



# TIREZIA

Volume 16, Issue 1

The Editorial Board  
-Beckoning Creati'wit'y

January Issue  
*Eclectic Essence*

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#National Army Day

**Interviewing**  
Smt. Kalpana Srivastava  
Chief Electrical Engineer, Indian Railways



# Message From The Editorial Board

As the solar chariot traverses the elysian expanse, January's effulgent radiance beckons, trumpeting the advent of an untrodden annum. This liminal month, poised at the cusp of revitalization and metamorphosis, embodies the paradoxical essence of Janus' bifacial visage. While the ether pulsates with the mellifluous oaths of New Year's resolutions, individuals embark upon an odyssey of autognosis and aggrandizement. Lohri's bonfire exults in jubilation, while Makar Sankranti fetes the ingress of spring with vibrant kites, both ecstatically commemorating the harvest. As the month's tenure wanes, Republic Day on January 26 commemorates India's emergence as a sovereign nation. Amidst these celebrations, the nocturnal firmament is set aflame with a breathtaking panorama of empyreal resplendence, as the Quadrantid meteor shower unfolds its mesmerizing tableau, choreographing a kaleidoscopic dance of luminous trails across the velvety expanse of the night sky. In this vein, January congeals as a mosaic of sanguinity and untapped puissance, heralding the genesis of a revitalized aeon in life's peregrination.

Showcasing progress across the national front, on August 15, 2024, India achieved a major breakthrough with the successful launch of its Gaganyaan mission, sending its first astronauts into space, a feat that was soon followed by hosting the G20 summit from September 9, 2024 to September 10, 2024. Simultaneously, in the realm of sports, India triumphed on September 14, 2024, by winning the ICC Men's T20 World Cup, defeating England in a thrilling final, and on December 3, 2024, young chess prodigy Gukesh became the youngest-ever World Chess Champion, further solidifying India's dominance in international sports. Meanwhile, January 15, 2025, marks National Army Day, honouring the valour, loyalty, and dedication of the Indian Army. The month also heralds the sacred Maha Kumbh festival, revamping pilgrims with resurgent conviction and spiritual serenity.

Amidst transformative shifts, the academic realm flourished, blending intellectual vigour with cultural dynamism. **The Editorial Board** organized a debate on August 14, 2024, honouring the 'Har Ghar Tiranga' movement and the heroes of the 'Kakori Train Action'. Furthermore, the calendar continued with the University's participation in IIT Kanpur and IIT BHU's annual sports festivals, from October 3 to October 20, 2024, and Vagmita, a prominent event honouring Hindi poetry from October 4 to October 8, 2024. Meanwhile, December commenced with the Annual Photoshoot, on December 13, 2024, immortalizing the graduating class' legacy, and the year culminated with students visiting IIT Bombay for its cultural festival from December 25 to December 27, 2024, alongside the University's technical fest, TechSrijan, from December 27 to December 30, 2024.

As January relinquishes its tenure, it bequeaths a tapestry woven with pivotal commencements, burgeoning aspirations, and incipient triumphs. While the impending manifestation of spring stirs the very soul of the Gaia, the year unveils its opus, brimming with untold sagas, igniting a symphony of renaissance and untamed vigour. The crepuscular haze enshrouds the month in an ineffable embrace, evoking time's transience and the limitless potentialities that beckon. With spirits fortified and cognitions refined, **The Editorial Board** proudly presents the January edition of **Tiresia**, extending our heartfelt wishes for a year replete with transcendence, revelation, and unbounded euphoria.

*bienvenidos!*

## Our Team

**Final Year Members:** Abhijeet Yadav, Aditya Raj, Akanksha Pal, Akshat Saxena, Awantika Krishna, Harshita Mishra, Khwaab Jaiswal, Lavanya Gupta, Mayank Jaiswal, Nadeem Ahmed Warsi, Nikhil Tiwari, Saanvi Gupta, Shreyas Kumar, Swati Tiwari

**Third Year Members:** Aadrika Barnwal, Aastha Singh, Harshit Pandey, Jayant Singh, Jyoti Singh, Nandini Mishra, Prisha Agrawal, Shivam Pal, Shivam Rai, Sneha Verma, Vishal Kotak, Vishwadeep Singh, Vivek Mani Tripathy, Yash Pratap Singh

**Second Year Members:** Aditi Sharma, Akshay Kumar, Alok Kumar, Ashmi Singh, Divyansh Singh Rathore, Gaurav Vishwakarma, Himanshu Mishra, Jagriti Singh, Pragya Kumari, Pranav Mishra, Shatakshi Srivastava, Shrestha Gupta, Vaishnavi Rai, Vinayak Yadav, Yashvardhan Ojha



# MESSAGE FROM

## *Faculty Advisor*



Dr. Abhijit Mishra  
Faculty Advisor

Madan Mohan  
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Gorakhpur - 273010



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[www.mmmut.ac.in/  
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I am profoundly exhilarated to present this invigorating issue of **Tiresia**. Each edition embodies the spirit, ingenuity, and intellectual dynamism of our student community, and this issue is no exception. The past few months have been momentous for the University, marked by distinguished milestones and commendable achievements. On August 29, 2024, Madan Mohan Malaviya University of Technology celebrated its 9<sup>th</sup> Convocation, conferring degrees upon 1,450 graduates. Hon'ble Chancellor and Governor of Uttar Pradesh, Smt. Anandiben Patel presided over the ceremony, with renowned rocket scientist and former ISRO Director Shri S. Nambi Narayanan as the Chief Guest, who also received the Doctor of Science (Honoris Causa) degree. Hon'ble Minister of Technical Education, Shri Ashish Patel, attended as the Guest of Honour.

The University made a historical achievement by securing commendable ranks in three categories of NIRF Rankings 2024 released by the Ministry of Education, Government of India. It stood 84<sup>th</sup> in Engineering, 94<sup>th</sup> in the University category, and 40<sup>th</sup> among State Public Universities. Further cementing its global stature, MMMUT ranked 292<sup>nd</sup> in South Asia and 901<sup>st</sup> in Asia in the QS World University Rankings 2025, alongside securing the 36<sup>th</sup> spot in the Times Engineering Survey 2024. The Technical Fest of our University, TechSrijan, provided a dynamic platform for students of MMMUT, and other institutions to showcase their technical

prowess. Reflecting the University's commitment to academic eminence, Prof. D. K. Dwivedi (Physics) and Prof. R. K. Yadav (Chemistry) were recognized among the world's top 2% scientists, as per Stanford University's 2024 rankings. The year also marked a significant achievement in placements, with over 90% of eligible students securing positions in reputed companies. Furthering innovation, the Electrical Engineering Department received a funding of Rs. 19.5 lakhs from UPCST, Lucknow, to develop a Solar-Powered Electric Boat. In a remarkable step towards digital transformation, MMMUT became the first state university in Uttar Pradesh to implement the Samarth E-Governance Portal, developed by the University of Delhi in collaboration with the Ministry of Education.

