

4th Edition
11th May 2026
National Technology Day

A HALF-YEARLY SCIENCE MAGAZINE



INFINITY INSIGHTS

Where RECIans Reconnoitre Science



**Raajdhani Engineering College,
Bhubaneswar**

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MESSAGE FROM PRINCIPAL

Dr. Bhaskar Pattnaik



It is a matter of great pride and satisfaction to witness the successful publication of the fourth edition of Infinity Insights, the half-yearly Science Magazine of Raajdhani Engineering College. This magazine is a testament to the dedication, creativity, and scientific temperament of our students and faculty members, who continuously strive to promote knowledge and innovation beyond the classroom.

Science and engineering are inseparable pillars of progress, and the strong foundation provided by the basic sciences enables technological advancements that shape our future. In an age driven by innovation and discovery, nurturing scientific curiosity and analytical thinking among students has become more important than ever. I am pleased to see Infinity Insights serving as a valuable platform for sharing ideas, exploring emerging technologies, and encouraging intellectual discussions across disciplines.

The enthusiastic participation of students in activities such as the Science Quiz and Math Olympiad reflects the vibrant academic culture of our institution. Such initiatives not only strengthen conceptual understanding but also inspire teamwork, confidence, and a spirit of healthy competition.

I extend my heartfelt appreciation to the editorial board, faculty coordinators, and all contributors for their sincere efforts in bringing out this wonderful edition. Their commitment and hard work have made this publication both informative and inspiring.

I also congratulate every student and faculty member associated with this magazine for their valuable contributions. I am confident that Infinity Insights will continue to motivate young minds to pursue excellence in science, research, and innovation.

My best wishes to the entire team for continued success in all future endeavors.



Editor's Note



It is with immense pride and enthusiasm that we present the Fourth edition of Infinity Insights, the half-yearly Science Magazine of Raajdhani Engineering College. This edition continues our endeavor to foster a deeper appreciation of Science, Mathematics, and Engineering by bringing together insightful articles on recent technological innovations, space exploration, and engaging discussions on the fundamental sciences.

The magazine stands as a reflection of the creativity, curiosity, and academic excellence of our students and faculty members. Each contribution showcases not only intellectual rigor but also the spirit of inquiry that drives scientific progress. The recently organized Science Quiz and Math Olympiad served as remarkable highlights of this academic session, demonstrating the enthusiasm, teamwork, and vibrant scholarly culture that define our institution.

At Raajdhani Engineering College, we strongly believe that engineering advancements are deeply rooted in the principles of mathematics, physics, chemistry, and other core sciences. In today's rapidly evolving technological landscape, these foundational disciplines continue to inspire innovation, critical thinking, and groundbreaking discoveries. Through Infinity Insights, we aim to encourage students to explore interdisciplinary learning and cultivate a lifelong passion for scientific exploration.

We extend our heartfelt gratitude to all the members of the editorial board for their tireless efforts, dedication, and commitment in making this edition a success. We also express our sincere appreciation to our respected Principal, Dr. Bhaskar Pattnaik, for his constant encouragement, valuable guidance, and unwavering support throughout the preparation of this magazine. We hope this edition inspires readers to think creatively, question deeply, and continue exploring the endless possibilities of science and technology.

*Prof. Barsha Bijayini Muduli
Editor-in-Chief
Infinity Insights, REC, Bhubaneswar*



MESSAGE FROM ASSOCIATE EDITOR

ASSOCIATE EDITOR
Prof. Gouri Sankar Barik
Mathematics



It is a moment of pride and joy to place in the hands of our esteemed readers' third issue of "Half-yearly Science magazine" "Infinity insight". The College Magazine is a most powerful platform of the students where they can focus their talents as well as their creativity in their respective field which may be benefited to all. Magazine plays a very important parts where hidden talents of the students as well as faculty members can expose.

As an Assistant Editor

I have tried my level best to include valuable article of the staff and the students of different Department by incorporating some weightful writing keeping in mind globalization pattern.

I thank the College Committee Board for giving me the opportunity to send this greeting and wish the publication a grand success.

MESSAGE FROM CHIEF ADVISOR



CHIEF ADVISOR
Dr. Sushree Ipsita
Physics

Science is more than a body of knowledge—it is a way of thinking, a path of exploration, and a commitment to uncovering truth. It is with great enthusiasm that I present this latest edition of "Infinity Insights" Magazine, a platform dedicated to celebrating the wonder, rigor, and relevance of scientific discovery.

In these pages, we aim to bring together the latest breakthroughs, timeless questions, and diverse perspectives that define the scientific enterprise. From the mysteries of the cosmos to the marvels of molecular biology, from climate research to cutting-edge technology, science continues to shape the world we live in and the future we imagine.

This magazine reflects our belief that science should be accessible, engaging, and inspiring to all. I extend my heartfelt appreciation to our authors, editors (Prof. B. B. Muduli and Prof. G. S. Barik), and contributors for their dedication and insight. And to our readers—students, educators, researchers, and lifelong learners—I hope this issue deepens your curiosity and strengthens your connection to the scientific world.

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AN INTERVIEW WITH A SCIENTIST

Prof. Satya Ranjan Mishra is a Professor in the Department of Mathematics at Siksha O Anusandhan Deemed to be University with over 22 years of teaching and research experience. His research interests include heat transfer, magnetohydrodynamics, porous media, and fluid dynamics. He has published nearly 445 SCI- and Scopus-indexed research papers and was recognized among the Top 2% World Scientists by Stanford University from 2020–2025. He has guided several Ph.D. scholars, delivered expert lectures, edited international publications, and authored the book Learning Numerical Method using MATLAB.



1. What initially inspired you to pursue mathematics as a career, and how did your interests evolve toward applied mathematics and fluid dynamics?

Ans. I consider myself a simple person with a strong interest in academics. During my early studies, I excelled particularly in chemistry. However, based on the guidance and encouragement of my teachers, I chose mathematics as my field of study, which later became my passion and career.

2. Could you share some key milestones in your academic journey that shaped your research direction?

Ans. The growing importance and wide-ranging applications of differential equations in solving real-world problems greatly influenced my academic journey. I was especially motivated by the idea that mathematical models can contribute meaningfully to society. From the beginning of my career, I developed a strong interest in differential equations and their applications to practical problems. This naturally led me toward fluid dynamics, a fascinating research area where differential equations and mathematical concepts play a central role.

3. Fluid dynamics is a vast area. What specific problems or phenomena are you most interested in studying?

Ans. Since the beginning of my research career, I have been particularly interested in heat transfer phenomena in both Newtonian and non-Newtonian fluids. Over time, with advancements in modern research and technology, my focus has also expanded toward nanofluids because of their significant applications in various engineering and industrial fields. Nanofluids are especially important due to their enhanced thermal properties, which make them highly effective in improving heat transfer performance.

