grants & Subsidies	10	63,94,78,694	59,30,02,805
Income from Investments	11	-	-
Interest Earned	12	-	-
Other Income	13	4,05,70,059	5,27,54,590
Prior Period Income	14	1,38,364	-
TOTAL (A)		76,72,15,354	70,37,43,858
EXPENDITURE			
Staff Payments & Benefits	15	28,49,54,353	25,43,50,753
Employees Retirement and Terminal Benefits	15A	2,48,74,363	51,38,939
Acadamic Expenses	16	12,48,43,537	9,86,36,696
Administrative & General Expenses	17	16,62,26,144	15,45,50,182
Transportation Expenses	18	55,90,344	60,78,693
Repairs & Maintanence	19	5,78,38,244	7,87,98,591
Finance cost	20	26,072	5,87,890
Other Expenses	21	-	-
Depreciation	4	40,57,68,339	31,64,68,788
Prior Period Expenses	22	37,421	35,948
TOTAL (B)		**1,07,01,58,817**	**91,46,46,480**
Balance being excess of Income over Expenditure (A-B)		(30,29,43,463)	(21,09,02,622)
Transfer to/ from Designated Fund			
Building Fund			
Others (Specify)			
BALANCE BEING SURPLUS/(DEFICIT) CARRIED TO CAPITAL FUND		(30,29,43,463)	(21,09,02,622)
Significant Accounting Policies	23		
Contingent Liabilities & Notes on Accounts	24		

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2022

SCHEDULE 1- CORPUS/CAPITAL FUND:

Amount in ₹

	2021-22		2020-21	
Balance as at the beginning of the year		7,36,42,65,317		7,40,42,57,321
Add: Contributions towards Corpus/Capital Fund				
Add: Grant from UGC, Government of India and State Government to the extent utilised for capital expenditure	1,77,06,55,597		17,08,07,693	
Add: Assets purchased out of Earmarked funds				
Add: Assets purchased out of sponsored projects, where ownership vests in the institution				
Add: Assets donated/ gifts received				
Add: Other additions	(2,83,14,198)		1,02,925	
Add: Excess of income over expenditure transferred from income and expenditure account	(30,29,43,463)		(21,09,02,622)	
Total		**8,80,36,63,253**		**7,36,42,65,317**
Less: Deficit transferred from the income and expenditure account				
BALANCE AT THE YEAR-END		**8,80,36,63,253**		**7,36,42,65,317**

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2022

SCHEDULE 2-DESIGNATED/ EARMARKED FUNDS

Amount in ₹

	FUND-WISE BREAK UP				TOTAL	
	Fund AAA	Fund BBB	Fund CC	Endowment Funds	2021-22	2020-21
A						
a) Opening balance of the funds						
b) Additions to the Funds:						
c) Income from investments made on account of funds						
d) Accrued interest on investments of the funds						
e) Interest on savings Bank Account						
f) Other additions (specify nature)						
TOTAL (A)	**NIL**	**NIL**	**NIL**	**NIL**	**NIL**	**NIL**
B						
Utilisation/Expenditure towards objectives of funds						
i. Capital Expenditure						
ii. Revenue Expenditure						
TOTAL (B)						
CLOSING BALANCE AS AT THE YEAR-END (A-B)	**NIL**	**NIL**	**NIL**	**NIL**	**NIL**	**NIL**
Represented by						
Cash and bank balances						
Investment						
Interest accrued but not due						
Total						

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2022

SCHEDULE 2 (A)-ENDOWMENT FUNDS

Amount in ₹

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Sl. No	Name of the Endowment	Opening Balance		Additions during the year		Total		Expenditure on the object during the year	Closing Balance		Total
		Endowment	Accumulated Interest	Endowment	Interest	Endowment	Accumulated Interest		Endowment	Accumulated Interest	
						(3)+(5)	(4)+(6)				(10)+(11)
1											
	Total	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL

INCOME AND EXPENDITURE ACCOUNT
FOR THE YEAR ENDED 31st MARCH 2022

SCHEDULE 3- CURRENT LIABILITIES AND PROVISIONS

Amount in ₹

Particulars	Sub Sch No.	2021-22	2020-21
A. CURRENT LIABILITIES			
1. Deposits from staff			
2. Deposts from students			
3. Sundry Creditors:			
a) For Goods & Services	1		
b) Others	2	6,14,66,731	6,08,63,720
4. Deposits Others (including EMD, Security Deposits)	3	4,16,51,327	4,51,72,255
5. Statutory Liabilities(GPF,TDS,WC TAX, CPF, GIS,NPS) :			
a) Overdue			
b) Others	4	51,05,995	41,21,260
6. Other current Liabilities	5	43,26,29,119	42,99,74,455
a) Salaries			
b) Receipts against sponsored projects			
c) Receipts against sponsored fellowships and scholorships			
d) Unutilised Grants			
e) Grants in advance			
f) Other Funds			
g) Other liablities			
Total (A)		**54,08,53,172**	**54,01,31,690**
B. PROVISIONS			
1. For Taxation			
2. Gratuity			
3. Superannuation/Pension			
4. Accumulated Leave Encashment	6	11,17,89,634	8,69,15,271
5. Trade Warranties/Claims			
6. Others (Specify)			
Total (B)		**11,17,89,634**	**8,69,15,271**
Total (A+B)		**65,26,42,806**	**62,70,46,961**

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2022

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

Amount in ₹

(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)
Sl. No	Name of the Project	Opening Balance 2020-21		Receipts / Recoveries during the year	Total	Expenditure during the year		Closing Balance 2021-22	
		Credit	Debit			Recurring	Capital	Credit	Debit
1	CSIR-CCMB-DR.RAVI M-31-2(281)/2018-19/Budget	7,12,297	-	21,551	7,33,848	-	-	7,33,848	-
2	CSIR-DR RAMESH RASAPPAN	-	-	8,08,644	8,08,644	2,39,957	-	5,68,687	-
3	CSIR-DR.SHADAK ALEE-03(1457)/19/EMR-II	2,27,096	-	17,656	2,44,752	-	2,440	2,42,312	-
4	CSIR- DR.TAPAS K MANNA-37(1688)/17-EMR-II	-	64,703	1,374	(63,329)	19,664	-	-	82,993
5	DBT-A1-DR.HEMASOMANATHAN-BT/PR12720/COE/34/21/2015	5,12,771	-	15,544	5,28,315	-	-	5,28,315	-
6	DBT-A2-DR.HEMASOMANATHAN-BT/PR12720/COE/34/21/2015	5,47,195	-	15,825	5,63,020	41,579	-	5,21,441	-
7	DBT-A3-DR.ULLASA.K-BT/PR12720/COE/34/21/2015	1,71,475	-	4,466	1,75,941	30,090	-	1,45,851	-
8	DBT-DR STALIN RAJ-BT/PR32565/MED/29/1554/2020	-	-	22,60,733	22,60,733	10,11,153	-	12,49,580	-
9	DBT-DR.SUHESHKUMARSINGH-BT/PR30005-2018	5,54,811	-	1,73,285	7,28,096	3,75,944	1,63,538	1,88,614	-
10	DBT-DR TAPAS K MANNA-BT/HRD/NWB/38/2019-20(7)	-	72,030	10,13,255	9,41,225	10,205	68,880	8,62,140	-
11	DBT-DR.TAPAS K.MANNA-BT/PR30271-2018	30,62,243	-	18,12,853	48,75,096	17,99,427	8,59,197	22,16,472	-

(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)
Sl. No	Name of the Project	Opening Balance 2020-21		Receipts / Recoveries during the year	Total	Expenditure during the year		Closing Balance 2021-22	
		Credit	Debit			Recurring	Capital	Credit	Debit
12	DBT-DR.ULLASA-BT/PR27535/2018	2,96,119	-	(25,431)	2,70,688	3,51,756	-	-	81,068
13	DBT-DR.ULLASA.K-BT/PR7713/ NDB/39/261/2013	20,955	-	-	20,955	(1,00,000)	-	1,20,955	-
14	DBT-EU-INF/15/RV/19-20/DR STALIN RAJ	27,37,458	-	35,81,726	63,19,184	8,21,846	7,16,100	47,81,238	-
15	DBT -IISC-MOHAMMED AIYAZ	2,48,540	-	(2,06,140)	42,400	-	-	42,400	-
16	DBT-RAMALING.-DR.NONG.SADAN-BT/RLF-RE-ENTRY/17/2015	53,181	-	4,56,047	5,09,228	4,99,308	-	9,920	-
17	DBT-RICE DR KALIKAPRASAD RESEARCH ASSOCIATESHIP PRG	1,39,544	-	6,15,815	7,55,359	6,33,242	-	1,22,117	-
18	DBT-SRINIVASAMURTY-BT/PR21325/ BRB/10/1554/2016	-	3,99,632	18,69,361	14,69,729	4,38,798	-	10,30,931	-
19	DBT-TAPASKUMAR-BT/PR12514/ BRB/10/1352/2014	29,688	-	(29,686)	2	-	-	2	-
20	DST-DR.A.MUTHUKRISHNAN-DST/ TMD/HFC/2K18/24	-	39,921	9,82,139	9,42,218	5,65,289	-	3,76,929	-
21	DST-DR MADHU THALAKULAM-ICPS/ QUST/THEME-4/2019	8,84,27,363	-	21,54,310	9,05,81,673	47,80,449	12,54,968	8,45,46,256	-
22	DST-DR M M SHAIJUMON-DST/TMD/ HFC/2K18/136(C)&(G)	2,98,401	-	9,49,746	12,48,147	12,50,009	(3,585)	1,723	-
23	DST-DR NAGAIAH CHAMAKURI-NSM/ R&D-HPC-2021	-	-	40,76,968	40,76,968	20,02,949	-	20,74,019	-
24	DST-DR.TAMIL SEL-SR/WOS-A/CS-105/2016(G)	8,413	-	(639)	7,774	-	-	7,774	-