This edition narrates themes of cultural and technical importance to the youth. **The Editorial Board's** assiduity in curating thought provoking articles, insightful interviews, and creative works, along with our contributors' dedication, has brought this issue to life. **Tiresia** remains a platform for expression, learning, and connection. I extend my cordial felicitations to **The Editorial Board** for their diligent efforts in crafting this magnificent edition, showcasing inspiring perspectives on life and science.

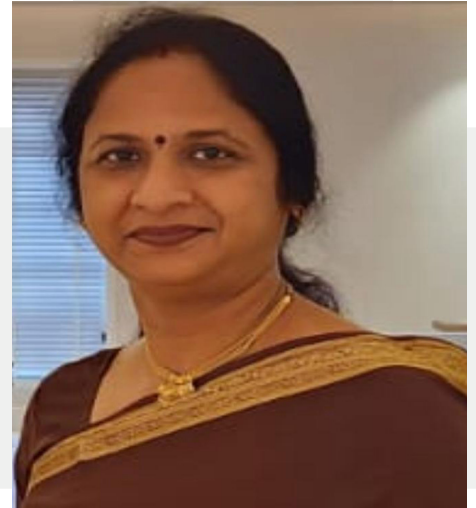
With best regards  
Dr. Abhijit Mishra  
Faculty Advisor  
**The Editorial Board**  
MMMUT

# Tête-à-tête

## *A talk with Smt. Kalpana Srivastava*

Mrs. Kalpana Srivastava, a proficient officer from the 2001 batch of the Indian Railway Services, currently serves as the Chief Electrical Engineer at the Western Railway Headquarters, Mumbai. After earning her degree in Electrical Engineering from MMMEC Gorakhpur in 1999, she began her career at the prestigious National Hydroelectric Power Corporation (NHPC), while her entry into the Indian Railway Service of Electrical Engineers (IRSEE) in 2002 marked the inception of an exceptional journey. With over 20 years of dynamic experience, she has revolutionized Indian Railways, pioneering the World Bank-funded Mumbai Urban Transport Project. A visionary philanthropist, she also represented India in international EMU programs, alongside playing a crucial role in sustaining Mumbai's suburban railway system. **The Editorial Board** had the honor of delving into her extensive expertise and unfurling profound insights into her remarkable odyssey.

Featured here is a distinguished excerpt from the discourse.



### **Q** How has your college journey shaped the trajectory of your career?

**A** The path that led me to my current role was shaped by the invaluable opportunities I embraced during my time in college. Being recognized as a 'Malaviyan' is a distinction that holds immense prestige across India. Amid the effulgent hustle of college, I formed lasting bonds that instilled in me a deep sense of humility and a natural inclination towards forgiveness. Adjusting to life away from home and confronting academic challenges became the crucible that influenced the way I navigate arduous predicaments. The demanding academic environment, along with the unflinching support of the faculty, equipped me with technical expertise and multitasking abilities. Looking back, those years shaped my character, honed skills, and instilled in me an unshakable drive for excellence.

### **Q** Could you share the story of your determination and perseverance that paved the way for your journey into the Indian Railways?

**A** My journey has been shaped by significant challenges and unwavering determination. After graduating in 1999, I moved to Jiya Sarai for UPSC preparation, where steep odds fueled a profound grit to prove my mettle. In 2001, I cleared the UPSC with an AIR 10 and began my career in the Railways. Joining as the only female officer in the Electrical Engineering batch was daunting, but it motivated me to overcome challenges of off-hours responsibilities, limited resources, and connectivity issues. Now, as the sole officer in the Senior Administrative Grade (SAG) of Western Railways, I oversee critical operations across regions like Gujarat, Mumbai, Kutch, Bhuj, and Dwarka. Yet, I believe these impediments were not hurdles but stepping stones to greater possibilities, shaping the

resilience and tenacity that defines my career today. With hindsight, I am gratified that my journey inspires others and propels those who dare to dream big toward boundless opportunities.

### **Q** What challenges did you encounter as a woman leading in a traditionally male-dominated field, and how did you navigate them?

**A** Leadership role in a traditionally male-dominated field has been both challenging and rewarding. On the outset, my journey was influenced by entrenched societal preconceptions and the intricacies of acclimating to an environment where women were often underrepresented. I faced several challenges at work, including gender stereotypes, limited growth opportunities, and lack of basic workplace amenities. The railways fostered inclusivity, valuing competence over gender, with supportive colleagues inspiring me toward excellence. Over time, advanced technologies and systems helped mitigate hurdles, empowering women to redefine boundaries and dismantle societal constraints. In essence, my unrelenting resolve and perseverance enabled me to rise above these challenges. The strides we've made today empower women to invigorate others, shatter barriers, and unlock their infinite potential for generations to come.

### **Q** What distinctive perspectives and competencies do you believe women contribute to engineering and leadership roles, especially in sectors such as the railways?

**A** Women's contributions to leadership and technical fields are invaluable, blending analytical rigor with empathetic insight to challenge traditional paradigms. Their attention to details, communication, and organisational skills enhances project management and



“Every challenge hides an opportunity; embracing it with courage transforms obstacles into milestones.”

stakeholder engagement, blending technical expertise with a human-centric approach to foster teamwork, inclusivity, and innovation. Under pressure, they demonstrate remarkable composure and grit, effectively prioritizing tasks and maintaining their composure in demanding circumstances. In light of this, intuitive problem-solving skills enable the implementation of proactive solutions to formidable situations. As more women break barriers and take on leadership roles, they are shaping a future that values collaboration, equity, and innovation. This evolution paves the way for more inclusive leadership and lays the foundation for a balanced and dynamic workforce.

**Q Did you make any lifelong friends or connections during your college years, and how have those relationships impacted your life?**

**A** During my college years, I was fortunate to forge friendships that have stood the test of time. The relationships nurtured during those vibrant and formative years have not only offered me a steadfast personal support system but also had a profound influence on my professional path. We often explore each other's homes, immersing ourselves in the distinct charm of every place, which deepens our connection. These friendships have blossomed into lifelong ties, becoming source of encouragement, collaboration, and mutual growth. Academia was an exuberant phase of shared experiences, laughter, and learning, where each moment spent with friends etched a treasured memory. The collective warmth and unwavering support from these relationships have endured the passage of time, leaving a lasting influence that transcends into the future.

**Q How has your engineering expertise shaped the course and development of your career?**

**A** My engineering background has been pivotal in shaping my professional journey, equipping me with a sharp analytical mindset, technical expertise, and strong project management skills to tackle convoluted hurdles with precision. Though not always directly applicable to administrative fields focused on policy, law, and governance, this knowledge has been invaluable in my vocation, emphasizing teamwork, communication, and empathy. However, in the railway sector, I've found that combining technical expertise with administrative responsibilities creates a unique advantage. It enables a distinctive approach to decision-making, bridging the gap between abstract concepts and pragmatic challenges to formulate impactful solutions to intricate issues.

**Q What key lessons and advice would you share with young Malaviyans based on your experiences and learnings?**

**A** Early in my career, I was given a profound piece of advice: the most valuable investment you can ever make is in yourself. This wisdom encouraged me to prioritize personal growth, continuously learn, and refine my skills, which laid the foundation for both professional success and personal fulfilment. Investing in your own development pays the highest dividends, as it equips you to adapt, innovate, and thrive in any situation. So, I'd just say that you should make the most of the opportunities available to you, both inside and outside the classroom. Focus on building a strong foundation in your technical subjects, for that knowledge will serve as a bedrock, particularly if you venture into fields where technical acumen is paramount. In moments of adversity, let dedication be the flame that keeps your dreams alight, guiding you toward horizons brimming with promise and possibility.