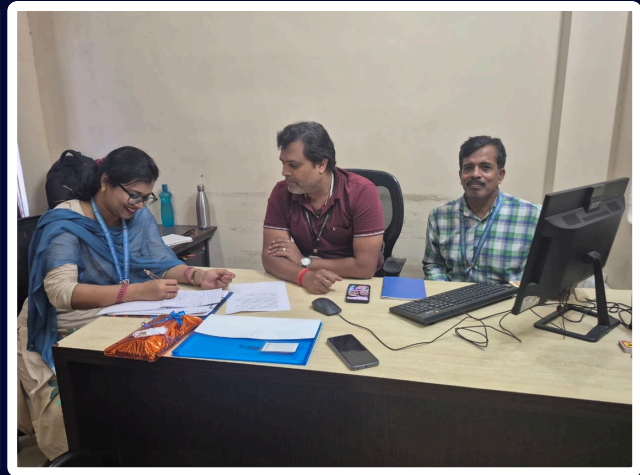
4. Could you explain one of your recent research projects in simple terms for a broader audience?

Ans. In my recent research work, I have been studying the use of various metal oxide and metallic nanoparticles dispersed in different base fluids to analyze and compare their heat transfer characteristics with those of conventional fluids. The objective is to understand how nanofluids can provide improved thermal performance over traditional heat transfer fluids. In recent years, machine learning approaches such as Artificial Neural Networks (ANN) and Physics-Informed Neural Networks (PINN) have gained significant importance in optimization and predictive modeling of heat transfer processes. These methods are particularly useful when theoretical or computational data are available. My current research focuses on developing predictive models for heat transfer rates using different nanofluids in various geometrical configurations.

5. How do you make advanced mathematical concepts accessible to students?

Ans. I believe advanced mathematical concepts can be made accessible to students through effective interaction and student-friendly teaching methods. A teacher should create an engaging learning environment where students feel comfortable asking questions and discussing concepts openly. Explaining the fundamentals clearly and connecting mathematical ideas with practical examples helps students understand topics more deeply and develop confidence in the subject.

A teacher should maintain a student-friendly approach and encourage active interaction in the classroom. Clear communication and discussion of mathematical concepts in depth help students understand the subject more effectively. When students feel comfortable engaging with the teacher, they become more confident and interested in learning.



6. How do you stay updated with the latest developments in your domain?

Ans. I stay updated with the latest developments in my field by regularly exploring research databases and academic platforms such as ScienceDirect and Google Scholar. These platforms provide access to recent research articles, review papers, and emerging trends in mathematics and fluid dynamics.

7. How can students overcome fear or difficulty in learning mathematics?

Ans. To help students overcome fear or difficulty in mathematics, it is important first to understand their academic background and learning level. Teachers should create a supportive and comfortable environment where students feel free to ask questions and express their doubts. Introducing real-life applications and practical examples of mathematics can make classes more engaging and help students develop genuine interest and confidence in the subject.

8. What are the career options for B.Tech students who want to pursue mathematics?

Ans. B.Tech students can pursue several higher education and career opportunities where mathematics plays a fundamental role. They may continue with postgraduate studies such as M.Sc., M.Tech., or interdisciplinary research programs. A strong mathematical foundation is highly valuable in areas such as data science, computational modeling, fluid dynamics, artificial intelligence, engineering analysis, and academic research.

In addition to engineering and research, mathematics also plays a significant role in management and optimization studies. Optimization is a broad and important branch of mathematics with applications in industries, business analytics, operations research, and decision-making processes.

9. As a student, did you always enjoy mathematics, or did your interest grow over time?

Ans. I have enjoyed mathematics since my childhood, and that interest has continued throughout my academic and professional journey. My curiosity and passion for the subject have motivated me to continue learning and exploring new areas of mathematics.

10. Can you share a simple real-life example where fluid dynamics plays an important role?

Ans. One of the best real-life applications of nanofluids is in the cooling of electronic devices such as CPUs, air conditioners, and other heat-generating systems. Due to their enhanced thermal conductivity, nanofluids can improve heat transfer efficiency and help maintain optimal operating temperatures in modern electronic equipment.

11. Are there any books or resources you recommend for building a strong foundation in mathematics?

Ans. Students should make proper and balanced use of modern AI-based learning resources such as ChatGPT and similar platforms to support their understanding and learning process. However, they should also focus on developing their own conceptual clarity and problem-solving abilities. For fluid dynamics, the books by Hermann Schlichting are highly recommended, as they provide strong conceptual understanding and detailed explanations of the subject.

12. Should students learn programming or computational tools along with mathematics? Why?

Ans. Yes, both mathematics and programming are equally important in today's academic and research environment. For students, especially those in computer science and engineering, programming knowledge combined with mathematical understanding is extremely valuable. Together, they help in solving complex computational problems, data analysis, simulation, machine learning, and scientific research.

13. What advice would you give to students who are unsure about their career path?

Ans. I believe there is no absolute concept of "failure"; rather, success largely depends on maintaining interest and dedication toward one's goals. Students should identify the field they are genuinely interested in and continue working consistently in that direction. With passion, persistence, and continuous learning, success naturally follows.

14. If you weren't a mathematician, what career would you have chosen?

Ans. I do not consider myself a complete mathematician yet, because learning is a continuous process. Every day offers new opportunities to explore, understand, and grow in the field of mathematics.

15. Do you have a favorite mathematical concept or problem? Why?

Ans. Any new mathematical problem or challenge becomes interesting to me. I enjoy exploring new problems because they provide opportunities for learning, critical thinking, and discovering innovative solutions.

REC SHINES AT BPUT 2025



It is a moment of immense pride, joy, and honor for Raajdhani Engineering College (REC), Bhubaneswar, as our talented and dedicated student, Abhinash Patra, has secured the position of 2nd Runner-Up in the prestigious Math Olympiad at the BPUT Tech Carnival 2025 organized by Biju Patnaik University of Technology (BPUT).

Abhinash has always been recognized for his exceptional academic excellence, deep interest in mathematics, and strong analytical abilities. His consistent dedication towards learning and problem-solving has made him stand out among his peers. Earlier, he had brought laurels to the college by emerging as the Winner of the Mathematics Olympiad organized by the Infinity Insights Committee, REC Bhubaneswar. His outstanding performance at the college level reflected not only his talent and preparation but also his passion for mathematical reasoning and innovation.

After receiving recognition for his remarkable achievement within the college, Abhinash was encouraged and guided by the faculty members and the college administration to represent REC at the BPUT Tech Carnival 2025. Accepting the challenge with confidence and determination, he participated in the university-level competition and once again proved his excellence by securing the position of 2nd Runner-Up among participants from various engineering institutions.

