

PHYS I SPECTRA

Volume 1 | Issue 2 | July 2024

A BI-ANNUAL E-NEWSLETTER OF DEPARTMENT OF PHYSICS
MANIPAL INSTITUTE OF TECHNOLOGY, MANIPAL ACADEMY OF HIGHER EDUCATION, MANIPAL, KARNATAKA, INDIA

About Department of Physics, MIT, Manipal

Manipal Institute of Technology (MIT) is known far and wide as an excellent technical institute in the country. It started in 1957 as a self-financed engineering college by Dr. T. M. A. Pai. Department of Physics is one of the founder departments of the Institute. Currently the department has grown and developed into a center of PG studies and research with a faculty strength of 22. Faculty are specialized in various fields such as Condensed Matter Physics, Thin Film Devices and Theoretical Physics. The total external funds received by the Department for various research projects is over Rs. 6 Crore. The department offers open elective subjects to BTech students apart from teaching Engineering Physics. The department offers MSc (Physics) and PhD programs. Presently about sixty students are pursuing fulltime PhD in the department.

Message from Head of the Department



Dear Readers,

Welcome to the second edition of our Physics Department e-newsletter!

It gives me immense pleasure to note that the Department of Physics is bringing out the second edition of the bi-annual newsletter titled “Physi-Spectra”, which focuses on the latest updates, achievements, and upcoming events within our community.

As we progress through the second half of the exciting academic year 2024, we are proud to highlight the remarkable accomplishments of our faculty, research scholars and PG students. From groundbreaking research published in prestigious journals to innovative teaching methods that inspire the next generation of physicists, our department continues to excel on multiple fronts.

I wish the editorial team of the newsletter and the vibrant community of the Physics department “all the very best.”

Dr. Sudha D Kamath

Professor & Head, Department of Physics
MIT, MAHE, Manipal

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Contact Details:

Department of Physics

Manipal Institute of Technology, Manipal – 576 104, Karnataka, India

Phone: 0820 2925621 (HOD), 0820 2925624 (Office) e-mail: physics@manipal.edu

Editorial

Dear Reader,

Warm greetings to you!

In the expansive landscape of technical education, the Manipal Institute of Technology (MIT) proudly stands as an enduring symbol of excellence. Founded in 1957 by the visionary Dr. T. M. A. Pai, MIT started as a self-financed engineering college and has remained steadfast in delivering top-notch education. At the heart of MIT's academic legacy lies the Department of Physics, a founding department integral to shaping the institute's identity. From its modest origins, the Department of Physics has evolved into a distinguished hub for post-graduate studies and cutting-edge research.



The department boasts a dedicated faculty of 22 experts specializing in fields such as Condensed Matter Physics, Thin Film Devices, and Theoretical Physics, positioning it at the forefront of academic excellence. Its commitment to advancing knowledge is evident in securing over Rs. 6 Crore in external funds for various research projects, highlighting the department's dedication to meaningful scientific contributions.

Beyond research, the department is devoted to holistic education. It imparts knowledge in Engineering Physics and offers open elective subjects to BTech students, ensuring a well-rounded learning experience. Additionally, the department provides MSc (Physics) and PhD programs, currently hosting around sixty full-time PhD students, fostering a culture of academic rigor and scholarly pursuit.

In the past six months, the department has been vibrant with activities and accomplishments. Notably, it signed an MoU with Elvikon India Pvt Ltd, conducted a workshop on Density Functional Theory, and organized a summer school for UG and PG students from other colleges. These events reflect the department's ongoing commitment to academic and research excellence.

We are pleased to present the second issue of our newsletter, "Physi-Spectra."

Warm regards,

Dr. Ismayil

Editor in Chief

HODs of Physics Department (Since 1959)

Sl. No.	Name	From	To
01	Prof. H. N. Udupa	July 1959	June 1961
02	Prof. G. N. Bhat	July 1961	June 1962
03	Prof. (Dr.) John Alexander	July 1962	July 1963
04	Prof. G. N. Bhat	August 1963	August 1969
05	Prof. K. Mohan Pai	September 1969	July 1992
06	Prof. I. Narayana	August 1992	November 1997
07	Prof. U. K. Rajgopal Rao	December 1997	August 2001
08	Prof. (Dr.) K. S. Aithal	September 2001	October 2005
09	Prof. (Dr.) Thukaram M	October 2005	October 2009
10	Prof. (Dr.) Ashok Rao	November 2009	September 2015
11	Prof. (Dr.) Vyasa Upadhyaya	October 2015	September 2018
12	Prof. (Dr.) Mohan Rao K	October 2018	September 2023
13	Prof. (Dr.) Sudha D Kamath	October 2023	-



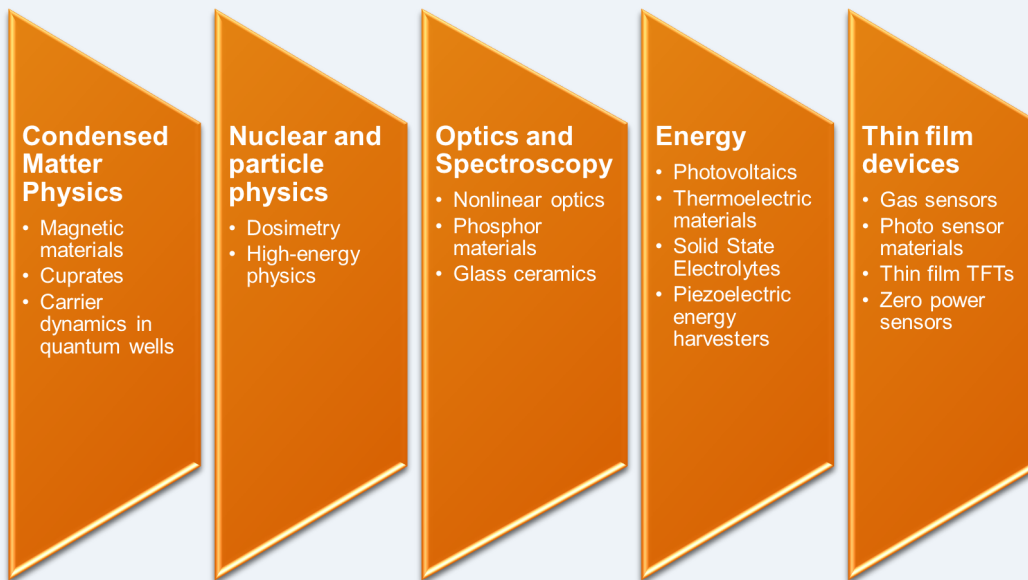
Department of Physics, MIT, Manipal

VISION

To provide state-of-the-art infrastructure to the Centre for Excellence in Physics Education with a blend of basic as well as applied research.

