

Samvid

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IIT Tirupati Campus

In October 2023, IIT Tirupati completed Phase-A of its campus construction, becoming the first among the third-generation IITs to do so. Phase-A comprises four main zones: academic, hostel, sports, and residential. The academic zone includes 62,351 square meters of facilities, featuring two academic buildings, department laboratories, a Central Instrumentation Facility, a Lecture Hall Complex, and an Administrative building. The hostel zone, covering 30,170 square meters, houses two new buildings for 1,000 students, a sports utility building, and a central dining facility with a mess and food court. The residential zone contains 168 apartments for faculty and staff with a built-up area of 33,769 square meters. In alignment with the Prime Minister's "Catch the rain where it falls, when it falls", the campus now includes two lakes covering 10 acres with an 80 million-litre capacity for sustainable rainwater storage. Natural swales constructed from local stones manage stormwater, enhancing the campus's ecological balance. The water management system features three Sewage Treatment Plants (STPs) with a total capacity of 700kLD, recycling treated water for irrigation, HVAC cooling, and flushing in residential and hostel facilities.

MoUs Signed by IIT Tirupati

IIT Tirupati entered MoU with Indian Institute of Information Technology, Design and Manufacturing Kancheepuram for Joint Agreement for Academic, Research and Innovation Collaboration on 24-08-2023

New Additions to the Family

Dr. Govind Narayan Sahu	Mechanical Engineering	Indian Institute of Technology Kanpur	Machine Tool Technology Department, Fraunhofer, IWU, Germany
Dr. Vishnu C R	Humanities and Social Sciences	National Institute of Technology Calicut	Vellore Institute of Technology Chennai
Dr. Kaushik Pal	Chemistry	Institute of Science Education and Research Bhopal	The Broad Institute of MIT and Harvard
Dr. Sarvendranath Rimalapudi	Electrical Engineering	Indian Institute of Science Bangalore	Indian Institute of Technology Guwahati
Dr. Ramesh Patel	Electrical Engineering	Ulsan National Institute of Science and Technology, South Korea	Ericsson Antena Technology Germany GmbH
Dr. Pancheti Jashnav	Civil and Environmental Engineering	Queensland University of Technology, Brisbane Australia	Scottsdale Construction systems, Australia
Dr. Chalavadi Vishnu	Computer Science and Engineering	Indian Institute of Technology Hyderabad	University of Adger, Norway

Staff

Srinivasulu K V	Junior Superintendent	Academic Research
Lavanuru Kishore Reddy	Junior Assistant	Mathematics and Statistics
Sumit Kumar Biswas	Registrar	Registrar Office
Thammi Reddy Sreedhar Reddy	Physical Training Instructor	Student Affairs
Naveen Kumar	Junior Technician	Central Workshop
Bodele Shubham Sanjay	Junior Technician	Central Workshop
Pelluru Bharath Kumar	Junior Technician	Physics
Gummuluri Sai Raj	Junior Technical Superintendent	Computer Science and Engineering
Badavath Rambabu	Junior Technician	Chemistry

Invited and Special Lectures / Talks held at IIT Tirupati

Between July and December 2024, three distinguished lectures and six special lectures were organized. Highlights of these lectures include Professor Rao R Tummala's lecture on the role of IITs in India's electronics emergence, Professor Pramod K Nayar's talk on climate crisis literature, and Professor Amitabha Ghosh's discussion on cosmology without a Big Bang. Professor Ramachandra Guha explored the lineage of Indian environmentalism, while Professor S. Ranganathan concluded the series with a talk on unlocking hidden powers.



Conferences, Workshops, Symposiums Organized by the Institute

1. The IP & Incubation Cell and CSRC organized "IPR Workshop on Innovation, Invention and Creativity" on 19-08-2023. Mr. Srihari, Partner at K&S Partners, Chennai covered vital IP topics including all facets pertaining to inter-alia, Patents, Trademarks, Copyrights, GIs, Designs, Plant Varieties, Genetic Resources and TK (including international filing procedures in accordance with PCT and Madrid protocol) among students and faculty members. Dr. Yamuna A, Patent Attorney, K&S Partners, Chennai explained Inadequate knowledge about the rights of individuals to protect their ideas and innovations and low awareness about the procedures involved in obtaining an IPR has hindered India's growth in Intellectual Property. With India's potential and its importance in the global arena, it's time we rise and become a leader in innovation and Intellectual Property.
2. The IP & Incubation Cell and CSRC organized a Workshop on "Startups Funding Ecosystem" on 30-08-2023. The Resource person Mr. Srinivas Rao Mahankali, CEO, THUB, Hyderabad covered domains of Entrepreneurs Ecosystems, India's Digital, Startup and Investor landscape, THUB Innovation network, and Startup Ecosystem etc. Mr. Suresh Raju, Founder, Jupiter Alternative Investment Fund briefs about key changes, major changes in India's Income Pyramid, Financial services, 4 D's driving India's decade, Business measures, and opportunities in India. Mr. Vikrant Varshney, Managing Partner, SucSEED Indovaton Fund, briefs about the importance of the design thinking course, and international investment, and interacts with students related to the identification of problem statements, how to start business and sustain.
3. The IP & Incubation Cell and CSRC organized a "National Entrepreneurship Day celebration" on 10-11-2023. The Resource persons Dr. Manish Diwan Head Strategic Partnership and Entrepreneurship, BIRAC, DBT, Govt. of India, and Dr. Penna Krishna Prasanthi, MD, FICP, FRSSDI, Non-official Independent Director, BIRAC, DBT, Govt. of India has discussed with faculty members, and students about the future developments in Institute. Dr. Thamida Sunil Kumar and ASN Pvt. Ltd. and Founder Mr. Naveen Giri presented their start-up technology and discussed with resource persons to step up.