His achievement is a true reflection of hard work, perseverance, discipline, and commitment towards academic excellence. Through his remarkable success, Abhinash has not only made himself proud but has also brought immense recognition and glory to Raajdhani Engineering College. His accomplishment serves as an inspiration for fellow students to pursue their goals with dedication, confidence, and continuous effort.

REC always believes in encouraging young minds to explore their potential and achieve excellence in academics, innovation, and co-curricular activities. The success of students like Abhinash strengthens the institution's commitment towards nurturing talent and creating opportunities for students to shine at higher platforms.

The entire REC family extends heartfelt congratulations to Abhinash Patra on this outstanding accomplishment. We wish him even greater success, many more achievements in the future, and a bright academic and professional journey ahead.



SCINOVA QUIZ



The Infinity Insights Committee successfully organized a captivating Science Quiz in the Conference Hall of Raajdhani Engineering College on April 25, 2026, from 3 PM to 4 PM. The event attracted robust participation, with 22 students registering to test their scientific knowledge. The competition was structured across two intense phases: Round 1 featured 20 MCQ questions with negative marking, which filtered the field down to the top 5 students who advanced to Round 2, a high-stakes Rapid Fire Round.



The competition proved exceptionally close, with multiple tie-ups adding to the excitement before the final winners were determined. Emerging victorious were Kumar Soumya Ranjan, Mech (B. Tech, IST Year), the winner; Hara Prasad Gouda, CSE-DS (B. Tech, IST Year), the 1st Runner-Up; and Divya Kumari, CSE-AIML (B. Tech, IST Year), the 2nd Runner-Up. These three students were celebrated for their sharp intellect and swift responses during the Prize Distribution Ceremony on May 8, 2026, where they received their well-deserved trophies and certificates from our Honorable Principal Sir.

NUMERICA GENIUS CHALLENGE



The Infinity Insights Committee successfully hosted a stimulating Mathematics Olympiad at Rajdhani Engineering College on May 25, 2026, commencing at 11:30 PM. The event saw enthusiastic participation, with a significant turnout of 17 students testing their problem-solving skills across 30 challenging MCQ questions.



Out of this competitive field, three exceptional students emerged as the top scorers: Hara Prasad Gouda, CSE-DS (B. Tech,^{1ST} Year), the winner; Abinash Patra, CSE (B. Tech,^{1ST} Year), the 1st Runner-Up; and Kumar Soumya Ranjan, Mech (B. Tech,^{1ST} Year), the 2nd Runner-Up. Their remarkable achievements were formally recognized during a special Prize Distribution Ceremony held on May 8, 2026, where they received trophies and certificates from our Honorable Principal Sir, celebrating their academic excellence and dedication to Mathematics.

LEADING THE WAY IN BASIC SCIENCE EXCELLENCE

First-year B.Tech students (2025–2026) who topped the Basic Science subjects in the BPUT 1st-semester exam have shown strong mastery of core concepts, inspiring others through their dedication and hard work.



Congratulations!



UTTAM KUMAR GIRI
B.Tech.(CSE (AIML))



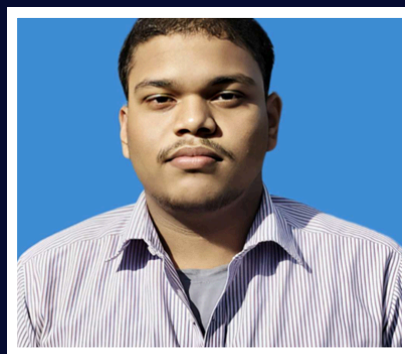
ITISHREE ROUT
B.Tech.(CSE)



BARSHA RANI BEHERA
B.Tech.(CSE)



ABHINASH THAKUR
B.Tech.(ECE)



PINAKI PATRA
B.Tech.(CSE)



AUROMITA SWAIN
B.Tech.(CSE)

HONOURING WARRIORS



We are delighted to congratulate Dr. Sushree Ipsita, Associate Professor, Department of Basic Science & Humanities, on being honored as "The Science Saviour" for her remarkable contribution to the Infinity Insights magazine (Winter 2025 Edition). Her article, titled, "SUPERFLUIDS" was selected as the best article in the faculty section, reflecting her creativity and deep scientific insight.

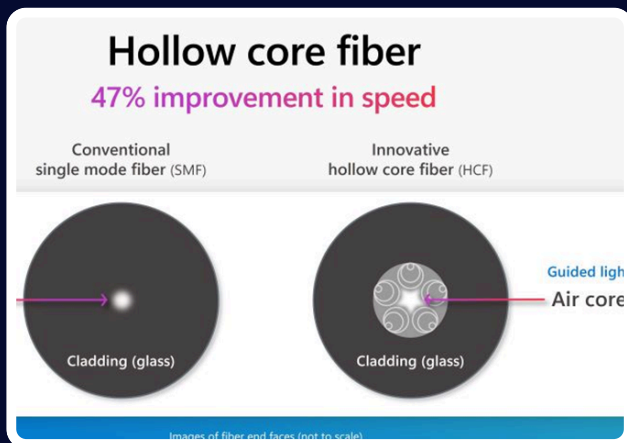
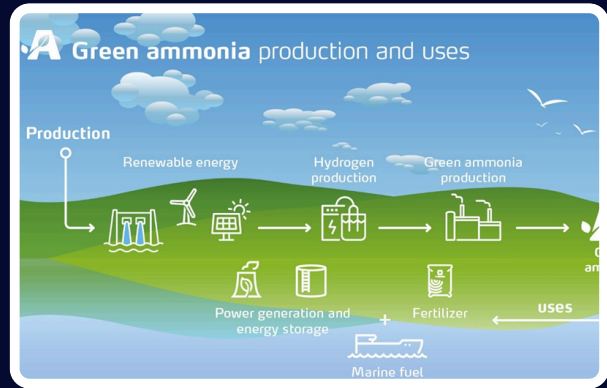


We are proud to recognize Satyajit Mahunta, a 3rd year B.Tech(CSE) student, as "The Science Wizard of the Semester" for his outstanding contribution to the Winter 2025 Edition of the institute's half-yearly science magazine, "Infinity Insights". His article, titled "Infinite Code: Unlocking the Universe" was selected as the best article in the Student Section, showcasing exceptional insight, creativity, and clarity in presenting the profound impact of mathematics in science and everyday life.