22	64	41	450	700+	46
Faculty Members	Current Ph.D. Students	Ph.D. Awarded	Lac INR Grant Amount	Research Publications	Department h - index

Current research field in the department :



Research output



11821
Citations

49
h-index

777
Article

49
Conference contribution

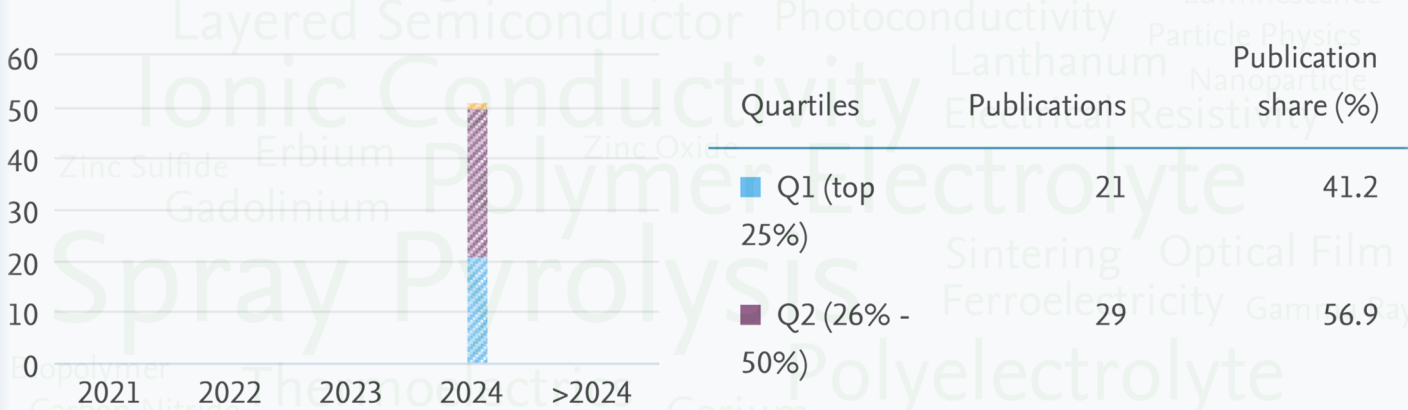
22
Conference article

14
Review article

Department of Physics, MIT, Manipal

Research Highlights (JAN - JUNE 2024)

Share of publications per Journal quartile by CiteScore Percentile



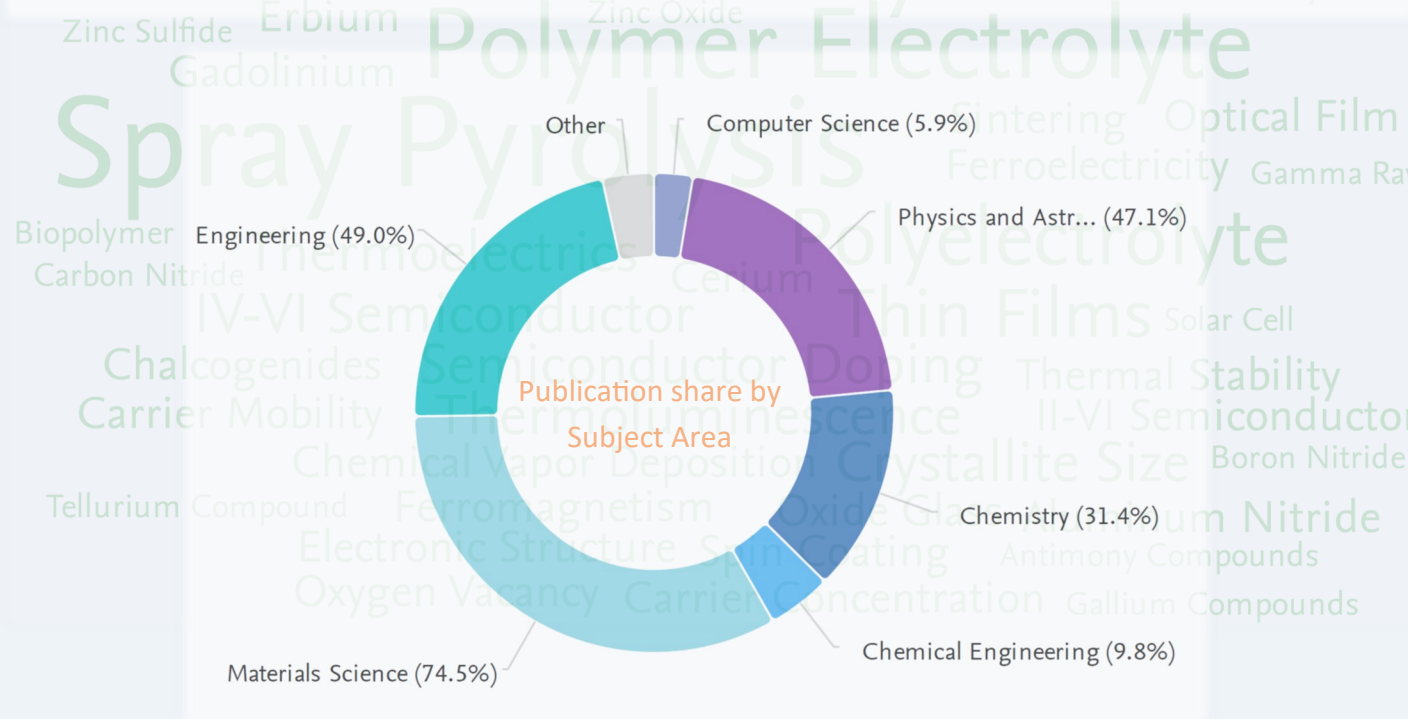
/// Incomplete year

Quartiles	Publications	Publication share (%)
Q1 (top 25%)	21	41.2
Q2 (26% - 50%)	29	56.9
Q3 (51% - 75%)	0	0.0
Q4 (76% - 100%)	1	2.0
Cumulative shares	Publications	Publication share (%)
Q1 to Q2 (top 50%)	50	98.0
Q1 to Q3 (top 75%)	50	98.0

Scholarly Output

51

number of publications by authors in First 6 months - 2024



Courses offered by Department of Physics

B.Tech.