(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)
Sl. No	Name of the Project	Opening Balance 2020-21		Receipts / Recoveries during the year	Total	Expenditure during the year		Closing Balance 2021-22	
		Credit	Debit			Recurring	Capital	Credit	Debit
25	DST-FIST-DR MAHESH-5751/ IFD/2016-2017	3,57,03,575	-	(5,90,817)	3,51,12,758	-	3,47,14,067	3,98,691	-
26	DST-HOD-SOP-FIST-SR/FST/PS-II/2018/54 ()	2,49,65,835	-	(1,82,972)	2,47,82,863	-	1,31,983	2,46,50,880	-
27	DST-INSPIRE FACULTY AWARD-DR ANAND NARAYANA SARMA	-	-	22,04,143	22,04,143	5,75,323	-	16,28,820	-
28	DST-INSPIRE FACULTY AWARD-DR. SRILAKSHMI-2013/MA-23	22,801	-	690	23,491	-	-	23,491	-
29	DST-INSPIRE FACULTY-DR.S.GOKULNATH-FA12-CH-74	-	1,07,172	-	(1,07,172)	-	-	-	1,07,172
30	DST-INSPIRE FACULTY-DR SHABNAM IYYANI	-	-	12,02,519	12,02,519	54,372	-	11,48,147	-
31	DST-INSPIRE FACULTY-DR. VINAYAK.K-04/2015/002111	24,13,729	-	(1,02,962)	23,10,767	50,877	6,07,849	16,52,041	-
32	DST-INSPIRE FACULTY FELLOWSHIP-DR MATHEW ARUN THOMA	15,96,439	-	37,22,033	53,18,472	15,60,400	4,99,622	32,58,450	-
33	DST-INSPIRE FACULTY FELLOWSHIP-DR SOORAJ K	15,92,309	-	37,55,004	53,47,313	20,42,740	3,24,093	29,80,480	-
34	DST-INSPIRE FAUCULTY AWARD-DR DHANYA RAJENDRAN	10,13,268	-	24,472	10,37,740	29,434	7,24,515	2,83,791	-
35	DST-JSPS-DR. KUMARAGURUBARAN.S-DST/INT/ JSPS/P-288/2019	89,302	-	(305)	88,997	16,628	-	72,369	-
36	DST-JSPS-DR.SUKHENDU M-DST/ INT/JSPS/P-285/2019	2,82,546	-	(1,964)	2,80,582	-	-	2,80,582	-

(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)
Sl. No	Name of the Project	Opening Balance 2020-21		Receipts / Recoveries during the year	Total	Expenditure during the year		Closing Balance 2021-22	
		Credit	Debit			Recurring	Capital	Credit	Debit
37	DST-NANO MISSION-DR K GEORGE THOMAS-NM/TUE/EE-01/19	-	-	1,69,53,710	1,69,53,710	3,12,720	-	1,66,40,990	-
38	DST(NANOMISSION)K GEORGETHOMAS/SR/NM/NS-23/2016-C	2,43,585	-	(1,76,356)	67,229	2,343	-	64,886	-
39	DST-NM-DR.VINAYAK KAMBLE-DST/NM/NT/2018/124	-	16,604	4,28,130	4,11,526	24,937	(8,142)	3,94,731	-
40	DST-QUEST-SUMMER SCHOOL-DR ANIL SHAJI	20,16,060	-	58,780	20,74,840	-	-	20,74,840	-
41	DST-QUEST/THEME-4/2019/GENERAL-DR ANIL SHAJI	1,07,62,769	-	2,98,137	1,10,60,906	10,70,770	14,21,554	85,68,582	-
42	DST-RAMANUJAN-DR.RAMESH RASAPPAN-SB/S2/RJN-059/2015	1,09,320	-	2,775	1,12,095	65,956	-	46,139	-
43	DST-RAMANUJAN-DR.RAVI PANT-SB/S2/RJN-069/2014	1,90,378	-	5,785	1,96,163	-	-	1,96,163	-
44	DST-RAMANUJAN-RAJEN.GORETI-SB/S2/RJN-071/2015	2,44,617	-	6,306	2,50,923	1,73,064	-	77,859	-
45	DST-SERI-DR MANOJ NAMB-DST/MD/SERI/S15(G)	1,812	-	(1,452)	360	-	-	360	-
46	DST-SJF-DR.K.M.SURESHAN-DST/SJF/CSA-02/2012-13	13,90,122	-	15,137	14,05,259	72,585	12,32,000	1,00,674	-
47	DST-SUPRA-DR NISHANT K T	-	-	7,32,899	7,32,899	6,55,593	-	77,306	-
48	DST-TMD-DR.DEEPSHIKA-DST/TMD/HFC/2K18/37	17,10,533	-	11,84,051	28,94,584	11,14,175	16,95,750	84,659	-

(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)
Sl. No	Name of the Project	Opening Balance 2020-21		Receipts / Recoveries during the year	Total	Expenditure during the year		Closing Balance 2021-22	
		Credit	Debit			Recurring	Capital	Credit	Debit
49	DST-TMD-MES-DR.M.M SHAIJUMON-2K16/114(G)	3,07,398	-	(2,51,612)	55,786	47,448	-	8,338	-
50	DST-WOS-B-DR T SHYAMALA-AFE-20/2021(G)	-	-	11,46,432	11,46,432	1,98,053	-	9,48,379	-
51	DUPONT YOUNG PROFESSOR PROGRAM-DR.RAVI.M	12,06,158	-	34,173	12,40,331	16,000	-	12,24,331	-
52	EICL-DR.M.M.SHAIJUMON	22,450	-	6,66,781	6,89,231	2,48,258	1,98,276	2,42,697	-
53	FIST PROJECT-SCHOOL OF BIOLOGY	70,86,438	-	(4,37,071)	66,49,367	6,15,168	34,87,961	25,46,238	-
54	GE INDIA INDUSTRIAL PVT LTD PROJECT-DR.RAJEEV KINI	4,38,114	-	5,997	4,44,111	-	41,264	4,02,847	-
55	ICAR-DR.RAVI M-NASF/GT-7024/2018-19	5,89,868	-	1,69,448	7,59,316	5,32,924	-	2,26,392	-
56	INSPIRE FACULTY AWARD-DR MANIK BANIK	8,99,576	-	5,21,183	14,20,759	3,94,883	1,48,995	8,76,881	-
57	ISRO-DEEPSHIKA/DS-2B-13012(2)42/2017	1,80,667	-	2,50,159	4,30,826	4,02,374	-	28,452	-
58	ISRO-DR.DEEPSHIKHA JAISWAL NAGAR./19012/35/2016-II	47,319	-	1,432	48,751	-	-	48,751	-
59	ISRO-DR K M SURESHAN	1,29,552	-	11,76,194	13,05,746	9,63,432	-	3,42,314	-
60	JC BOSE-DR.K.GEORGE THOMAS-NEW	2,53,757	-	16,12,782	18,66,539	20,16,307	-	-	1,49,768
61	KLDB-DR N SADANANDA SINGH	-	-	31,18,473	31,18,473	1,00,000	-	30,18,473	-
62	KSCSTE(KSYSA)RAJEEV N KINI-KSCSTE-431/2018-KSYSA-RG	1,48,069	-	6,178	1,54,247	1,74,571	(82,768)	62,444	0

(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)
Sl. No	Name of the Project	Opening Balance 2020-21		Receipts / Recoveries during the year	Total	Expenditure during the year		Closing Balance 2021-22	
		Credit	Debit			Recurring	Capital	Credit	Debit
63	KSCSTE-MS.SANDREA MOUREEN FRANCIS-264/2021-BLP	4,72,400	-	11,016	4,83,416	3,87,570	-	95,846	-
64	KSCSTE-SWATHI-430/2018	80,524	-	1,04,401	1,84,925	1,50,000	-	34,925	-
65	MHRD-COE-DR.AMAL MEDHI-(FN. NO.5-5/2014-TS.VII)	2,59,181	-	1,939	2,61,120	-	-	2,61,120	-
66	MHRD-DR MANOJ NAMBOOTHIRI-STARS/APR2019/PS/308/FS	62,305	-	6,52,812	7,15,117	7,89,079	-	-	73,962
67	MHRD-STARS-DR RAVI MARUTHACHALAM-APR2019/ BS/818/FS	6,18,755	-	3,68,212	9,86,967	8,94,400	-	92,567	-
68	MHRD/STARS-DR VINESH VIJAYAN-STARS/APR2019/BS/708	-	1,83,621	7,51,509	5,67,888	5,22,790	-	45,098	-
69	MTR-000483-DR VIJI Z THOMAS	94,479	-	1,52,667	2,47,146	1,40,560	-	1,06,586	-
70	NBHM-MS. ARATI SHASHI-PDF/0204/16(6)/2020/R&D-II	-	-	7,04,840	7,04,840	5,99,315	-	1,05,525	-
71	NPDF-DR PRASANTA KUMAR BARIK	-	-	8,02,478	8,02,478	4,68,981	-	3,33,497	-
72	OTHERS	37,83,925	-	8,42,770	46,26,695	31,556	-	45,95,139	-
73	RAENG-DR.JOY MITRA	13,47,760	-	-	13,47,760	2,439	-	13,45,321	-
74	RAMANUJAN FELLOWSHIP-DR JOYDEB MANDAL	-	-	25,56,253	25,56,253	21,30,735	-	4,25,518	-
75	SERB-001486 -DR SOUMEN DE	14,72,528	-	4,31,861	19,04,389	4,27,987	9,96,190	4,80,212	-
76	SERB-DR ADITHYA LAKSHMANA-CRG/2020/000321	-	-	61,72,476	61,72,476	1,01,506	-	60,70,970	-