Mrs. Kalpana Srivastava advancing her project



# CAMPUS

**AUG 14** On **August 14, 2024** **MMMUT, Gorakhpur** secured the **40<sup>th</sup>** position among state government Universities and **94<sup>th</sup>** in the All India Universities Ranking by **NIRF**. In the engineering category, it ranked **84<sup>th</sup>**. This achievement highlights the University's commitment to excellence in education and reflects the dedication and hard work of the entire university community. It serves as an inspiration for future generations to strive for even greater heights.

**AUG 14** On August 14, 2024 **The Editorial Board** organized a **Debate Competition** to commemorate the centenary of the Kakori Train Action and honour the spirit of freedom through the Har Ghar Tiranga initiative, reflecting on the sacrifices that shaped India's legacy.

**AUG 29** The **9<sup>th</sup> Convocation** of the batch 2020-24, organized on **August 29, 2024** marked the completion of another spectacular journey at the University. It was a day filled with pride and heartfelt goodbyes, as graduates looked forward to their future endeavours while cherishing the unforgettable memories they had made. The event was graced by the presence of Hon'ble Governor Smt. Anandiben Patel and Shri Nambi Narayanan, former ISRO Director.

**OCT 04** The Editorial Board organized Vagmita, an online Hindi poetry event from **October 04, 2024** to **October 09, 2024**. The event fostered the refinement of critical thinking and fortified confidence through the art of poetic articulation. It also allowed students to express their creativity and connect through Hindi poetry.

## यूनिवर्सिटी रैंकिंग में एमएमएमयूटी का श्रेष्ठ प्रदर्शन

➤ 3 वर्ष में 84वें स्थान पर  
लोक भारती न्याज ह्यारी

[illegible]

**AUG 23** The Computer Engineering Society organized **Game of Codes** on **August 23, 2024**. This online event, conducted on HackerRank, provided students with valuable exposure to programming, enhancing their skills and fostering a competitive coding spirit in a dynamic learning environment.

**OCT 24** Aayansh 2024, organized by the NSS MMMUT, Gorakhpur, on **October 24, 2024** exemplified the spirit of Diwali through the donation of stationery to underprivileged children. The event was a shining example of how we can come together to give back to our community, fostering a sense of unity and togetherness during the festive season.



# BUZZ

**OCT 26** The Alumni Meet, organized on **October 26, 2024** brought former students together to reconnect and relive cherished college memories. The event served as a bridge between past and present, fostering a sense of nostalgia while inspiring current students through heartfelt stories, invaluable experiences, and professional camaraderie.

**NOV 06** On **November 06, 2024** the University made its debut in the **QS World University Rankings 2025**. MMMUT, Gorakhpur secured the **292<sup>nd</sup>** position in Southern Asia and was ranked among the 901+ Universities in Asia, marking a significant milestone in academic excellence and global recognition.

**NOV 17** The Social Engineers' Board proudly hosted **Dhishan** from **November 17, 2024** to **November 19, 2024** creating an engaging platform for freshmen to exhibit their soft skills and showcase exceptional oration and debate skills, leaving a mark of their intellectual prowess.

**DEC 01** The **Foundation Day** of our University was celebrated on **December 01, 2024** commemorating more than a decade of impacting lives and illuminating minds. It was held in the enigmatic presence of **Shri Rajesh Kumar Pandey**, who shared his inspiring insights on the institution's journey and future aspirations.

**OCT 31** On **National Unity Day**, celebrating **Sardar Vallabhbhai Patel's** birth anniversary, **The Editorial Board** organized an inter-college competition with events like mono act, speech, singing, essay writing, and poetry. The event promoted unity and creativity while honoring **Sardar Patel's** ideals.



**NOV 23** **Heats**, an audition event, was organized by **Cultural Synod** on **November 28, 2024** giving freshmen a chance to showcase their talents in dance, music, fine arts, and dramatics. The event witnessed enthusiastic participation, with students putting forth captivating performances that highlighted their creativity and passion.





# CAMPUS

**DEC 13** **The Annual Photoshoot**, a longstanding tradition conducted by **The Editorial Board**, was organized on **December 13, 2024** with great enthusiasm and meticulous planning. This cherished event brought together the final year students in a way that marked a significant milestone in their academic journey.



**DEC 27** **techSRIJAN** an electrifying fest organized from **December 27, 2024** to **December 29, 2024** by the collaboration of **IEEE Student Branch** and the **SAE Collegiate Club**, offered an extraordinary platform in the form of an array of dynamic events such as Bridgekriti, Cadathon, Incognito, Junkyard Warz, Techbiz, Techczar, El-Tiro, and many others.



**DEC 29** **Fresher's Talk**, organized by the **E-Cell** at **MMMUT**, was a vibrant three-day event held from **December 29, 2024** to **December 31, 2024**. The program featured inspiring motivational talks, lively networking sessions, and a gateway to numerous promising opportunities for freshmen. It served as a perfect introduction to the vibrant entrepreneurial culture.

**JAN 02** **Labyrinth**, a captivating event organized by **Electrical Engineers' Legation** from **January 02, 2025** to **January 03, 2025** was an exhilarating treasure hunt. Participants navigated through puzzles, riddles, and brain teasers to uncover clues and claim victory. With each solved mystery, teams advanced through a web of challenges, testing their wit, teamwork, and perseverance.

**JAN 04** **Computer Society of Software Engineering** organized **Technokratos** a dynamic event for the freshmen of **ITCA** department on **January 04, 2024**. The event featured activities like dance, singing, poetry, and games, providing a platform for students to showcase their talents and bond with their peers.





# BUZZ

**JAN 09** On January 09, 2025 MMMUT, Gorakhpur made a remarkable achievement with 114 scientists securing positions in the 'Scientists Ranking 2025.' This is a significant rise from last year, showcasing University's growing excellence in research at global and national levels. This achievement reflects the University's commitment to fostering innovation, research, and academic excellence.

