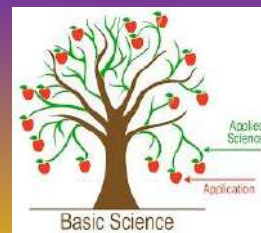


Sci-Tech Newsletter

Department of Physics, Chemistry & Mathematics



Volume 9

Issue 1

September 2025



Vision and Mission of the Institute

Vision

To be one of the premier institutions of Engineering and Management education through excellence in academics, research, innovation and entrepreneurship with global standards.

Mission

- To impart world class value-based education in Engineering and Management.
- To establish centres of excellence in sustainable technologies by collaborating with industries to carry out interdisciplinary research and innovation activities.
- To generate highly skilled and competent manpower with societal concerns and ethical standards.

Objectives

- To achieve educational goals as stated in the vision through the mission statements which depicts the distinctive characteristics of the Institution.
- To make teaching-learning process an enjoyable pursuit for the students and teachers.

Department of Physics

Vision

To impart quality education by promoting Research & Innovation in Applied Physics to solve engineering problems.

Mission

- To make the student community to understand the inclusiveness of Physics through various technical applications.
- To instil curiosity among students to develop a scientific temperament and problem-solving skills through experiential learning.
- To engross faculty in research to enrich teaching-learning process through scientific methodologies and Innovative techniques.

Department of Chemistry

Vision

To impart quality education by promoting Research & Innovation in Applied Chemistry to solve societal problems.

Mission

- To integrate the concepts of Chemistry with engineering practices to address global challenges
- To create an atmosphere of active collaboration for the development of sustainable technologies
- To engage faculty members in research and innovation to enrich the teaching-learning process.

Department of Mathematics

Vision

To impart quality education by promoting Research & Innovation in Engineering Mathematics to solve complex problems.

Mission

- Provide a platform to acquire mathematical skills for solving complex engineering problems.
- To impart experiential learning skills in Mathematics.
- To engage faculty in research to enrich teaching-learning process.

Contents

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- Editorial Team



B. N. M. Institute of Technology

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Editor's Desk

Dear Readers,

Engineering is not just a discipline; it is a mindset that transforms ideas into reality and challenges into opportunities. In today's rapidly evolving world, engineers are at the forefront of innovation, sustainability, and technological advancement.

This edition of our newsletter highlights the dynamic academic and co-curricular spirit of our institution. It features creative student projects, innovative research initiatives, and notable achievements in competitions, as well as community engagement efforts. Together, these elements showcase the dedication and creativity of our aspiring engineers.

We strongly believe that education extends beyond the confines of textbooks. It encompasses questioning, experimenting, and applying knowledge to address real-world challenges. As we progress, it is increasingly vital for students to develop not only technical skills but also critical thinking, ethical responsibility, and a dedication to lifelong learning.

We want to thank everyone who helped make this edition possible from the bottom of our hearts.

Your excitement and hard work continue to encourage excellence and a culture of innovation on our campus.

We hope that this newsletter will inform, inspire, and spark curiosity in our readers.

Happy Reading!

- Editorial Team

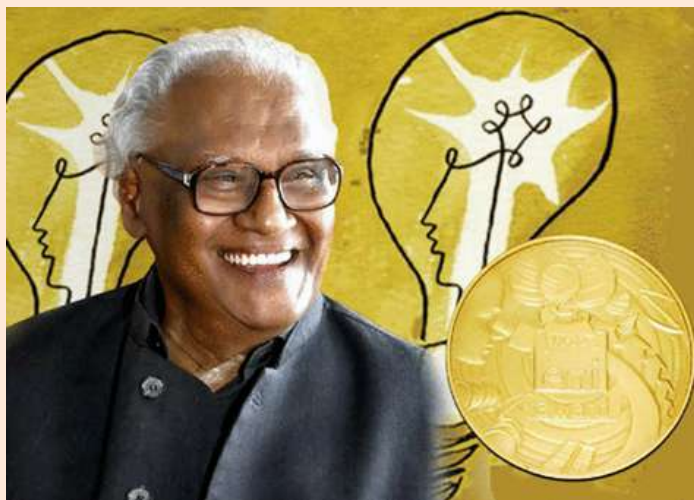
About Departments

The Department of Physics aims to train future engineers with various aspects of fundamental physics that will make them understand develop and innovate, contributing to the advancement of technology. The department has a well-established laboratory to provide hands on experience in physics experiments to students and a dedicated research laboratory where faculty members are actively engaged in research activities in the areas of photo physics, computational physics and materials Science. It has full-fledged Research Centre, recognized by Visvesvaraya Technology University, Belagavi.

The Department of Chemistry is led by a team of highly qualified, dedicated, and passionate faculty members committed to delivering excellence in academics and research. With a strong foundation in fundamental and applied chemistry, the Department fosters scientific inquiry, critical thinking, and problem-solving skills, preparing students to compete globally. It encourages innovation and inspires students to contribute to scientific advancements while addressing real-world environmental and industrial challenges. The department is actively involved in guiding engineering students in various projects. The Department has a well-equipped lab and a recognized research Centre under VTU Belagavi. The Department ensures hands-on learning and personalized mentor ship. The Department is actively engaged, in cutting-edge research across diverse domains, including Pharmaceutics, Corrosion Science, Materials Chemistry, Nanomaterials, Water Treatment, and Medicinal Chemistry. Its sustained commitment to, innovation is evidenced by a robust portfolio of publications in reputed national and international journals and patents. These achievements collectively underscore the Department's role as a center of research excellence and knowledge dissemination.

The Department of Mathematics has experienced, academically rich and research-oriented faculty members specializing in areas such as Fluid Mechanics and Graph Theory, among others. The department is producing excellent results every year, and the number of students securing cent percent marks is increasing considerably. It also has a full-fledged Research Centre, recognized by Visvesvaraya Technology University, Belagavi. So far seven research scholars have been awarded Ph. D. degrees, and nine research scholars are currently registered for the doctoral program at the Research Centre. In addition, the department has successfully organized six International Conferences in the areas of Fluid Mechanics and Applied Sciences.

Dedication



Bharat Ratna Prof. C. N. R. Rao, Padma Shri Awardee

This issue is dedicated to Prof. Chintamani Nagesa Ramachandra Rao, one of India's most celebrated scientists, recipient of the Padma Shri, Padma Vibhushan, and the nation's highest civilian honor, the Bharat Ratna.

A pioneer in solid-state and materials chemistry, Prof. Rao's groundbreaking research has bridged the worlds of Physics, Chemistry, and Mathematics, shaping the very foundations of modern science. His global recognition is unparalleled. He has been awarded honorary doctorates from more than 80 universities worldwide, a testament to his extraordinary influence and inspiration across continents.