FRESH INSIGHTS

Green Ammonia

Green Ammonia is ammonia (NH_3) produced using renewable energy-powered electrolysis (green hydrogen) and nitrogen from the air, resulting in near-zero carbon emissions. A new room-temperature alternative to the Haber-Bosch process was developed at the State University of New York, synthesizing ammonia without the massive carbon emissions associated with traditional high-pressure methods. This innovative approach significantly reduces energy consumption and supports global efforts toward sustainable industrial practices. Green ammonia is also emerging as a promising clean fuel and energy storage medium for future transportation and power generation systems. Its development is expected to play a vital role in reducing greenhouse gas emissions and advancing the global transition to renewable energy.



Hollow-Core Fiber Optics

Hollow Core Fiber is an advanced optical cable that transmits light through an air- or vacuum-filled core instead of solid glass, enabling up to 40% faster data propagation and significantly lower latency. It offers reduced signal loss, minimal dispersion, and high-power handling capability, making it highly suitable for high-frequency trading (HFT), AI workloads, telecommunications, and data center interconnects.

The technology also improves bandwidth efficiency and enhances long-distance data transmission performance. Due to its ultra-fast communication capability, Hollow Core Fiber is considered a major breakthrough for next-generation internet infrastructure, cloud computing, and quantum communication networks. Researchers and technology companies are actively exploring its applications to meet the growing global demand for faster and more reliable digital connectivity.

Noperthedron

Noperthedron is the first convex polyhedron proven to lack the Rupert property, meaning it is impossible to cut a hole through it large enough for an identical copy of the shape to pass through. Its name is a combination of the words "nope" and "Rupert," reflecting this unique mathematical limitation.

The discovery of the Noperthedron has attracted significant interest in the field of geometry and spatial mathematics, as it challenges long-standing assumptions about convex shapes and self-passage properties. Researchers believe this finding could contribute to deeper understanding in geometric optimization, topology, and three-dimensional structural analysis. It also highlights how seemingly simple mathematical objects can reveal surprising and complex behaviors.



EXPLORING ADVANCES IN QUANTUM PHYSICS AND TECHNOLOGY



Dr. Sushree Ipsita, Associate Professor of Physics at Raajdhani Engineering College, actively participated in the National Seminar on "Quantum Physics to Quantum Technology: A Century's Journey – 2026" along with the 42nd Annual Convention of the Orissa Physical Society. The prestigious event was organized by the P.G. Department of Physics, Berhampur University, in collaboration with Parala Maharaja Engineering College, on February 7–8, 2026.

Representing the B.Sc. & H Department of Raajdhani Engineering College, Dr. Ipsita's participation highlights the institution's dedication to academic excellence, scientific research, and professional development. The seminar brought together renowned academicians, researchers, scientists, and students from different institutions to discuss recent advancements in quantum physics, quantum computing, and emerging quantum technologies.

During the seminar, various technical sessions and expert talks focused on the growing impact of quantum science in modern technology and future innovations. Dr. Ipsita actively engaged in scholarly discussions and interactions with experts, gaining valuable insights into contemporary developments in the field. Her participation reflects her continuous commitment to expanding knowledge in modern physics and promoting research-oriented learning among students.

Such academic engagements strengthen the research culture within the institution and enhance faculty expertise in emerging scientific domains. The knowledge and experience gained from the seminar will further contribute to teaching, research activities, and student mentoring at Raajdhani Engineering College. The college takes pride in encouraging faculty members to participate in reputed seminars and conferences that inspire innovation, scientific inquiry, and academic excellence.

CONTRIBUTION TO SCIENCE FROM ODISHA



Odisha has made notable contributions to science through its distinguished scholars, particularly in mathematics, physics, and chemistry, who have advanced both fundamental research and academic development in India and beyond. The state continues to nurture scientific talent through premier institutions and a strong culture of higher education and research.

Gadadhar Misra is a distinguished Indian mathematician born on 1 March 1956 in Bhubaneswar, Odisha, known for his profound contributions to operator theory and functional analysis. He completed his M.Sc. from Sambalpur University and earned his Ph.D. from the State University of New York at Stony Brook under the supervision of Ronald G. Douglas. Over the course of his career, he has held several prestigious academic positions, notably serving as Professor and Chair of the Department of Mathematics at the Indian Institute of Science, and has also been associated with the Indian Statistical Institute and the Indian Institute of Technology Gandhinagar as a visiting professor. Prof. Misra's research lies at the intersection of operator theory, complex geometry, and representation theory, where he has made seminal contributions to the understanding of Hilbert modules and the structure of linear operators on Hilbert spaces. He is particularly well known for his work on the Cowen–Douglas class of operators, where he developed classification results for homogeneous operators and provided important counterexamples to long-standing conjectures in the field. His introduction and development of quasi-free Hilbert modules and his work on curvature inequalities have significantly advanced the study of operator models and invariants. Additionally, he has explored deep connections between operator theory and complex geometry through the study of holomorphic Hermitian vector bundles, thereby enriching both disciplines. His research output includes influential papers such as "Curvature inequalities and extremal properties of bundle shifts" and "Contractive modules and curvature inequalities", along with several advanced expository works on operator algebras and Hilbert modules. In recognition of his outstanding contributions to mathematical sciences, he was awarded the prestigious Shanti Swarup Bhatnagar Prize in 2001 and the Biju Patnaik Award for Scientific Excellence in 2013, and he is a Fellow of major Indian science academies including INSA, IAS, and NASI. Widely respected for his scholarly impact, Prof. Misra has played a crucial role in mentoring young researchers and strengthening mathematical research in India, particularly in the area of modern analysis.

WOMEN IN SCIENCE



Sujatha Ramdorai:

Sujatha Ramdorai (born May 1962) is one of India's most eminent mathematicians, widely known for her contributions to number theory, particularly Iwasawa theory. She completed her Ph.D. in 1989 from the Tata Institute of Fundamental Research, where she later became a distinguished faculty member. Over the years, she has also been associated with leading international institutions such as the University of British Columbia and University of California, San Diego.

Among her important academic contributions are several influential research papers. Notable works include "Iwasawa Theory of Elliptic Curves with Complex Multiplication" (1990s), which studies elliptic curves in number theory; "Euler Systems and Special Values of L-functions" (2000s), exploring deep relationships in arithmetic structures; and "Growth of Selmer Groups in p-adic Lie Extensions", which examines advanced algebraic behavior in number fields. She has also contributed to the study of modular forms and Iwasawa theory, further expanding the scope of modern mathematics. In addition to research papers, she has authored important books such as Lectures on Iwasawa Theory (2011) and Cyclotomic Fields and Zeta Values (co-authored), which are widely used by advanced students and researchers. In recognition of her outstanding contributions, she was awarded the Shanti Swarup Bhatnagar Prize in 2004. Beyond research, she has played a key role in promoting mathematics education and supporting women in the field through initiatives like the Indian Women and Mathematics program.