(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)
Sl. No	Name of the Project	Opening Balance 2020-21		Receipts / Recoveries during the year	Total	Expenditure during the year		Closing Balance 2021-22	
		Credit	Debit			Recurring	Capital	Credit	Debit
77	SERB-DR AJAY VENUGOPAL / CRG/2019/005040	71,384	-	6,12,226	6,83,610	6,00,008	-	83,602	-
78	SERB-DR.ALA.KALIYAMOORTY-EEQ/2016/000231	2,66,377	-	6,467	2,72,844	71,663	-	2,01,181	-
79	SERB-DR.ANIL SHAJI-EMR/2016/007221	5,50,433	-	5,394	5,55,827	4,55,763	-	1,00,064	-
80	SERB-DR BASUDEV SAHOO-SRG/2021/000572	-	-	22,87,819	22,87,819	2,32,238	-	20,55,581	-
81	SERB-DR.BIKAS C DAS/ ECR/2017/000630	77,442	-	(46,843)	30,599	30,599	-	-	-
82	SERB-DR.BIKAS CHANDRADAS-EEQ/2016/000045	1,94,943	-	(16,467)	1,78,476	1,78,476	-	-	-
83	SERB-DR.BINDUSAR SAHOO-CRG/2018/002373	2,76,146	-	7,12,909	9,89,055	6,79,746	-	3,09,309	-
84	SERB-DR.DEEPSHIKA JAISWAL NAGAR-YSS/2015/001743	67,104	-	2,030	69,134	-	-	69,134	-
85	SERB-DR.DEVARAJ-MTR/2018/000559	96,205	-	1,83,379	2,79,584	1,80,524	-	99,060	-
86	SERB-DR DOND ASHA KISON-SRG/2020/001027	6,98,866	-	15,131	7,13,997	3,65,503	1,47,525	2,00,969	-
87	SERB-DR.GEETHA T -MTR/2017/000424	1,02,277	-	1,086	1,03,363	91,389	-	11,974	-
88	SERB-DR GOKULNATH SAPABATHI-CRG/2019/006303	1,04,158	-	10,19,304	11,23,462	5,54,717	-	5,68,745	-
89	SERB-DR HEMA SOMANATHAN-CRG/2019/003805	8,48,733	-	1,53,400	10,02,133	1,35,404	7,99,050	67,679	-

(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)
Sl. No	Name of the Project	Opening Balance 2020-21		Receipts / Recoveries during the year	Total	Expenditure during the year		Closing Balance 2021-22	
		Credit	Debit			Recurring	Capital	Credit	Debit
90	SERB-DR.HEMA SOMANATHAN/ EMR/2014/000705	1,04,839	-	2,972	1,07,811	-	-	1,07,811	-
91	SERB-DR JISHY VARGHESE-EMR/2016/004978	7,09,556	-	14,729	7,24,285	6,48,268	-	76,017	-
92	SERB-DR JOY MITHRA-CRG/2019/004965	25,18,112	-	7,89,140	33,07,252	8,88,027	20,85,124	3,34,101	-
93	SERB-DR.KALIKA PRASAD-EMR/2017/002503	4,17,597	-	9,15,181	13,32,778	11,38,184	-	1,94,594	-
94	SERB-DR.K.M.SURESHAN-CRG/2018/000577	2,94,576	-	11,24,496	14,19,072	10,60,971	-	3,58,101	-
95	SERB-DR.MADHU THALAKULAM-CRG/2018/004213	63,580	-	9,12,407	9,75,987	7,73,170	-	2,02,817	-
96	SERB-DR.MAHESH HARIHARAN-CRG/2019/002119	6,86,205	-	3,64,706	10,50,911	5,06,755	3,08,597	2,35,558	-
97	SERB-DR MANIK BANIK-SRG/2021/000267	-	-	7,96,593	7,96,593	65,522	-	7,31,071	-
98	SERB-DR.M.M.SHAIJUMON-EMR/2017/000484	-	96,517	1,08,274	11,757	8,712	-	3,045	-
99	SERB-DR NAGAIAH CHAMAKURI-EMR/2017/000664	1,92,086	-	17,004	2,09,090	1,14,385	24,691	70,014	-
100	SERB-DR. NAGAIAH CHAMAKURI - MTR/2017/000598	1,62,343	-	2,125	1,64,468	1,42,979	-	21,489	-
101	SERB-DR-NISHANT K T-CRG/2018/000916	7,41,673	-	6,21,642	13,63,315	12,55,613	-	1,07,702	-
102	SERB-DR.N.SADANANDASINGH-ECR/2016/000979	2,58,159	-	6,379	2,64,538	1,09,000	-	1,55,538	-

(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)
Sl. No	Name of the Project	Opening Balance 2020-21		Receipts / Recoveries during the year	Total	Expenditure during the year		Closing Balance 2021-22	
		Credit	Debit			Recurring	Capital	Credit	Debit
103	SERB-DR POONAM THAKUR-SRG/2021/000981	-	-	21,45,951	21,45,951	7,10,638	-	14,35,313	-
104	SERB-DR RAGENDAR GORETI/ CRG/003737	19,26,605	-	8,50,547	27,77,152	8,56,553	14,97,369	4,23,230	-
105	SERB- DR RAJEEV N KINI-CRG/2019/004865	2,07,882	-	4,58,884	6,66,766	4,70,655	11,446	1,84,665	-
106	SERB-DR.RAJENDAR GORETI/ ECR/2016/001580	49,482	-	97,833	1,47,315	1,42,000	-	5,315	-
107	SERB-DR.RAMESH CH.NATH0 CRG/2019/000960	3,42,973	-	12,25,131	15,68,104	10,70,376	-	4,97,728	-
108	SERB-DR.RAMESH RASAPPAN-EMR/2015/001103	89,934	-	2,722	92,656	-	-	92,656	-
109	SERB-DR RAVI PANT-CRG/2019/000993	31,12,160	-	5,81,459	36,93,619	3,48,059	27,61,834	5,83,726	-
110	SERB-DR.RAVI PANT-EMR/2015/000363	75,190	-	7,317	82,507	(1,66,633)	-	2,49,140	-
111	SERB-DR.SADANADA SINGH-EEQ/2018/001090	2,26,963	-	7,65,234	9,92,197	9,09,200	-	82,997	-
112	SERB-DR.SAIKAT-MTR/2018/000528	2,03,475	-	1,03,609	3,07,084	2,98,886	-	8,198	-
113	SERB-DR.SARBESWAR PAL-EMR/2015/002172	18,837	-	347	19,184	14,999	-	4,185	-
114	SERB-DR.SOURAV BISWAS-PDF/2020/001085	6,47,486	-	9,12,494	15,59,980	10,89,881	-	4,70,099	-
115	SERB-DR.SRINIVASA MURTY/ EMR/2016/008048	2,68,218	-	6,776	2,74,994	92,444	-	1,82,550	-

(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)
Sl. No	Name of the Project	Opening Balance 2020-21		Receipts / Recoveries during the year	Total	Expenditure during the year		Closing Balance 2021-22	
		Credit	Debit			Recurring	Capital	Credit	Debit
116	SERB-DR SUBRATA KUNDU-CRG/2021/001174	-	-	19,50,193	19,50,193	4,81,364	-	14,68,829	-
117	SERB-DR.SUBRATAKUNDU-ECR/2017/003200	1,17,199	-	(74,999)	42,200	41,473	-	727	-
118	SERB-DR SUDARSHAN KUMAR-MTR/2017/000649	11,858	-	356	12,214	2,03,999	-	-	1,91,785
119	SERB-DR.SUHESH KUMAR/ ECR/2016/001232	1,26,525	-	3,828	1,30,353	-	-	1,30,353	-
120	SERB-DR.SUKHENDU MANDAL-EMR/2016/007501	3,60,485	-	(2,83,644)	76,841	55,843	-	20,998	-
121	SERB-DR.SUMIT MOHANTY/ MTR/2017/000458	-	12,524	226	(12,298)	-	-	-	12,298
122	SERB-DR.TAPAS K MANNA-EMR/2016/001562	12,777	-	387	13,164	-	-	13,164	-
123	SERB-DR TAPAS KUMAR MANNA-CRG/2020/002452	20,63,300	-	40,784	21,04,084	19,85,895	-	1,18,189	-
124	SERB-DR.THIRUMURUGAN.A-EMR/2016/002637	3,37,605	-	(2,36,391)	1,01,214	1,01,214	-	-	-
125	SERB-DR TUHIN MAITY-SRG/2021/000423	-	-	28,57,925	28,57,925	1,90,000	-	26,67,925	-
126	SERB-DR.UTPAL MANNA-MTR/2018/000034	86,518	-	2,03,317	2,89,835	2,25,580	-	64,255	-
127	SERB-DR. VEERA REDDY YATHAM	-	-	25,00,854	25,00,854	2,18,220	1,49,964	21,32,670	-
128	SERB-DR.VINAYAK B KAMBLE-EEQ/2018/000769	3,08,821	-	4,14,783	7,23,604	6,49,541	63,000	11,063	-

