



बेहउतै रइहोतै



THE ANNUAL MAGAZINE

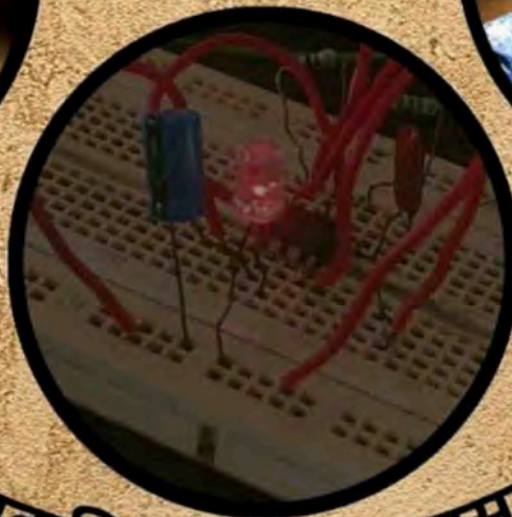
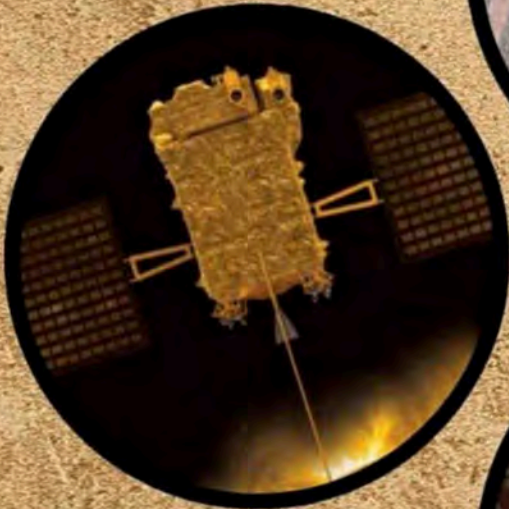
OF

DEPARTMENT OF PHYSICS

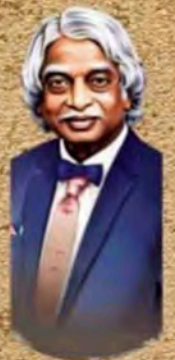
MAITREYI COLLEGE, UNIVERSITY OF DELHI



"स्वावलम्बनं स्वाभिमानं च राष्ट्रस्य बलं भवति।"



"स्वावलम्बनं स्वाभिमानं च राष्ट्रस्य बलं भवति।"



Building Atma Nirbhar Bharat: The Physics Perspective

• ISSUE 3

• APRIL 2025

Let's Start The Journey



Drawing by- Saniya B.Sc(H) 3rd year

Principal's Message



Prof. Haritma Chopra

Greetings from Maitreyi College!
Dear Readers,

I am delighted to know that the Department of Physics is bringing out the third annual edition of Bhautik Kshitij, The Physics Magazine 2025. We, at Maitreyi college emphasize at escalating the students' potential with indispensable support, guidance and encouragement from our committed faculty. Our endeavor has been to contribute to Higher Education not only by enabling the students to get a degree in Science, Commerce or Humanities

but also by developing in them the aptitude to think imaginatively and articulate their views with confidence and conviction. This issue is a promising platform to encourage the students to display their subject specific expertise, creativity and innovative ideas. I congratulate and acknowledge the teamwork of editorial team and the students who have utilized their time in a positive ingenious manner through the creation of the third edition of this bulletin.

Best Wishes
Prof. Haritma Chopra
Principal



Teacher - Convener



Prof. Poonam Juneja

Welcome to the third edition of BHAUTIK KSHITIJ. In this edition, we aim to showcase the incredible work being done within our Physics Department and highlight the diverse talents and achievements of our students and alumni. From showcasing artistic representations of scientific concepts to highlighting unique approaches in problem-solving, we want to demonstrate that creativity is an integral aspect of successful scientific endeavors. Through interviews with alumni, who have made significant contributions in various fields or profiles on current students engaged in

extracurricular activities related to art or community service, we aim to showcase the well-rounded nature of those involved in studying Physics.

This third edition aims not only to be informative but also inspiring and thought-provoking. We hope it will spark conversations about new ideas within the field while promoting interdisciplinary thinking that extends beyond traditional boundaries.

Thank you for joining us on this journey as we explore different domains of our students' creativity that make up the vibrant world of our department!

