



# INFOTECH

## VOLUME 9 ISSUE 2





## Vision and Mission

### Vision of the Institute

**“To satisfy the aspirations of the youth force, who wants to lead the nation towards prosperity through techno-economic development.”**



### Mission of the Institute

**“To provide, nurture and maintain an environment of high academic excellence, research and entrepreneurship for all aspiring students, which will prepare them to face global challenges maintaining high ethical and moral standards.”**

# VISION OF THE DEPARTMENT



**“TO BE A NUCLEUS NURTURING LEARNER TO CATER CURRENT  
& FUTURE DIGITAL NEEDS.”**

# MISSION OF THE DEPARTMENT



- 1. EDUCATING ASPIRANTS TO FULFILL TECHNOLOGICAL AND SOCIAL NEEDS THROUGH EFFECTIVE TEACHING LEARNING PROCESS.**
- 2. IMPARTING IT SKILLS TO DEVELOP INNOVATIVE SOLUTION SCATERING NEEDS OF MULTIDISCIPLINARY DOMAIN.**



# PEO'S AND PSO'S

## PEO

### Program Educational Objectives

**PEO1:** GRADUATE SHALL HAVE THE ABILITY TO EXHIBIT EXCELLENCE IN PROFESSIONAL CAREER BY DEMONSTRATING A POSITIVE REPRESENTATION OF THEIR BRAND.

**PEO2:** GRADUATE SHALL HAVE THE ABILITY TO LEARN LATEST TRENDS COPING PRESENT AND FUTURE NEEDS.

**PEO3:** GRADUATE SHALL HAVE SENSE OF SOCIAL RESPONSIBILITY BY BALANCING THE EMOTIONAL QUOTIENT AND STRENGTHENING THE PERSONAL TRAITS.

## PSO

### Program Specific Outcomes

**PSO1:** APPLY APPROPRIATE TECHNOLOGIES AND EMPLOY SUITABLE METHODOLOGIES BY MANAGING THE INFORMATION TECHNOLOGY RESOURCES OF AN INDIVIDUAL OR ORGANISATION FOR BETTERMENT.

**PSO2:** ANTICIPATE THE EVER-CHANGING TRENDS IN INFORMATION TECHNOLOGY AND ASSESS THE LIKELY UTILITY OF NEW TECHNOLOGIES

**PSO3:** DEVELOP IT SYSTEMS THAT WOULD RESOLVE ISSUES RELATED TO SOCIO-ECONOMIC DEVELOPMENT AND BUILD THE NATION THROUGH DIGITISATION.



# Message from the Principal



**Dr. T.K Nagaraj**  
**Principal Jspm's Bsiotr**

**It is an honor to present INFOTECH 2024-2025, Volume 9, Issue 2, a testament to the innovation and dedication of our IT Department. In an ever-evolving digital world, staying informed and adaptive is the key to success.**

**This edition showcases insightful articles, pioneering projects, and the latest trends, bridging the gap between theory and real-world application. I commend the efforts of our students, faculty, and editorial team for bringing this to life.**

**May INFOTECH inspire and empower you to push the boundaries of knowledge and innovation.**

**Wishing you success in all your endeavors!**

# Message from the HOD



**Dr. Vinod S Wadne**  
HOD Dept of IT

**With immense pride, I introduce INFOTECH 2024-2025, Volume 9, Issue 2, a platform celebrating technological creativity and expertise. The IT domain is constantly advancing, and continuous learning is the way forward. This edition highlights cutting-edge research, innovative projects, and industry trends, reflecting the enthusiasm and dedication of our students and faculty. It's not just a magazine, it's a movement toward excellence. Congratulations to the editorial team and contributors for making this possible. May INFOTECH spark new ideas and drive future innovations. Best wishes to all!**