Engineering Physics
 Applied Physics for Engineers
 Fundamentals of Astronomy & Astrophysics (OE)
 Radiation Physics (OE)
 Solid State Physics (OE)
 Modern Optics (OE)
 Physics of low dimensional materials (PE)

M.Sc. (Physics)

Electives:

Condensed Matter Physics
 Optoelectronics
 Nuclear Physics
 Theoretical Physics

Ph.D. Course works

Advanced Materials Characterization Techniques
 Advanced Methods in Theoretical Physics

Courses offered for other institutions of MAHE:

International Center For Applied Sciences (ICAS)

Physics - I
 Physics - II

Bachelor of Optometry (BOPT)

Geometrical Optics - I
 Geometrical Optics - II
 Physical Optics

M.Sc. (Medical Radiation Physics)

Modern Physics

B.Sc. (Health Sciences)

Physics - I
 Physics - II

B.Sc. (Nursing)

Physics

Salient features of M.Sc. (Physics) program Dept. of Physics, MIT, Manipal

- Revised Programme Structure and Curriculum 2024
- Choice Based Credit System
- Duration: 2 years, 4 Semesters
- First year for theory and lab courses (40 credits)
- Second year devoted entirely to Project/Research Internship (40 credits).
- Opportunity to work on collaborative research projects at industries/ institutes of national and international repute.

Collaboration with industry and institutes for internships and placement opportunities for MSc. Physics (PG) students

- Elvikon India Pvt. Ltd., Hyderabad
 (MOU is signed b/n MAHE and Elvikon India, on March 11, 2024)
- Center For Advanced Learning (CFAL), Mangalore
- Blackfrog Technologies Pvt. Ltd., Manipal.
- Manipal Skill Development Center (MSDC), Manipal



MAHE (on behalf of Physics department, MIT) and Elvikon India Pvt Ltd signed MOU for Academic Collaboration

Manipal Academy of Higher Education (on behalf of Physics department, MIT) has signed an MOU with Elvikon India Pvt Ltd, based in Hyderabad, Telangana on 11th March 2024. The objective is to foster joint academic activities, benefiting faculty members, research scholars, and postgraduate students. The signing ceremony witnessed the presence of key figures including Dr. P. Giridhar Kini, Registrar of MAHE; Dr. Rambabu Atluri, CEO of Elvikon; Dr. Anil Rana, MIT's Director; Dr. Harish Kumar, Director of Corporate Relations at MAHE; and Dr. Somashekar Bhat, Joint Director, MIT. Dr. Sudha D Kamath, HOD Physics, and Dr. Gurumurthy S C, Associate Professor of Physics, also attended.



The collaboration aims to facilitate joint research projects, internships, and knowledge exchange programs, bridging academia and industry. It underscores a commitment to enriching academic experiences and fostering practical skills among students. Both parties expressed optimism about the partnership's potential to drive innovation and address real-world challenges. The MOU signifies a significant step towards enhancing research capabilities and providing valuable opportunities for academic growth and industry relevance.

Inauguration of *Nano to Infinity* Physics Club at MIT Manipal

As an initiative to collectively bring the masters students associated with Department of Physics, MIT Manipal, a technical club was inaugurated on 8th February, 2024, at the Mechanical and Industrial Engineering seminar hall, MIT. Dr. K. V. Sriram, Associate Director, Industry Liaison, Placement & Practice School, participated as the chief guest of the event. The event was conducted in the esteem presence of Dr. Sudha D Kamath, HoD, Physics and Faculty Advisor of the club, Dr. Raghavendra K. G. along with office bearers of the club from 1st and 2nd M.Sc (Physics). Faculty members of the Department of Physics, research scholars and PG students participated in the event.



Dr. Sudha Kamath welcomed the gathering along with a word of encouragement for the activities of the club. Dr. Raghavendra K. G., briefed about the vision behind initiating this club along with objectives and activities planned through the club. Dr. K. V. Sriram blessed the occasion by formally inaugurating the club, revealing the name of the club “Nano to Infinity” and sharing his wisdom to the student community and calling for a pro-

active participation in the club events. The club is driven by the M.Sc physics students with mentorship from the Department faculty members. Mr. Matlub and Ms. Gayathri from 2nd M.Sc (Physics) are selected as the president and secretaries of the club, respectively and Ms. Alaka Pramod and Mr. Adithya from 1st M.Sc (Physics) were selected as the joint secretary and treasurer, respectively.



Summer School on Functional Material Synthesis and Advanced Materials Characterization

The Summer School on Functional Material Synthesis and Advanced Materials Characterization organized by Physics department from May 20 to May 22, 2024. Total 38 UG and PG students from various colleges and universities attended the summer school. The event was inaugurated by Cdr. (Dr.) Anil Rana, who emphasized the importance of advanced material research. Dr. Sudha D. Kamath welcomed the attendees and discussed career prospects in the field. The coordinator of the summer school,



Dr. Dhananjaya Kekuda briefed about the schedule. The vote of thanks for the function was delivered by Dr. Ismayil, who is the co-coordinator of the summer school. The program kicked off with plenary lectures by Dr. Mohan Rao K on X-ray diffraction (XRD) techniques and Dr. Vishwanath Managuli on Scanning Electron Microscopy (SEM) and Atomic Force Microscopy (AFM). Participants toured the Central Instrumentation Facility (CIF) to see these technologies in action and later participated in a quiz. Day two featured a lecture by Dr. Dhananjaya Kekuda on synthesis techniques, followed by Dr. Sudha D. Kamath's session on optical spectroscopic methods. Dr. Sudhakar Y N delivered a talk on electrochemical workstations. Participants visited the Physics and Chemistry Departments and engaged in another quiz. The final day included lectures by Dr. Mahesha M G on electrical characterization and Dr. Ismayil on the Impedance Analyzer, complemented by hands-on lab sessions. The event concluded with a valedictory function and certificate distribution. The summer school provided an in-depth exploration of material synthesis and characterization, combining theoretical lectures with practical experience, and preparing participants for future research in materials science.