Through his lifelong dedication to scientific research and education, Prof. Rao has demonstrated that true discovery is driven by curiosity, creativity, and perseverance. "Science is the best way to understand the beauty of nature and the universe."

—Prof. C. N. R. Rao

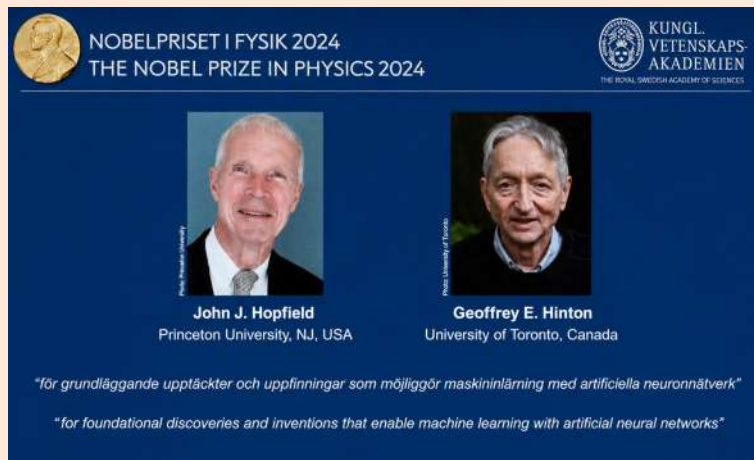
Breakthrough Prize in Mathematics



*The Breakthrough Prize in Mathematics is an annual award of US\$3 million, established in 2012 to recognize outstanding mathematicians for groundbreaking discoveries and contributions to the field. It is part of the broader Breakthrough Prize program, often referred to as the "**Oscars of Science**." The program was founded by Sergey Brin, Mark Zuckerberg, Yuri Milner, Julia Milner, Priscilla Chan, and Anne Wojcicki.*

Dennis Gaiatsgory, an Israeli-American mathematician and Professor at the Max Planck Institute for Mathematics (MPIM) in Bonn, Germany, was awarded the 2025 Breakthrough Prize in Mathematics for his foundational work and numerous breakthrough contributions to the geometric Langlands program and its quantum version. His achievements include developing the derived algebraic geometry approach and proving the geometric Langlands conjecture in characteristic 0.

2024 Nobel Prize in Physics



Nobel Prize in Physics 2024 has been awarded to John J. Hopfield and Geoffrey Hinton for foundational discoveries and inventions that enable Machine Learning (ML) with Artificial Neural Networks (ANNs).

John Hopfield invented Hopfield network, a type of recurrent neural network that can store and reconstruct information. These networks work like a memory system, where they can store patterns (like images) and retrieve them. Network relies on Donald Hebb's hypothesis - when neurons act together, they can enhance network's capability to process and store information.

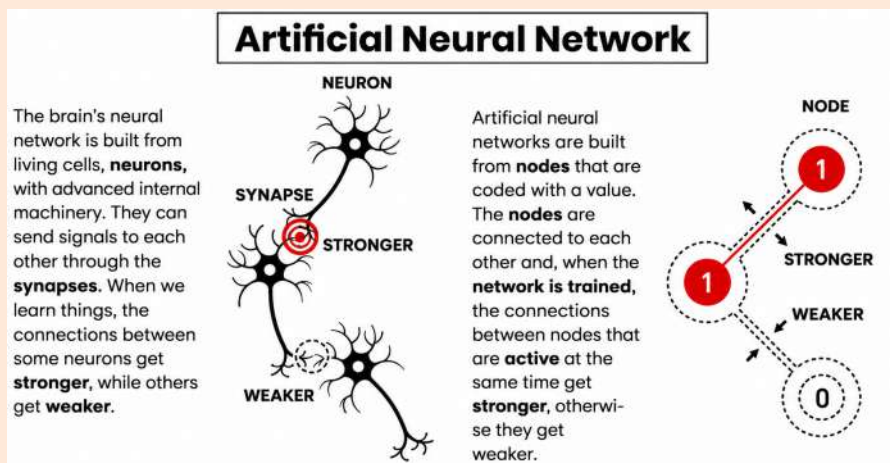
Hopfield networks can be used for tasks like image recognition and data reconstruction, making them valuable for various applications in machine learning.

Geoffrey Hinton invented a method (Boltzmann machine) that can independently discover properties in data and has become important for large ANNs now in use. Boltzmann Machine is an early example of a generative model, which can create new patterns or examples based on what it has learned. A trained Boltzmann machine can recognize familiar traits in information it has not previously seen.

Artificial Neural Networks (ANNs)

ANN is a ML program or model that makes decisions in a manner similar to the human brain, by using processes that mimic the way biological neurons work together to identify phenomena, weigh options and arrive at conclusions.

Working of ANN, Human brain is the inspiration behind neural network architecture. Human brain cells, called neurons, form a complex, highly interconnected network and send electrical signals to each other to help humans process information. Similarly, an ANN is made of artificial neurons or nodes that work together to solve a problem



ANN Structure: Basically, every neural network consists of layers of artificial neurons interconnected in three layers:

Input Layer: Process the data, analyze or categorize it, and pass it on to the next layer.

Hidden Layer: Analyzes output from input layer, processes it further, and passes it on to next layer. ANNs can have a large number of hidden layers with each layer.

Output Layer: It gives final result of all data processed by ANN.

Major types of ANN

Deep Neural Networks: These are neural networks with many layers, each building on the previous layer to refine and optimize the prediction or categorization.

Convolutional Neural Networks (CNNs): Used primarily in computer vision and image classification applications.

Recurrent Neural Networks (RNNs): Typically used in natural language and speech recognition applications as they use sequential or time-series data.

Generative Adversarial Networks (GANs): Used to create new data resembling the original training data. These can include images appearing to be human faces—but are generated, not taken of real people. .

2024 Nobel Prize in Chemistry

NOBEL PRIZE IN CHEMISTRY
**'FOR COMPUTATIONAL PROTEIN DESIGN' & 'FOR PROTEIN
STRUCTURE PREDICTION'**



DAVID BAKER, 62
Professor at University of Washington; PhD from University of California



DEMIS HASSABIS, 48
CEO of Google DeepMind; PhD from University College London



JOHN M JUMPER, 39
Senior Research Scientist at Google DeepMind; PhD from University of Chicago



IN 2023: Awarded to Moungi G Bawendi, Louis E Brus, and Aleksey Yekimov for the discovery and synthesis of quantum dots.

The Royal Swedish Academy of Sciences awarded the Nobel Prize in Chemistry 2024 to David Baker “for computational protein design” and the other half jointly to Demis Hassabis & John Jumper “for protein structure prediction”.