## विश्व के वैज्ञानिकों की रैंकिंग में एमएमएमयूटी के 114 शिक्षक

पिछले वर्ष सिर्फ 58 शिक्षक व छात्रों को रैंकिंग में मिली थी जगह, एक साल में दो गुनी हो गई संख्या

संवाद ज्यूल एजेंसी

गोरखपुर। महान मोहन मालवीय विश्वविद्यालय में शिक्षा के क्षेत्र में विश्व की प्रमुखता का प्रमाण प्रदर्शन हो रही है। एमएमएमयूटी के 114 शिक्षक रैंकिंग में शामिल हुए हैं। इन शिक्षकों में शिक्षक व शोध धारा शामिल हैं।



वर्ष 2024 में 58 शिक्षक, वर्तमान में इस वर्ष 114 शिक्षक शामिल हैं। विश्व स्तर पर भी पिछले वर्ष विश्वविद्यालय की रैंकिंग 2797 थी।

रैंकिंग में शीर्ष 20 स्थान पाने वाले शिक्षक

प्रो. श्रीकेश द्विवेदी, भौतिकी  
प्रो. श्रीराम सिंह, गणित  
प्रो. प्रभाकर सिंह, इलेक्ट्रिकल इंजीनियरिंग  
प्रो. रमेश कुमार, कंप्यूटर साइंस  
प्रो. आरके द्विवेदी, गणित  
प्रो. श्रीकेश सिंह, इलेक्ट्रिकल इंजीनियरिंग  
प्रो. प्रदीप कुमार, इलेक्ट्रिकल इंजीनियरिंग  
प्रो. श्रीराम सिंह, इलेक्ट्रिकल इंजीनियरिंग  
प्रो. श्रीराम सिंह, इलेक्ट्रिकल इंजीनियरिंग  
प्रो. श्रीराम सिंह, इलेक्ट्रिकल इंजीनियरिंग

प्रो. रमेश सिंह, इलेक्ट्रिकल इंजीनियरिंग  
प्रो. प्रभाकर सिंह, इलेक्ट्रिकल इंजीनियरिंग  
प्रो. रमेश कुमार, कंप्यूटर साइंस  
प्रो. आरके द्विवेदी, गणित  
प्रो. श्रीकेश सिंह, इलेक्ट्रिकल इंजीनियरिंग  
प्रो. प्रदीप कुमार, इलेक्ट्रिकल इंजीनियरिंग  
प्रो. श्रीराम सिंह, इलेक्ट्रिकल इंजीनियरिंग  
प्रो. श्रीराम सिंह, इलेक्ट्रिकल इंजीनियरिंग  
प्रो. श्रीराम सिंह, इलेक्ट्रिकल इंजीनियरिंग  
प्रो. श्रीराम सिंह, इलेक्ट्रिकल इंजीनियरिंग

**JAN 12** On January 12, 2025 IIRF released the college rankings for the BBA program, and MMMUT, Gorakhpur proudly ranked 1<sup>st</sup> in Uttar Pradesh and 19<sup>th</sup> in India. This remarkable achievement reflects the University's dedication to academic excellence, industry-oriented curriculum, and comprehensive student growth.

**MADAN MOHAN MALAVIYA UNIVERSITY OF TECHNOLOGY, GORAKHPUR**  
(Accredited 'A' by NAAC)

**Leading the way: MMMUT'S BBA ranks among the top in IIRF Ranking**

MMMUT's BBA Program ranks top for Academic Excellence in IIRF 2025.

The BBA Program ranks 1<sup>st</sup> in Uttar Pradesh and 19<sup>th</sup> in India, celebrated for its

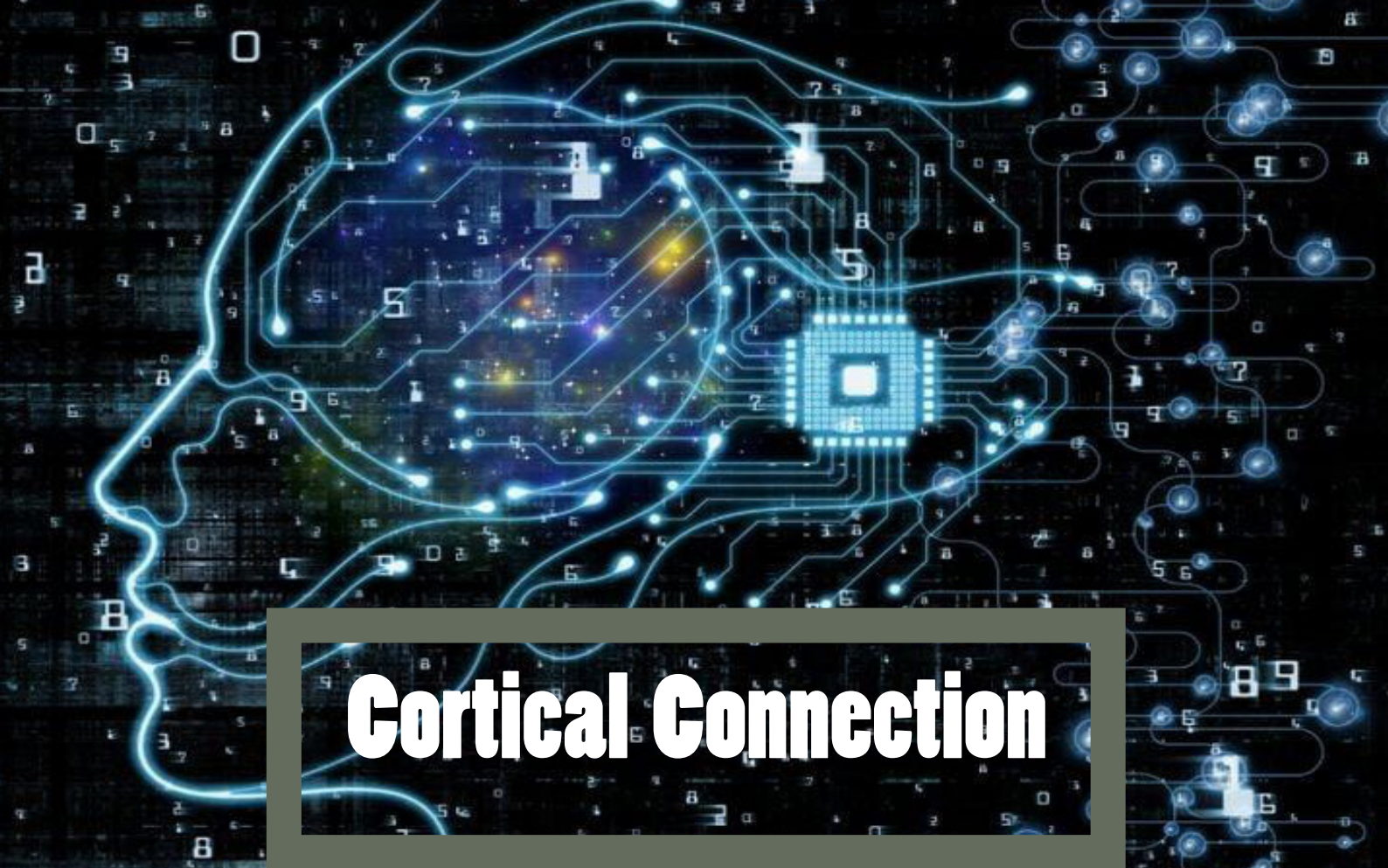
**JAN 13** On January 13, 2025 Shree Ashish Patel, Hon'ble Minister of Technical Education, Government of Uttar Pradesh, visited our campus. He engaged in meaningful conversations with students, emphasizing the importance of open dialogue and the exchange of ideas between students and policymakers. He also shared his insights on the future of technical education.

**JAN 26** On January 26, 2025 MMMUT, Gorakhpur hosted a seminar on "Good Governance and Atal Bihari Vajpayee Ji's Contribution to Nation Building". Vice Chancellor, Prof. J. P. Saini sir and Chief Speaker, Prof. Pratyush Dubey sir inaugurated the event with lamp lighting and tributes to Maa Saraswati, Malaviya Ji and Shri Atal Bihari Vajpayee Ji.