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Introductory Workshop on Density Functional Theory and its Applications Using Quantum Espresso

A comprehensive six-day workshop aimed at delving into the intricacies of Density Functional Theory (DFT) and its practical applications utilizing Quantum Espresso software was organized by Physics Department. Commencing on January 29, 2024, and culminating on February 3, 2024, the workshop provided a platform for participants to gain insights into the theoretical foundations of DFT and its utilization in diverse domains of material science. The inaugural ceremony, held on January 29, 2024 was graced by Cdr. (Dr.) Anil Rana, Director of MIT Manipal, who presided over the proceedings. Dr. Shashi Kumar K from Alva's Institute of Engineering and Technology adorned the event as the Chief Guest, offering valuable perspectives on the subject matter. The workshop commenced with an illuminating talk by Dr. Shashi Kumar K, shedding light on the intricate details for experimentalists utilizing DFT calculation tools. Dr. Vikash Mishra from the Department of Physics at MIT, Manipal, subsequently addressed the gathering, providing insights into Materials Modeling for Electronic Structure Calculations using Quantum Espresso, both in theory and practice.



On the second day, Dr. Kartick Tarafder from the Department of Physics at NITK, Surathkal, elucidated the fundamentals of DFT in his session. This was followed by a discourse on Doping and defect calculation with DFT, conducted by Dr. Suranjan Shil from MCNS, MAHE, Manipal. Days three through six were dedicated to hands-on sessions, meticulously led by Mr. Anantharam and Ms. Sunetha. Participants were actively engaged in applying DFT methodologies across various classes of materials, including metals, semimetals, insulators, and semiconductors. Furthermore, the introduction of dopants and other defects was comprehensively illustrated, enriching the practical understanding of the participants.

The valedictory program, held on February 3, 2024 marked the conclusion of the workshop. Dr. Ashok Rao, Associate Director (R&C) at MIT Manipal, graced the occasion as the presiding authority, emphasizing the significance of such initiatives in fostering academic excellence and research acumen. Dr. Sudha D Kamath chaired the workshop, ensuring its smooth conduction, while Dr. Mahesha M G served as the Convener, orchestrating the various components of the event seamlessly. The workshop not only served as a forum for knowledge dissemination but also facilitated networking and collaboration among participants, paving the way for future advancements in the realm of Density Functional Theory and its applications.

Session on Research to Patent

The Department of Physics at Manipal Institute of Technology organized an enlightening session titled "Research to Patent" on May 2, 2024. Key speakers included Dr. Suchand Sandeep, who discussed his research journey to patenting, Dr. Venkatachalam H., who shared insights on commercialization, and Dr. S. Varadarajan, who provided an overview of the patenting process. This event, meticulously coordinated by the Industry and Academia Connect Team of Physics Department, aimed to bridge the gap between academic research and the patenting process, fostering innovation and collaboration between scholars and industry.

Newly Renovated Engineering Physics Lab Inaugurated at MIT

The newly renovated and well-equipped Engineering Physics Laboratory at AB2 of the Manipal Institute of Technology was inaugurated on January 2, 2024. The occasion was marked by a traditional Sharadha Pooja, symbolizing the auspicious beginnings of new ventures in the realm of education.



Director of MIT, Cdr. (Dr) Anil Rana and Dr. Sudha D. Kamath, Head of the Physics Department led the inauguration. Their dedication and vision have been pivotal in realizing this state-of-the-art lab. The ceremony was honored by the presence of Dr. Somashekhar Bhat, Joint Director of MIT, alongside Associate Directors, faculty members, research scholars, and non-teaching staff.

Physics department launches Bi-Annual E-Newsletter: Physi-Spectra

Physics Department of MIT, Manipal, celebrated academic achievement by launching its bi-annual e-newsletter, Physi-Spectra, at Sir M V Seminar Hall, AB2 on January 27, 2024. The event brought together faculty, students, and esteemed guests, creating an atmosphere of inspiration and collaboration. Dr. Sudha D. Kamath, Head of the Physics Department, opened the ceremony with a heartfelt welcome address. She emphasized the significance of Physi-Spectra as a platform to highlight the diverse achievements and contributions within the department, fostering a collaborative spirit among all stakeholders. Dr. Ismayil, Chief



Editor of Physi-Spectra, provided an insightful overview of the e-newsletter, detailing its vision and mission. He highlighted its role in showcasing faculty achievements, student accomplishments, and research milestones. Commander (Dr.) Anil Rana, Director of MIT, officially released the inaugural edition of Physi-Spectra. He praised the Physics Department for its dedication and innovation, emphasizing the importance of knowledge-sharing and collaboration in academic advancement. Dr. Somashekara Bhat, Joint Director of MIT, also honored the event with his presence. Dr. Bhagyesh, a subeditor of Physi-Spectra, delivered a vote of thanks, expressing gratitude to all contributors. The event was expertly guided by Mr. Lozil Denzil Mendonca, a research scholar in the Physics Department, who served as the Master of Ceremonies with grace and efficiency. The launch of Physi-Spectra marks a new chapter in the department's commitment to excellence and innovation in the pursuit of knowledge.



Guest Lecture by Dr. P D Babu, Center Director, UGC-DAE Consortium for Scientific Research, Mumbai

A guest lecture on the topic “Nanomagnetic materials” by Dr. P D. Babu, Center Director, UGC-DAE Consortium for Scientific Research, Mumbai Center was organized at MIT KEF R&D Centre Auditorium on 19th January 2024. Dr. P D. Babu has given information about facilities available in their center and method of accessing these facilities by students, research scholars and faculties of University and Institutes. He provided information on the beam facilities of the Dhruva reactor and the use of neutron beams to analyze



the magnetic properties of bulk and nanomaterials. He outlined the advantages of neutron diffraction over x-ray diffraction. Additionally, he addressed the co-existence of the spin glass phase and modulated antiferromagnetism in intermetallic compounds that are rich in rare earths. Dr. B. V. Rajendra, the event's co-ordinator, introduced the speaker to the distinguished audience and Prof. Dr. Sudha D Kamath, the Head of Department, expressed gratitude and presented a memento. This talk was attended by 65 members of the physics department, which included faculty members, research scholars, and postgraduate students.