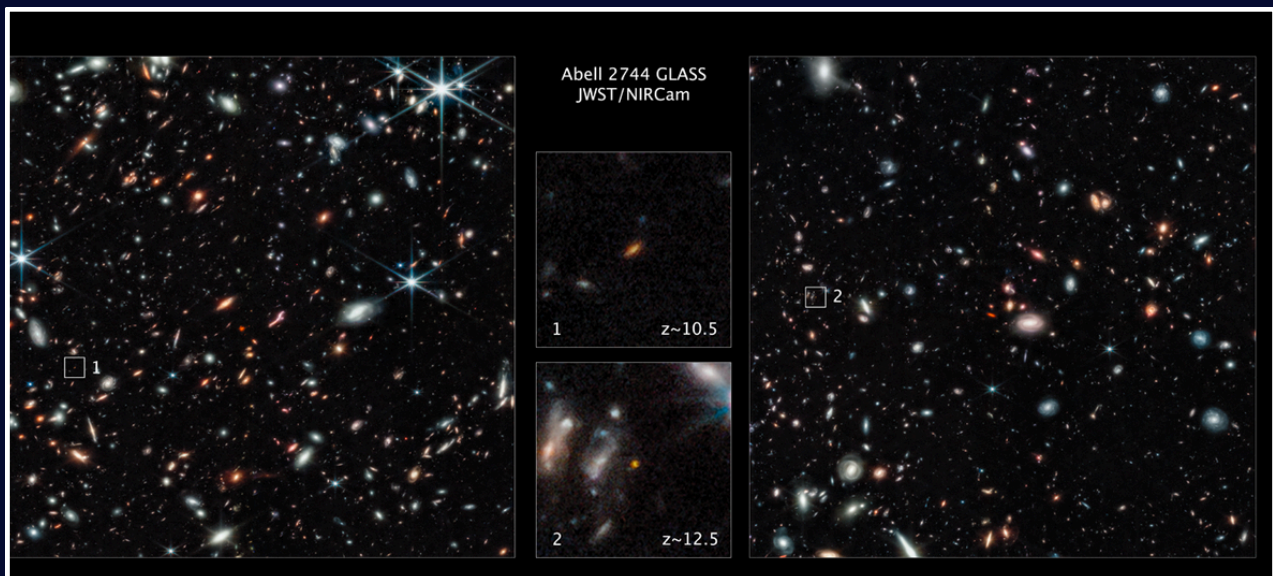
Neena Gupta:

Neena Gupta (born 1984) is one of India's most accomplished modern mathematicians, widely recognized for her outstanding contributions to algebraic geometry and commutative algebra. She completed her Ph.D. in 2011 from the Indian Statistical Institute (ISI), where she later became a faculty member.

Neena Gupta gained international fame for solving the long-standing Zariski Cancellation Problem in positive characteristic, a major breakthrough in algebraic geometry. This problem deals with understanding whether certain algebraic structures can be uniquely identified based on their properties. For decades, mathematicians believed the cancellation property held universally, but Gupta's work provided counterexamples that challenged this assumption. Her results, published around 2014, reshaped the understanding of affine spaces and opened new directions in mathematical research. This achievement placed her among the leading mathematicians of her generation.

In recognition of her ground breaking work, Neena Gupta has received several prestigious awards. She was honoured with the Shanti Swarup Bhatnagar Prize in 2019, one of the highest scientific awards in India. Later, she received the internationally acclaimed Ramanujan Prize in 2021, awarded to young mathematicians from developing countries for exceptional contributions to the field. These honours highlight her impact on global mathematical research.

LIFE BEYOND EARTH



Space Science & Exploration Updates

- *Artemis II Returns Successfully* – NASA's Artemis II crew safely returned after humanity's first crewed lunar mission in over 50 years.
- *Blue Origin MKI Tested* – Blue Origin's lunar lander passed vacuum testing for its upcoming Moon mission.
- *Artemis III Rocket Ready* – NASA rolled out the SLS core stage for the Artemis III Moon mission.
- *Juno Studies Thebe* – NASA's Juno spacecraft captured new images of Jupiter's moon Thebe.
- *Curiosity Continues on Mars* – Despite wheel damage, the Curiosity rover remains operational on Mars.
- *JWST Explores Early Universe* – The James Webb Telescope observed galaxies formed shortly after the Big Bang.
- *SpaceX CRS-34 Mission* – NASA and SpaceX are preparing a new ISS resupply launch.
- *Russian Satellites Maneuver Closely* – Two Russian satellites performed a precision close-orbit operation in space.

ANCIENT MATHEMATICIAN



Swami Bharati Krishna Tirtha

Vedic Mathematics, popularized by Swami Bharati Krishna Tirtha in his book *Vedic Mathematics*, is a system that uses simple formulas called sutras to make calculations quicker and easier. It focuses on mental math, pattern recognition, and short tricks that help solve problems in fewer steps, often without writing much. Many people find it fun and helpful for fast calculations in areas like multiplication, division, and squares. It is also believed to improve memory and speed in solving problems. However, although it is claimed to be based on ancient Vedic texts, many scholars argue that these methods are not actually found in the original Vedas and may be a modern creation. So, while Vedic Mathematics is useful as a set of quick techniques, its historical origin remains debated.

Key features and claims associated with Vedic Mathematics:

1. **Sutras:** Vedic Mathematics is said to be based on 16 main formulas, called sutras, and 13 smaller formulas, called upa-sutras, which were presented by Swami Bharati Krishna Tirtha in his book *Vedic Mathematics*. These formulas are short and easy to remember, and they give quick and different ways to solve math problems. Using these methods, people can perform calculations like addition, subtraction, multiplication, division, and even find square roots and cube roots more easily and often faster than usual methods. The idea is to make mathematics simpler, quicker, and easier to do in the mind.
2. **Mental Calculation:** Vedic Mathematics emphasizes mental calculation and claims to offer techniques that allow individuals to perform complex mathematical computations in their heads quickly. Proponents of Vedic Mathematics argue that these techniques can lead to faster and more efficient calculations compared to traditional methods.
3. **General Applicability:** Vedic Mathematics is said to be applicable to a wide range of mathematical problems and is not limited to specific areas of mathematics. Proponents claim that it can be used in various fields, including arithmetic, algebra, geometry, and calculus.
4. **Controversy and Criticism:** While Vedic Mathematics has gained popularity in some educational circles and has been the subject of books and workshops, it has also faced criticism and skepticism from mainstream mathematicians and educators. Critics argue that many of the techniques promoted as Vedic Mathematics are not significantly different from or more efficient than established mathematical methods.
5. **Educational Use:** Vedic Mathematics has been introduced as a teaching tool in some schools and educational programs. It can help students develop mental math skills and improve their speed and accuracy in calculations.