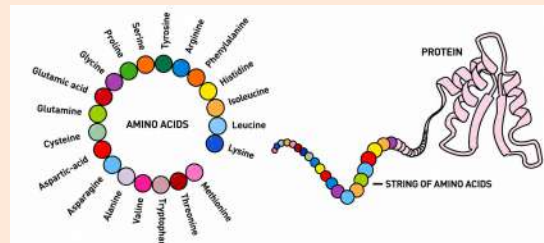
Proteins are fundamental to all living organisms, playing a crucial role in nearly every biological process. They are large and complex molecules composed of long chains of amino acids, responsible for functions such as speeding up biochemical reactions (enzymes), providing structural support, storing energy, and aiding immune responses. Life itself would be impossible without proteins.

Their contribution differs from traditional discoveries, as they developed tools that significantly accelerate the process of determining protein structures and creating new proteins. These breakthroughs were achieved

using artificial intelligence (AI) and computational tools, making structural prediction and protein synthesis far easier and more precise.

Proteins – They are fundamental to almost all biological processes and are built from 20 amino acids joined into long strings.

Haemoglobin is a protein that transports oxygen and insulin helps absorption of glucose from blood. Protein Structure is with the string of amino acids twists and folds into a distinct three-dimensional structure which gives proteins their function.



Alpha Fold – It is an artificial intelligence model that could predict the structures of millions of proteins. Hassabis and Jumper received the other half of the prize for developing this model. Alpha Fold is an upgraded version used with AI neural network called transformers which can find protein with enormous data in a flexible manner, basically Alpha Fold trained by the database of vast information of known protein and amino acid sequences.

AI tool predicts the structure of protein using sequence of amino acids from the database, these predictions were then matched to cataloged protein structure in the referred database. AI tool estimates the correctness of the structure and the reliability of their prediction done by researcher.

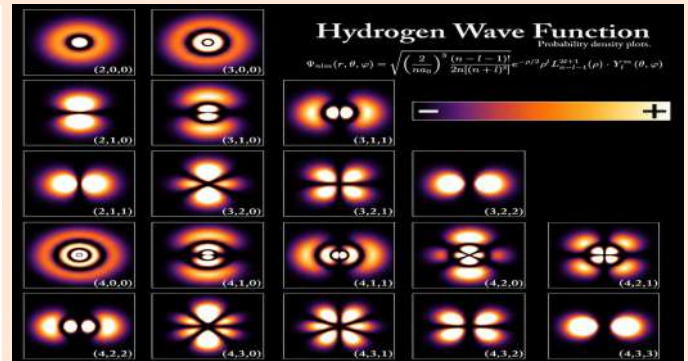
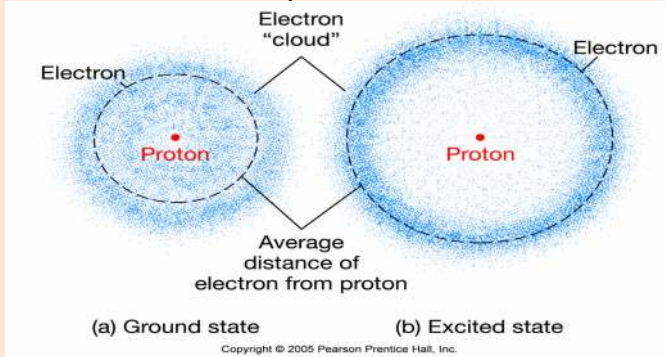
Significance of the invention:

- Improved Protein Understanding: Their efforts made it possible to better visualize the structure of proteins and create new proteins according to human needs.
- AlphaFold2 has predicted the structure of almost all of the 200 million proteins that scientists have found so far while mapping Earth's creatures, and it has calculated the structure of every human protein.
- Time-saving: It used to take years to calculate the protein structure, but today it only takes a few minutes.
- Improved Knowledge of Life: It helps us comprehend how life works.
- Clarity on Diseases: Understanding the relationship between amino acids and protein structure aided in the understanding of some diseases.
- Comprehending the bacterial enzymes responsible for antibiotic resistance can aid in the development of preventative measures.
- Plastic Decomposition: This technology can be used to create synthetic proteins and enzymes that can break down plastic.
- Development of Bio-products: The capacity to produce proteins can result in new nanomaterials, targeted medications, faster vaccine development, fewer sensors, and a more environmentally friendly chemical industry.

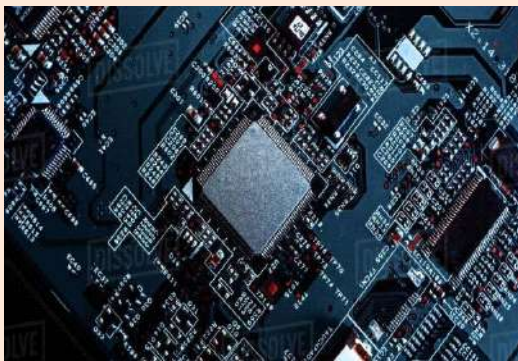
The Rise of Quantum Computing and Algorithms

At the atomic scale, matter behaves very differently from what classical physics predicts. Electrons do not move in fixed circular orbits like planets; instead, they exist in probability clouds described by wave functions. Energy exists in discrete packets known as quanta. These discoveries in the early twentieth century completely reshaped scientific understanding and laid the groundwork for quantum mechanics.

Concepts such as superposition, quantization of energy, and wave-particle duality are not just theoretical ideas. They explain how electrons move within materials, how atoms absorb and emit light, and how energy transitions occur at microscopic levels. These principles became the scientific foundation upon which modern electronics was built.