Sponsored Research Projects

S. No.	Title	Funding Agency	Investigator and Dept.
1.	DST's Nodal Center at IISER Tirupati (Tirupati-Chennai-Bengaluru Cluster) for the development and production of key starting materials, intermediates, and other raw materials that are required by the Health Care Sector	Department of Science and Technology (DST)	Dr. Gouriprasanna Roy
2.	Design, Development, Testing and Automation of LPG, PNG and CNG Operated Refractory Burners for Cooking and Industrial Applications	Science and Engineering Research Board (SERB)	Prof. P. Muthukumar
3.	GPU Accelerated Mesh free Method Solution for FSI Problem on Hemo dynamics and its influence on cancer treatments	Department of Science and Technology (DST)	Dr. Panchatcharam
4.	Separation, Purification and Characterization of Valuable Compounds from Coconut Waste/by-products for incorporation in health foods	Coconut Development Board (CDB)	Prof. KSMS Raghavarao
5.	Machine Learning Techniques to Address the Pilot Transmission Overhead in an Intelligent Reflecting Surface Aided Antenna Selection System	Department of Science and Technology (DST)	Dr. Sarvendranath Rimalapudi
6.	Multiple intelligent reflecting surfaces to improve network coverage in rural areas and hilly terrains	Science and Engineering Research Board (SERB)	Dr. Sarvendranath Rimalapudi
7.	Design of a Secure and Dependable RISC-V Core for Cryptographic Applications	Ministry of Electronics and Information Technology	Dr. Vikramkumar Pudi

S. No.	Title	Funding Agency	Investigator and Dept.
8.	AI assisted techniques to extract business rules from legacy code base	IBM	Dr. Sridhar Chimalakonda
9.	Performance enhancement of Multi-Temporal Synthetic Aperture Radar Interferometry (MT-InSAR) for accurate and fast deformation estimation in mountainous terrain	Science and Engineering Research Board (SERB)	Dr. Avadh Bihari Narayan
10.	Understanding the microscopic origin of kosmotropicity and chaotropicity of osmolytes in the aqueous phase	Department of Science and Technology (DST)	Dr. Rajib Biswas
11.	Mechanochemical Approach for Solvent-Free Synthesis of (Hetero)Aromatic Fluorides	Ministry of Education (MoE)	Dr. Gandeepan P
12.	Organomercurials are More Neurotoxic than the Inorganic Mercury Compounds: A Detailed Investigation at Molecular and Cellular Levels to Understand the Mechanisms Underlying Extremely High Neurotoxicity of Organomercurials	Ministry of Education (MoE)	Dr. Gouriprasanna Roy
13.	Nano Finishing of 3D Printed Complex Biomedical Implants using Economic Polymer Rheological Abrasive Semisolid Medium	Department of Science and Technology (DST)	Dr. Ravi Sankar M
14.	Development of an atomic processes data base using calculation & measurement in Tokamak & Lab Plasma	Department of Atomic Energy (DAE)	Dr. Reetesh Kumar Gangwar
15.	Granular chains, translating or rotating or oscillating objects in a granular medium	Science and Engineering Research Board (SERB)	Dr. Anki Reddy Katha
16.	Micro-irrigation Adoption, Resource Efficiency, Sustainability, and Smallholder Farmers Well-being: Evidence from the Rayalaseema Region in Andhra Pradesh: A study under PM Krishi Sinchai Yojana	Indian Council of Social Science Research (ICSSR)	Dr. Chandra Sekhar Bahinipati
17.	PHEM for D3 – Parallel Heterogeneous External Memory Algorithms for Dealing with the Data Deluge	Science and Engineering Research Board (SERB)	Dr. G. Ramakrishna

Industrial Consultancies

1.	Mixture design for normal concrete (M30 grade) and self-compacting concrete (M40 and M60 grade)	KPC Projects Limited	Dr. A.V. Rahul
2.	Geotechnical Investigations for the proposed 2650 ML capacity summer storage tank near Vinukonda ULB, Guntur District, Andhra Pradesh.	P.H. Quality Control Circle	Dr. B. Janaki Ramaiah
3.	Techno Economic Study-Removal of CO ₂ and N ₂ from Natural Gas produced from Dandewala Field of Oil Rajasthan	Oil India Limited	Dr. Sasidhar Gumma
4.	Enhancing Communication Aspects of Unmanned Aerial Vehicles	KISANKOPTERS LLP	Dr. Sarvendranath R
5.	Geotechnical investigations of foundations soil along the proposed earthen bund alignment of summer storage tank at Peddacheruvu, Vishakhapatnam, A.P.	Public Health Division Vishakhapatnam, AP.	Dr. B. Janaki Ramaiah

S. No.	Title	Funding Agency	Investigator and Dept.
6.	Proof Checking of 3D printed small structures -3 units	Tvasta Manufacturing Solutions PVT LTD	Dr. Bijily Balakrishnan
7.	Developing a highly thixotropic self-compacting concrete for inclined surfaces and sloped roof applications	DEC Infrastructure Projects India Pvt. Ltd.,	Dr. A.V. Rahul
8.	Evaluation of Mechanical Properties of HYSD bars	KPC Projects Limited	Dr. N. Nithyadharan
9.	Structural proof checking for box culverts	Andra Pradesh Industrial Infrastructure Corporation	Dr. N. Nithyadharan
10.	Proof checking of steel framing system supporting solar panels	M/s Arcedo Systems	Dr. N. Nithyadharan
11.	Proof checking of structural design of BSL-03 & Animal House Building at IISER Tirupati Campus	Integrated Cleanroom Technologies Private Limited	Dr. Bijily Balakrishnan
12.	Mix Design of Pavement Quality Concrete	Sai Construction & Services	Dr. Krishna Prapoorna
13.	Conducting Ultrasonic Pulse Velocity Test on U-girders and pier arms of CMRL Phase- II	Chennai Metro Rail Limited	Dr. Behera Prasanna Kumar
14.	A Compiler base approach for automatic conversion of python Scripts to C++	Toshiba Software (India) Private	Dr. Kalidas Y
15.	Green AI Frameworks Comparing Energy Consumption of Deep Learning Frameworks	Accenture Solutions Private limited	Dr. Sridhar Chimalakonda
16.	Recommendation of remedial measures to restore the distressed portion between the chainage 1520 m and 1735 m of the Summer Storage Tank Bund at Puttur, A.P.	Public Health Division, Nellore	Dr. B. Janaki Ramaiah
17.	Impact Assessment of the Policy and strategic framework for preventing environmental pollution and protecting public health	The United Nations Development Programme (UNDP) India	Prof. Suresh Jain
18.	Proof checking for underground tunnel design at Railway /Metro crossings	Chennai Metro Rail Limited	Dr. Bijily Balakrishnan
19.	Proof checking of structural design of ETB and MCW Hanger	M/s Karekar & Associates	Dr. Bijily Balakrishnan
20.	The Purañjana Project - Towards Creating a Sense of Excitement on Computing Research for Underrepresented Rural Students of India	Google Research	Dr. Sridhar Chimalakonda
21.	No One Is Left Behind - Fostering DEI and Nurturing Communication, Collaboration and Computing skills in Underrepresented Rural Students of India through a Collaborative Game	Google Research	Dr. Sridhar Chimalakonda
22.	Proof checking of Design of CMRL elevated viaduct and tunnels crossings railway tracks/existing metro tunnels-Part 2	Chennai Metro Rail Limited	Dr. Bijily Balakrishnan