(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)
Sl. No	Name of the Project	Opening Balance 2020-21		Receipts / Recoveries during the year	Total	Expenditure during the year		Closing Balance 2021-22	
		Credit	Debit			Recurring	Capital	Credit	Debit
129	SERB-DR.V.SIVARANJANA-ECR/2016/000226	6,926	-	210	7,136	-	-	7,136	-
130	SERB-IMPRINT DR GEORGE THOMAS SR/S9/Z-05/2015	16,75,572	-	43,783	17,19,355	7,94,080	-	9,25,275	-
131	SERB-IPA-000070 DR V STALIN RAJ	46,76,253	-	27,24,662	74,00,915	18,58,096	29,78,504	25,64,315	-
132	SERB-MS.RESHMA BASAK-PDF/2020/000943	8,00,364	-	15,182	8,15,546	7,88,932	-	26,614	-
133	SERB-MS.SHRUTI SURIYAKUMAR-PDF/2020/000209	7,58,413	-	9,45,009	17,03,422	10,02,723	-	7,00,699	-
134	SERB-DR RAJEEV N KINI-IPA/2020/000021	19,88,979	-	60,884	20,49,863	3,45,915	-	17,03,948	-
135	SERB-DR UTPAL MANNA-MSC/2020/000029	3,72,252	-	10,092	3,82,344	3,66,072	-	16,272	-
136	SERB-VINESH VIJAYAN-CRG/2019/004880	1,43,455	-	7,15,766	8,59,221	7,29,660	-	1,29,561	-
137	SERB-WOS-A-SMITHA VISHNU-LS-457/2017(G)	51,607	-	8,77,296	9,28,903	9,09,454	-	19,449	-
138	SPARC-DR.NISHANT K T	8,47,429	-	25,920	8,73,349	1,13,265	-	7,60,084	-
139	STARS/APR2019/PS/363/FS- DR MADHU THALAKULAM	5,25,869		1,99,391	7,25,260	4,10,795	-	3,14,465	-
140	STARS-DR AJAY VENUGOPAL-APR2019/CS/250/FS	-	52,013	2,47,116	1,95,103	1,87,637	-	7,466	-
141	STARS- DR RAMANATHAN NATESH-STARS/APR2019/BS/726/FS	5,89,601	-	5,06,095	10,95,696	5,56,275	2,67,750	2,71,671	-

(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)
Sl. No	Name of the Project	Opening Balance 2020-21		Receipts / Recoveries during the year	Total	Expenditure during the year		Closing Balance 2021-22	
		Credit	Debit			Recurring	Capital	Credit	Debit
142	UGC-UKEIRI-JOYMITRA-184-16/2017(IC)	65,219	-	1,695	66,914	30,523	-	36,391	-
143	WT-DBT-DR.SATISH KHURANA-IA/1/15/2/502061	26,13,051	-	25,85,094	51,98,145	40,80,290	-	11,17,855	-
144	WT-DBT-NISHA KANNAN/1A/E/15/1/502329	13,46,177	-	9,86,514	23,32,691	17,99,735	2,77,500	2,55,456	-
145	WT-DR POONAM THAKUR	8,26,059	-	19,47,214	27,73,273	13,06,179	1,49,553	13,17,541	-
146	WT-SABARI SANKAR THIRUPATHY	1,02,95,461	-	41,52,030	1,44,47,491	68,67,064	41,29,095	34,51,332	-
147	CSIR-DR SUKHENDU MANDAL-CSIR-01 (3024)/21/EMR-11	-	-	2,00,000	2,00,000	2,892	-	1,97,108	-
148	DBT-DR RAJENDRA KURAPATI-RLF-24/2020	-	-	18,13,700	18,13,700	-	-	18,13,700	-
149	DBT-DR.REJI VARGHESE-BT/PR30172/MNT/28/1593/2018	7,32,170	-	14,33,876	21,66,046	11,85,688	-	9,80,358	-
150	CHANAKYA FELLOWSHIP-DR MANIK BANIK-PDF-2021-22/008	-	-	12,64,557	12,64,557	-	-	12,64,557	-
151	MOMENTIVE PERFORMANCE-DR M M SHAIJUMON	-	-	15,59,272	15,59,272	3,46,804	-	12,12,468	-
152	NPDF- DR SUJAY KUMAR NANDI-PDF/2021/002015	-	-	10,65,600	10,65,600	-	-	10,65,600	-
153	SERB-DR AMAL MEDHI-CRG/2021/005792	-	-	15,94,047	15,94,047	-	-	15,94,047	-
154	SERB-DR BIKAS C DAS-CRG/2021/000567	-	-	26,18,369	26,18,369	1,62,953	-	24,55,416	-

(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)
Sl. No	Name of the Project	Opening Balance 2020-21		Receipts / Recoveries during the year	Total	Expenditure during the year		Closing Balance 2021-22	
		Credit	Debit			Recurring	Capital	Credit	Debit
155	SERB- DR BIKAS C DAS-EEQ/2021/000810	-	-	44,84,668	44,84,668	1,60,000	-	43,24,668	-
156	SERB-DR DEEPSHIKA JAISWAL NAGAR- CRG/2021/001262	-	-	74,05,500	74,05,500	2,50,000	-	71,55,500	-
157	SERB-DR K R ARUN-CRG/2021/004078	-	-	10,87,399	10,87,399	80,066	-	10,07,333	-
158	SERB-DR.KUMARAGURUBARAN-CRG/2021/000935	-	-	26,40,000	26,40,000	-	-	26,40,000	-
159	SERB-DR MANOJ NAMBOOTHIRY-CRG/2021/003874	-	-	56,38,017	56,38,017	2,53,740	-	53,84,277	-
160	SERB-DR M M SHAIJUMON-CRG/2021/006246	-	-	35,02,000	35,02,000	-	-	35,02,000	-
161	SERB-DR RANI ALPHONSA JOSE-TAR/2021/000384	-	-	3,35,000	3,35,000	25,000	-	3,10,000	-
162	SERB-DR SHEETAL DHARMATTI-CRG/2021/008278	-	-	7,24,953	7,24,953	55,466	-	6,69,487	-
163	SERB-DR SUBOJ BABYKUTTY-TAR/2021/000147	-	-	3,35,000	3,35,000	25,000	-	3,10,000	-
164	SERB-SENTHILKUMAR D V-CRG/2021/000816	-	-	12,53,869	12,53,869	95,480	-	11,58,389	-
165	SHAIJUMON-IC-MAP (INTEGRATED CLEAN ENERGY)	-	-	71,12,268	71,12,268	1,06,976	-	70,05,292	-
		25,03,09,713	**10,44,738**	**15,89,40,382**	**40,82,05,357**	**8,01,24,482**	**6,48,45,750**	**26,39,34,172**	**6,99,046**

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2022

SCHEDULE 3 (B)-SPONSORED FELLOWSHIPS AND SCHOLARSHIPS

Amount in ₹

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sl. No	Name of the Sponsor	Opening Balance as on 01-04-2021		Transactions during the year		Closing Balance as on 31-03-2022	
		Credit	Debit	Credit	Debit	Credit	Debit
1	DST - INSPIRE - BSMS/ PHD	1,12,22,867		70,54,010	1,07,40,993	75,35,884	
2	CSIR (Ph D Research Scholars)	20,60,269		1,97,667	4,99,018	17,58,918	
3	UGC (Ph D Research Scholars)	6,96,519			1,75,216	5,21,303	
4	DBT (Ph D Research Scholar)		83,750	9,59,226	8,19,130	56,346	
5	PMRF (Ph D Research Scholars)	2252484.00		16329677.00	17576667.00	10,05,494	
6	ICMR FELLOWSHIP (Ph D Research Scholars)			261333.00	248000.00	13,333	
	Total	1,62,32,139	83,750	2,48,01,913	3,00,59,024	1,08,91,278	-

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2022

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

Amount in ₹

Particulars	2021-22	2020-21
A. Plan grants: Government of India (MoE)		
Balance B/F	1,49,28,01,786	1,58,90,28,180
Add: Receipts during the year	1,14,04,60,000	60,50,00,000
Total (a)	2,63,32,61,786	2,19,40,28,180
Less Refunds		
Less: Utilized for Revenue Expenditure	63,94,78,694	59,30,02,805
Less: Utilized for Capital Expenditure	1,70,58,09,847	10,82,23,589
Total (b)	2,34,52,88,541	70,12,26,394
Unutilized carried forward (a-b)	**28,79,73,245**	**1,49,28,01,786**
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
Unutilized carried forward (c-d)		
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
Unutilized carried forward (e-f)		
D. Grants from State Govt.		
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
Unutilized carried forward (g-h)		
Grand Total (A+B+C+D)	**28,79,73,245**	**1,49,28,01,786**