# Message from the Chief Editor



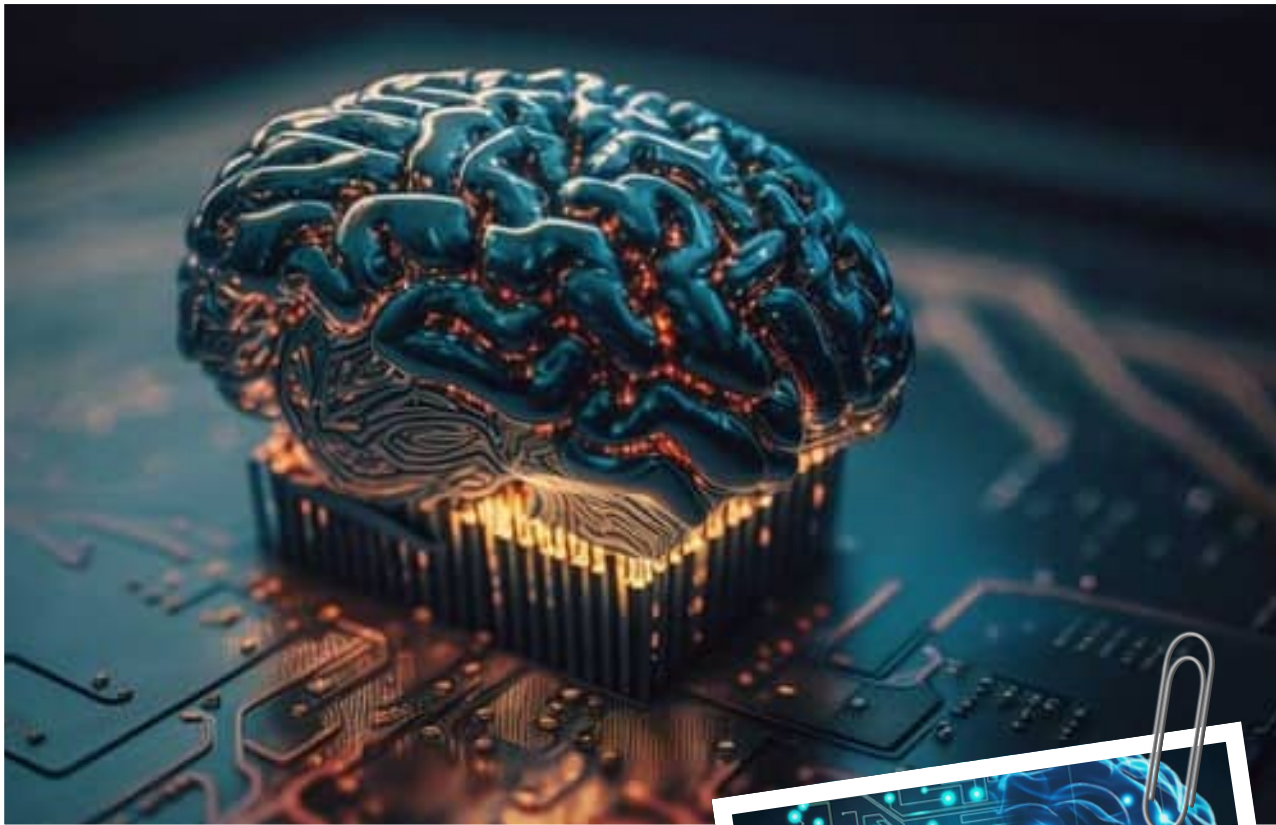
**Prof. Rekha S. Kotwal**

**Welcome to INFOTECH 2024-2025, Volume 9, Issue 2, where ideas turn into inspiration. This magazine is a collective effort to showcase knowledge, creativity, and the ever-evolving world of technology.**

**From groundbreaking research to thought-provoking articles, this edition brings you insights from bright minds passionate about IT. It's a celebration of learning, innovation, and collaboration.**

**A heartfelt thank you to our Principal, HOD, faculty, and editorial team for their support. To our readers may INFOTECH ignite your curiosity and passion for technology!**

**Happy reading and keep innovating!**



# Neuromorphic Computing

Neuromorphic computing is an advanced AI approach that seeks to replicate the way the human brain processes information. Unlike traditional computers, which use binary logic and von Neumann architecture, neuromorphic chips use artificial neurons and synapses to enable real-time learning, pattern recognition, and energy-efficient AI processing. This technology allows for ultra-fast decision-making with significantly lower power consumption, making it ideal for applications such as autonomous robots, edge AI, and brain-machine interfaces. The potential of neuromorphic computing extends across various domains, including healthcare, security, and industrial automation



Rashi Magar  
(BE-IT)



# AI-driven Drug Discovery & Personalized Medicine



## Generative AI In Drug Discovery

Artificial Intelligence is transforming the pharmaceutical industry by significantly accelerating drug discovery and development. Traditionally, identifying new drug candidates is a time-consuming process that can take years. AI-driven models, however, can rapidly analyze massive datasets, predict molecular interactions, and identify promising compounds within weeks. AI-powered platforms, such as DeepMind's AlphaFold, have revolutionized protein structure prediction, a critical aspect of drug design.