**JAN 26** On January 26, 2025 our University celebrated the Republic Day with great enthusiasm. Vice Chancellor Prof. J. P. Saini sir inaugurated the Constitution in the library and the newly renovated gym in CSA. The event featured an NCC parade inspection, the felicitation of Run for Unity winners, and inspiring student speeches on the significance of Republic Day.







# Cortical Connection

“

*When the mind and machine intertwine,  
they forge a future both bold and fine.*

The prospect of controlling our surroundings with mere thoughts, once confined to science fiction, is on the cusp of becoming a reality, driven by breakthroughs in Brain-Computer Interface technology. The Brain-Computer Interface (BCI) represents a transformative leap in merging human biology with digital devices, allowing individuals to control computers, robotic limbs, and more, through brain signals alone. Modelled after the electrophysiology of the brain's neural network, BCIs capture neural signals generated in the synapses located in the nervous system, process and interpret them, and convert them into directives that are transmitted to an output device to execute a desired task.

The seminal discovery of the brain's electrical activity by Hans Berger, in 1924, laid the foundational groundwork for the evolution of Brain-Computer Interfaces (BCIs). Widely regarded as the inventor of the BCIs, in 1973, computer scientist Jacques J. Vidal of University

of California, coined the term brain-computer interface (BCI) in his paper titled "Toward Direct Brain-Computer Communication", proposing the revolutionary idea of directly translating brain signals into computer commands. Researchers elicited measurable brain activity through EEG demonstrating that transient neural responses to visual stimuli could be harnessed for communication, proving that the brain's electrical activity could serve as a direct interface with a computer thus substantiating the concept of neural signals as a conduit for computational interaction. Studies exhibited that monkeys could learn to control the deflection of a biofeedback arm using neural activity, prompting the identification of a mathematical relationship validating that groups of neurons collectively controlled motor commands. Building on this understanding of neural activity, Phillip Kennedy and his team built the first intracortical BCI by implanting neurotrophic-cone electrodes in monkeys. These animal studies paved the way for human



BCI applications. In 1998, Dr. Richard Andersen at Caltech achieved a major breakthrough by implanting microelectrodes into the motor cortex, directly recording high-quality neural signals. This shift from EEG to more precise brain activity monitoring allowed for detailed neuron firing patterns, offering more stable and accurate signals. This advancement opened new possibilities for BCIs in prosthetics, communication systems, and assistive technologies, marking a critical milestone in BCI research.

Researchers at the University of Tübingen showed that a patient with ALS could control a computer cursor using brain signals. The BrainGate system enabled a paralyzed man to control a robotic arm, soon after a quadriplegic woman used a robotic arm to feed herself. Researchers eventually enabled a locked-in syndrome patient to spell words using a non-invasive BCI. Neuralink, has developed the 'Link', a coin-sized implant, focusing on treating paralysis with ongoing human trials. Its 'Blindsight' project aims to restore vision by transmitting visual data directly to the brain. Synchron's 'Stentrode', an alloy chip inserted via blood vessels, translates neural signals into digital commands, enabling paralyzed patients to interact with computers. Inbrain Neuroelectronics is undergoing trials for applications in Parkinson's disease and brain tumour surgeries. These innovations highlight the immense potential of BCIs to transform medical care and enhance quality of life.

All Brain-Computer Interface (BCI) systems under development face significant challenges. Invasive BCIs grapple with safety concerns and the long-term stability of implanted electrodes. Non-invasive EEG-based BCIs, suffer from limited signal strength and frequency range. Advanced BCI applications especially those requiring complex command sequences, may overwhelm users and reduce practicality. Additionally, data privacy is



Neuralink brain implant

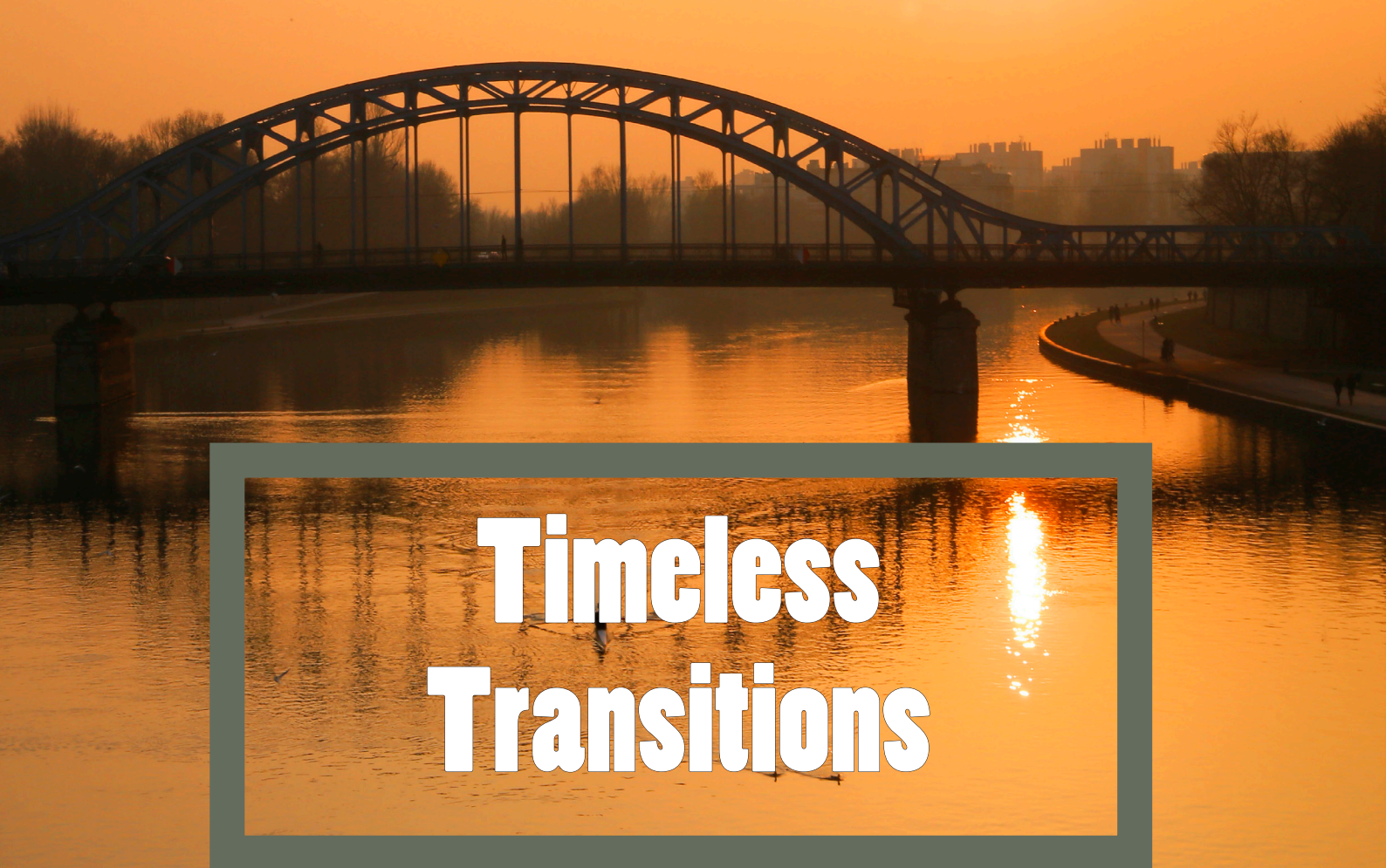
#### Augmented Reality Diagnosis



a growing concern, as advanced non-invasive BCIs collect vast amounts of sensitive user data that could be misused without proper safeguards.