GREAT MINDS IN MATHEMATICS

Mathematics is a world of imagination, logic, and discovery, where brilliant minds transform abstract ideas into powerful truths. To honour such contributions, several prestigious awards celebrate excellence in this field.

The Fields Medal is one of the most prestigious awards in mathematics. It is awarded every four years to mathematicians under the age of 40 for outstanding achievements. It recognizes both exceptional work and future potential, making it a symbol of youthful brilliance in the field.

Fields Medal (1936): The first winners were Lars Ahlfors and Jesse Douglas.

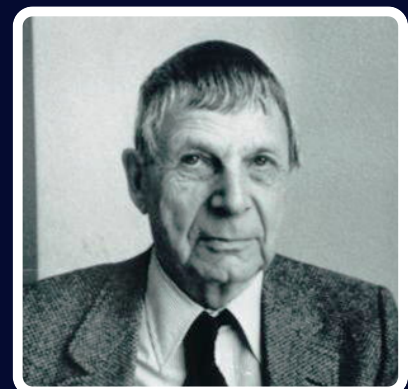
Full name: Jesse Douglas

- Born: July 3, 1897, New York City, U.S.
- Died: October 7, 1965, New York City, U.S.
- Major honor: Fields Medal (1936)



- Full name: Lars Valerian Ahlfors
- Born: April 18, 1907, Helsinki, Finland
- Died: October 11, 1996, Pittsfield, Massachusetts, USA
- Fields Medal: 1936 (first ever awarded)

Wolf Prize in Mathematics: 1981



The Wolf Prize in Mathematics is awarded annually to recognize outstanding contributions to mathematics. Established in 1978, it is considered one of the most important international awards and often honours work that has greatly influenced the field.

Wolf Prize in Mathematics (1978): The first winners were Israel Gelfand and Carl Ludwig Siegel.

Full name: Israel Moiseevich Gelfand

Born: September 2, 1913, Krasnye Okny, Ukraine

Died: October 5, 2009, New Brunswick, New Jersey, USA

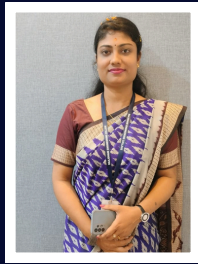
Fields: Functional analysis, algebra, representation theory, biology

Major awards: Wolf Prize (1978), Kyoto Prize (1989), MacArthur Fellowship (1994)





A COLLECTIVE VIEW: ARTICLE BY RECIANS



PROF. SWATI SAMIKSHYA DAS

Dreams in Equations

*In lines and curves, so pure and bright,
Mathematics paints the world with light.
From zero's calm to infinity's height,
It builds the day and shapes the night.*

*A point appears, no size, no face,
Yet marks the start of time and space.
A line extends without an end,
Where endless paths and patterns blend.*

*In triangles, truths forever stay,
As Pythagorean Theorem leads the way.
Squares of sides in quiet claim,
Reveal that all right angles tame.*

*Circles spin with perfect grace,
Every radius finds its place.
Pi whispers softly, never still,
An endless number we can't fulfill.*

*Equations dance in balanced art,
Two sides equal, yet worlds apart.
Unknowns hide behind each sign,
Waiting for logic to redefine.*

*From simple sums to complex schemes,
Math is the language of our dreams.
A silent song, both deep and true—
Where numbers speak, and thoughts
renew.*



PROF. LILIJA P. RAY

Fast Technology

*In a world that moves at lightning speed,
Technology answers every need.
From tiny chips to satellites high,
It connects the earth, the sea, the sky.*

*Messages travel in just a blink,
Machines now learn, compute, and think.
Robots working day and night,
Turning darkness into light.*

*Cars that drive without a hand,
Smart devices understand.
Virtual worlds and AI dreams,
Changing life in countless streams.*

*Knowledge flows with just one touch,
The modern age has given so much.
Yet with this power, wise we must be,
To shape a brighter destiny.*

*Fast technology leads the way,
Building tomorrow from today.
With innovation, hope, and art,
It brings the future to every heart.*

"Science Without Words? Why Communication Matters as Much as Discovery"



PROF. SNEHASHISH MAHAKUD

"Science is a beautiful gift to humanity; we should not distort it."

— A. P. J. Abdul Kalam

Science is often seen as a world of experiments and discoveries. If we can't share our findings in a clear way even the best discoveries can be ignored or misunderstood. Science needs language to share knowledge validate ideas and inspire ideas.

In engineering and science being able to communicate is just as important as being good at your job. Engineers need to present their ideas in reports, presentations and discussions. If you can't explain your invention to others, it won't make a difference. Whether to fellow researchers, industries or society at large. Communication helps turn knowledge into action.

A good example of this is C. V. Ramans work. His discovery of the Raman Effect was a breakthrough and it became famous worldwide because it was clearly documented and shared with the scientific community. Without communication such a discovery might not have reached the world or been recognized.

In today's world English is the common language of science and engineering. Research papers, technical manuals and international collaborations all rely on language. If there is a miscommunication it can lead to mistakes, project failures or even safety risks in engineering.

For students developing communication skills is crucial. Writing reports participating in group discussions and delivering presentations are not academic tasks. They are professional necessities. Communication helps students organize their thoughts think critically and convey ideas with confidence.

In conclusion science without communication is incomplete. Discovery creates knowledge. Communication gives it life, meaning and reach. Communication is essential, in science and engineering. Science and communication go hand in hand.

The Story of π (Pi): The Timeless Number



PROF. GOURI SANKAR BARIK

The symbol π (pi) represents one of the most famous and mysterious numbers in mathematics. Defined as the ratio of a circle's circumference to its diameter, π is an irrational and transcendental number meaning it can never be expressed exactly as a fraction or as the root of any algebraic equation. Its decimal expansion goes on forever without repeating, beginning as 3.1415926535... and continuing infinitely.

Historical Origins

The quest to understand π began thousands of years ago, long before modern mathematics.

- The Babylonians (c. 1900–1600 BCE) used $\pi \approx 3.125$ in their construction and engineering calculations.
- The Ancient Egyptians (c. 1650 BCE), through the Rhind Mathematical Papyrus, used a value of about 3.1605.

These early approximations show that ancient civilizations recognized the consistent relationship between a circle's size and its boundary.

Contributions from Other Cultures: In China, mathematician Zu Chongzhi (429–501 CE) calculated π to seven correct decimal places (3.1415926) and introduced the fraction $355/113$, still recognized as one of the best ancient approximations. In India, scholars like Aryabhata (c. 500 CE) estimated $\pi \approx 3.1416$, and later Madhava of Sangamagrama (c. 1400 CE) discovered infinite series that could compute π with great precision — a precursor to calculus. Meanwhile, Islamic scholars preserved and expanded upon Greek geometry, ensuring that knowledge of π passed into Renaissance Europe.