AI is also playing a crucial role in personalized medicine, tailoring treatments to individual patients. By analyzing genetic data, lifestyle factors, and medical history, AI can recommend customized therapies that maximize effectiveness while minimizing side effects. This approach is particularly promising in cancer treatment, where AI-driven systems can match patients with the most suitable drugs based on their genetic profiles. As AI continues to evolve, the future of medicine will be increasingly precise, predictive, and patient-centric.

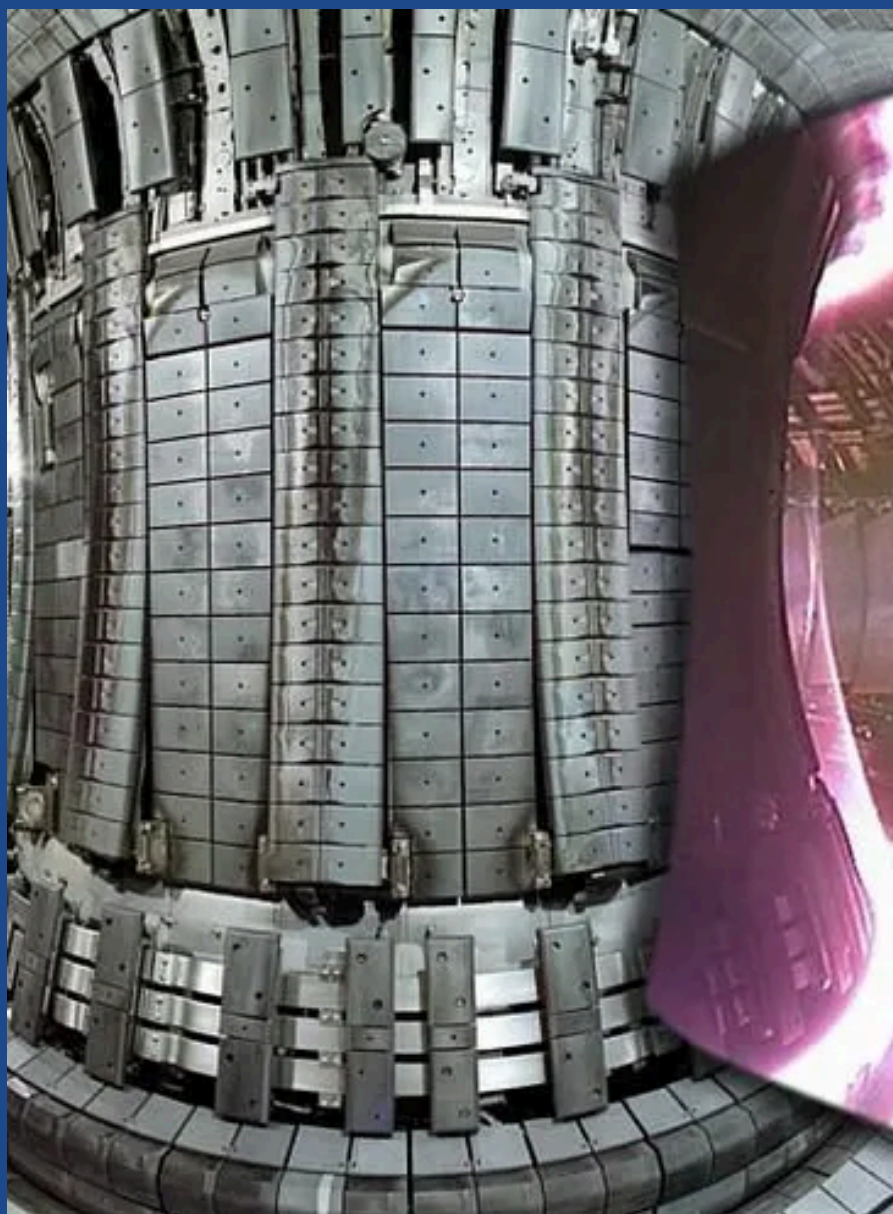
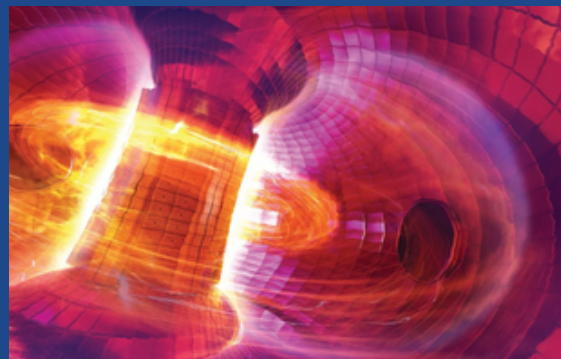
Ritesh Patil  
(BE-IT)