Addressing these challenges requires a multifaceted approach. For invasive systems, advances in biocompatible materials and electrode stability are crucial to ensure long-term performance. EEG-based BCIs can benefit from improved signal processing techniques and the development of systems with multiple independent control channels to enhance functionality. Intelligent adaptation and learning algorithms can reduce user fatigue and streamline command sequences, making BCIs more user-friendly. Ensuring robust data protection through clear regulatory frameworks and policies can mitigate privacy risks and build user trust. Moreover, prioritizing speed, accuracy, convenience, and aesthetics in BCI design will be critical for achieving widespread adoption and practical implementation.

Brain-Computer Interface (BCI) research and development is an exciting, interdisciplinary endeavour, drawing on the expertise of neuroscientists, engineers, mathematicians, computer scientists, psychologists, neurologists, and clinical rehabilitation specialists. While BCI technology remains in its nascent stages, its vast potential offers promising prospects. This rapidly advancing field holds immense promise, particularly in improving the quality of life for diverse populations. Each step forward in BCI research holds the potential to revolutionize both the medical field and human-computer interaction, offering transformative benefits to countless individuals in need.



# Timeless Transitions



*Winds may scatter autumn's grace,  
yet spring revives the lost embrace.*

Transitions are an inherent part of the human experience, a fundamental aspect of nature, and a constant in the world around us. We chase ambitions, set goals, and map out our futures, all while the clock ticks relentlessly forward. But amidst all the flux, there is a timeless thread that weaves it all together. Does life feel ever-changing or perpetually evolving? One moment you are blooming like spring, the next you are fading like autumn. But here is the thing: beneath all these changes, there is a steady pulse. The American author, Bob Goff, once said: “Embrace uncertainty. Some of the most beautiful chapters in our life won’t have a title much later.” This quote captures the idea that the beauty of change lies in the unfolding of new, unexpected experiences. Through the prism of personal growth, we witness timeless transitions that transcend the boundaries of time, space, and circumstance.

Imagine having the freedom to design your own work life, free from the traditional 9-to-5 grind. The era of being confined to a single job has come

to an end. Instead, people are embracing portfolio careers – curating a mix of part-time roles, freelance gigs, and passion projects that ignite their creativity and fuel their passions. There are numerous instances ahead. Money has always been about connection – people exchanging value, building trust, and fueling progress. Now, digital currencies and cryptocurrencies are revolutionizing the way we think about money. In the field of fashion, the **saree’s** transition into global runways shows how traditional attire is being reimagined and appreciated outside its original cultural context, with influences that reflect hybridized identities. Denim - the fabric of our lives, has been a perpetual attire element since its espial. The fabric’s ability to stay relevant while maintaining its core values of comfort and simplicity ensures that it continues to be cherished and worn worldwide. While early pottery focused on functionality and local craftsmanship, the development of ceramic materials, glazes, and firing techniques has resulted in highly specialized and aesthetically refined works of



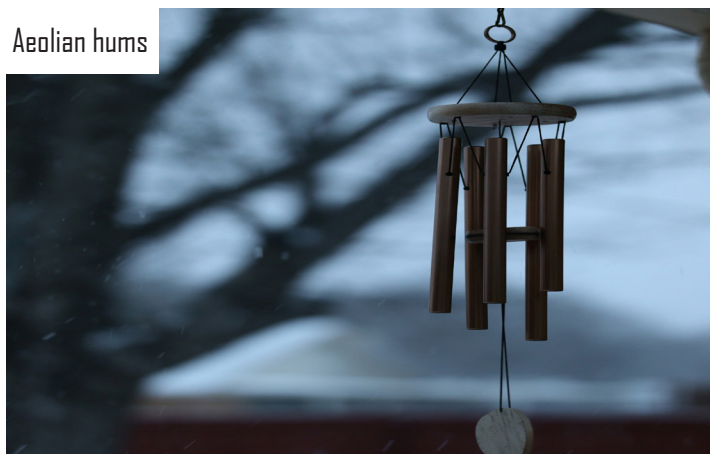
art. The advent of streaming services like Netflix, Spotify, and YouTube revolutionized how we access music, movies, and TV shows. We no longer need to own physical copies of media; everything is available digitally at the click of a button. Online learning platforms, MOOCs (Massive Open Online Courses), and digital classrooms have made education more accessible and flexible where learners can now access quality education from top institutions worldwide. In the wake of the COVID-19 pandemic, the world experienced a swift and dramatic transition in how work is structured and conducted. The widespread adoption of remote work reshapes workplace culture and human behaviour. However, there exist several consequences too. As the world becomes more interconnected, there is a risk that local cultures may be diluted or overshadowed by dominant global trends, leading to the erosion of diversity and unique cultural expressions. The shift towards more digitized and automated systems can lead to an over reliance on technology, reducing individual's ability to perform basic tasks without digital assistance. The rise of industries like technology and finance can result in the concentration of wealth in the hands of a few, leaving some populations behind, particularly those lacking access to education or capital.

A career change can be a transformative experience, requiring individuals to adapt to new environments, roles, and expectations. This transition often involves rethinking one's skills, values, and long-term goals. In organizational and team settings, successful transitions require thoughtful planning and execution. Leaders can facilitate this by creating an inclusive environment where all voices are heard, ensuring transparency in decision-making, and offering consistent support. Strategies such as setting clear expectations, fostering open communication, and providing opportunities for professional growth can ease the transition process. Empathetic leadership that acknowledges the emotional impact of change is crucial in building trust and maintaining morale. Ultimately, leadership plays a pivotal role in steering individuals and communities through transformative



Ephemeral bloom

Aeolian hums



periods, serving as a beacon of stability and vision amidst uncertainty. Similarly, personal transitions such as moving to a new place or experiencing the loss of a loved one can profoundly affect an individual's outlook on life, prompting reflection on what truly matters. The most poignant of personal transitions is the experience of aging and the eventual approach of death. As people grow older, they often find themselves thinking about the legacy they will leave behind, reflecting on what they have achieved, and coming to terms with the fact that life is finite. Aging, though something we cannot avoid, brings its own kind of wisdom and a deeper sense of peace as we accept the natural course of life. Furthermore, the tempo of transition can be destabilizing - an abrupt shift may prove overwhelming, while protracted periods of change risk inducing fatigue or stagnation.