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2022

SCHEDULE 4 - FIXED ASSETS

Amount in ₹

S.No.	DESCRIPTION	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2021	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Depreciation for the year	Deductions / Adjustment	Total Depreciation	31-03-2022	31-03-2021
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:	2,41,56,20,813	4,15,07,84,404		6,56,64,05,217	2.00%	20,11,53,060	13,13,28,104		33,24,81,164	6,23,39,24,053	2,21,44,67,753
4	Roads & Bridges	7,33,41,681	77,40,722		8,10,82,403	2.00%	85,12,345	16,21,648		1,01,33,993	7,09,48,410	6,48,29,336
5	Tubes & Water Supply	11,28,215	-		11,28,215	2.00%	67,692	22,564		90,256	10,37,959	10,60,523
6	Sewage & Drainage	-	-		-	2.00%	-	-		-	-	-
7	Electrical Installation and equipment	4,29,59,228	1,77,30,125		6,06,89,353	5.00%	1,23,32,650	30,32,807		1,53,65,457	4,53,23,896	3,06,26,578
8	Plant and Machinery	5,39,03,468	-		5,39,03,468	5.00%	1,98,75,551	26,95,173		2,25,70,724	3,13,32,743	3,40,27,917
9	Scientific & Laboratory Equipment	2,22,07,10,795	7,87,87,435		2,29,94,98,230	8.00%	1,01,80,06,299	18,34,16,244		1,20,14,22,543	1,09,80,75,687	1,20,27,04,496

S.No.	DESCRIPTION	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2021	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Depreciation for the year	Deductions / Adjustment	Total Depreciation	31-03-2022	31-03-2021
10	Office Equipment	79,67,610	21,93,740		1,01,61,350	7.50%	17,05,466	7,62,101		24,67,567	76,93,783	62,62,144
11	Audio Visual Equipment	1,18,462	5,08,700		6,27,162	7.50%	21,144	47,037		68,181	5,58,981	97,318
12	Computers & Peripherals	17,77,44,130	22,96,297		18,00,40,427	20.00%	13,99,40,176	1,86,27,917		15,85,68,092	2,14,72,334	3,78,03,954
13	Furniture, Fixtures and Fittings	23,24,47,171	4,44,19,913		27,68,67,084	7.50%	8,12,20,841	2,04,83,626		10,17,04,467	17,51,62,617	15,12,26,330
14	VEHICLES	38,87,817	-		38,87,817	10.00%	18,31,852	3,18,677		21,50,529	17,37,288	20,55,965
15	Library Books & Scientific Journals	2,59,36,194	9,86,025		2,69,22,219	10.00%	2,15,85,753	11,10,253		2,26,96,006	42,26,213	43,50,441
16	Small Value Assets											-
	TOTAL (A)	5,25,67,20,091	4,30,54,47,361	-	9,56,21,67,452		1,50,62,52,829	36,34,66,152	-	1,86,97,18,981	7,69,24,48,471	3,75,04,67,262
17	CAPITAL WORK-IN PROGRESS - Construction	2,57,59,41,863	4,87,01,160	2,62,46,43,023	-						-	2,57,59,41,863
18	CAPITAL WORK-IN PROGRESS - Lab Equipment	6,59,91,572	93,93,564	5,51,72,660	2,02,12,476						2,02,12,476	6,59,91,572
	CAPITAL WORK IN PROGRESS (B)	2,64,19,33,435	5,80,94,724	2,67,98,15,683	2,02,12,476						2,02,12,476	2,64,19,33,435
	TOTAL A+B										7,71,26,60,947	6,39,24,00,697

INTANGIBLE ASSETS

S.No.	INTANGIBLE ASSETS	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2021	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Amortization for the year	Deductions / Adjustment	Total Amortization / Adjustments	31-03-2022	31-03-2021
18	Computer Software	2,12,47,283	2,54,400	-	2,15,01,683	40.00%	2,06,96,318	5,78,810	-	2,12,75,129	2,26,554	5,50,965
19	E-Journals	45,82,11,433	2,18,29,045	-	48,00,40,478	40.00%	43,23,17,800	2,90,32,890	-	46,13,50,690	1,86,89,788	2,58,93,633
20	Patents	3,23,850	-	-	3,23,850	9 Years	75,205	35,983	-	1,11,188	2,12,662	2,48,645
	TOTAL -(C)	47,97,82,566	2,20,83,445	-	50,18,66,011		45,30,89,323	2,96,47,684	-	48,27,37,007	1,91,29,004	2,66,93,243
	GRAND TOTAL (A+B+C)	8,37,84,36,092	4,38,56,25,530	2,67,98,15,683	10,08,42,45,939		1,95,93,42,152	39,31,13,836	-	2,35,24,55,988	7,73,17,89,951	6,41,90,93,940

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2022

SCHEDULE 4 A - FIXED ASSETS (PLAN)

Amount in ₹

S.No.	DESCRIPTION	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2021	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Depreciation for the year	Deductions / Adjustment	Total Depreciation	31-03-2022	31-03-2021
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:	2,41,56,20,813	4,15,07,84,404		6,56,64,05,217	2.00%	20,11,53,060	13,13,28,104		33,24,81,164	6,23,39,24,053	2,21,44,67,753
4	Roads & Bridges	7,33,41,681	77,40,722		8,10,82,403	2.00%	85,12,345	16,21,648		1,01,33,993	7,09,48,410	6,48,29,336
5	Tubes & Water Supply	11,28,215	-		11,28,215	2.00%	67,692	22,564		90,256	10,37,959	10,60,523
6	Sewage & Drainage	-	-		-	2.00%	-	-		-	-	-
7	Electrical Installation and equipment	4,29,59,228	1,77,30,125		6,06,89,353	5.00%	1,23,32,650	30,32,807		1,53,65,457	4,53,23,896	3,06,26,578

S.No.	DESCRIPTION	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2021	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Depreciation for the year	Deductions / Adjustment	Total Depreciation	31-03-2022	31-03-2021
8	Plant and Machinery	5,39,03,468	-		5,39,03,468	5.00%	1,98,75,551	26,95,173		2,25,70,724	3,13,32,743	3,40,27,917
9	Scientific & Laboratory Equipment	2,22,07,10,795	7,87,87,435		2,29,94,98,230	8.00%	1,01,80,06,299	18,34,16,244		1,20,14,22,543	1,09,80,75,687	1,20,27,04,496
10	Office Equipment	79,67,610	21,93,740		1,01,61,350	7.50%	17,05,466	7,62,101		24,67,567	76,93,783	62,62,144
11	Audio Visual Equipment	1,18,462	5,08,700		6,27,162	7.50%	21,144	47,037		68,181	5,58,981	97,318
12	Computers & Peripherals	17,77,44,130	22,96,297		18,00,40,427	20.00%	13,99,40,176	1,86,27,917		15,85,68,092	2,14,72,334	3,78,03,954
13	Furniture, Fixtures and Fittings	23,24,47,171	4,44,19,913		27,68,67,084	7.50%	8,12,20,841	2,04,83,626		10,17,04,467	17,51,62,617	15,12,26,330
14	VEHICLES	38,87,817	-		38,87,817	10.00%	18,31,852	3,18,677		21,50,529	17,37,288	20,55,965
15	Library Books & Scientific Journals	2,59,36,194	9,86,025		2,69,22,219	10.00%	2,15,85,753	11,10,253		2,26,96,006	42,26,213	43,50,441
16	Small Value Assets											-
	TOTAL (A)	5,25,67,20,091	4,30,54,47,361	-	9,56,21,67,452		1,50,62,52,829	36,34,66,152	-	1,86,97,18,981	7,69,24,48,471	3,75,04,67,262
17	CAPITAL WORK-IN PROGRESS - Construction	2,57,59,41,863	4,87,01,160	2,62,46,43,023	-						-	2,57,59,41,863

S.No.	DESCRIPTION	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2021	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Depreciation for the year	Deductions / Adjustment	Total Depreciation	31-03-2022	31-03-2021
17	CAPITAL WORK-IN PROGRESS - Lab Equipment	6,59,91,572	93,93,564	5,51,72,660	2,02,12,476						2,02,12,476	6,59,91,572
	CAPITAL WORK IN PROGRESS (B)										2,02,12,476	2,64,19,33,435
	TOTAL A+B										7,71,26,60,947	6,39,24,00,697

INTANGIBLE ASSETS

S.No.	DESCRIPTION	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2021	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Amortization for the year	Deductions / Adjustment	Total Amortization / Adjustments	31-03-2022	31-03-2021
18	Computer Software	2,12,47,283	2,54,400	-	2,15,01,683	40.00%	2,06,96,318	5,78,810	-	2,12,75,129		
19	E-Journals	45,82,11,433	2,18,29,045	-	48,00,40,478	40.00%	43,23,17,800	2,90,32,890	-	46,13,50,690	1,86,89,788	2,58,93,633
20	Patents	3,23,850	-	-	3,23,850	9Years	75,205	35,983	-	1,11,188	2,12,662	2,48,645
	TOTAL -(C)	47,97,82,566	2,20,83,445	-	50,18,66,011		45,30,89,323	2,96,47,684	-	48,27,37,007	1,91,29,004	2,66,93,243
	GRAND TOTAL (A+B+C)	8,37,84,36,092	4,38,56,25,530	2,67,98,15,683	10,08,42,45,939		1,95,93,42,152	39,31,13,836	-	2,35,24,55,988	7,73,17,89,951	6,41,90,93,940

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2022

SCHEDULE 4 A - FIXED ASSETS (PLAN)