Semiconductors and the Birth of Modern Electronics



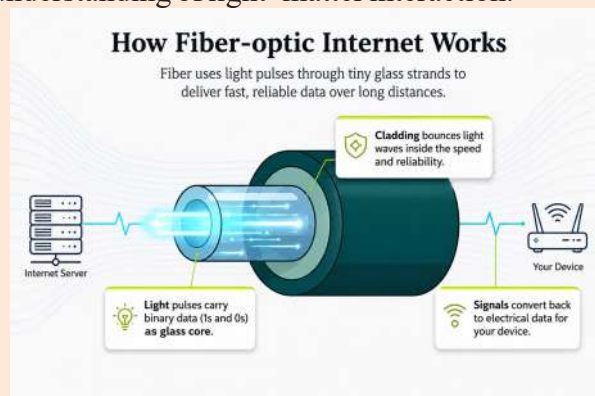
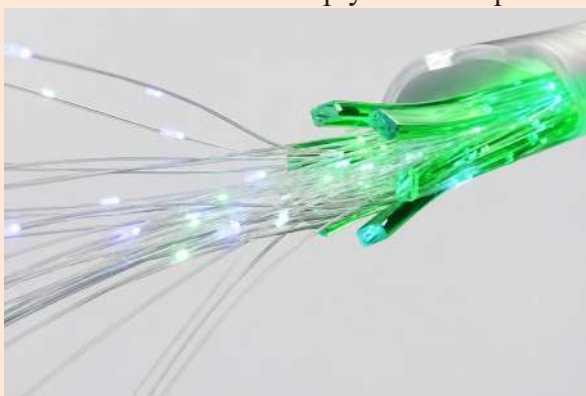
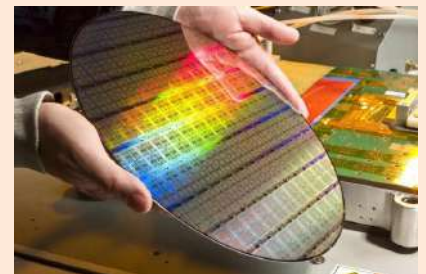
The invention of the transistor is one of the most powerful demonstrations of applied quantum physics. Transistors are semiconductor devices that function as switches and amplifiers in electronic circuits. Their operation depends on quantum concepts such as energy bands and band gaps within materials like silicon. Modern integrated circuits contain billions of transistors packed into tiny microchips. As device sizes shrink to nanometer scales, quantum effects such as tunneling and electron confinement become increasingly significant. Engineers must design circuits

while carefully accounting for these atomic-level behaviors. Without quantum theory, computers, mobile phones, and communication systems would not exist in their present form.

Lasers, Photonics, and Communication system

Laser technology operates on the quantum principle of stimulated emission, where excited atoms emit coherent light when triggered by incoming photons. This phenomenon allows precise generation of monochromatic and highly focused light beams.

Fiber-optic communication relies on lasers to transmit information as light pulses over long distances with minimal signal loss. The internet infrastructure, satellite communication, and high-speed data transmission networks are deeply rooted in quantum understanding of light-matter interaction.



Quantum Physics in Medicine and Imaging

Medical imaging technologies such as MRI scans are based on nuclear spin properties and magnetic resonance—concepts derived from quantum mechanics. These techniques allow non-invasive visualization of internal organs, enabling early diagnosis and effective treatment.

From cancer detection to neurological studies, quantum-based technologies have revolutionized healthcare. What once existed as mathematical equations now directly contributes to saving human lives.

The next frontier in technology is quantum computing. Unlike classical bits that represent either 0 or 1, quantum bits (qubits) can exist in superposition, holding multiple states simultaneously. Additionally, entanglement connects qubits in ways that classical systems cannot replicate.

Quantum algorithms promise to solve complex problems in cryptography, optimization, material science, and artificial intelligence far more efficiently than classical computers. Although still developing, quantum computing represents the bridge between atomic-scale physics and advanced digital intelligence.

The journey from atoms to algorithms illustrates how fundamental scientific discoveries evolve into transformative technologies. Quantum physics is embedded in microchips, communication networks, medical devices, and emerging computational systems. For students of Electronics and Communication, understanding quantum principles provides insight into the deeper functioning of circuits, signals, and modern digital infrastructure. As technology advances further into the nanoscale, mastery of quantum mechanics will define the future of innovation.

Aditya S
ECE, First Year

When Memories Fade: Understanding Alzheimer's Disease

Imagine sitting in your living room and suddenly forgetting why you went there. Imagine looking at someone you love and struggling to recognize their face. Unsettling, isn't it? For millions of people around the world, this is not just a passing fear — it is their reality. Alzheimer's disease is the most common cause of dementia and primarily affects older adults. It is a progressive condition that gradually damages brain cells, affecting memory, thinking, and behavior, and slowly altering a person's sense of identity.

In a healthy brain, neurons communicate with each other to store memories, process information, and control thinking. However, in Alzheimer's disease, abnormal protein deposits known as beta amyloid plaques accumulate between neurons, while twisted tau proteins form tangles inside the cells. These abnormalities disrupt communication between brain cells and eventually lead to their death. One of the first areas affected is the hippocampus, a region responsible for memory and learning, which explains why memory loss is often one of the earliest and most noticeable symptoms of the disease.

Alzheimer's disease is more than a medical condition; it is a challenge that affects individuals, families, and societies around the world. As the disease gradually erodes memory and cognitive abilities, it also threatens the very essence of identity and human connection.

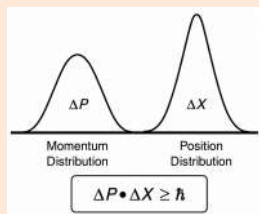
Although there is currently no complete cure, ongoing research continues to improve our understanding of the disease and develop methods for early detection and better treatment.

By spreading awareness and supporting scientific research, we move one step closer to protecting the memories and experiences that shape who we are.

Nidhi Kalibhat
ECE, First Year

Uncertainty: The Quantum Nature of Human Decisions

Uncertainty is a natural part of life. No matter how carefully we plan our future, we cannot always predict what will happen next. Surprisingly, this idea is not limited to human experiences; it is also a fundamental property of nature itself. In the world of quantum physics, the Heisenberg Uncertainty Principle explains that it is impossible to know certain properties of a particle, such as its exact position and momentum, at the same time with complete accuracy. Proposed by physicist Werner Heisenberg in 1927, this principle revolutionized our understanding of the microscopic world which states that we cannot know both the exact position and the exact momentum (speed $\times$ direction) of a particle at the same time with perfect precision.



The mathematical form is: $\Delta x \times \Delta p \geq \frac{h}{4\pi}$

Where:

- Δx = uncertainty in position
- Δp = uncertainty in momentum
- h = Planck's constant

This equation shows that a limit exists in nature itself, not because of poor measurement instruments. Beyond physics, it also offers a meaningful perspective on human life, reminding us that uncertainty is not a flaw but an essential part of reality.

Human life is full of uncertainty because our thoughts and decisions depend on many changing factors. A person's choices are influenced by emotions, past experiences, environment, and sometimes even small random events that we cannot control. For example, the same person may react differently to the same situation on different days depending on their mood, mental state, or surrounding circumstances. Because these factors constantly change, it becomes extremely difficult to predict exactly how someone will think or behave in the future. Human behaviour is therefore not perfectly predictable, and life naturally contains uncertainty.

A similar concept can be seen in physics through the Heisenberg Uncertainty Principle, proposed by physicist Werner Heisenberg. This principle states that in the microscopic world, we cannot simultaneously know both the exact position and the exact momentum of a particle, such as an electron. The more precisely we measure one quantity, the less precisely we can measure the other. This limitation does not occur because of poor instruments but because uncertainty is a fundamental property of nature itself.