In a world that consistently demands an accelerated pace, we are only supposed take a step back and have faith in the journey. The cyclical patterns of nature, the evolving trends of culture, the innovations in technology, and the introspective journeys of the individual all underscore the inevitability of transition. Every aspect of life has its dualities, so the advantages cannot be overlooked. One can fully understand the purpose of the change and its broader implications, leading to more informed, meaningful choices. As timeless transitions weave the fabric of human progress, they underscore the paradoxical harmony between continuity and change, inviting us to embrace the dynamic tension that shapes our evolving world. To resist these changes is to deny the essence of existence itself; instead, embracing transitions with grace and resilience opens the door to a future that is continually enriched by the lessons of the past, the challenges of the present, and the possibilities of the future. It is essential for all of us to acknowledge and honor the pivotal cultural and historical events that have influenced the development of our community.

```
#include <iostream>
using namespace std;
int main() {
char str[] =
"ABCDEFGHIJKLMNOPQRSTUVWXYZ";
char *p = str;
cout << *(p + ((2 << 4) >> 2) + ((1 << 3) - 4))
<< *(p + (((32 >> 1) >> 3) - (9 - 7)))
<< *(p + (((3 << 3) >> 2) + (1 << 3) - 7))
<< *(p + (((10 >> 1) << 2) - ((2 << 1) * 5)))
<< *(p + (((2 << 4) >> 2) + ((1 << 3) - 4)))
<< *(p + (((17 << 1) >> 1) - ((3 << 2) + 5)))
<< *(p + (((5 << 3) >> 2) + (1 << 2) - 1))
<< *(p + (((52 >> 2) << 1) - (13 * 2)))
<< endl;
return 0;
}
```

What is the output of above C++ program?

COMPUTER SCIENCE  
AND ENGINEERING

Consider a computer system with a 4-level cache hierarchy: L1, L2, L3, and L4. The hit rates for these caches are 95%, 90%, 85%, and 80% respectively. The access times for the caches are as follows: 1 cycle for L1, 5 cycles for L2, 20 cycles for L3, and 50 cycles for L4. The main memory has an access time of 200 cycles. Calculate the average memory access time (AMAT) for this cache hierarchy.

INFORMATION TECHNOLOGY

Given an AM transmitter that produces 13 kW with a modulation percentage of 63%, determine the percentage power saving if both the carrier and one of the sidebands were suppressed before transmission.

ELECTRONICS AND  
COMMUNICATION ENGINEERING

A bed of spherical glass beads with a diameter of  $10^7 \text{ \AA}$  and a bed porosity of 0.5 is to be fluidized by water at  $4^\circ\text{C}$  and viscosity  $0.020885 \text{ slug/ft.s}$ . Assume that the Reynolds number based on particle diameter is very small compared to one. If  $g = 1000 \text{ Gal}$  and the minimum velocity (in m/s) required to fluidize the bed is 0.333, what will be the specific gravity?

CHEMICAL ENGINEERING

Determine the Z-transform of the discrete-time signal  $x[n]$  which is defined as follows: for  $n > 0$ ,  $x[n] = n^2$  and for  $n \leq 0$ ,  $x[n] = e^n$ . Calculate the Z-transform of the piecewise-defined signal, considering the different definitions for positive and non-positive values of  $n$ .

ELECTRICAL ENGINEERING

For a given material, Young's modulus is  $140 \text{ GN/m}^2$  and shear modulus is  $46 \text{ GN/m}^2$ . Find the bulk modulus and lateral contraction of a round bar with a diameter of  $42.5 \text{ mm}$  and a length of  $2.4 \text{ m}$ , when it is stretched by  $2.5 \text{ mm}$ .

MECHANICAL ENGINEERING

A steel post with a square cross-section of  $200 \text{ mm} \times 200 \text{ mm}$  and a length of  $2.5 \text{ m}$  is fixed to the ground at one end and free at the other. A horizontal force  $F$  is applied to its free end, causing a maximum horizontal deflection  $d_{\text{max}} = 25 \text{ mm}$ . The post is made of steel with  $E = 200 \text{ GPa}$ . Assuming the post behaves elastically, if the horizontal force is replaced with an impact load delivered by a  $100 \text{ kg}$  mass moving at  $v = 1.5 \text{ m/s}$ . Determine the maximum horizontal deflection of the post.

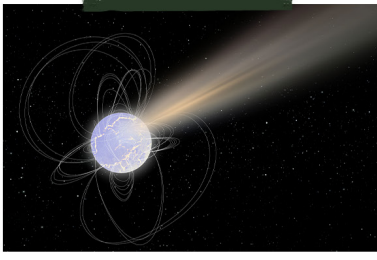
CIVIL ENGINEERING



Winner of the Tech inSights of Tiresia Volume 15, Issue 3 is Parv Agarwal, B.Tech 2<sup>nd</sup> Year, CSE.  
 Rest of the answers were either late or unsatisfactory.



# Cosmovista



## The Cosmic Signals

In a fleeting instant, a burst of energy streaks across the cosmos; then, silence. Discovered in 2007, Fast Radio Bursts (FRBs) remain a mystery, emerging from distant galaxies. Are they dying stars, black holes, or something unknown? Like cosmic heartbeats, they keep us listening, wondering, and searching for answers.

~Vaishnavi Rai, CE 2<sup>nd</sup> year

## Nature's Magnifying Glass

Imagine peering through a cosmic magnifying glass, not of glass, but of gravity. Massive objects like galaxies bend light, unveiling hidden wonders. Gravitational lensing lets us explore deeper into the universe, revealing distant worlds and dark matter. This natural illusion draws us ever closer to the mysteries of the cosmos.

~Shrestha Gupta, ECE 2<sup>nd</sup> year



## A Ring of Cosmic Beauty

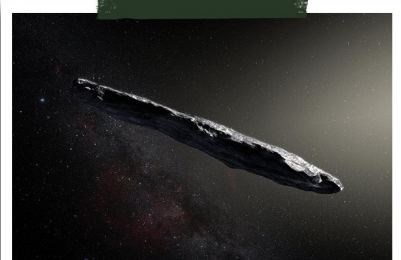
Hoag's Object, a rare galaxy discovered in 1950, forms a perfect ring of glowing stars around a mysterious core. Its flawless symmetry puzzles scientists. How did it form? Why so rare? No one knows. Yet, in a chaotic universe, it stands as a quiet reminder that nature loves symmetry.

~Alok Kumar, ECE 2<sup>nd</sup> year

## The Interstellar Visitor

In 2017, a mysterious, cigar-shaped object entered our solar system from the unknown. Oumuamua moved in puzzling ways, defying full explanation. Was it a fragment of a distant world, a frozen traveler, or something more? As it vanished into the darkness, it reminded us of the universe's many mysteries.

~Akshay Kumar, EE 2<sup>nd</sup> year



We invite all students to unveil the cosmic phenomena that captivate their imagination. Draft a concise description of the event and submit it to [literaryedb@mmmut.ac.in](mailto:literaryedb@mmmut.ac.in). The most compelling entries will be published in the next issue of **Tiresia**.