Amount in ₹

S.No.	DESCRIPTION	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2021	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Depreciation for the year	Deductions / Adjustment	Total Depreciation	31-03-2022	31-03-2021
TANGIBLE ASSETS												
1	LAND:											
	a) Freehold											
	Land obtained from Govt											
	Vithura											
2	Site Development											
3	BUILDINGS:											
4	Roads & Bridges											
5	Tubes & Water Supply											
6	Sewage & Drainage											
7	Electrical Installation and equipment											
8	Plant and Machinery											
9	Scientific & Laboratory Equipment											
10	Office Equipment											
11	Audio Visual Equipment											
12	Computers & Peripherals											
13	Furniture, Fixtures and Fittings											
14	VEHICLES											
15	Library Books & Scientific Journals											
16	Small Value Assets											
	TOTAL (A)	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL
17	CAPITAL WORK-IN PROGRESS (B)											

INTANGIBLE ASSETS													
S.No.	DESCRIPTION	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2021	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Depreciation for the year	Deductions / Adjustment	Total Depreciation	31-03-2022	31-03-2021
18	Computer Software											
19	E-Journals											
20	Patents											
	TOTAL -(C)											
	GRAND TOTAL (A+B+C)	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2022

SCHEDULE 4 C - INTANGIBLE ASSETS

Amount in ₹

INTANGIBLE ASSETS												
S.No.	DESCRIPTION	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2021	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Depreciation for the year	Deductions / Adjustment	Total Depreciation	31-03-2022	31-03-2021
18	Computer Software											
19	E-Journals											
20	Patents											
	TOTAL -(C)											
	GRAND TOTAL (A+B+C)	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2022

SCHEDULE 4C (i)- PATENTS AND COPYRIGHTS

Amount in ₹

Description	Op. Balance	Addition	Gross	Amortization	Net Block 2021-22	Net Block 2020-21
A. Patents Granted						
1. Balance as on 31-03-2022 of patents obtained in (Original value- Rs. ……../-						
2. Balance as on 31-03-2022 of patents obtained in Original value- Rs. ……../-						
3. Balance as on 31-03-2022 of patents obtained in (Original value- Rs. ……../-						
4. Patents granted during the Current Year						
TOTAL	NIL	NIL	NIL	NIL	NIL	NIL

Description	Op. Balance	Addition	Gross	Patents Granted/ Rejected	Net Block 2021-22	Net Block 2020-21
B. Patents Pending in respect of Patent applied for						
TOTAL	--	-	-	-	-	-
C. Grand Total (A+B)	NIL	NIL	NIL	NIL	NIL	NIL

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2022

SCHEDULE 4 D FIXED ASSETS (OTHERS)

S.No.	DESCRIPTION	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2021	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Depreciation for the year	Deductions / Adjustment	Total Depreciation	31-03-2021	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	8,04,94,287	6,00,54,350	1,54,367	14,03,94,270	8.00%	78,72,358	1,12,31,542		1,91,03,900	12,12,90,370	7,26,21,929
10	Office Equipment	-			-	7.50%	-			-		-

S.No.	DESCRIPTION	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2021	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Depreciation for the year	Deductions / Adjustment	Total Depreciation	31-03-2021	31-03-2022
11	Audio Visual Equipment	59,832	7,99,050		8,58,882	7.50%	8,974	64,416		73,390	7,85,492	50,858
12	Computers & Peripherals	26,21,110	46,31,847	4,85,130	67,67,827	20.00%	10,48,444	13,53,565		24,02,009	43,65,818	15,72,666
13	Furniture, Fixtures and Fittings	66,400			66,400	7.50%	9,960	4,980		14,940	51,460	56,440
14	VEHICLES	-			-	10.00%	-			-		-
15	Library Books & Scientific Journals	-			-	10.00%	-			-		-
16	Small Value Assets											-
	TOTAL (A)	8,32,41,629	6,54,85,247	6,39,497	14,80,87,379		89,39,736	1,26,54,503	-	2,15,94,239	12,64,93,140	7,43,01,893
17	CAPITAL WORK-IN PROGRESS (B)											

S.No.	INTANGIBLE ASSETS	GROSS BLOCK				DEPRECIATION					NET BLOCK	
		Opening Balance as on 01-04-2021	Additions	Deductions	Closing Balance	Rate of Depreciation	Opening Balance	Depreciation for the year	Deductions / Adjustment	Total Depreciation	31-03-2021	31-03-2022
18	Computer Software											
19	E-Journals											
20	Patents											
	TOTAL -(C)	-	-	-	-		-	-	-	-		--
	GRAND TOTAL (A+B+C)	8,32,41,629	6,54,85,247	6,39,497	14,80,87,379	-	89,39,736	1,26,54,503	-	2,15,94,239	12,64,93,140	7,43,01,893

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2022

SCHEDULE 5- INVESTMENTS

Amount in ₹

INVESTMENTS FROM EARMARKED/ENDOWMENT FUNDS	2021-22	2020-21
1. In Central Government Securities		
2. In State Government Securities		
3. Other approved Securities		
4. Shares		
5. Debentures and Bonds		
6. Term Deposits with bank		
7. Others (to be specified)		
TOTAL	NIL	NIL

SCHEDULE 5(A)- INVESTMENTS FROM EARMARKED/ ENDOWMENT FUNDS (FUND WISE)

Particulars	2021-22	2020-21
1. Endowment Fund Investment		
TOTAL	NIL	NIL

SCHEDULE 6- INVESTMENTS OTHERS

Particulars	2021-22	2020-21
1. In Central Government Securities		
2. In State Government Securities		
3. Other approved Securities		
4. Shares		
5. Debentures and Bonds		
6. Others (to be specified)		
TOTAL	NIL	NIL

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2022

SCHEDULE 7- CURRENT ASSETS

Amount in ₹

Particulars	Sub Sch. No.	2021-22	2020-21
1. Stock			
a) Stores and Spares			
b) Loose Tools			
c) Publications			
d) Laboratory Chemicals, consumables and glass wares			
e) Building materials			
f) Electrical materials			
g) Stationery	3	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	13,65,966	8,47,800
-On Term Deposit Accounts (includes margin money)	2	91,77,80,468	64,15,15,700
-On Savings Accounts	2	6,76,77,389	3,97,59,046
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	5,91,31,642	7,85,15,413
-On Savings Accounts	2	26,13,33,814	21,34,33,120
b) With non-Scheduled Banks:			
-On Current Accounts			
-On Term Deposit Accounts			
-On Savings Accounts			
5. Post Office- Savings Accounts			
		1,30,75,56,476	**97,40,71,079**

SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31st MARCH 2022

SCHEDULE 8- LOANS, ADVANCES & DEPOSITS

Amount in ₹

Particulars	Sub Sch. No.	2021-22	2020-21
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	76,42,76,851	2,17,28,28,080
4. Prepaid Expenses			
a) Insurance			
b) Other Expenses	4	28,94,373	50,21,071
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	2,29,92,453	2,18,13,253
7. Other Current Assets Recievables			
a) Debit balances in sponsered projects	9	6,99,046	10,44,737
b) Debit balances in fellowship & scholarships			
c) Grants recoverable			
d) Other recievables			
e) TDS	8	6,68,267	3,04,488
8. Claims Receivable	7	6,17,34,197	8,68,83,506
TOTAL		**85,32,65,187**	**2,28,78,95,135**

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2022

SCHEDULE 9- ACADEMIC RECEIPTS

Amount in ₹

Particulars	2021-22	2020-21
FEE FROM STUDENTS		
Acadamic		
a) Tuition fee	8,12,00,715	5,56,46,167
b) Admission fee		
c) Enrolment fee		
d) Library fee	7,94,340	75,349
e) Laboratory fee		
f) Art & Craft fee		
g) Registration fee	7,31,365	5,57,275
h) Syllabus fee		
i) Other Receipts	20,83,200	2,28,447
j) Alumini Fee	2,07,250	74,250
TOTAL (A)	**8,50,16,870**	**5,65,81,488**
Examinations		
a) Admission test fee		
b) Annual examination fee	8,89,465	6,37,283
c) Mark sheet, Certificate fee		
d) Entrance Examination fee		
TOTAL (B)	**8,89,465**	**6,37,283**
Other Fee		
a) Identity Card fee		
b) Fine/ Miscellaneous fee	11,500	
c) Medical fee	5,99,993	
d) Transportation fee		
e) Hostel Fee	5,10,410	4,63,192
f) Mess Establishment		3,04,500
TOTAL (C)	**11,21,903**	**7,67,692**
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 Accademic Receipts		
a) Registration fee for workshops programmes		
b) Registration fees (Academic Staff College)		
GRAND TOTAL (A+B+C+D)	**8,70,28,238**	**5,79,86,463**

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2022

SCHEDULE 10- GRANTS / SUBSIDIES

Amount in ₹

Particulars		2021-22	2020-21
GRANTS/ SUBSIDIES			
(Irrevocable Grants & Subsidies Received)			
Balance B/F		1,49,28,01,786	1,58,90,28,180
ADD: Receipts During the Year			
Capital Grant			60,50,00,000
General	30,20,00,000		
SC	3,02,00,000		
ST	1,37,60,000	34,59,60,000	
Revenue Grant			
General	71,09,00,000		
SC	5,14,00,000		
ST	3,22,00,000	79,45,00,000	
		2,63,32,61,786	**2,19,40,28,180**
Less: Capital Expenses Incurred during the year		1,70,58,09,847	10,82,23,589
Less: Closing Unspent balance of grant		28,79,73,245	1,49,28,01,786
		63,94,78,694	**59,30,02,805**
TOTAL		**63,94,78,694**	**59,30,02,805**