# FUSION ENERGY

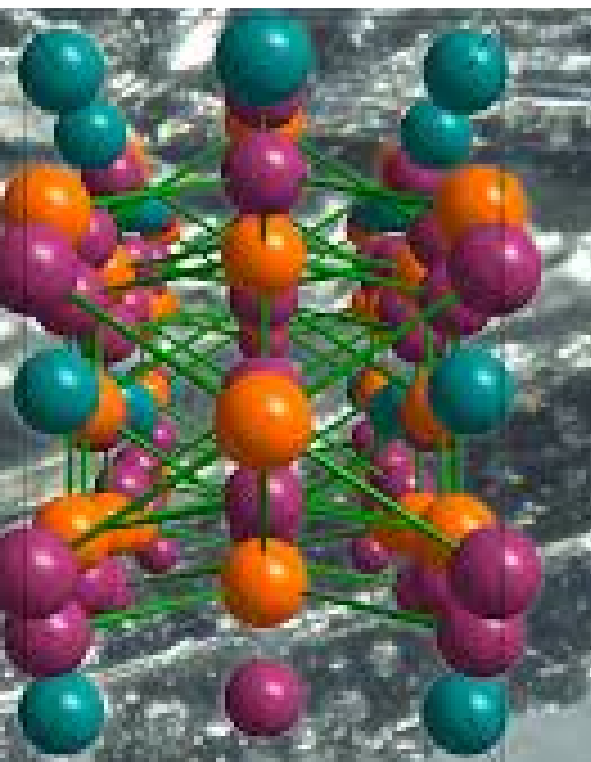
## THE FUTURE OF LIMITLESS POWER



Fusion energy represents one of the most promising solutions to the global energy crisis, offering virtually limitless, clean, and sustainable power. Unlike traditional nuclear fission, which splits atoms to generate energy, fusion mimics the process occurring in the sun by combining hydrogen isotopes to produce helium and vast amounts of energy. The key advantage of fusion is that it produces no greenhouse gases, generates minimal nuclear waste, and uses abundant fuel sources such as deuterium and tritium, which can be extracted from seawater.

Recent advancements in magnetic confinement (such as tokamaks and stellarators) and inertial confinement (laser-based fusion) are bringing us closer to commercial fusion reactors. AI-driven simulations and quantum computing are accelerating fusion research by optimizing plasma stability and reactor designs. If successful, fusion energy could revolutionize the global energy landscape, providing an inexhaustible power source for industries, smart cities, and even space exploration.