Another interesting lesson from the Uncertainty Principle is that the act of observing or measuring something can itself disturb its natural state. When scientists try to observe very small particles such as electrons, they must use light or other particles to detect them. These particles interact with the electron during the measurement process and slightly change its motion. Because of this interaction, the electron no longer behaves exactly as it did before the observation. This idea was explained by physicist Werner Heisenberg, it shows that at a fundamental level observation is not completely separate from the system being observed.

A similar situation can be noticed in human life and thinking. When people constantly analyse every thought, emotion, or decision too deeply, it can sometimes disturb their natural mental flow. Over thinking may create confusion, stress, or self-doubt, even in situations that would otherwise be simple. Not everything in life needs to be examined with complete precision. Sometimes thoughts, ideas, and emotions develop more clearly when they are allowed to arise naturally.

The uncertainty principle reminds us that uncertainty is not always a problem; it is simply a natural part of reality. In human life, trying to predict everything or control every outcome can create stress and confusion. Instead, accepting that the future is uncertain can help us live more peacefully. A simple life that focuses on learning, relationships, and personal growth is often more fulfilling than constantly worrying about unpredictable outcomes. Just as physics shows that the universe contains unavoidable uncertainty, life also teaches us that embracing uncertainty with a calm and open mind can lead to a more balanced and meaningful way of living.

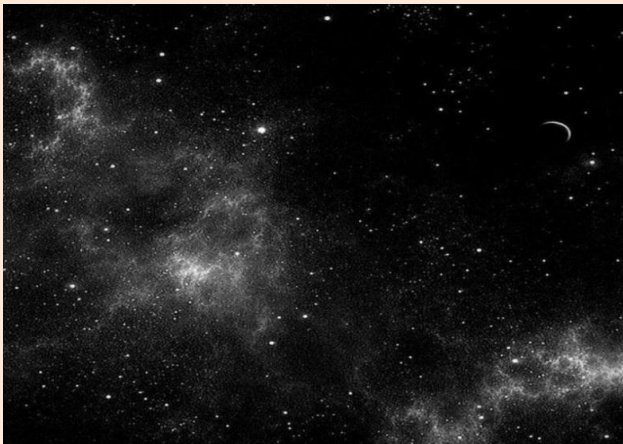
Vaishnavi Hakeem
EEE, First Year

The Black Hole

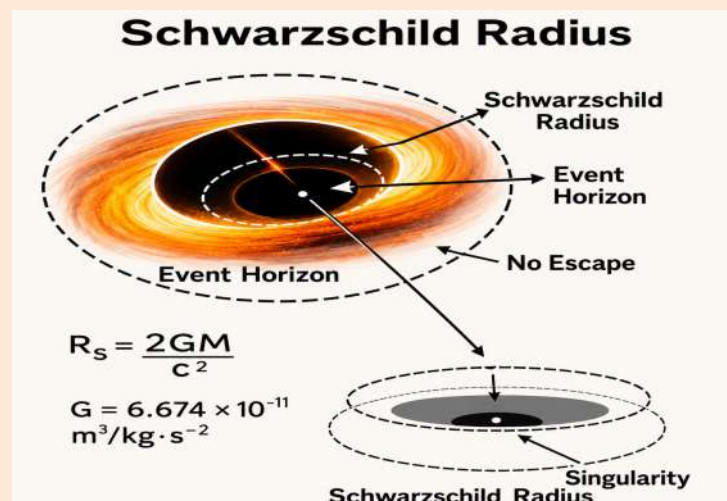
“Where Gravity Becomes Infinity”

Black holes are among the most mysterious cosmic objects, much studied but not fully understood. These objects aren't really holes. They're huge concentrations of matter packed into very tiny spaces. A Black Hole is an incredibly dense region of space-time where Gravity is so intense that nothing -not even light can escape its pull. They are not actually “holes” but are massive concentrations of matter packed into a very small volume which creates a “Points of no Return” known as the event horizon. History of Black Hole The concept of black holes has developed over more than 200 years, evolving from early theoretical ideas to modern scientific discoveries.

Early Idea of Dark Stars - (1783)

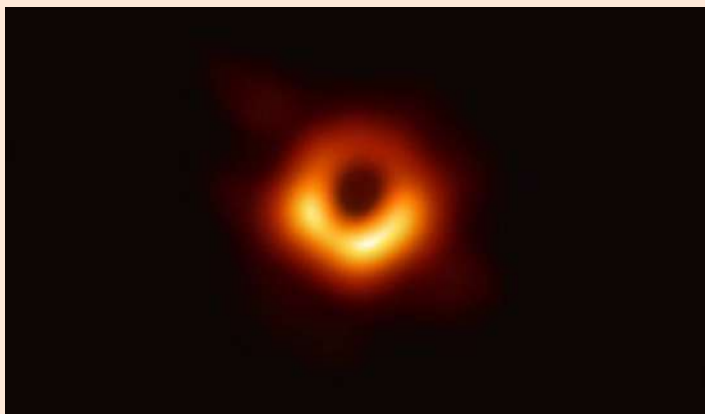


John Michell (1783): The British clergyman and natural philosopher John Michelle became the first person to propose the existence of what we now call “Black Hole”. Using the laws of Newtonian gravity to theorize objects so massive that light could not escape them. Reasoning was based on two primary scientific assumptions of his time. Pierre-Simon Laplace (1796): Independently proposed a similar concept in his book, suggesting the largest bodies in the universe might be invisible.



First Images of Black Holes

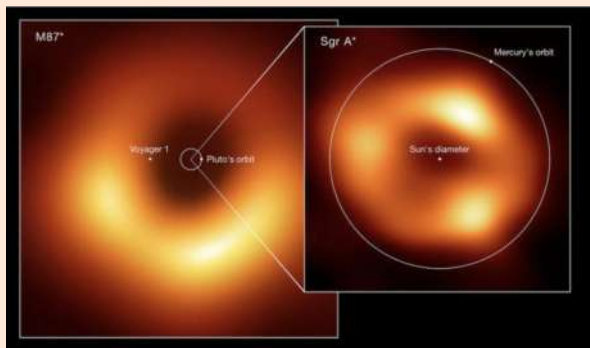
2019 – Image of Messier 87 Black Hole



In 2019, scientists from the Event Horizon Telescope Collaboration released the first-ever image of a black hole. The image showed the super massive black hole at the centre of the galaxy Messier 87.

This historic observation confirmed many predictions of Albert Einstein's General Theory of Relativity. The image revealed a bright ring of glowing gas surrounding the dark shadow of the black hole, marking the boundary of the Event Horizon.

2022 – Image of Sagittarius A*



In 2022, the Event Horizon Telescope Collaboration captured the first image of Sagittarius A*, the super massive black hole located at the centre of our galaxy, the Milky Way Galaxy. This discovery was a major achievement in astronomy because it provided direct visual evidence of the black hole at the centre of our own galaxy. The image helped scientists better understand the behaviour of matter and gravity near black holes.