Guest Talk on Experimental Demonstration of Quantum Communication by TIFR Research Scholars

In a collaborative effort between the Department of Physics and the Department of Electronics and Communication at the Manipal Institute of Technology, Manipal, a guest talk titled "Experimental Demonstration of Quantum Communication" was organized. The seminar featured esteemed speakers Rounak, Kiran, and Sonali, research scholars from the Tata Institute of Fundamental Research (TIFR), Mumbai. The event took place on February 16, 2024. The seminar attracted a diverse audience comprising research scholars, postgraduate students, and faculty members from various departments of MIT, Manipal, as well as participants from other constituents of Manipal Academy of Higher Education (MAHE), including the Manipal Centre for Natural Sciences (MCNS). Notably, Prof. Somashekara Bhat, Joint Director of MIT, Manipal graced the occasion with their presence.



The session commenced with a warm welcome by Prof. Kumar Shama, Head of the Department of Electronics and Communication, and Prof. Sudha D. Kamath, Head of the Department of Physics, who extended their greetings to all participants. The focus of the seminar was on Quantum Key Distribution (QKD), a cutting-edge quantum communication technology. The speakers elucidated how QKD ensures data security by leveraging fundamental principles of physics, contrasting it with the reliance on mathematical complexity in classical cryptography. Discussions revolved around various facets of QKD, encompassing its theoretical foundations, technological implementations, and practical implications. Moreover, the session shed light on ongoing research endeavors aimed at augmenting the performance, scalability, and real-world deployment of QKD systems. An intriguing aspect highlighted during the seminar was the experimental demonstration of a "Free Space" quantum communication protocol, specifically the B92 Protocol, within a laboratory setting.

Seminars and Live Streaming Event for Semiconductor Fabrication Facilities Foundation Stone Laying Ceremony

The Department of Physics at Manipal Institute of Technology (MIT), Manipal, arranged a dual event on March 13, 2024, combining insightful seminars with the live streaming of the foundation stone laying ceremony for three mega semiconductor fabrication facilities by Honorable Prime Minister Sri Narendra Modi.



Dr. Sudha D. Kamath, Head of the Department of Physics, initiated the proceedings by extending a warm welcome to the attendees, emphasizing the crucial necessity of semiconductor fabrication units within the country.

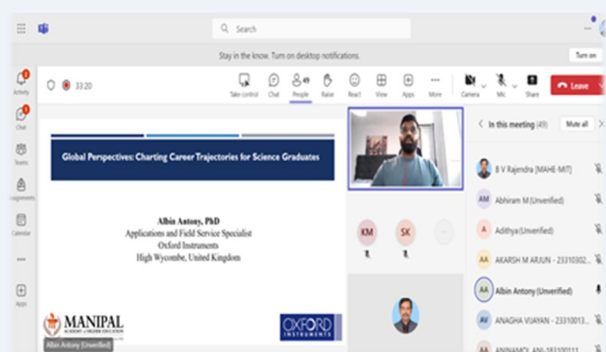
The event commenced with two enlightening seminars delivered by esteemed faculty members. Dr. Vikash Mishra, Assistant Professor of Physics at MIT, Manipal, delved into the realm of "Semiconductor-based Optoelectronic Devices" during the first seminar. His comprehensive discourse elucidated various facets of semiconducting materials, with a particular focus on photo detectors based on oxide semiconductors. Attendees found the talk highly informative, engaging, and relevant to contemporary technological advancements. Following Dr. Mishra's presentation, Dr. Sandeep Suchand took the stage to discuss "Semiconducting Nanocrystals for Solar Cells." Dr. Suchand provided insights into the intricacies of wafer technology, alongside an analysis of the current landscape of photovoltaics. Both seminars



fostered productive discussions and underscored the indispensable role of materials in the domains of optoelectronics and renewable energy applications. Subsequently, attendees were treated to a live streaming event featuring the foundation stone laying ceremony for three mega semiconductor fabrication facilities by Honorable Prime Minister Sri Narendra Modi. Dr. Dhananjaya Kekuda, Associate Professor from the Department of Physics at MIT, Manipal, adeptly coordinated the event, ensuring its seamless execution.

Physics Department Hosted International Alumni Talk with Dr. Albin Antony

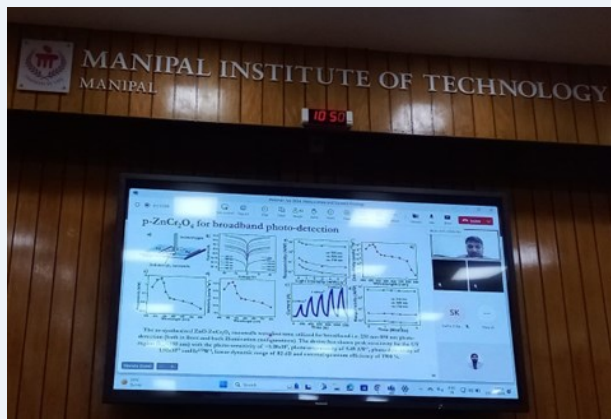
The Department of Physics at Manipal Institute of Technology (MIT) organized an International Alumni Talk in the online mode on April 6, 2024, featuring Dr. Albin Antony, an esteemed MAHE alumnus from the 2014-16 M.Sc. Physics batch and Ph.D. graduate of 2020. Dr. Antony, now an Applications and Field Service Specialist at Oxford Instruments NanoAnalysis, UK, spoke on "Global Perspectives: Charting Career Trajectories for Science Graduates." Welcomed by Dr. Sudha D Kamath, the department head, Dr. Antony discussed Oxford Instruments' global operations and emphasized the importance of science and technology in societal development. He offered valuable career insights and tips on preparing professional documents and managing social media. The talk, attended by 52 postgraduate students and research scholars, concluded with Dr. B. V. Rajendra expressing gratitude to Dr. Antony for his enlightening session.



Webinar on Nanoscience and Nanotechnology

The Department of Physics at Manipal Institute of Technology organized a webinar on 23rd January 2024. The thematic focus of the webinar was "Nanoscience and Nanotechnology," aiming to unravel the burgeoning potential of artificial intelligence (AI) in these fields and delineate the trajectory of future research. With an audience primarily comprising students, research scholars, and faculty members of MIT Manipal, the webinar sought to amplify awareness and foster discourse on this symbiotic relationship.