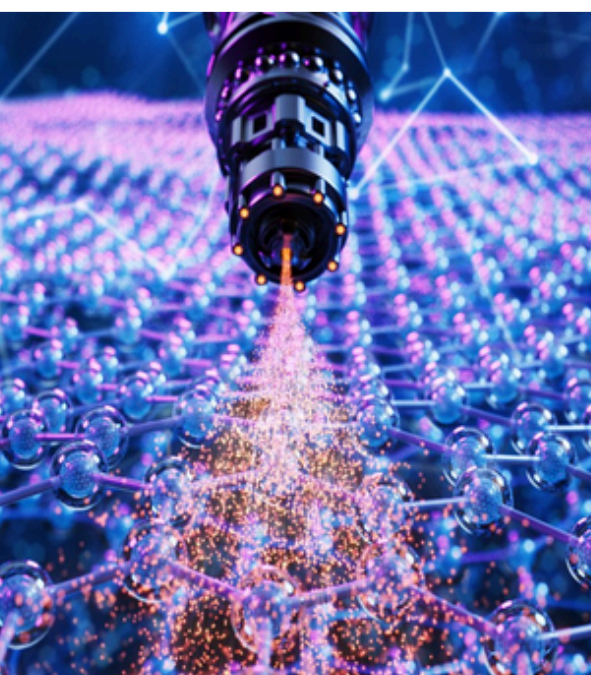
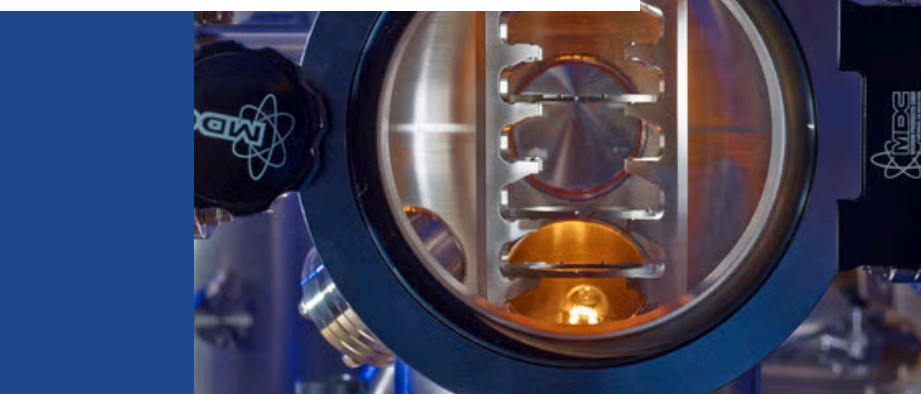




## QUANTUM MATERIALS IN COMPUTING

### The Next Leap in IT Hardware

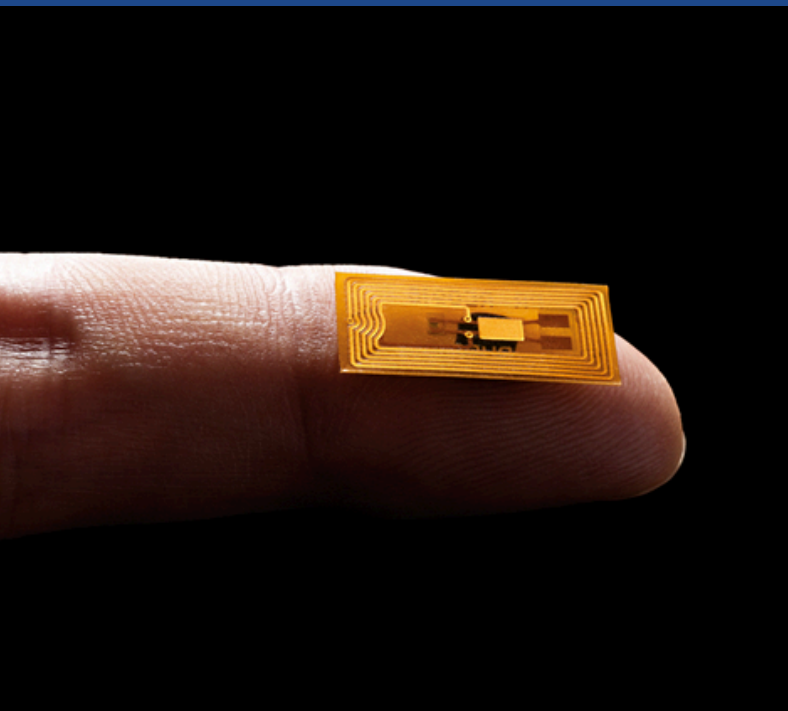
Quantum materials are a class of advanced materials that exhibit unique electronic, magnetic, and optical properties governed by quantum mechanics. These materials, such as topological insulators, high-temperature superconductors, and 2D materials like graphene, have the potential to revolutionize computing by enabling ultra-fast, energy-efficient processors. Unlike conventional semiconductors, quantum materials can facilitate electron movement with minimal resistance, reducing power consumption and heat dissipation.