The Symbol π : The Greek letter π was first used to represent this constant by William Jones in 1706. It became standard after Leonhard Euler, one of history's greatest mathematicians, adopted it in 1737. The choice of π came from the Greek word περίμετρος (perimetros), meaning perimeter.

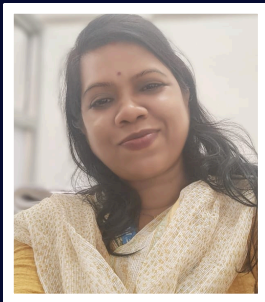
Modern Computation: With the invention of calculus in the 17th century, mathematicians such as Newton, Leibniz, and Euler developed formulas to calculate π to any desired number of digits.

In the 20th and 21st centuries, the development of computers revolutionized this process π has now been computed to over 100 trillion digits. Interestingly, even though π 's digits never repeat, all real-world applications from engineering to space travel use only about 15 decimal places of accuracy.

The Significance of π : π is not just a number for circles. It appears in countless mathematical and scientific formulas from trigonometry and geometry to probability, quantum physics, and Einstein's theory of relativity. It connects the geometry of circles to the fabric of the universe itself. Every year, mathematicians and enthusiasts celebrate Pi Day on March 14 (3/14), symbolizing the first three digits of π .

From ancient clay tablets to modern supercomputers, π has inspired centuries of curiosity and discovery. It stands as a symbol of the human desire to understand patterns, infinity, and the hidden order of nature. Although we can never write all of its digits, the mystery of π continues to remind us that even in mathematics, some things are infinite and endlessly beautiful.

Discovery of a Novel Methane-Producing Organelle in Gut Microbes



PROF. JAYANTI MANJARI SAHOO

Methane production in the gastrointestinal tract has traditionally been attributed to specialized archaea known as methanogens. In this study, we report the discovery of a previously unidentified intracellular organelle, termed the methanosome, in certain anaerobic gut bacteria. Using advanced imaging techniques, including cryo-electron microscopy and fluorescence tagging, the methanosome was observed as a membrane-bound structure localized within the cytoplasm. Biochemical analyses revealed that this organelle contains key enzymes involved in methanogenesis, such as methyl-coenzyme M reductase, previously thought to be exclusive to archaeal species.

Genomic sequencing and proteomic profiling confirmed the presence of gene clusters associated with methane metabolism, suggesting horizontal gene transfer events between archaea and bacteria. Functional assays demonstrated that bacteria harboring methanosomes are capable of producing methane independently under anaerobic conditions, thereby expanding the known diversity of methane-producing organisms in the gut ecosystem.



The identification of methanosomes has important implications for gut microbiome research, host health, and environmental methane emissions. It also opens new possibilities for therapeutic interventions targeting methane-associated gastrointestinal disorders and provides insight into the evolutionary dynamics of metabolic pathways across microbial domains.

Science and the Sacred: Where Logic Meets Inner Truth



PROF. MADHUSMITA DAS

Human beings have always searched for answers—about the universe, life, and their own existence. In this journey, two paths have stood out: science and the sacred. One is driven by logic and evidence, the other by faith and inner experience. Yet, despite their differences, both try to understand the same mystery from different angles.

Science is all about questioning, testing, and discovering. It explains how things work in a clear and structured way. For instance, the idea of Gravity helps us understand why planets stay in orbit and why objects fall to the ground. Scientific theories are not fixed; they evolve with new discoveries. This makes science a constantly growing body of knowledge, always open to change and improvement.

On the other side, the sacred is not concerned with proof in the same way. It focuses on meaning, purpose, and connection. Spiritual traditions talk about a deeper reality that cannot always be measured or seen. Practices like meditation, prayer, or silence help individuals connect with themselves and something greater than them. These experiences are personal, yet powerful.

What makes this relationship interesting is that science and spirituality are not as separate as they seem. In recent times, areas like Quantum Physics have shown that reality is far more complex than our everyday understanding. At the smallest level, everything is energy and constantly changing—an idea that feels surprisingly close to what many spiritual philosophies have suggested for centuries.

The real difference lies in how they approach truth. Science looks outward, observing the physical world and seeking answers that can be tested and proven. The sacred looks inward, encouraging self-awareness and inner peace. One gives us knowledge; the other gives us wisdom.

In everyday life, both are important. Science makes our lives easier, safer, and more advanced. It gives us technology, medicine, and understanding of the natural world. The sacred, however, helps us stay grounded. It reminds us of values like compassion, patience, and balance—things that science alone cannot teach.

Instead of choosing one over the other, a balanced approach can be more meaningful. When we respect science for its clarity and the sacred for its depth, we begin to see a fuller picture of life. Logic and faith, together, create a harmony that allows us to grow not just intellectually, but emotionally and spiritually as well.

In the end, science explores the universe outside us, while the sacred explores the universe within. And perhaps, true understanding lies somewhere in between.

The Invisible Map: How Graph Theory Guides You Home



KUMAR SOUMYA RANJAN
B.Tech(ME),1st Year

You open Google Maps, type a destination, and in seconds — the fastest route appears. It feels like magic. It is actually mathematics.

Behind every navigation app lies Graph Theory, a branch of mathematics that studies networks of connected points. In formal terms, a graph is a set of vertices (points) and edges (connections between them). A city map, translated into mathematics, becomes exactly this — intersections are vertices, roads are edges.

The real genius is in the algorithm. Google Maps uses Dijkstra's Algorithm, developed by mathematician Edsger Dijkstra in 1956, to find the shortest path between two vertices in a graph. It works by exploring all possible routes simultaneously and eliminating longer ones — millions of calculations happening in milliseconds.

But it doesn't stop at roads. Graph Theory powers every network humans have built — the internet (servers as vertices, cables as edges), social media (people as vertices, friendships as edges), even epidemic tracing (who infected whom).

In 1736, Leonhard Euler solved the Königsberg Bridge Problem — can you cross seven bridges without repeating one? His solution became the founding moment of Graph Theory. A 300-year-old puzzle now guides you home every day.

Mathematics doesn't just describe the world. It navigates it.

THE LANGUAGE OF THE UNIVERSE



Satyajit Mahunta
B.Tech (CSE), 3RD YEAR

Introduction : Science and mathematics are not just subjects—they are the invisible forces shaping our world. While science explores nature, mathematics explains it with precision. Together, they drive discovery and innovation.

Patterns in Nature : Everything in the universe follows patterns. From planetary motion to atomic structure, mathematics helps decode these mysteries. Scientific laws are expressed through equations, making complex ideas predictable.

Powering the Modern World : Artificial Intelligence, data science, and space exploration all depend on mathematical models. From weather forecasting to medical breakthroughs, mathematics is the backbone of innovation.