Best Wishes



Teacher- Convener



Dr. Prajwalit Shikha

It gives me immense pleasure to present this year's edition of Bhautik Khitiz, the annual magazine of the Department of Physics, Maitreyi College, themed Atmanirbhar Bharat: The Physics Perspective. This year, the spirit of self-reliance resonated deeply in our department — not just through indigenous innovation, but through a mindset of inquiry and execution. From a hands-on course in Arduino-based product design to enthusiastic student participation in prestigious internships, our focus has been on practical skill-building and meaningful

application of physics.

The launch of our Astronomy Club marked a major step toward nurturing scientific curiosity and helping create a culture of space science engagement.

What makes this issue special is the fresh wave of creativity it captures — innovative articles and games by students, insightful alumni interviews, original poems, art, and the latest in physics research. Bhautik Khitiz reflects not only our academic rigor but our collective spirit of exploration and innovation.

We hope this edition inspires every reader to think, create, and contribute towards a truly Atmanirbhar Bharat — through science, passion, and collaboration.

Best Wishes

EDITORIAL TEAM

Head



Kashish Mishra,
3rd year

Head



Draksha Singh,
2nd year

Sub- Head



Harshita,
2nd year

Member



Nikita Bhardwaj,
2nd year

Member



Shivani Gupta,
2nd year

Member



Kavita,
2nd year



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2nd year

Member



Priyal Sood,
2nd year

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Ruchi Yadav,
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Saniya,
3rd year

Sketch at article session



Prashi Mishra,
Class XI,
Adarsh Public School,
Noida

Back Cover Design



Dewanshi,
3rd year





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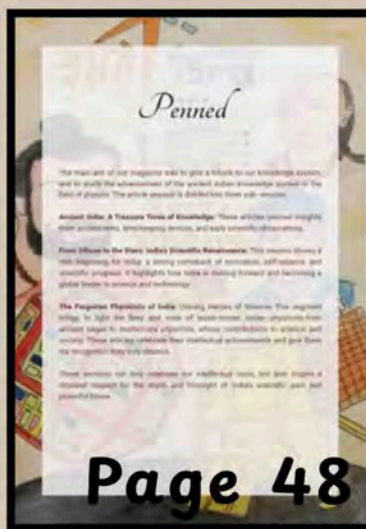
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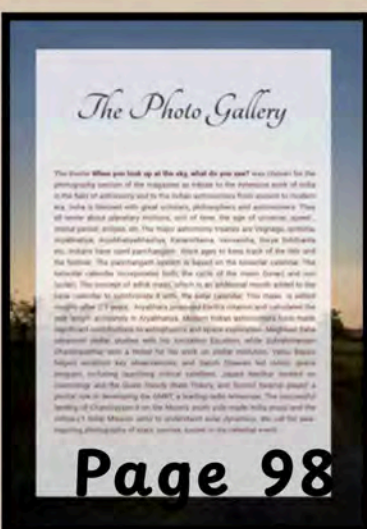
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Scintillations, the Physics Society of Maitreyi College, University of Delhi, serves as a vibrant platform for students to immerse themselves in the dynamic world of physics. Established to foster both academic and extracurricular engagement, the society plays a central role in advancing the department's mission of holistic education.

Comprising elected office bearers from the second and third-year B.Sc. (Hons.) Physics students, *Scintillations* is guided by dedicated faculty members and led by the Teacher-In-Charge of the department. This collaborative structure ensures that the society remains student-driven while benefitting from experienced mentorship.

Scintillations organizes a diverse array of activities aimed at enriching the academic experience. These include lectures by eminent speakers, educational trips to renowned institutions, and interactive workshops. Such initiatives enable students to delve deeper into the subject, stay updated on recent advancements, and explore practical applications of their theoretical knowledge.

Beyond academics, the society places strong emphasis on community building. Events like fresher welcomes, farewell ceremonies, and interdepartmental gatherings are thoughtfully curated to foster camaraderie among students. These gatherings not only celebrate important milestones but also strengthen the departmental bond.

The vision of *Scintillations* extends beyond the college walls. By promoting the excitement of physics to a wider audience, the society seeks to inspire a greater appreciation for the subject. Through seminars, discussions, and outreach programs, *Scintillations* strives to ignite curiosity and encourage exploration in the field of physics.