One of the most exciting applications of quantum materials is in quantum computing, where exotic materials such as Majorana fermions and superconducting qubits are being explored for fault-tolerant quantum processors. Additionally, quantum materials could enhance AI-driven computing, enabling breakthroughs in deep learning, cryptography, and real-time data processing. As research in quantum materials progresses, they will play a pivotal role in shaping the future of supercomputing, AI, and next-generation electronic devices.

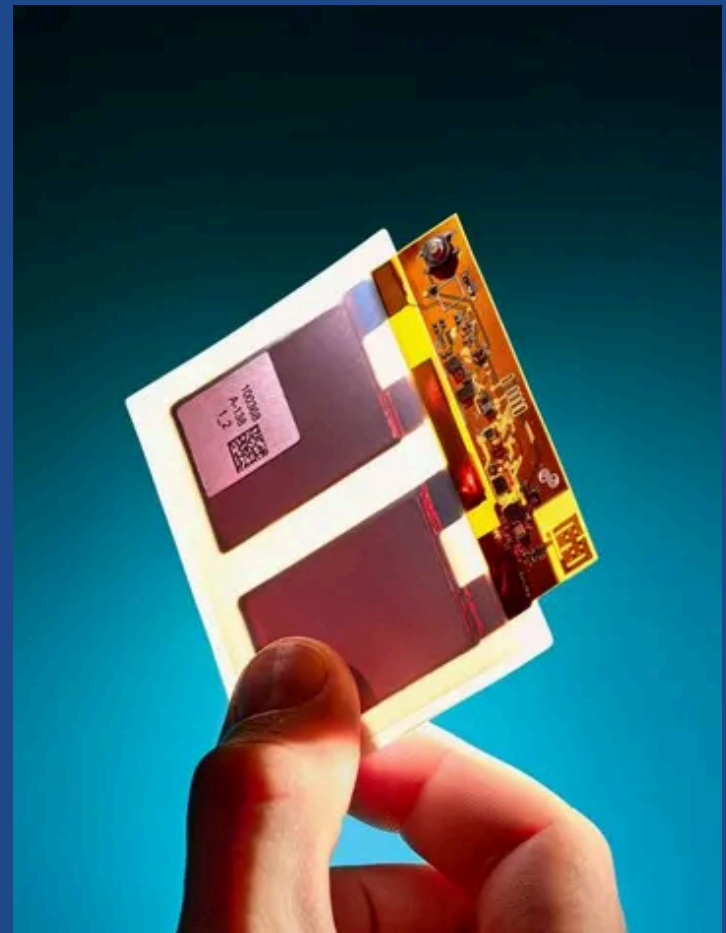
Abhijit Patil  
(BE-IT)

## SMART DUST & NANO-SENSORS FOR UBIQUITOUS COMPUTING



Smart dust refers to tiny, wirelessly connected sensors that can monitor environmental conditions, detect chemicals, and track movement in real-time. These minuscule devices, powered by AI, can be deployed in industrial automation, agriculture, and defense for seamless data collection. Smart dust sensors are small enough to be embedded in everyday objects, enabling a future where everything from roads to household appliances can communicate and optimize their functions.

The potential applications of smart dust are vast. In healthcare, nano-sensors can be implanted inside the human body to monitor vital signs and detect diseases at an early stage. In agriculture, smart dust can track soil moisture and temperature, optimizing irrigation and crop yield. With continuous advancements in nanotechnology, smart dust will play a crucial role in the Internet of Things (IoT), creating a world where computing and data analysis become invisible but omnipresent.



Tushar Kolhe  
(BE-IT)



# Biocomputing

## Living Cells as Data Processors



Biocomputing is an emerging field that explores the use of biological molecules, such as DNA and proteins, for computational tasks. Unlike traditional silicon-based processors, biological computers use molecules to store and process information, allowing for unprecedented data density and energy efficiency. Researchers have successfully demonstrated that DNA can store massive amounts of digital information, potentially replacing conventional hard drives in the future.

One of the most exciting aspects of biocomputing is its potential in medical diagnostics. Scientists are developing DNA-based circuits capable of detecting diseases at the cellular level and triggering targeted treatments. Additionally, bioengineered bacteria can be programmed to process environmental data, making them useful for pollution control and climate monitoring. As the field advances, biocomputing could pave the way for a new generation of intelligent, sustainable, and bio-compatible computing systems.

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Anuja Chavan  
(BE-IT)