Recent Faculty Publications

Journals

Chemical Engineering

- Arjun, M., & Nabil, M. (2023). Convex optimization approach to design sensor networks using information theoretic measures", *AIChE Journal*.
- Devi, M., Moorthy, B., & Thangavel, R. (2023). Recent developments in zinc metal anodes, cathodes, and electrolytes for zinc-ion hybrid capacitors. *Sustainable Energy Fuels*, 7, 3776-3765.
- Irfan, M., Lakshmi, C. N., & Singh, N. (2023). Superhydrophobic polyurethane sponge modified with polydimethylsiloxane/ zinc oxide-rGO for efficient oil or organic solvent/water separation. *Materials Letters*. 348:134668.
- Kim, B., Misra, S., & Maravelias, C. T. (2023). Lignocellulosic fuels and chemicals co-production," *Joule*.
- Maheshwari A., Misra S., Gudi R. D., Subbiah S., & Laspidou C. (2023). An operational scheduling framework for tanker-based water distribution systems under uncertainty. *Industrial & Engineering Chemistry Research* 62 (27), 10523–10541.
- Moorthy, M., Moorthy, B., Ganesan, B. K., Saha, A., Yu, S., Kim, D. H., Hong, S., Park, S., Kang, K., Thangavel, R., & Lee, Y. S. (2023). A series of hybrid multifunctional interfaces as artificial SEI layer for realizing dendrite free, and long-life sodium metal anodes. *Advanced Functional Materials*, 2300135.
- Nagendra, V., Reddy, A., Karan S., & Das, Chandan (2023). Semi-aromatic polyamide membrane in forward osmosis: Molecular insights. *Journal of Physical Chemistry B*.
- Raghuwanshi, V. S., Vir, A. B., Lin, M., & Garnier, G. (2023). From transparent to structural white: Modulating nanoscale self-assembly in silica and nanocellulose
- Composites. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, Volume 675, 131999.
- Rajasekhar, P., Kumar, A., & Reddy, K. A. (2023). Understanding the boron rejection of cation intercalated multilayered graphene oxide (GO) membrane in reverse osmosis (RO) process: A molecular dynamics study. *Journal of Molecular Liquids*, 389, 122817.

Civil & Environmental Engineering

- Allabakshi, S. M., Srikar, P. S. N. S. R., Gangwar, R. K., & Maliyekkal, S. M. (2023). Treatment of azo, direct, and reactive dyes in surface dielectric barrier discharge: Valorization of effluent, the influence of wastewater characteristics, and plasma modeling by Stark broadening technique. *Journal of Water Process Engineering*, 56, 104503.

Computer Science & Engineering

- Agrahari, V., Shanbhag, S., Chimalakonda, S., & Rao, A. E. (2023). A catalogue of game-specific anti-patterns based on GitHub and game development stack exchange. *Journal of Systems and Software*, 111789.

Electrical Engineering

- Bandi, S. K., & Vooka, P. (2023). A non-invasive current measurement technique using magnetic sensors for concealed conductors. *IEEE Transactions on Instrumentation and Measurement*, 72,1-11, 2023, Art no. 2008311. <https://doi.org/10.1109/TIM.2023.3328096>
- Makireddy, P., & Vooka, P. (2023). A comparison-based interface circuit for detection of motion direction of humans using capacitive sensor. *IEEE Sensors Journal*, 23 (23), 29063-29072. <https://doi.org/10.1109/JSEN.2023.3325250>

Mechanical Engineering

- Cejpek, O., Maly, M., Dhinasekaran, V. K., Avulapati, M. M., Dacanay, L., & Jedelsky, J. (2023). Novel atomizer concept for CCS applications: Impinging effervescent atomizer. *Separation and Purification Technology*, 311,123259.

Chemistry

- Ahmed, R., & Manna, A. K. (2023). Electronic structures and charge mobilities of several regio-isomeric B2N2-substituted Perylenedi-imides. *J. Phys. Chem. A* 127, 2742-2750.
- Ahmed, Raka, & Manna, Arun K. (2023). Understanding pH tailored photophysical properties of a π -conjugated aryl hydrazone-derived dye for sensing application. *J. Chem. Sci.* 135, 9.
- Ahmed, R., & Manna, A. K. (2023). Understanding remarkably high triplet quantum yield in Thione analogues of Perylenedi-imide: A detailed theoretical study. *J. Chem. Phys.* 158, 214304.
- Debnath, P., Ahmed, R., & Manna, A. K. (2023). Molecular-scale design of azulene based triplet photosensitizers: Insights from time-dependent optimally tuned range-separated hybrid. *J. Phys. Chem. B* 127, 10016-10024.
- Sahoo, R., Mondal, Karan, S., Das, C., Manna, A. K., & Das, M. C. (2023) A water-stable cationic SIFSIX MOF for luminescent probing of Cr2O7²⁻ via single-crystal to single-crystal transformation. *Small*, 2304581.
- Tedy, A. M., Ahmed, R., & Manna, A. K. (2023). Assessing intersystem crossing rates in donor and/Acceptor functionalized corroles: A computational study. *J. Phys. Chem. A* 127, 3347-3355.