Distinguished speakers from eminent institutions took the virtual podium to share their insights. Dr. Tejendra Dixit, from the Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram, illuminated the audience on "Optoelectronic Intelligence." Concurrently, Dr. Ravi Trivedi, representing the Bhabha Atomic Research Centre, Mumbai, expounded on "Recent Advances in Nanotechnology." The convergence of perspectives during the webinar underscored the pivotal role that optoelectronic artificial intelligence is poised to play in the realm of nanoscience and nanotechnology. It envisaged a future where the fusion of these cutting-edge disciplines could propel innovation to unprecedented heights. Presiding over the webinar was Prof. Sudha D. Kamath, Head of the Department of Physics, who provided invaluable guidance and leadership throughout the session. The event witnessed an enthusiastic participation of 52 individuals, including M.Sc. students, research scholars, and faculty members, reflecting the keen interest and commitment to advancing knowledge in this domain. Dr. Akhilesh Ranjan and Dr. Vikash Mishra served as the convener and co-convener of the webinar, respectively, organizing the seamless execution of the event.



Department of Physics Clinches MIT Research Award for Third Consecutive Year

The Department of Physics at Manipal Institute of Technology (MIT) received the Award for Excellent Research Performance-2024 for the third consecutive year on April 17, 2024, during MIT Research Day. Recognized under the Science and Humanities & Management stream, the department was lauded for its outstanding research contributions through publications, extramural funds, patents, and consultancy. Dr. Sudha D Kamath, Head of the Department, and faculty members received the trophy from MIT Director Cmd. (Dr.) Anil Rana. Expressing gratitude, Dr. Kamath emphasized the department's dedication to advancing scientific frontiers. The award underscores their commitment to research excellence, inspiring academic rigor and innovation across MIT. MIT Research Day serves as a platform to showcase institutional research prowess and celebrate scholarly achievements. The Department of Physics' consecutive wins reflect its leadership in scientific exploration, setting benchmarks and motivating future researchers.



Faculty Accomplishments

Dr. Suchand Sandeep Shines at Lifeathon 2024

Lifeathon 2024, held on June 8th, 2024, was a collaborative hackathon between the Innovation Centre, MAHE, MIT Manipal, and KMC Manipal. The event aimed to bridge healthcare and technology sectors. Dr. Suchand Sandeep C S from MIT Manipal's Physics Department was a key member of the second place-winning team. Their project, "Smartphone Attachment for Detection of Refractive Error," impressed judges from clinical, industry, and intellectual property backgrounds.



Dr. Sudha D Kamath Excels at Lifeathon 2024

Lifeathon 2024, a unique hackathon bridging healthcare and technology, was held on June 8th, 2024, in collaboration with the Innovation Centre, MAHE, MIT Manipal, and KMC Manipal. Dr. Sudha D Kamath from the Physics Department at MIT Manipal was instrumental in the fourth place-winning team. Their project, "Abdominal Compression Device for Radiotherapy," garnered significant attention. The event, coinciding with KMC Research Day, was inaugurated by Dr. Narayana Sabhahit and Dr. Anil Rana. Thirty teams presented their solutions to a panel of judges from clinical, industry, and intellectual property backgrounds.



Dr. Suchand Sandeep, Associate Professor – Research, Department of Physics, MIT Manipal delivered an invited talk on 2nd March 2024, at the International Conference on Light Matter Interaction & Ultrafast Processes (ICLMIUP 2024), hosted by MG University, Kottayam, Kerala. He presented recent research results on ultrafast laser direct writing for the fabrication of diffractive and refractive micro-optical components and their applications.

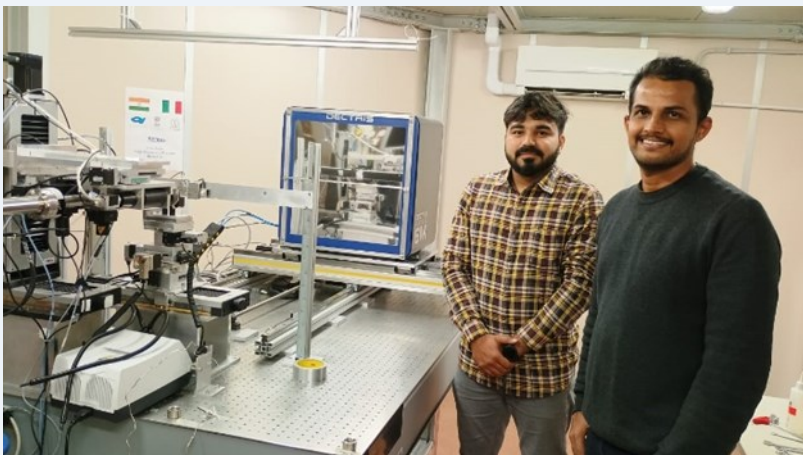


Dr. Suchand Sandeep, Associate Professor – Research, Department of Physics, MIT Manipal was an invited resource person at the National Conference on Advanced Materials for Chemical and Biological Applications organized by the Department of Chemistry at Sri Dharmasthala Manjunatheshwara College, Ujire, Karnataka, on 6th March 2024. In his lecture titled Renewable Energy with Quantum Dots, exciting results obtained through ultrafast optical and terahertz measurements on quantum dots were discussed from the perspective of inexpensive and efficient solar cells. He also chaired an oral presentation session at the conference.



Faculty Accomplishments

Dr. Raghavendra K. G, Assistant Professor in the Department of Physics, has recently received approval for utilization of the High Pressure Synchrotron beamline at the prestigious Elettra Synchrotron facility in Trieste, Italy. The experimental endeavor, financially supported by the Department of Science and Technology (DST), India, through the Indian Institute of Science (IISc), Bengaluru, has allocated approximately ₹1,33,000 each for Dr. Raghavendra K. G and Mr. Saideep, a Ph.D. research scholar from the Department of Physics. This sponsorship underscores India's commitment to cutting-edge scientific research on the global stage.



Dr. Raghavendra K. G and Mr. Saideep embarked on their visit to the Elettra Synchrotron facility from 30th May to 5th June, 2024. During this period, they conducted experiments utilizing the advanced capabilities of the High Pressure Synchrotron beamline. The facility's state-of-the-art equipment and collaborative environment provided a conducive platform for their research, aimed at pushing the boundaries of understanding in their respective fields. The approval and successful execution of this experimental proposal mark a significant milestone in the careers of Dr. Raghavendra K. G and Mr. Saideep, highlighting their contributions to advancing scientific knowledge through international collaboration and cutting-edge research techniques.