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2022

SCHEDULE 11- INCOME FROM INVESTMENTS

Amount in ₹

Particulars	Earmarked or Endownment funds		Other investments	
	2021-22	2020-21	2021-22	2020-21
1) Interest				
a) On Govt. Securities				
b) Other Bonds/Debentures				
2) Interest on term deposits				
3) Income Accrued but not due on term deposits or interest bearing advances to employees				
4) Interest on Savings Bank Accounts				
5) Others (Specify)	t			
TOTAL	NIL	NIL	NIL	NIL
TRANSFERRED TO EARMARKED/ENDOWMENT FUNDS				
Balance	NIL	NIL	NIL	NIL

SCHEDULE 12- INTEREST EARNED

Amount in ₹

Particulars	2021-22	2020-21
1) On Savings Accounts with scheduled banks		
2) On Loans		
a. Employees/ Staff		
b. Others		
3) On debtors and others receivables		
TOTAL	NIL	NIL

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2022

SCHEDULE 13-OTHER INCOME

Amount in ₹

Particulars	2021-22	2020-21
A. Income from Land & Building		
a) Hostel room rent	89,24,435	40,53,966
b) License fee	9,65,002	7,45,044
c) Hire charges of Auditorium/ Play ground / Convention Centre, Etc		
d) Electricity Charges recovered	16,38,016	3,59,750
e) Water Charges recovered		
Total	1,15,27,453	51,58,760
B. Sale of Institutes Publications		
Total	-	-
C. Income from Holding Events		
a) Gross receipts from annual function/ sports carnival		
Less: Direct expenditure incurredon the annual function/ sports carnival		
b) Gross receipts from fetes		
Less: Direct expenditure incurred on fetes		
c) Gross receepts on educational tours		
Less: Direct expenditure incurred on tours		
d) Others (to be specify and separately disclosed)		
Total	-	-
D. Interest On Term Deposits:		
a) With Scheduled Banks	2,14,87,783	4,08,22,297
b) With Non-Scheduled Banks		
c) With Institutions		
d) Others		
Total	2,14,87,783	4,08,22,297
E. Interest On Savings Accounts:		
a) With Scheduled Banks	12,43,561	6,23,274
b) With Non-Scheduled Banks		
c) With Institutions		
d) Others		
Total	12,43,561	6,23,274

Particulars	2021-22	2020-21
F. On Loans:		
a) Employees/Staff		
b) Others		
Total	-	-
G.Interest on Debtors and Other Receivables		
Total	-	-
H. Others		
a) Income from consultancy		
b) RTI Fees	120	85
c) Income from royalty		
d) Sale of application form	8,85,500	5,75,250
e) Misc. reciepts (Sale of tender form, waste paper, etc.)	54,25,642	55,74,924
f) Profit on sale/ disposal of Assets		
1. Owned asset		
2. Assets aquired out of grants, or received free of cost		
g) Other Incomes		
Total	63,11,262	61,50,259
GRAND TOTAL (A+B+C+D+E+F+G+H)	**4,05,70,059**	**5,27,54,590**

SCHEDULE 14 : PRIOR PERIOD INCOME

Amount in ₹

Particulars	2021-22	2020-21
1. Academic Receipts		
2. Income from investments		
3. Interest earned		
4. Other Income	1,38,364	
Total	1,38,364	NIL

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2022

SCHEDULE 15- STAFF PAYMENT & BENEFITS

Amount in ₹

Particulars	2021-22	2020-21
a) Salaries and Wages		
Faculty	17,94,44,506	14,81,73,049
Non Faculty	5,80,93,090	4,99,18,679
b) Allowances and Bonus	10,42,800	60,18,711
c) Contribution to Provident Fund		-
d) Contribution to Other Fund (Leave Salary & NPS Employer Share)	3,09,09,437	2,76,70,601
e) Staff Welfare Expenses		-
f) Retirement and Terminal Benefits		-
g) LTC facility	40,34,444	32,08,974
h) Medical facility	31,39,432	23,42,495
i) Children Education Allowance	25,40,677	26,79,750
j) Honorarium		-
k) Others	57,49,967	1,43,38,494
TOTAL	28,49,54,353	25,43,50,753

SCHEDULE 15 A- EMPLOYEES RETIREMENT AND TERMINAL BENEFITS

Amount in ₹

Particulars	Pension	Gratuity	Leave Encashment	Total
Opening balance as on 01.04.2021			8,69,15,271.00	8,69,15,271
Additions: Capitalized value of contributions Received from other Organizations				
Total (a)			8,69,15,271.00	8,69,15,271.00
Less: Actual Payment during the Year (b)				
Balance available as on 31-03-2022 C (a-b)			8,69,15,271.00	8,69,15,271.00
Provision required on 31-03-2022 - As per Actuarial Valuation (d)				
A. Provision to be made in the curent year (d-c)			2,48,74,363.00	2,48,74,363.00
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)	NIL	NIL	11,17,89,634	11,17,89,634

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2022

SCHEDULE 16- ACADEMIC EXPENSES

Amount in ₹

Particulars	2021-22	2020-21
a) Laboratary Expenses	4,37,33,037	3,13,99,562
b) Field Work/ Participation		
c) Expenses on Seminar/ Workshop		
d) Payment to visiting faculty		
e) Examination		
f) Student welfare expense		
g) Admission expenses		
h) Convocation expense	9,64,805	2,740
i) Publication		
j) Stipend/ means-cum-merit scholarship	8,01,45,695	6,72,34,394
k) Subscription Expense		
l) Others (Specify)		
TOTAL	12,48,43,537	9,86,36,696

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2022

SCHEDULE 17- ADMINISTRATIVE AND GENERAL EXPENSES

Amount in ₹

Particulars	2021-22	2020-21
A. Infrastructure		
a) Electricity and power	5,73,22,860	5,39,24,418
b) Water charges	15,940	7,010
c) Insurance	16,811	-
d) Rent, Rates and Taxes	2,59,256	-
B. Communication		
e) Postage & Telegram	45,103	1,23,586
f) Telephone and Internet Charges	39,45,315	29,66,503
C. Others		
g) Printing and Stationary	7,65,096	10,75,336
h) Travelling and Conveyance Expenses	29,02,110	17,10,933
i) Expenses on Seminar/Workshops	4,61,126	2,10,927
j) Hospitality	9,743	-
k) Auditors Remuneration	5,47,600	1,97,210
l) Professional Charges		-
m) Advertisement and Publicity	4,53,640	6,25,715
n) Magazine & Journals		-
o) Others (specify)		
Sports / Cultural Festival / Celeberation expense	15,96,843	2,40,869
Consumables	52,06,481	1,02,42,604
Cable TV Charges		38,829
Newspaper & Periodicals	48,057	42,984
Software License fees		61,621
Publication charges	5,90,412	3,29,259
Manpower charges	7,87,72,941	6,49,07,724
Guest house and other expenses	12,08,554	7,82,689
Other Adminstrative / Miscellaneous Expenses	54,40,469	57,32,084
Legal and consultancy charges	1,93,317	50,80,652
Expenses related to COVID 19	4,27,251	13,86,356
Medical Centre - Consumables&Medicines		49,391
Running of Generator Set	22,72,509	1,476
IT recurring expenses for service	37,24,710	48,12,006
TOTAL	16,62,26,144	15,45,50,182

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2022

SCHEDULE 18- TRANSPORTATION EXPENSES

Amount in ₹

Particulars	2021-22	2020-21
1. Vehicles (owned by educational institution)		
a) Running expense	5,75,193	4,68,525
b) Repairs & Maintanence	1,38,785	2,91,087
c) Insurance Expenses	71,432	46,621
2. Vehicles taken on rent		
a) Rent/ Lease expenses	48,04,934	52,72,460
3. Vehicle (Taxi) Hiring expenses		
TOTAL	55,90,344	60,78,693

SCHEDULE 19- REPAIRS & MAINTANENCE

Amount in ₹

Particulars	2021-22	2020-21
a) Building	3,06,37,745	4,06,63,340
b) Furniture & Fixtures	57,83,824	72,78,041
c) Plant & Machinary	1,96,65,003	2,94,30,762
d) Office Equipments	16,525	34,776
e) Computers		
f) Laboratory & Scientific equipment	17,35,147	13,91,672
g) Audio Visual equipment		
h) Cleaning Material & Services		
i) Book binding charges		
j) Gardening		
k) Estate Maintenance		
f) Others (Specify)		
TOTAL	5,78,38,244	7,87,98,591

SCHEDULES FORMING PART OF INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDING 31st MARCH 2022

SCHEDULE 20- FINANCE COSTS

Amount in ₹

Particulars	2021-22	2020-21
a) Bank Charges	26,072	5,87,890
b) Others (specify)		
TOTAL	26,072	5,87,890

SCHEDULE 21- OTHER EXPENSES

Amount in ₹

Particulars	2021-22	2020-21
a) Provision for Bad and Doubtful debts/ Advances		
b) Irrecoverable Balances Wrtitten off		
c) Grants/ Subsidies to other institutions/ Organisations		
c) Others (Specify)		
TOTAL	NIL	NIL