Building the Future : Mathematics builds logical thinking, while science applies it to solve real-world problems. They inspire creativity, curiosity, and critical thinking.

Conclusion : Science and mathematics are the twin pillars of progress. They help us understand the universe and shape the future.

AI in Chemical Research

Akankshya Pati
B.tech (ECE),1st year



Artificial Intelligence (AI) is revolutionizing chemical research by making scientific processes faster, smarter, and more efficient. Traditionally, chemists relied on lengthy experiments and trial-and-error methods. Today, AI technologies such as machine learning and deep learning help analyze complex chemical data, predict reactions, and design new compounds accurately.

One major application of AI is drug discovery. AI can quickly examine millions of chemical compounds and identify potential medicines for diseases like cancer and Alzheimer's. It also predicts toxicity and side effects, reducing time and costs in pharmaceutical research.

AI is also useful in chemical synthesis and materials science. It predicts reaction pathways, improves industrial processes, and helps develop advanced materials for batteries, nanotechnology, and renewable energy systems. In analytical chemistry, AI enhances techniques like spectroscopy and chromatography by interpreting large datasets efficiently.

Despite its advantages, AI depends on high-quality data and cannot fully replace human creativity and scientific judgment. However, its ability to save time, reduce costs, and increase accuracy makes it an essential tool in modern chemistry.

In the future, AI-driven laboratories may perform experiments independently, leading to faster scientific discoveries and sustainable innovations. Overall, AI is transforming chemical research and shaping the future of science and technology.



India's Cosmic Future

Manmayee Muduly
B.Tech(CSE-DS),1st year

India's private space industry achieved a significant milestone as Agnikul Cosmos successfully tested its indigenously developed 3D-printed rocket booster engine named 'Agnite.' The test marks an important step toward advancing cost-effective and rapid rocket manufacturing technologies in the country.

The 'Agnite' booster engine has been manufactured using advanced 3D printing techniques, allowing engineers to reduce production time, minimize material waste, and improve design efficiency. Unlike traditional rocket engines that require multiple assembled parts, this engine integrates complex components into a single structure, enhancing reliability and performance.

The successful test demonstrates India's growing capabilities in private space innovation and highlights the increasing role of startups in strengthening the national space ecosystem. Agnikul Cosmos aims to use the Agnite booster to support its small satellite launch vehicle, Agnibaan SOrTeD, which is designed for flexible and on-demand satellite launches.

The development aligns with India's broader vision of promoting commercial space activities under the guidance of organizations like Indian Space Research Organisation. By enabling faster launches and reducing operational costs, innovations like the Agnite engine can help India compete in the rapidly expanding global small-satellite launch market.

Overall, the successful testing of the Agnite booster engine represents a major leap for India's space technology sector, showcasing how indigenous innovation and private entrepreneurship are shaping the future of space exploration.

HOW TIME TRAVEL MIGHT BE POSSIBLE ?



ABINASH PATRA
B.Tech(CSE),1st Year

Time travel means moving forward or backward in time. It may sound like science fiction, but some ideas from science suggest it could be real. According to Einstein's Theory of Relativity, time is not fixed and does not pass at the same rate everywhere. It depends on how fast you are moving and the conditions around you. This means time can slow down or speed up, which makes time travel possible in some cases. One important idea is time dilation. When something moves very fast, especially close to the speed of light, time slows down for it. This means a person traveling in a very fast spaceship would age more slowly than people on Earth. In this way, they can travel into the future. Scientists have tested this idea using fast-moving particles and very accurate clocks, and the results match the theory. However, with today's technology, the effect is very small for humans. Another idea is Wormholes. These are thought to be shortcuts that connect two different places in space and time. If they exist, they might allow people to travel between different times very quickly. Some scientists think wormholes could form in space, but keeping them open would need a special kind of matter that we do not fully understand yet. Traveling into the past is much harder. It can create problems, like changing events that have already happened. For example, if someone changes the past, it could affect the present in confusing ways. Because of this, many scientists think it may not be possible, or there may be rules in nature that prevent it. In conclusion, traveling to the future may be possible, but traveling to the past is still uncertain.

The Logic of Life

Subhashree Bal
B.Tech(CSE),1st Year



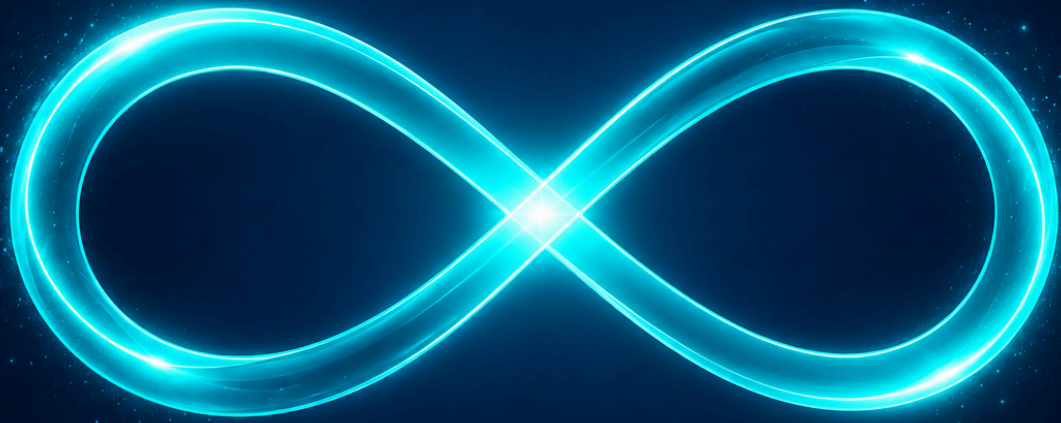
Mathematics is the study of numbers, shapes, and patterns. It is often called the language of the universe because it helps us understand how the world works. From simple daily activities like counting money and telling time to complex scientific discoveries, mathematics plays an essential role in human life. People of all ages use mathematics, from young children learning numbers to scientists solving advanced problems.

Mathematics exists everywhere around us. We use it while shopping, cooking, measuring distances, or managing time. Engineers apply mathematics to design buildings and machines, while businesses depend on it for calculations and planning. Without mathematics, many modern developments would not be possible.

The importance of mathematics lies in its ability to develop logical thinking and problem-solving skills. It teaches us to think clearly, analyze situations, and make informed decisions. Mathematics is widely used in fields such as science, technology, engineering, and business, making it a foundation of progress and innovation.

Learning mathematics trains the mind to think step by step and understand patterns and relationships. With regular practice, it becomes easier and even enjoyable.

In conclusion, mathematics is more than formulas; it is a powerful tool that supports learning, daily life, and the advancement of society.



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