- Tedy, A. M., & Manna, A. K. (2023). Does the intersystem crossing rate of β -iodinated phosphorus-corrole depend on iodine numbers and/or positions. *J. Phys. Chem. A* 127, 10118-10127.

Physics

- Allabakshi, S. M., Srikar, P. S. N. S. R., Gangwar, R. K., & Maliyekkal, S. M. (2023). Treatment of azo, direct, and reactive dyes in surface dielectric barrier discharge: Valorization of effluent, the influence of wastewater characteristics, and plasma modeling by Stark broadening technique. *Journal of Water Process Engineering*, 56, December, 104503.
- Aravinda, S. & Ranjan, M. (2023). Complexity growth for one-dimensional free-fermionic lattice models. *Phys. Rev. B* 108, 064309.
- Alvarez, G., Joglekar, A., Phoroutan-Mehr, M., & Yu, H. (2023). Heating neutron stars with inelastic dark matter and relativistic targets. *Phys. Rev., D* 107, 103024.
- Baral, S., Easwaran, R. K., Jose, J., Ganesan, A., & Deshmukh, P. C. (2023). Temporal response of atoms trapped in an optical dipole trap: A primer on quantum computing speed. *Atoms*, 11(4), 72.
- Chatterjee, P., & Modak, R. (2023). One-dimensional Levy quasicrystal. *J. Phys.: Condens Matter* 35, 505602.
- De, S., & Sharma, A. (2023). Indigenisation of the quantum clock: An indispensable tool for modern technologies. *Atoms*, 11(4), 71.
- Deshmukh, P. C., Banerjee, S., & Manson, S. T. (2023). Measurability of the Wigner time delay in atomic photoionization. *Canadian Journal of Physics*.
- Khademhosseini, R., Deshmukh, P. C., & Manson, S. T. (2023). Attosecond time delay in atomic photoionization: Angular-dependent transition from dipole to quadrupole and spin-flip dynamics. *Phys. Rev. A* 108, 063107.
- Kumar, A., Procaccia, I., & Singh, M. (2023). Disorder-induced mode coupling and symmetry breaking in amorphous solids. *Europhysics Letters* 142, 36001.
- Shahee, A., Yoo, K., Koteswararao, B., Ter-Oganessian, N. V., & Kim, K. H. (2023). Observation of linear magnetoelectric effect in a Dirac magnon antiferromagnet Cu_3TeO_6 . *Frontiers in Materials*, 10, 1.
- Shukla, N., Modak, R., & Mandal, B.P. (2023). Uncertainty relations for non-Hermitian systems", *Phys. Rev., A* 107, 042201.
- Singh, V. K., Link, J., Kargeti, K., Barik, M., Lenz, B., Saraswat, N., Jena, U., Heinmaa, I., Khuntia, P., Boya, K., Panda, S. K., Stern, R., Bitla, Y., Chakrabarty, T., & Koteswararao, B. (2023). Magnetic properties of $S=1/2$ distorted honeycomb lattice $\text{NaCuIn}(\text{PO}_4)_2$. *Physical Review, B* 107, 214430.

- Sreeram, P. G., Modak, R., & Aravinda, S. (2023). Witnessing quantum chaos using observational entropy. *Phys. Rev. E* 107, 064204.
- Srikar, S., Kumar, T., Kiran, D. V., & Gangwar, R.K. (2023). Non-invasive optical characterization and estimation of Zn porosity in gas tungsten arc welding of Fe-Al joints using CR model and OES measurements. *Plasma Science and Technology*, 25(11).
- Suresh, I., Srikar, P. S. N. S. R., Priti, S., R., & Gangwar, R. K. (2023). Relativistic calculation of electron impact excitation of tin: cross sections of importance in plasma modelling. *Plasma Sources Science and Technology*, 32(7).
- Voma, U. K., Shahee, A., Kim, K., Lee, J., Boya, K., Bhowal, S., Kim, K. H., & Koteswararao, B. (2023). Observation of magnetic-field-induced ferroelectricity in a compound $\text{CaFe}_3\text{O}(\text{PO}_4)_3$. *Journal of Applied Physics*. 133, 164105.

Mathematics and Statistics

- Ayoob, F., Das, I., & Sen, S. (2023). Doubly-inflated poisson INGARCH models for count time series. *Journal of Statistical Theory and Practice*, 17(4).

Humanities and Social Sciences

- Biswal, D., & Bahinipati, C.S. (2023). Crop-insurance adoption and impact on farm households' well-being in India: Evidence from a panel study. *Journal of the Asia Pacific Economy*. <https://doi.org/10.1080/13547860.2023.2266204>
- Hagen, I., Allen, S., Bahinipati, C.S., Frey, H., Huggel, C., Karabaczeck, V., Kienberger, S., Mechler, R., Menk, L. & Schinko, T. (2023). An international perspective on comprehensive climate risk management: Experiences from Peru, India and Austria. *Climate Risk Management*, 41, 100534. <https://doi.org/10.1016/j.crm.2023.100534>
- Paul, B., Murari, K.K., Patnaik, U., Bahinipati, C.S., & Subash, S. (2023). Sustainability transition for Indian agriculture. *Scientific Reports (Nature Journal)*, 13 (1): 7290. <https://doi.org/10.1038/s41598-023-34092-0>
- Singh, M., & Bahinipati, C.S. (2023). Urban households' investment behaviour towards home appliances in India: Do gender and neighbourhood effect matter? *Environment and Urbanization Asia*, 14(2): 285-298.