The Structure of Black Hole

A black hole has several important parts that describe its structure and behaviour:

1. Singularity

The singularity is the central point of a black hole where matter is compressed into an extremely small space. At this point, gravity becomes infinitely strong.

2. Event Horizon

The event horizon is the boundary around the black hole. Once an object crosses this boundary, it cannot escape the black hole's gravitational pull.

3. Accretion Disk

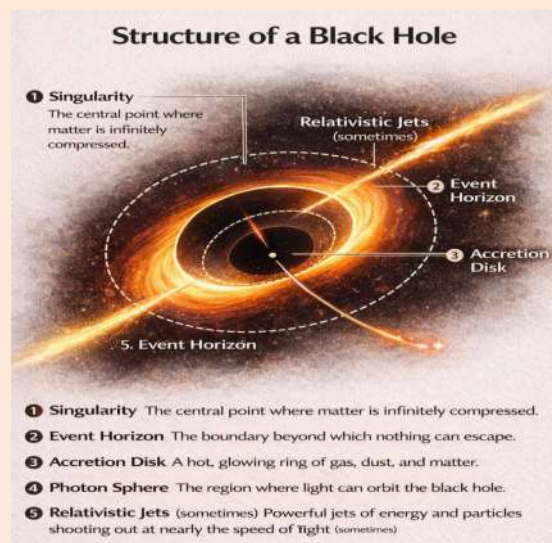
The accretion disk is a bright disk of gas, dust, and matter that spins around the black hole before falling into it. The matter becomes very hot and emits light.

4. Photon Sphere

The photon sphere is a region where gravity is strong enough that light can orbit the black hole.

5. Relativistic Jets (sometimes)

Some black holes produce powerful jets of energy and particles that shoot out from the poles at nearly the speed of light.



Black holes are among the most fascinating objects in the universe. From early theories of dark stars to modern discoveries of quantum radiation, scientists continue to study them to understand the nature of gravity, space-time, and the universe itself. The study of black holes has revolutionized modern astrophysics and continues to reveal new mysteries about the cosmos.

Harshitha K M
ECE, First Year

Department of Physics

Awards

- **Dr. K. N. N. Prasad**, has received Shiksha Gaurav Puraskar 2024 Award by Centre for Educational Growth and Research, New Delhi, during August 2024.

Publication Details

- **Dr. K. N. N. Prasad**, published a research article titled "A Comprehensive Multi Spectroscopic and Molecular docking Studies on the Interaction of bioactive coumarines with bovine serum albumin", Journal of Bio molecular Structure and Dynamics, pp. 1-12, 2025.
- **Dr. S. Balasaraswathy**, published a research article titled "A Comprehensive Multi Spectroscopic and molecular docking Studies on the interaction of bioactive coumarines with bovine serum albumin", Journal of Bio molecular Structure and Dynamics, pp. 1-12, 2025.
- **Dr. S. Chandrasekhar**, published a research article titled "A Comprehensive Multi Spectroscopic and molecular docking Studies on the interaction of bioactive coumarines with bovine serum albumin", Journal of Bio molecular Structure and Dynamics, pp. 1-12, 2025.
- **Dr. S. Chandrasekhar**, published a research article titled "Synthesis, Computational, DFT Calculations, Photo physical and Docking Studies of Novel Fluorescent Pyrimidine-Chlorothymol Hybrid as Potent Antimicrobial Agent", Journal of Fluorescence, Vol. 35, pp. 9731-9746, 2025.
- **Dr. S. Chandrasekhar**, published a research article titled "Synthesis and Antioxidant activity of Gallic acid based Fluorescent Benzothiazole analogue: Photo physical, electrochemical, conceptual DFT, QTAIM and docking investigations, Journal of Molecular Structure, Vol. 1321, 2025.

Book Chapters:

- **Dr. K. N. N. Prasad and Dr. S. Chandrasekhar**, authored the chapter titled "Theoretical Insights and Solvatochromic Behaviour of 1, 3-Benzodioxole Derivatives, International Book", Current Research Progress in Physical Science, 75-91, August 2024. (Publisher: B P International, UK).

Department of Chemistry

Awards

- **Dr. Prathibha B.S.**, has been awarded with:
 - Women of the Year Award-2025 by Herstory Times on 15th January 2026.
 - She the Power Award in July 2025 from the Women's Headlines, News, and Press Release Network.
 - Best IP Researcher Award-2025, by Bakliwal Foundation, College of Arts, Commerce, and Science, Mumbai, on 11th July 2025.
 - Inspiration Award-2025, by the Indian Women's History Museum (IWHM).
 - Dr. A.P.J. Abdul Kalam Nation Star Award, 12th March 2025, by Welred Foundation, a nonprofit organization.
 - India's Education Excellence Award-2025, 24th January 2025, by Bharat Good Times 24/7 News Network.
 - India's inspiring Teachers' Award - 2024, 5th September 2024, by Bharat Good Times 24/7 News Network.
- **Dr. Anusuya A. M.**, has received the best paper presentation award in the International Conference on 'Recent Advances in Chemical and Biological Sciences for Sustainability' during February 2025 by Dayananda Sagar College of Engineering, Bangalore.

Patent details:

- **Dr. Prathibha B. S.**, has registered an Indian design patent for her innovative “*Solar-assisted Water Purification System*” (Design No. 382036-001, 2025), marking a significant step toward sustainable water solutions.
- **Dr. Prathibha B. S.**, has registered an Indian design patent for “*Soil Organic Carbon Detector*” (Design No. 411106-001, 2025), advancing tools for sustainable agriculture.
- **Dr. Prathibha B. S.** has registered an Indian design patent for “*Portable Water Tank Cleaning Machine*” (Design No. 436579-001, 2025), enhancing hygiene and water management practices.
- **Dr. Prathibha B. S.**, has published an Indian patent for “*Catalytic Adsorptive Material for the Treatment of Vehicular Exhaust, Method of Its Preparation, and Apparatus Thereof*” (Patent No. 202541051117, 2025), contributing to cleaner air and environmental protection.
- **Dr. Prathibha B. S.**, has registered an Indian design patent for “*Plastrack*” (Design No. 463912-001, 2025), showcasing innovation in tracking and monitoring systems.
- **Dr. Prashanth M. K.**, has published an Indian patent for “*System and Method for Dispensing Medication Based on Biometric Authentication, Emotional State Detection, and Temperature Monitoring*” (Patent No. 202541055681, 2025), advancing healthcare technology.
- **Dr. Anusuya A. M.**, has registered a UK design patent for her “*Smart Device to Create Polymer-Based In Situ Gel for Nasal Drug Delivery*” (UK Design No. 6412527, 2025), marking progress in drug delivery innovation.