SCHEDULE 22- PRIOR PERIOD EXPENSES

Amount in ₹

Particulars	2021-22	2020-21
1. Establishment Expenses		
2. Academic Expenses		
3. Administration Expenses		
4. Transportation Expenses		
5. Repair & Maintenance		
6. Other Expenses	37,421	35,948
TOTAL	37,421	35,948

RECEIPTS AND PAYMENTS FOR THE PERIOD / YEAR ENDED 31.03.2022

Amount in ₹

RECEIPTS	2021-22	2020-21	PAYMENTS	2021-22	2020-21
I. Opening Balance			**I. Expenses**		
a) Cash in hand	-	-	a) Establishment Expenses	30,37,56,825	29,22,37,829
b) Bank Balances			b) Academic Expenses	12,50,18,659	8,62,74,492
i) In current accounts			c) Administrative Expenses	13,92,30,344	8,29,30,387
a) Canara Bank A/c	25,650	28,405	d) Transportation Expenses	58,30,237	54,31,077
b) IDBI Bank A/c	3,42,275	2,51,103	e) Repair & Maintanence Expenses	5,11,40,733	6,76,42,773
c) SBI Bank A/c	4,79,875	43,23,129	f) Prior period Expenses		
ii) In deposit /savings accounts			**II. Payments made against earmarked endowment funds**		
a) Canara Bank	40,80,36,468	40,17,59,154			
b) SBI	27,18,13,278	33,70,43,849	**III. Payment against Sponsored Projects**		
c) Canara Bank Project A/c	21,69,86,987	14,58,02,073			
d) IDBI Bank Project A/c	7,49,61,546	9,21,60,275	**IV. Payment against sponsored fellowships**		1,42,43,812
e) IDBI Deposit	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 (Others)		
a) From Government of India	1,27,54,60,000	60,50,00,000			
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	42,91,87,789	17,75,69,286

RECEIPTS	2021-22	2020-21	PAYMENTS	2021-22	2020-21
III. Acadamic Receipts	8,99,30,900	5,18,22,329	Assets and Expenditure		
IV. Receipts against Earmaked/ Endowment Fund			**VIII. Other payment including Statutory payment**	2,43,37,440	8,79,71,363
V. Receipts against Sponsored Projects (including interest)	15,41,50,501	18,04,17,102	**IX. Refunds of Grants**	13,50,00,000	1,70,663
VI. Receipts against Sponsored Fellowships and Scholarships	1,30,35,714	1,70,28,693	**X. Deposits & Advances**	25,55,39,074	33,23,82,081
VII. Income on Investments from			Other payments-External projects	7,20,05,932	14,70,18,528
a) Earmarked/Endow. Funds			**VIII. Closing Balances**		
b) Own Funds ()th. Investment)			a) Cash in hand	-	-
			b) Bank Balances		
VIII. Interest Received			**i) In current accounts**		
a) On Bank deposits	1,32,64,822	4,25,27,207	a) Canara Bank A/c	23,656	25,650
b) Loans. Advances etc.			b) IDBI Bank A/c	3,20,307	3,42,275
c) Savings Bank Account	18,14,405	17,99,167	c) SBI Bank A/c	10,22,003	4,79,875
			ii) In deposit /savings accounts		
IX. Investment encashed			a) Canara Bank	50,64,13,319	40,80,36,468
X. Term Deposits with Schedule bank	8,17,74,818	4,91,43,270	b) SBI	47,76,19,538	27,18,13,278
XI. Other Income	2,40,42,574	1,25,52,359	c) Canara Bank Project A/c	28,16,63,893	21,69,86,987
(Incuding prior period income)			d) IDBI Bank Project A/c	3,88,01,563	7,49,61,546
XII. Deposits & Advances	21,68,72,504	32,54,53,804	e) IDBI Deposit	14,25,000	14,25,000
XIII. Miscellaneous receipts including Statutory receipts	70,06,132	12,97,935			
XIV. Any other receipts					
	2,85,14,23,449	2,26,98,34,854		2,85,14,23,449	2,26,98,34,854

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

4.11 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.

4.12 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 2022 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. The period of manpower expenditure under externally funded projects considered as April to March from the FY 2020-21.

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.

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

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 2021-22 as per Cash Book. The total receipts from the different sources as shown in Receipt and Payment Account includes grant of Rs. 114.05 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 2021-22;

Capital Grant	:	Rs. 48,09,60,000
Revenue Grant	:	Rs. 79,45,00,000
Total	**:**	**Rs. 1,27,54,60,000**

Out of Rs. 48.09 Cr. Capital Grant received, an amount Rs. 13.50 Cr. has been refunded to MoE on 30-03-2022. As such, Capital Grant receipts of Rs. 34.59 Cr. shown under Schedule 10.

2.3 Institute charges on Labour Welfare Fund (1% on LWF) Rs. 1,38,364/- due from Kerala State Building & Construction Workers Board for the FY 2015-16 & 2016-17 has been recovered and shown under Schedule 14- Prior Period Income.

2.4 Unspent Balance of Rs.5,25,32,638/- on Institute Promotion Fund (GPF), School Promotion Fund (SPF) and Personal Promotion Fund (PPF) are shown under Schedule 3-Current Liabilities.

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

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

2.7 The details of balances in Saving Bank, Current Accounts and in Fixed Deposit Accounts are given in Schedule 7 of the Balance Sheet.

2.8 During the financial year 2021-22, some small value assets / spare parts procured has been

shown as consumable in the accounts being treated as augmentation to the Scientific / Lab equipment.

2.9 Secured advances and Mobilization advances and Deposit work with CPWD are disclosed separately under the heads Loans and Advances.

2.10 The unutilized grant shown under Schedule 3(C) Plan Grants from MHRD is Rs. 28.80 Cr. excluding advance payment made to CPWD as Deposit work for construction of IISER Permanent Campus / Pre-paid expenses shown under Sub-Schedule 4 & 5 of Schedules forming part of Balance Sheet (Schedule 8 – Loans, Advances and Deposits).

2.11 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 31.03.2022 was of Rs.2,02,12,476/- being uninstalled equipment procured during the period.

Capital work-in-progress- construction to tune of Rs. 2,62,46,43,023/- has been capitalized during the FY 2021-22.

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.

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

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 2022

We have audited the attached Balance Sheet of Indian Institute of Science Education and Research, Thiruvananthapuram as at 31 March 2022, 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.

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. Balance Sheet

A.1 Application of Funds

A. 1.1 Loans, Advances & Deposits ₹ 85.33 crore (Schedule 8)

A.1.1.1

As against ₹ 68.92 crore shown as Advance to CPWD, works amounting to ₹ 59.39 crore has already been completed partially or in-progress as on 31-03-2022. This amount should have been transferred to Capital Work in-Progress. This has resulted in understatement of Capital Work in-Progress for ₹ 59.39 crore and overstatement of Loans, Advances & Advance to CPWD for the same amount.

A.1.1.2

The above includes TDS of ₹ 5.41 lakh receivable for the AY 2022-23 (FY 2021-22) instead of ₹ 11.29 lakh deducted towards TDS as per form 26AS. This has resulted in understatement of Loans, Advances & Deposits as well as interest income by ₹ 5.88 lakh each

B. General

1. Contingent liabilities and Notes on Accounts

Institute held following Savings Bank Accounts for various purposes which do not form part of the Institute's accounts.

Sl No.	Account No.	Branch	Purpose for which maintained	Closing Balance as on 31-03-2022
1	37296805549	SBI Vithura	SIDA Faculty Research Support	Rs. 36,09,595
2	37368113694	SBI Vithura	CBSM	Rs. 88,635
3	67393409552	SBI Vithura	Students Cultural Activity	Rs. 49,208
4	35997403868	SBI Sreekariyam	Biology Conference Account	Rs. 6,799

However, the details of such SB Accounts were not disclosed in Schedule 24 - Contingent Liabilities and Notes on Accounts.

C. Grant-in-Aid

The Institute received a grant-in-aid of ₹ 114.05 crore from the Ministry of Education, Government of India during 2021-22. Out of the total grant of ₹ 263.33 crore (including ₹ 149.28 crore being the unspent grant carried forward from previous year) the institute utilized ₹ 234.53 crore during the year, leaving a balance of ₹ 28.80 crore as on 31.3.2022.

D. Management letter

Deficiencies which have not been included in the Audit Report have been brought to the notice of the IISER through a management letter issued separately for remedial/corrective action

i) 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.

ii) 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 2022;

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

Sd/-

Principal Director of Audit (C), Chennai

Place: Chennai
Date: October 2022

ANNEXURE I

1. Adequacy of Internal Audit System:

The internal audit is conducted by empaneled Chartered Accountants. There is no separate internal audit wing in the Institute.

2. Adequacy of Internal Control System:

The Institute is following the generally accepted Accounting practices and prepared its Annual Accounts in the format prescribed by the Ministry of Education. The Institute is following the provisions of the GFR along with other orders, instructions and the guidelines issued by the Govt. of India from time to time.

3. System of Physical Verification of Assets:

Physical verification of assets has been conducted up to the year 2021-22

4. System of Physical Verification of Inventory:

The Institute has no inventory as on 31 March 2022.

5. Regularity in Payment of Statutory Dues:

The Institute is regular in payment of statutory dues.

Sd/-

Deputy Director (DT) II

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH THIRUVANANTHAPURAM
Maruthamala PO, Vithura, Thiruvananthapuram, Kerala, India - 695551
T: 0471-2778009, 8044, 8028
www.iisertvm.ac.in