Book Review

- Raghuramaraju, A. (2023). "Vivekananda: Cosmopolitan vedantic philosopher?", book review of *Swami Medhananda. Swami Vivekananda's vedantic cosmopolitanism*. New York, Oxford University Press, 2022, i-xvi and 1-412, in the *Journal of World Philosophies* 8 (Summer): 157-162.

Books/Book Chapters

- Balakrishna, N., Cheng, F., Koul, H. L., & Mimoto, N. (2023). An analog of the Bickel-Rosenblatt test for error density in the linear regression model. *Statistical Inference for Time Series and Related Models*, Springer Nature, 291-324.
- Balkhi, S. A. A., Karki, B. K., Philip, L., & Maliyekkal, S. M. (2023). Water quality status and challenges in India and Nepal. *Technological Solutions for Water Sustainability: Challenges and Prospects*, 13.
- Deshmukh, P.C. (2023). *Quantum mechanics - formalism, methodologies, and applications*. Cambridge University Press.
- Hebbar, H. U., Sharma, R., Chaurasiya, R. S., Ranjan, S., & Raghavarao, K. S. M. S. (Eds.) (2023). *Engineering aspects of food quality and safety*. Springer.
- Jyothi, M. N., Amesh, P., & Maliyekkal, S. M. (2023). *Bio-polymer-reinforced nanocomposites for water and wastewater treatment: Applications and future prospects*. Technological Solutions for Water Sustainability: Challenges and Prospects, 97.
- Saxena, M., Sharma, A. K., Srivastava, A. K., Dixit A. R., Singh, N., & Singh, M. (2023). *Microwave-assisted vs. conventional hydrothermal synthesis, morphology, microstructure, and surface area analysis of g-C₃N₄/MoS₂ nanocomposite*. In Kumar, A., Kumar, P., Srivastava, A. K., Goyat, V. (Eds.), *Modeling, Characterization, and Processing of Smart Materials*, 151-64. IGI Global.
- Vajitha, G., Madan, K. P., Tewari, C., Sahoo, N. G., & Maliyekkal, S. M. (2023). *Carbon-based filters for water and wastewater treatment*. Technological Solutions for Water Sustainability: Challenges and Prospects, 155.

Newspaper Articles

- Raghuramaraju, A. (2023, July 10). Faith, family and freedom in American life: New possibilities. *The Telegraph*.
- Raghuramaraju, A. (2023, August 8). Spirit of enquiry: Reassessing the past for the future of the nation. *The Telegraph*.
- Raghuramaraju, A. (2023, September 9). How it all began: Scientific exploration must shun commerce. *The Telegraph*.
- Raghuramaraju, A. (2023, October 14). Return to theory: Philosophical texts through feminist lens. *The Telegraph*.
- Raghuramaraju, A. (2023, November 11). Unique pairing: A woman, death, and a poem. *The Telegraph*.

Conferences/Proceedings

Chemical Engineering

- Gupta, A. K. (2023). "Thermal air sterilizer," Akhil Bharatiya

Siksha Samagam, Exhibition of inventions organized by MoE Innovation Council, Delhi, 29th-30th July.

- Khan, B. B., Vir, A., & Kumar, T. S. (2023). "Oscillatory characteristics of the pressure drop and the velocity during droplet formation in microfluidic systems," ICOM – Indian Conference on Micro-nanofluidics, IIT Madras, 29th September to 1st October.
- Kumar, T. S. (2023). "Low global warming potential refrigerants," Workshop organized by Ozone Cell, MOEFCC, 4th August.
- Kumar, T. S. (2023). "Performance of heat exchangers with nanofluids, FDP – emerging technologies in thermal energy production and storage," 13th to 17th September, BVRIT, Hyderabad.
- Kumar, T. S. (2023). "Panel discussion on Lignin valorization," Global Bio India Program, Organized by DBT & BIRAC, Delhi, 5th December.
- Irfan, M., & Singh, N. (2023). "Fabrication of nonfluorinated and superhydrophobic/superoleophilic PDMS/PMMA electrospun membranes for vacuum-driven separation of moisture from virgin coconut oil," IIT Patna, December. (Selected for best oral presentation)
- Misra, S. (2023). "Control, decision and information technologies," 9th International Conference, Sapienza University of Rome, 3rd-6th July.
- Nagalakshmi, C. & Singh, N. (2023). "Effect of doped iron oxide to graphitic carbon nitride ratio in nanocomposites for degradation of emerging pollutants," ICWT 2023, IIT Bombay, December.
- Nagalakshmi, C. & Singh, N. (2023). "Comparison of microwave-assisted and hydrothermal synthesis of α -Fe₂O₃/ZnO/perlite nanocomposites for the photocatalytic degradation of antibiotic," GCDEM2023, NTU Singapore.
- Raghavarao, K. S. M. S. (2023) was the Session Chair for "Food processing: Current practices and future trends," CompFlu, IIT Madras, 20th December.
- Reddy, K. A. (2023). UK Cambridge University, 28th June to 14th July.
- Reddy, K. A. (2023). "Semi-aromatic polyamide membrane in FO process: Molecular insights," Invited Talk at IIT Ropar, 26 July.
- Reddy, N. T. (2023). "Food science: A soft matter perspective," Comp-Flu, IIT Madras, 20th December.

Civil & Environmental Engineering

- Allabakshi, S. M., Srikar, P., Gangwar, R. K., & Maliyekkal, S. M. (2023). "Photo-plasma: A sustainable way to reduce the scavenging effect of radicals by salts in textile wastewater treatment," 3rd Energy Security and Chemical Engineering Congress, Malaysia.