Publication details:

- **Dr. Prathibha B.S.**, published a research article titled "Adoption and performance impact of IoT- and AI-enabled smart waste management: empirical evidence from Indor India" in MSW Management Journal, Vol. 35, pp.2522-2528, 2025.
- **Dr. Prathibha B.S.**, published a research article titled "Synthesis, Computational, DFT Calculations, Photo physical, and Docking Studies of Novel Fluorescent Pyrimidine-Chlorothymol Hybrid as Potent Antimicrobial Agent" in Journal of Fluorescence, Vol. 35, 2025.
- **Dr. B. K. Jayanna**, published a research article titled “Hybrid ZnO-CuO nanoparticles: for MCPE in dopamine detection, dye degradation, and antibacterial assessment” in Journal of Nanoparticle Research, Vol. 27, pp 35, 1-20, 2025.
- **Dr. B. K. Jayanna**, published a research article titled “Photocatalytic degradation of crystal violet dye using honey-mediated synthesis of NiFe₂O₄ nanoparticles" in Green Chemistry Letters and Reviews, Vol. 18, pp 1751-8253 / 1751-7192, 2025.
- **Dr. B. K. Jayanna**, published a research article titled “Prioritization of photochemical isolation and characterization against HER2 as a breast cancer target based on chromatographic methods, DFT studies, 3D-QSAR analysis, and molecular docking simulations" in Royal Society of Chemistry Advances, Vol. 15, pp. 25103–25114, 2025.
- **Dr. Prashanth M.K.**, published a research article titled "Exploring the cytotoxicity and DNA binding studies of green-synthesized europium stannate nanoparticles through experimental and computational approaches" in Materials Chemistry and Physics, Vol. 333, pp. 130327, 2025.
- **Dr. Prashanth M.K.**, published a research article titled "Waste silk fibre-derived nitrogen-doped reduced graphene oxide-anchored nickel-doped cobalt vanadate for supercapacitor applications" in Diamond and Related Materials, Vol. 153, pp. 1879-0062, 2025.
- **Dr. Prashanth M. K.**, published a research article titled "Synthesis and antioxidant activity of gallic acid-based fluorescent benzothiazole analogue: Photo physical, electrochemical, conceptual DFT, QTAIM, and docking investigations" in Journal of Molecular Structure, Vol. 1321, pp. 130327, 2025.
- **Dr. Prashanth M.K.**, published a research article titled "Fabrication of spinel magnesium stannate-polyaniline nanocomposite for electrochemical detection of fenitrothion pesticide and super capacitor applications" in Talant Open, Vol. 11, pp. 2666-8319, 2025.
- **Dr. Prashanth M.K.**, published a research article titled “A Comprehensive Multi-spectroscopic and Molecular Docking Studies on the Interaction of Bioactive Coumarins with Bovine Serum Albumin" in Journal of Bio molecular Structure and Dynamics, pp. 1-12, 2025.
- **Dr. Prashanth M.K.**, published a research article titled "Design, Synthesis, and Molecular Docking of Novel Benzothiazinone Derivatives as DprE1 Inhibitors with Potential Anti tubercular Activities" in Russian Journal of Bio-organic Chemistry, Vol. 51, pp. 65-78, 2025.

- **Dr. Prashanth M.K.**, published a research article titled "Novel pyrochlore type europium stannate–tungsten disulfide hetero structure for light-driven carbon dioxide reduction and nitrogen fixation" in *Environmental Research*, Vol. 257, pp. 119372,, 2024.
- **Dr. Prashanth M.K.**, published a research article titled "Praseodymium orthovanadate-waste PET bottle-derived sulphur-doped carbon for efficient Z-scheme photo catalytic CO₂ reduction" in *Journal of Environmental Chemical Engineering*, Vol. 12, pp. 113171, 2024.
- **Dr. Prashanth M.K.**, published a research article titled "Interweaving two-dimensional mesoporous covalent organic frameworks for efficient removal of mercury from aqueous solution" in *Journal of Molecular Structure*, Vol. 1324, pp. 140828, 2025.
- **Dr. Prashanth M.K.**, published a research article titled "Design, synthesis, and docking studies of new molecular hybrids bearing benzimidazole and thiazolidine-2,4-dione as potential anti-tubercular agents" in *Journal of the Indian Chemical Society*, Vol. 101, pp. 101346, 2024.

Department of Mathematics

Awards

- **Dr. Roopa G.** has received best paper award in International Conference on 'Recent Trends in Applied Sciences', during April 2025 at Srinivas Institute of Technology, Valachil, Mangaluru.

Publication details

- **Dr. L. Venkata Reddy, Dr. N. P. Chandrashekara and Dr. Roopa G.** published a research article titled "Investigation of Hydromagnetic Flow and Heat transfer in a Boussinesq - Stokes suspension over an exponentially stretching sheet" *Journal of Neonatal Surgery*, Vol.14, pp. 2226-0439, 2025.
- **Dr. Nagarathnamma K G. and Dr. Leena N. Shenoy** published a research article titled "On Hamilton Laceability and Random Hamiltonian", *Laceability of Total Transformation Graph G^{+t}* , *Journal of Dynamics and Control*, Vol. 9, pp. 36–45, 2025.
- **Manjula M., Dr. Leena N. Shenoy and Dr. Sowmya Krishna** published a research article titled "Laceability Partition Dimension of Some Special Graphs", *Indian Journal of Science and Technology*, Vol. 17(31), pp. 3183-3189, 2024.
- **Manjula M., Dr. Leena N. Shenoy and Dr. Deepthy D.** published a research article titled "A Study on Laceability Partition Dimension of A Graph", *Mathematics and Statistics*, Vol. 13, pp. 56-61, 2025.
- **Satisha M. and Dr. A. Pranesha Setty** published a research article titled "Effect of rotation on Linear Double Diffusive Convection of a Binary Liquid in a Metal Foam Porous Rectangular Enclosure Using Lapwood-Brinkman Model with Cross Diffusion Effect", *Tuijin Jishu/Journal of Propulsion Technology*, Vol.45, pp. 1001-4055, 2025.
- **Dr. Harish A., Dr. A. Pranesha Setty and Dr. Roopa G.** published a research article titled "Optimization of parameters for the shot peening effect on welded specimen using Artificial Neural Network", *Utilitas Mathematica*, Vol.12, pp. 0315-3681, 2025.
- **Dr. Roopa G., Dr. L. Venkata Reddy and Dr. N.P. Chandrashekara** - "Effect of Variable Viscosity on Linear Thermal Convection in Ferromagnetic Liquids under Gravity Condition", *Journal of Emerging Technologies and Innovative Research (JETIR)*, Vol. 12, pp. 2349-5162, 2025.
- **Dr. Roopa G., Dr. L. Venkata Reddy and Dr. Raveendra N.** published a research article titled "Effect of Variable Viscosity on Non-linear Ferroconvection in Rotating Ferromagnetic Liquids", *International Journal of Mathematics*, Vol. 4, pp.17-30, 2025.
- **Dr. Yogalakshmi S., Dr. Silvia Leera Sequeira and Dr. G. C. Basavaraju** published a research article titled "Radio Number of Mycielski Graph of a Path", *Periodico di Mineralogia*, Vol. 94, pp. 0369-8963, 2025.