Dr. Suchand Sandeep, Associate Professor – Research, Department of Physics, MIT Manipal delivered an invited talk at the *International Symposium on Recent Advances in Biophotonics and Imaging* organized by the Department of Atomic and Molecular Physics at Manipal Academy of Higher Education, Manipal on 2nd January 2024. In his lecture Dr. Sandeep highlighted his recent research in artefact-free fluorescence bioimaging using random lasers and the development of a microscopic system for simultaneous imaging and detection of tumour polyps using random lasing.



Dr. Raghavendra K. G, Assistant Professor, Department of Physics, MIT Manipal had been invited by Dr. K. V. Rao Scientific Society Hyderabad to be part of the judge's panel for the 13th SPARK Innovation award held on 3rd February 2024 at Hyderabad. The competition was held for the school children across India in various categories such as in Physics (Bhoutikam Awards), Chemistry (Rasayanam Award), Biology (Jeevanam Awards) and Mathematics (Ganitam Awards).



PhD Student Achievements

Shrinatha M B, Research Scholar, Received Inspire Fellowship

Shrinatha M B, a research scholar at the Department of Physics, has been awarded the esteemed Inspire Fellowship by the Department of Science and Technology, Government of India. He is pursuing PhD under the guidance of Prof. Mohan Rao K. This accolade highlights Shrinatha's commitment and innovative contributions to the field of science. His selection for this prestigious fellowship underscores his dedication and promising potential in advancing scientific research.

**B S Srujana, Research Scholar, Received Inspire Fellowship**

B S Srujana, research scholar working under the guidance of Dr. Raviprakash Y, in Department of Physics, MIT, Manipal has been awarded with the prestigious DST INSPIRE Fellowship for a period of five years by the Department of Science and Technology, India. The fellowship has been awarded for her PhD. work titled "Development of Molybdenum based Electrodes for Photoelectrochemical Water Splitting Applications."

**Research Scholar Mrs. Sabhya Honored at Manipal Research Colloquium 2024**

Mrs. Sabhya, a dedicated Research Scholar in the Department of Physics at MIT, Manipal, under the mentorship of Dr. Mohan Rao K, has achieved acclaim for her exemplary work. At the Manipal Research Colloquium 2024 (MRC-2024), held from April 12th to 13th, 2024, she was awarded the best poster presentation certificate. The recognition was bestowed for her outstanding poster titled "Investigation of codoped Hafnia thin films for device applications". This research promises significant advancements in technology and has garnered attention for its potential impact in device applications.



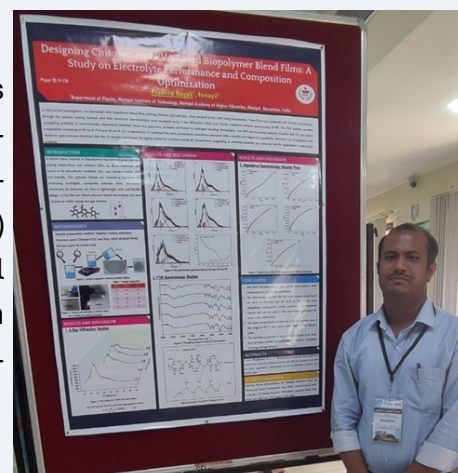
PhD Student Achievements

Pramitha A won best oral presentation award:

Pramitha A, research scholar from Department of Physics, MIT, Manipal, won third place for best oral presentation in 3rd International Conference on Nanomaterials for Energy Conversion and Storage Applications (NECSA) -2024 held at Pandit Deendayal Energy University (PDEU), Gandhinagar, Gujarat in collaboration with Department of Solar Energy (DSE) and Solar Research and Development Center (SRDC) from 21st to 23rd February 2024. She presented her abstract titled "Systematic investigation on PANI-coated Mn_3O_4 thin film electrode for supercapacitor application" in the oral presentation. She is carrying out her research work under the guidance of Dr. Raviprakash Y, Additional Professor, Department of Physics, MIT, Manipal.

**Pradeep Nayak won best poster presentation award:**

Pradeep Nayak, research scholar from the Physics department, was honored with the Best Poster Presentation Award for his work on designing Chitosan and PVA-based biopolymer blend films in the International Conference on Nanoscience and Nanotechnology (ICNN-2024) organised by Manipal Academy of Higher Education (MAHE), Manipal during 29th February – 1st March, 2024. He is carrying out his research work under the guidance of Dr. Ismayil, Associate Professor, Department of Physics, MIT, Manipal.

**Kiran R. Awarded Best Presentation at SAINTS-2024 Conference:**

Bangalore's Christ (Deemed to be University) recently hosted the prestigious Scientific Advances in Natural Sciences & Techniques (SAINTS-2024) conference, attracting participants worldwide. Among them, Mr. Kiran R. stood out for his exceptional contributions in poster presentation. Guided by Prof. Sudha D. Kamath of MIT, Manipal, Kiran presented "Synthesis and Photoluminescence Properties of $BaB_2O_4xSm^{3+}$ Phosphor" to widespread acclaim. His insightful research earned him first place in the poster presentation category.



Alumni Achievements

Alumni Excel in GATE 2024 Rankings

Two alumni from the June 2023 MSc (Physics) batch showcased outstanding performance in GATE 2024. Mr. Hrishikesh Borthakur secured All India Rank of 575, while Mr. Bishal Kumar attained All India Rank of 3399.



Mr. Hrishikesh Borthakur



Mr. Bishal Kumar

Both alumni participated in the "NET Focus Session" conducted by the Physics department last year. This session was initiated and completely monitored by Dr. Raviprakash Y, Additional Professor, Department of Physics, MIT. The research scholars of Physics department conducted the classes for these students on a voluntary basis. The session aimed to provide specialized guidance for competitive exams like GATE and NET, with classes conducted voluntarily by research scholars. Mr. Hrishikesh and Mr. Bishal Kumar's impressive rankings reflect the effectiveness of the "NET Focus Session" and the quality of education provided by the Physics Department.

MSc Student Achievements

Shrestha Sharma Participated in Vigyan Vidhusi (Physics) 2024

Shrestha Sharma, MSc Batch 2023-25, participated in the prestigious Vigyan Vidhusi (Physics) 2024 at TIFR. Held at the Homi Bhabha Centre for Science Education in Mumbai from May 27 to June 15, 2024, the program provided advanced training for MSc women students in physics.

Gayathri G participated Refresher and Preparative Winter School (RPWS)

Gayathri G has participated in the 18 days Refresher and Preparative Winter School (RPWS) in Physics held at IISER Thiruvananthapuram during December 3-20, 2023.