- Allabakshi, S. M., Srikar, P., Gangwar, R. K., & Maliyekkal, S. M. (2023). "Surface dielectric barrier discharge: A potential plasma reactor system in treating textile wastewater" Conference on Desalination, Brine Management and Water Recycling (DeSaltM 23) scheduled to be held between 21st and 22nd July, IIT Bombay.
- Allabakshi, S. M., Srikar, P., Gangwar, R. K., & Maliyekkal, S. M. (2023). "Non-invasive diagnostic of nonthermal hybrid plasmas applied for water treatment applications," Conference on Plasma Theory and Simulations (PTS 23), JNU. Delhi, September.
- Jyothi, M. S. V. N., Ramaiah, B. J. & Maliyekkal, S. M. (2023). "Self-granulated AIOOH-nanocomposite for enhanced selenium removal from groundwater," India-Dalhousie Student Research Symposium: Addressing Common Challenges via Research & Innovation, July 27th, held at IIT Tirupati.
- Kannan, U. & Maliyekkal, S. M. (2023). "Influence of Water Quality Parameters on Point-Of-use Silver- based Disinfection System: An Unrivalled Effect of Bicarbonates," 3rd Energy Security and Chemical Engineering Congress (ESChE) 2023, Langkawi. Malaysia, 28th-30th August.
- Sampath, P. V., & Gaddam, S. J. (2023). "Characterizing the spatiotemporal dynamics of future groundwater droughts under climate change: Implications for interventions," AGU Fall Meeting Abstracts, H23R-1816, December.
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Physics

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- Manna, R. S. (2023). "Tuning the ground state of La₂CoTiO₆ with distortion and pressure," Annual Conference on Quantum Condensed Matter (QMAT2023), National Institute of Science Education & Research, India, November 27-30.
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Mathematics and Statistics

- Challa, D. P., G., Divya, & Sini, M. (2023). "The Foldy-Lax approximation of scattered field by many small cavities near the resonating frequencies for lame system," Applied Inverse Problems 2023 (AIP – 2023), organized in Gottingen, Germany, September 4th-8th, 2023.
- Challa, D. P. (2023). "The propagation of waves by small bodies and their applications", National conference on emerging trends of mathematics in engineering and Applied Sciences (NCETMEAS-2023)", Sri Venkateswara University Tirupati, December 22nd-23rd.

Humanities and Social Sciences

- Bahinipati, C. S. (2023). "How to enhance adoption of climate-smart agricultural practices in India? Institutions, incentives, and information," Presented at Water Security and Climate Adaptation Conference 2023, IIT Madras, India, October 4th-7th.
- Bahinipati, C. S., (2023). "Climate change, extreme events and food security: Understanding farmers' coping strategies in India," presented at the National Seminar on "Food for All", VIT Business School, Chennai, India, October 16th.
- Biswal, D., & Bahinipati, C. S. (2023). "Whose wellbeing improved after adoption of crop insurance in India? Assessing benefits across land holding farmer groups," Accepted for presentation at 3rd International Symposium on Disaster Resilience and Sustainable Development (DRSD-2023), Asian Institute of Technology Bangkok, December 7th-8th, 2023.
- Raghuramaraju, A. (2023). "Exploring the nature of the underlying relationship that obstructs and enables cooperation, contentment and care," in Colloquium on Cooperation, Contentment and Care, to Enable Justice for All, organized by Centre for Legal Philosophy and Justice Education, NALSAR University of Law, Hyderabad during 2nd-5th November.
- Raghuramaraju, A. (2023). "The role of Indian languages in technical education," in a one-day workshop organized by Centre for Classical Telugu, Nellore, on November 11.
- Raghuramaraju, A. (2023). "Textual criticism," in a Refresher course on Telugu, organized by UGC-Human Resource

Development Centre, Osmania University, Hyderabad, on 12th July.

- Raghuramaraju, A. (2023). "Foundations of research in India," in a CEP online course on "Formulating Research Proposal" from 4th to 11th December organized by the Department of Humanities and Social Sciences, Indian Institute of Technology, Kharagpur.
- Singh, M., & Bahinipati, C. S. (2023). "Gender, household investment in appliances and urban India: Do education, autonomy and owning property matter?" Presented at 2023 HDCA conference 'Vulnerability, human development and cooperative re-building in turbulent times.' Sofia University St. Kliment Ohridski, Sofia, Bulgaria, 11th-13th September.
- Singh, M., & Bahinipati, C. S. (2023). "Gender empowerment, information, and attitude: do they help to reduce the energy efficiency gap in urban India?" Presented at the 12th Congress of Asian Association of Environmental and Resource Economics, Waseda University, Tokyo, Japan, 29th-30th August.

Awards/Achievements

- Gourav Parmar, and Madan Mohan A. Analyzing the effect of neighbouring droplets on the evaporation of urea-water-solution, 27th National and 5th International ISHMT-ASTFE Heat and Mass Transfer Conference December 14-17, 2023, IIT Patna, Patna-801106, Bihar, India Paper No: IHMTTC-2023-148.
- Mr. Yumnam Nandan Singh (Research scholar) received the Prime Minister's Fellowship for Doctoral Research.
- Ms. N. Sai Prasanna (Research scholar) received the Prime Minister's Fellowship for Doctoral Research.
- Mr. Allabakshi S. M. received the "best poster award" from the Centre of Excellence at Conference on Desalination, Brine management, and Water Recycling held on July 21-22nd, 2023 at IIT Bombay.
- Mr. Allabakshi S. M. received the "best poster award" for "Non-invasive diagnostic of nonthermal hybrid plasmas applied for water treatment applications" in Conference on Plasma Theory and Simulations (PTS 23), September 2023, JNU Delhi.
- Sridhar Chimalakonda received the IBM Academic Award 2023, Legacy Modernization and COBOL, September 2023.
- Sridhar Chimalakonda received the Microsoft Research Award 2023, AI mocktails: Finding jewels in the jungle of source code representations and models for AI-driven software engineering tasks, September 2023.
- Sridhar Chimalakonda received the Google Research explore CSR Award 2023, Facilitate ways to support computing research from rural India, October 2023.
- Sridhar Chimalakonda received the Google Research Award for Inclusion Research 2023, Facilitate ways to support

communication, collaboration and computing skills in Underrepresented rural students of India through a collaborative game, October 2023.