The Student Induction Programme at the BNM Institute of Technology was conducted from 17/09/2025 to 30/09/2025 for newly admitted Bachelor of Engineering (B.E.) students. The programme aimed to help students adapt to the academic environment, understand human values, maintain physical and mental well-being, and recognize their potential. It also focused on strengthening mentor-mentee relationships, encouraging social interaction and teamwork, enhancing personality and interpersonal skills, introducing emerging technologies, promoting environmental awareness, and fostering camaraderie with seniors and peers both within and outside the institution



"A warm welcome to new beginnings. The ceremonial lamp is lit by Sri Swami Japanandaji (Sri Ramakrishna Sevashrama, Pavagada), alongside the management, students, and parents at the Induction Programme to inspire knowledge, growth, and success."



"Mr. Hareesh P.K., CEO and Founder of Arjunaa Academy for Achievers, delivered an inspiring session on Universal Human Values, emphasizing ethical living and harmonious relationships."



" Mr. Abhishek, a certified life coach, delivered an inspiring speech highlighting key aspects of personal growth, career advancement, mindset development, and emotional well-being."



"Dr. Shatavadhani R. Ganesh delivered a thought-provoking session on 'Applying Vedanta to Life,' explaining how understanding the essence of things helps individuals appreciate their true nature."

Glimpses of Induction Programme-2025



Event Highlights of Prodothan



Prodothan Winners

- **Aryank Lokesh, Yashwanth Udupa, Yashas P. Phatak and Bhuvan Bapat** have secured First Prize in the Hardware Track for their innovative project titled **"IoT-based Smart Lighting Solutions."** The project enables users to remotely control home lighting through a mobile application and promotes energy efficiency by automatically switching off unused lights.
- **Suhas Shivakumar, Prerana Mohan, Harika M., Abhinav B. and Prarthana D.P.** have won First Prize in the Software Track for their innovative project, **"Predicting Employee Attrition and Providing Solutions."** The project utilizes data-driven analytics to predict the likelihood of employee attrition within organizations and recommends effective strategies to enhance employee retention and workforce stability.
- **Hiranmayee, Suhani S, Vishwathma H. P. and Chiranth Yadalam** have won First Prize in the Design Track for their project **"Habit-Building and Progress Tracking Application."** The innovative solution helps users establish positive habits and effectively monitor their progress over time, encouraging consistency, self-discipline, and personal growth.

- **Vishnu Prasad, Nandan Nalwade M, B. R. Pranav Swaroop and Vignesh L. K.** have won Second Prize in the Hardware Track for their project **“IoT-Integrated Fire Detection System.”** The innovative solution enhances safety by leveraging IoT technology to enable real-time fire detection and continuous monitoring capabilities.
- **Abhinav Jai Vathsav, Arnab Sadhu, Chirag Prasad and Samarth S. R.** have won Second Prize in the Software Track for their project **“Native Password Manager with Two-Factor Authentication and Built-in Strength Checker.”** The innovative solution strengthens digital security by offering a user-friendly platform that combines secure password management, two-factor authentication, and real-time password strength analysis to help users protect their online accounts effectively.
- **Prabhav Pandey, Siri D. S., Shreya Shri Pathak and Dhanik G. K.** have won Second Prize in the Open Category – Design Track for their project **“Simplifying Hostel Life.”** The team developed an innovative mobile application designed to streamline daily hostel activities, enhance convenience, and improve the overall living experience for students residing in hostels.
- **Abhay K. P, Prateek H, Aditya Anil Chanda, Namita Sharma and Shrisharvari S.** have won Third Prize for their project **“Temperature-Sensitive IoT-Powered Fan Control System.”** The innovative solution leverages IoT technology to automatically regulate fan operation based on ambient temperature, promoting energy efficiency, automation, and enhanced user comfort.
- **Kushal M. R, Sanaka Pavaman, Kushal H. and Sridatta Khoday** have won Third Prize for their project **“Helping People Understand Their In-Body Scan Results.”** The innovative project focuses on simplifying the interpretation of health data, enabling individuals to easily access and understand their body composition analysis, thereby supporting informed decisions for improved wellness and health management.
- **Amogh M. S, Jeevan, Shravya Muthigi, Manu V. M., Manish L. and Sneha** have won Third Prize for their project **“Portfolio of an Institution.”** The project envisions a comprehensive digital portfolio platform that showcases institutional achievements, academic strengths, and student innovations, thereby enhancing institutional visibility and engagement with stakeholders.
- **Preetham U, Vishnu Bargav, Arnav P. Dhaval and Sai Samarth M. R.** have won Third Prize for their project **“Recipe App for Diet and Fitness Enthusiasts.”** The application is designed to promote healthy living by providing personalized recipes, nutritional guidance, and fitness-oriented meal planning to help users achieve their wellness goals.

Achievements of Students

- **Neha Y. S. (AIML)** of the II Semester secured a **Silver Medal** in the 'Western Group Song' category at the VTU Youth Festival, held from 24th to 27th March 2025 at the Global Academy of Technology, Bengaluru.
- **Deepanshi Pradeep (ISE)** of the II Semester secured **two Silver Medals**, in the 'One Act Play' and 'Skit' categories, at the VTU Youth Festival held from 24th to 27th March 2025 at the Global Academy of Technology, Bengaluru.
- **Raghu Shenoy (AIML) and Yuktha T. P. (ISE)** of the II Semester secured third place in the 'Triple Jump' event at the VTU 26th State Level Intercollegiate Athletic Meet 2024–2025, held from 15th to 18th March 2025 at JNNCE, Shivamogga.
- **Bruhathi (ECE)** of the II Semester secured a **Gold Medal** in the 'Installation' event at the VTU Youth Festival 2025, held from 24th to 27th March 2025 at the Global Academy of Technology, Bengaluru.

Editorial Team

Faculty

Dr. Roopa G., *Assistant Professor,*
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Dr. Anusuya A. M., *Assistant Professor,*
Department of Chemistry

Dr. Sudeshna Pandey ., *Assistant Professor,*
Department of Humanities

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Sri. Anand P. M., *System Manager*
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