# वैराग्य

“

संयम एवं सदाचार जब,  
जीवनपथ में जुड़ जाता है।  
आलोकित करता कर्म मार्ग,  
वह वैराग्य कहलाता है॥

**वै**राग्य – एक शब्द, एक भावना, एवं कदाचित् जीवन के समर्पण की सबसे गहरी परिभाषा है। वैराग्य किसी गुफा में स्थापित होकर तप करने का साधन नहीं, अपितु हमारे भीतर का वह संग्राम है जो हमें स्वयं से परे होकर संसार को देखने की दृष्टि देता है। यह हमारी सीमाओं को लांघने, हमारे दुखों से दूर जाने तथा हमारी नश्वरता को समझने का एक शक्तिशाली उपाय है। यह मनःस्थिति हमें शांति एवं आत्म-शक्ति का बोध कराती है। जब हम वैराग्य की साधना करते हैं, तो हमें स्वयं से मुक्त होने का अनुभव होता है—वही मुक्ति जो न केवल हमारे भौतिक अस्तित्व से, अपितु हमारी आंतरिक इच्छाओं और भावनाओं से भी जुड़ी होती है।

वैराग्य का शाब्दिक अर्थ देखें तो वह समस्त अभिलाषाओं से विरक्त होना है। यह अपनी इच्छाओं तथा भौतिक जगत से जुड़ी आशाओं को कम करने का और प्रत्येक परिस्थिति में आत्म-संतुलन बनाए रखने का एक साधन है। यह न केवल संसार से त्याग का संकेत है, बल्कि गहरी समझ एवं शांति की प्राप्ति का एक मार्ग भी है। जब हम वैराग्य के मार्ग पर अग्रसर होते हैं, तो हमें इस वास्तविकता को स्वीकार करना होता है कि जो कुछ भी हमारे

पास है वह अस्थायी है। इस पथ पर हमें यह बोध होता है कि हमारा अस्तित्व उतना विराट भी नहीं जितना हम सांसारिक विक्षेप के कारण आंक लेते हैं, किंतु तुच्छ भी नहीं क्योंकि अंततः हम सभी उन परमपिता परमेश्वर के ही अंश हैं।

हम अपनी इच्छाओं एवं आशाओं से मुक्त होने के पश्चात् अपने जीवन को उसके वास्तविक स्वरूप में समझ पाते हैं। इसका वर्णन करते हुए कबीरदास जी कहते हैं—

"माया मरी न मन मरा, मर-मर गया शरीर।  
आशा तृष्णा न मरी, कह गए दास कबीर।"

अर्थात् मनुष्य का शरीर तो मृत हो सकता है, किंतु माया एवं आशाएँ समाप्त नहीं होती हैं। जब तक मनस इनसे मुक्त नहीं होता, सच्ची शांति नहीं मिलती है। वैराग्य की यही विशेषता है, यह हमें सांसारिक मोह से मुक्त करके वह शांति प्रदान करता है जिससे हमें परम आनंद की अनुभूति होती है।

वैराग्य का इतिहास उतना ही प्राचीन है, जितना मानव का स्वयं के अस्तित्व को समझने का प्रयास रहा है। भारतीय ग्रंथ जैसे श्रीमद्भागवतम्,



उपनिषद्, पतंजलि के योग सूत्र तथा आदि शंकराचार्य जी द्वारा रचित विवेकचूडामणि में वैराग्य का उल्लेख है। श्रीमद्भगवद्गीता के द्वितीय अध्याय में श्रीकृष्ण ने अर्जुन से कहा है—

“कर्मण्येवाधिकारस्ते मा फलेषु कदाचन।  
मा कर्मफलहेतुर्भूर्मा ते संगोऽस्त्वकर्मणि॥”

अर्थात् तुम्हारा अधिकार केवल कर्म करने तक सीमित है, उसके परिणाम की चिंता करना तुम्हारा अधिकार नहीं है। कर्म को फल का कारण न बनाओ और न ही कर्म से विरक्त हो। यही सच्चा वैराग्य है—कर्म करते रहना, परंतु उसके परिणामों से अनासक्त रहना।

ऋषि पतंजलि के योग सूत्र में वैराग्य के चार चरणों का वर्णन है। प्रथम चरण यतमान वैराग्य है, जहाँ व्यक्ति माया एवं इच्छाओं से अलग होने का प्रयास करता है, किंतु अभी मोह एवं आदतों से पूर्णता मुक्त नहीं हो पाता। द्वितीय चरण व्यतिरेक वैराग्य है, जिसमें व्यक्ति उच्च तथा निम्न इच्छाओं के बीच भेद कर, कुछ विशेष इच्छाओं एवं सांसारिक सुखों से दूरी बनाना शुरू करता है। तीसरा चरण एकेन्द्रिय वैराग्य है, जब व्यक्ति अपनी इंद्रियों पर पर्याप्त नियंत्रण स्थापित कर लेता है, जिससे बाहरी सुखों के प्रति रुचि समाप्त हो जाती है और मन स्थिर एवं शांत रहने लगता है। चौथा एवं अंतिम चरण वशीकार वैराग्य है, जहाँ व्यक्ति सभी इच्छाओं एवं मोह से मुक्त होकर प्रत्येक परिस्थिति में समानता एवं शांति का अनुभव करता है।

वैराग्य से संबन्धित यह एक भ्रम है कि वैराग्य का तात्पर्य केवल सामाजिक सुखों से मुक्ति प्राप्त करना है, परंतु सत्य यह है कि वैराग्य उन सुखों के प्रति हमारे लगाव को सीमित करने का एक साधन है। आज के युग में वैराग्य का अर्थ भौतिक वस्तुओं का त्याग नहीं, बल्कि उनके बीच रहकर भी मानसिक स्वतंत्रता तथा अनासक्ति बनाए रखना है। गृहस्थ मनुष्य के लिए वैराग्य साधना हेतु रामायण में उल्लिखित मिथिला नरेश राजा जनक का उदाहरण सबसे उपयुक्त है, जिन्होंने राज-पाट संभालते हुए भी स्वयं को भोग-विलासों से दूर रखा।

प्रसिद्ध लेखक लियो टॉलस्टॉय ने भी अपने जीवन में वैराग्य का अभ्यास किया था। उन्होंने भौतिक संपत्ति का त्याग कर, साधारण जीवन जीने का निर्णय लिया। उनका निर्णय न केवल उनके लिए, बल्कि उनके पाठकों के लिए भी प्रेरणा का स्रोत बना। उनकी कहानी यह दर्शाती है कि वैराग्य केवल भौतिक संसार से विमुख होने का नाम नहीं है, यद्यपि यह आंतरिक मुक्ति है, जो हमें अपने अस्तित्व के गहन अर्थ को समझने का अवसर देती है।

प्रत्येक अनुभव, कष्ट एवं खुशी एक शिक्षक है, तथा हम जो कुछ भी अनुभव करते हैं, वह हमारी आत्मा को मोक्ष के निकट ले जाने का मार्ग प्रशस्त करता है। वैराग्य का अभ्यास जीवन के प्रत्येक पक्ष में आत्मसंतोष एवं शांति का दीप प्रज्ज्वलित करता है। जब हम वैराग्य की इस यात्रा को स्वीकार करते हैं, तो यह हमें हमारे मूल व्यक्तित्व की ओर ले जाता है, जो क्षणिक और भौतिक नहीं, अपितु शाश्वत एवं अभिन्न है।





## The Editorial Board

*-Beckoning Creati'wit'y*

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