- Sridhar Chimalakonda elected as Convener of Ad-hoc group on AI-based software development (ISO/IEC JT1/SC7 (Software and Systems Engineering) to investigate and create a roadmap towards a set of standards in AI-based software development, Aug 2023.
- Vignesh Kumar D, Anand T. N. C. and Madan Mohan A. Evaluation of air assisted impinging jet atomization for viscous liquids, ILASS-Asia 2023, October 19-21, Korea.
- Vinod Kumar Naidu P., Madan Mohan A. Experimental studies on the effect of micro explosion on the neighbouring droplets, ILASS-Asia 2023, October 19-21, Korea.

Patent

- Dr. Thamida Sunil Kumar, Mr. Babajan Bakhtar Khan and Dr. Anil Vir got the patent for "Pressure oscillation-based approach for counting droplets in microfluidics." Patent application no. 202341062737, Filed on September 19, 2023.
- S. Sengupta, G. Vajitha, S. M. Maliyekkal got the patent for "Design of fully automated membrane-modified capacitive deionisation module." Patent application no. 392781-001, filed on August 15, 2023.

Events/Activities

- CAMOST-G20-S20 consortium seminar series on "Disruptive Sciences and Technologies" was conducted between August 16 and October 28, 2023. The seminar series included 19

seminars about half of which were in-person, and others online. World leaders participated in the seminar series from many G20 countries. The series concluded with a Panel Discussion on 28th October. The following experts participated in the in-person panel discussion:

- Prof. Achanta Venugopal - Director, NPL, Delhi
- Prof. Arvind - IISER-Mohali and Vice-Chancellor, Punjabi University
- Prof. Umakant Rapol - IISER-Pune
- Prof. Vijayaraghavan - TIFR, Mumbai
- Prof. Utpal Roy - IIT-Patna, and
- Prof. Urbasi Sinha - RRI, Bengaluru
- NPTEL course on "Fundamentals of Attosecond Science and Technology" jointly offered by IIT Madras and IIT Tirupati. Lecturers: Sivarama Krishnan (IITM), P C Deshmukh (IITT), Vinay Pramod M (IITT)
- Kalamkari workshop by Nirajan Jonnalagadda on November 04
- Flute Concert by Smt Sikkil Mala Chandrasekhar, accompanying Artists: Sri. V V Srinivasa Rao on Violin and Sri Neyveli S Skanda Subramaniam on Mridangam
- Kalaripayattu by Vallabhata Kalari Team. Accompanying Artists: Shri Krishna Das, Shri Rajeev, Shri Dinesh, Shri Baskaran, Shri K Syamalan, Shri Ajithsankar, Shri Gokul, Shri Umeshnarayanan, Kum Devika, Kum Aswathisunilkumar
- Kuchipudi dance by Smt Vyjayanthi Kashi. Accompanying Artists: Smt. Harshitha Vidya on Vocal, Kum. Shivani Avadhani on Nattuvangam, Shri Vibhudendra Simha GG on Violin, and Shri Tumkur Sashishankar on Mridangam

Students Corner

Gagan Vedhi

The Gagan Vedhi club hosted a series of engaging events, beginning with a Club Intro and Basic Astrophotography Workshop on August 19, 2023, where new students learned about the club's goals and the basics of astrophotography using Adobe Lightroom. This was followed by a humorous Memthon meme-making competition on September 3. The club also organized a Moon and Star Gazing Activity on September 9, which included a telescope setup tutorial for members and students. On September 15, a Movie Night featured a screening of "The Martian" with over 60 participants. The club's Astrofest in collaboration with IISER included several events on October 22, such as AstroTrivia, an Astrophotography Workshop by a professional, and Meme Madness. The festival concluded with JAM (Just a Minute) on October 29 and a two-day treasure hunt called Star Quest held at both IIT and IISER campuses on October 22 and 29.

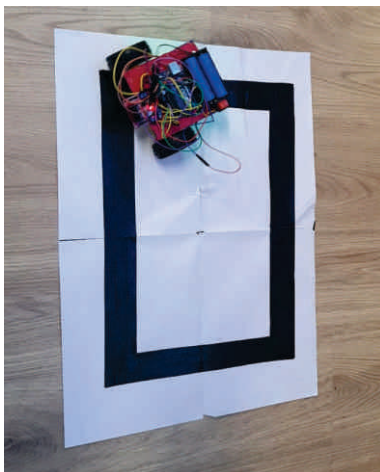


The E-Cell

The E-Cell at IIT Tirupati had an active semester, beginning with position allotments in June 2023. They hosted a variety of events, including "The Pitchers" idea competition, "CASE MASTER" business quiz and case study, and several workshops such as the Business Model Canvas and Intellectual Property Rights. The E-Cell also organized virtual stock trading competitions like "IITT Mock Stock" and "The Stock BAZAAR," and inter-college events like "The Big Shot." Notable guest lectures and collaborations included partnerships with Movidu Technologies, T-HUB, and IvyCamp. The semester concluded with an orientation session, the allocation of a new office, and a visit to IIT Madras to explore their innovation and entrepreneurship ecosystem.

The Automobile Club, later named "NAVGATI - The Automobile Club," began with the formation of its core team and a strategic vision to fabricate a cross-cart. Led by the Club Head and coordinators, the club held its first offline meeting in August 2023, followed by the unveiling of its logo in September. A significant shift occurred in October when the club decided to design a new frame outside traditional FSAE specifications. By December, the club had prioritized chassis fabrication, securing AISI 4043 pipes from carefully selected vendors.

Techmaniacs Club



The TechManiacs club at IIT Tirupati revitalized its defunct YouTube channel by uploading workshop recordings, established vendor contacts to secure discounted components, and registered the club as an organization on GitHub to document all projects and events.