Venumadhav Reddy Participated in ICQTA 2024

Venumadhav Reddy Gurreddy has participated and presented his research work in "International Conference on Quantum Technologies and Applications (ICQTA 2024) at TMA Pai Auditorium, MAHE, Manipal during February 12-14, 2024.

MSc Student Achievements

Prathiksha attended NCFMA-2024

Prathiksha attended the National Conference on Functional Materials and Applications (NCFMA-2024) at Cochin University of Science and Technology (CUSAT), Kochi, Kerala during January 18-19, 2024 .

Rohith Jagan, Gayathri G and Twinkle Gurung attended ICFPA-2024

Rohith Jagan, Gayathri G and Twinkle Gurung International Conference on Frontiers in Pure and Applied Physics, hosted by the University of Science and Technology, Meghalaya during February 29 - March 2, 2024.

Shubhashri S Shenoy attended Annual Meeting of the Astronomical Society of India

Shubhashri S Shenoy attended the 42nd Annual Meeting of the Astronomical Society of India at IISc, Bengaluru during Jan 31 - Feb 4, 2024.

Panchami Chatra and Nishitha Prabhu attended ICRTMS-2024

Panchami Chatra and Nishitha Prabhu attended International Conference on Recent Trends in Materials Science (ICRTMS) at Kristu Jayanti College, Bengaluru during March 6-7, 2024.

PhD Students Conference Presentation

Pradeep Nayak and Anusha attended ICNN-2024

Pradeep Nayak and Anusha attended International Conference on Nanoscience and Nanotechnology – 2024 (ICNN-2024) held at Dr. T.M.A. Pai Auditorium, Manipal during 29th February – 1st March 2024.



**Pradeep Nayak and P C Dhanush attended ACSSI-2024**

Pradeep Nayak and P C Dhanush attended 18th Asian Conference on Solid State Ionics – 2024 (ACSSI-2024) held at Meenakshi College for Women, Kodambakkam, Chennai, India during February 19-22, 2024.



Doctorate Awardees of Physics Department

(List continued from previous issue...)

Sl. No.	Name of the Candidate	Thesis Title	Guide / Co-guide	Date of Award
41	Ms. Asha Hind P 	Preparation and characterization of La ³⁺ and Eu ³⁺ doped transparent metal oxides for device applications	Dr. B V Rajendra	19 JAN 2024
42	Ms. Ashwitha Nancy D'Souza 	Ionizing radiation Shielding and Dosimetry Studies on Rare- earth Oxide doped Heavy Metal Oxide Boro- Silicate Glasses	Dr. Sudha D Kamath	28 FEB 2024
43	Mr. Sharanu 	Evaluation of tin-based ternary oxide thin films for device applications	Dr. Mohan Rao K	23 APR 2024

Hands on training to Summer School participants by Research Scholars of Physics Department



The Polymer Odyssey: Researcher's Quest in the Realm of Molecules

- Pradeep Nayak
Research Scholar

In the heart of the lab, where science resides,
Lies a tale of polymers, where knowledge abides.
Through beakers and flasks, a journey unfolds,
With researcher at the helm, brave and bold.

Polymers, they whisper, in chains they align,
From simple beginnings to structures so fine.
With carbon and hydrogen, they twist and they bend,
Creating new forms, their wonders unend.

The researcher, with a curious mind,
Explores the vast realm, where molecules bind.
The researcher delves into polymers, both old and new,
Seeking the secrets, the knowledge to accrue.

From polyethylene's stretch to nylon's grace,
Researcher's keen eye, no detail misplaced.
Researchers studies their strength, and their form,
In their hands, the polymers transform.

In the glow of the lab, under soft, gentle light,
Researchers weaves their magic, through day and night.
Researchers charts out new paths, where science has no end,
With polymers as allies, and knowledge their friend.

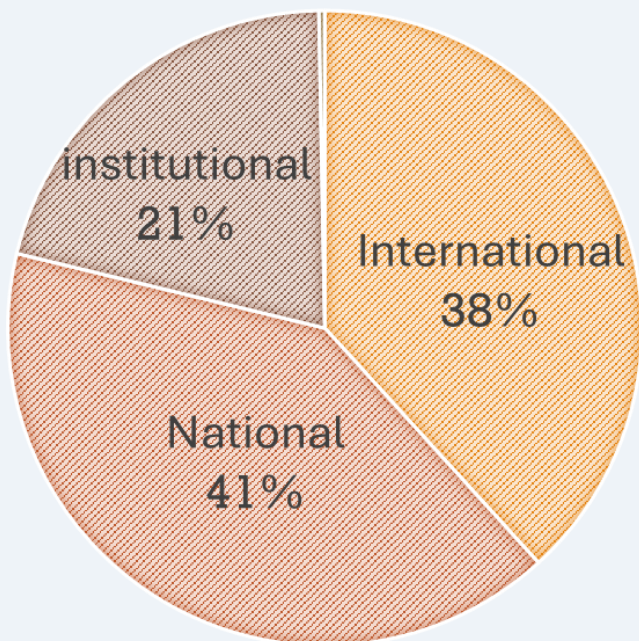
Oh, polymers and researcher, a dance so profound,
In the halls of research, where wonders are found.
Together they journey, through chemical streams,
Bringing forth innovations, fulfilling their dreams.

A problem is something to be solved, an obstacle is something to be overcome.

- Dr. T M A Pai



Research Collaborations of Physics Department:



- Universiti Putra Malaysia
- Imam Abdulrahman Bin Faisal University, Saudi Arabia
- University of New South Wales, Australia
- National Dong Hwa University, Taiwan
- Częstochowa University of Technology, Poland
- MISIS, Moscow, Russia
- Al-Isra Private University, Jordan
- Kyongpook National University, South Korea
- Technical University of Denmark
- RAS - P.N. Lebedev Physics Institute, Moscow, Russia
- International Iberian Nanotechnology Laboratory, Portugal
- Flinders University, Adelaide, Australia
- Chungnam National University, South Korea

- Indian Institute of Science (IISc), Bangalore
- Bhabha Atomic Research Centre (BARC), Mumbai
- Raja Ramanna Centre for Advanced Technology (RRCAT), Indore
- UGC-DAE Consortium for Scientific Research, Indore
- Mangalore University, Mangalore
- Vellore Institute of Technology, Vellore
- Sikkim Manipal University, Sikkim
- National Institute of Technology Karnataka, Surathkal