The Arduino Interest Group at IIT Tirupati achieved significant progress this academic year, starting with an introductory workshop on Arduino basics, where students learned coding, sensor integration, and completed hands-on projects like an Obstacle Avoiding Robot and an Air Piano. The group showcased projects at TIRUTSAVA 2023, such as Piano Stairs and a Radar with Arduino. They organized their inventory and initiated two new projects: an Omni-Directional Robotic Arm and an Idea-Square Automation System. The club plans to complete these by April and is

considering future projects like a Face Recognition Robot and a Snake Robot.



The Drone Interest Group at IIT Tirupati made significant strides this year, including hosting an orientation workshop that attracted over 40 participants. They initiated two key projects: a hexacopter for package delivery and a fixed-wing plane for wildlife tracking. The hexacopter was tested on Alumni Day, with future plans for a robust, weather-resistant design. The fixed-wing plane project, although delayed due to funding, aims to be a cost-effective UAV for wildlife monitoring. Additionally, they are collaborating with CSU Chico on developing an AI-enabled drone for automated videography, with completion targeted for 2025.

Electronics Interest Group

The Electronics Interest Group achieved significant milestones, including creating a Bluetooth speaker system with multi-speaker connectivity and integrating LiFi technology for secure, fast audio transmission. They also conducted a hands-on project on DIY piano keys using a 555



Timer IC. The group developed a comprehensive inventory and launched new projects like an FM Transmitter and a Digital Scoreboard. These efforts reflect their dedication to innovation, learning, and growth within the electronics community.

Robotics Interest Group

The Robotics Interest Group made significant strides by conducting a successful ROS2 workshop, winning first place in the ROBOTRAC 2024 competition with a line follower robot, and initiating an Autonomous Rover project. They also expanded their inventory with new components like LiDAR and stereo cameras to support ongoing projects. These achievements demonstrate their commitment to advancing robotics knowledge and innovation, with plans for continued growth and success in the field.



waste management. They conducted surveys in villages under the Unnat Bharat Abhiyan program, visited local schools, and raised awareness on single-use plastic and organic farming. Horticulture programs were continuously promoted in the Sahana hostel to enhance the living environment. The NSS also organized events like "Best out of Waste" and room cleaning initiatives to foster creativity and personal responsibility among students. These activities reflect NSS's commitment to community service, sustainability, and holistic development.



NSS

The NSS unit at IIT Tirupati undertook various impactful activities this year, promoting patriotism, health, cleanliness, and environmental awareness. Key initiatives included the "Har Ghar Tiranga" campaign for Independence Day, a 5K Walkathon for World Health Day, and celebrating the 55th NSS Day with tree plantation and bush cleaning. The unit also engaged in multiple cleanliness drives, including a 2K Walkathon, railway station and village cleanups, and campus



The NSS unit at IIT Tirupati organized various impactful health and awareness events, including interactions with HIV-positive children, cardiology, neurology, eye, and dental health camps, and a diabetes awareness camp. The unit also hosted a suicide prevention talk, a blood donation camp, and multiple visits to support children at the David & Lois Rees Hospital. These activities received positive feedback, engaged numerous volunteers, and contributed significantly to community welfare and health awareness.



NSS IIT Tirupati engaged in various educational and community activities, including career guidance and competitions for local schools, and interactive science demonstrations. Key events included Independence Day competitions, regular doubt-clearing sessions at the SOS village, and experiment demonstrations at ZPHS Panguru and Rachagunneri. The initiative also featured a final quiz for participating schools, personality development sessions in collaboration with Ullas Trust, and an Open School Day with campus tours and guidance sessions. These activities fostered educational enrichment and community engagement, receiving positive feedback from students and educators alike.

Cultural Report

In 2023, the college hosted a variety of cultural and festive events. Freshers Orientation and Week welcomed new students with cultural activities and competitions. Independence Day, Onam, Janmashtami, and Ganesh Chaturthi were celebrated with traditional rituals, performances, and games. The Intra IIT Fiesta, held in

October, featured a series of cultural and literary events themed around space, culminating in a competition among houses. Dussehra and Halloween were marked by vibrant festivities and a spooky haunted house experience. Diwali was celebrated with diya painting, pooja, and sky lamps, while pre-Christmas festivities included carols, dances, and roleplay, spreading holiday cheer.



Artista Club

In 2023, a vibrant array of art and cultural events unfolded, showcasing creativity and engagement across campus. The year kicked off with the Fresher's Day Introductory Events. Followed by the Independence Day Doodle game and the Basics to Drawing Workshop. The Janmashtami Painting Contest highlighted artistic talent with a canvas painting theme. The Ganesha Idol Making event, though interrupted



by rain, saw the creation of clay idols later immersed in tradition. Intra IIT featured various art competitions, including Canvas Painting, Charcoal Art, and Live Sketching Contests. The Millet Mission of India promoted environmental awareness through an online painting contest. Festive celebrations included Ravan Dahan with a cardboard mascot for Dasara, a spooky Halloween Haunted House experience, Diwali Diya Painting and rangoli making. The year concluded with Prop Making for Actomania Club, where artistic props for a skit were crafted, enriching the cultural tapestry of the campus.



Celeste

In 2023, various artistic and performance events marked a dynamic year. Newspaper Costume Making event involved creating costumes from newspapers and ribbons. For the Actomania Club, Celeste designed diverse costumes using unique draping techniques for a Ganesh Chaturthi skit. The Inter IIT Fashion Show saw participation with the theme "Scattered Elegance" in Kharagpur. August kicked off with core team selections, band performances, and auditions. The club featured two notable performances in August: a band

performance for Freshers' Orientation and a tabla-classical performance for Independence Day. September focused on preparing the second band and organizing Antara during Freshers' Week. In October, the club's bands performed at the Alumni Reunion and hosted intra-IIT events like Vibrato (solo singing), Concerto (solo instrumental), and Pair on Stage (duos). November and December were dedicated to Inter IIT preparation, with the band delivering strong performances despite some day-of mishaps.



Editors

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