In essence, *Scintillations* stands as a testament to the department's dedication to nurturing inquisitive minds and fostering a vibrant academic community. By blending scholarly pursuits with engaging activities, the society plays a pivotal role in shaping well-rounded individuals poised to contribute meaningfully to the world of physics and beyond.



OFFICE BEARERS

"For the students, by the students"



President: Dewanshi – B.Sc.
(Hons.) Physics, 3rd Year

Vice President: Saniya –
B.Sc. (Hons.) Physics, 3rd
year

General Secretary: Arpita
Chaudhary – B.Sc.

(Hons.) Physics, 2nd Year

Treasurer: Bhumi Goyal –
B.Sc. (Hons.) Physics, 2nd
Year

The driving force behind the events and initiatives of SCINTILLATIONS is a team of dedicated office bearers from the final year of the department. With their leadership and collaborative spirit, they have worked tirelessly to ensure the smooth execution of society activities while fostering a sense of unity and enthusiasm among students. Their collective efforts have kept the society vibrant and active, creating memorable experiences for all members.



HEADS AND SUBHEADS

"Reliable hands behind the success"

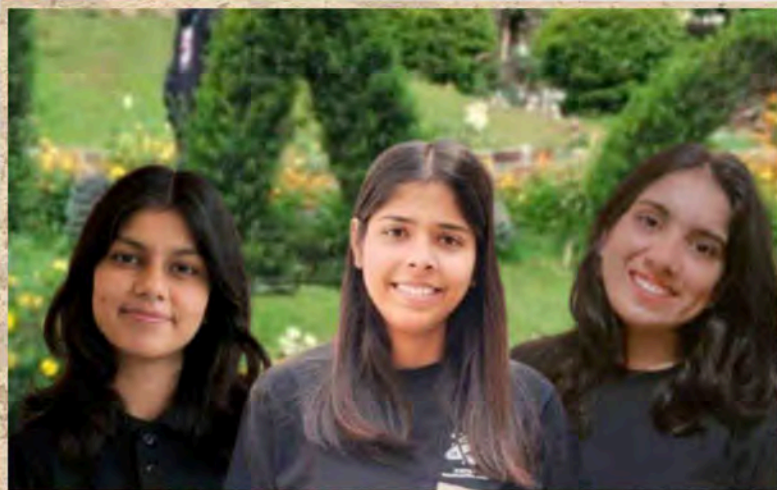


Editorial Department

Head- Kashish Mishra, BSc(H)
Physics, 3rd year
Head- Draksha Singh, BSc(H)
Physics, 2nd year
Sub-Head- Harshita Panth, BSc(H)
Physics, 2nd year

Social Media Team

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year
Sub-Head- Ishita Sharma, BSc(H)
Physics, 2nd year
Sub-Head- Lalita Swami, BSc(H)
Physics, 2nd year





Cultural Team

Head- Anjali Chaudhary, BSc(H)
Physics, 3rd year

Sub-Head- Yashi Kardam, BSc(H)
Physics, 2nd year

Astroclub

President- Lakshita Dahiya,
BSc(H) Physics, 3rd year

Secretary- Yashi Kardam, BSc(H)
Physics, 2nd year



SHORT-TERM COURSE ON PRODUCT DESIGNING WITH ARDUINO

DURATION: 2ND MARCH – 29TH MARCH 2025



ABOUT THE COURSE

This intensive course was designed to bridge the gap between academic concepts and practical innovation. Students were introduced to Arduino microcontroller programming, circuit designing, and electronic prototyping using KiCad, a popular open-source EDA tool.

The course covered the complete process of turning ideas into functional products— from conceptualization and schematic drawing to PCB layout and fabrication. It enabled students to think beyond the classroom and apply their physics knowledge in creative and tangible ways.

The Department of Physics, Maitreyi College, successfully conducted a 30-hours short-term course titled **"Product Designing with Arduino"** from 2nd March to 29th March 2025.

This skill-based program aimed to provide undergraduate students with hands-on training in designing and developing real-life electronic products using **Arduino** and **PCB** designing techniques.



FOOTPRINT CREATION AND FABRICATION TECHNIQUES

One of the key skills taught during the course was the **creation of custom footprints** using KiCad. Students learned how to align schematic symbols with actual components by designing accurate physical layouts. This empowered them to build customized circuits suited to specific Arduino-based applications.

The fabrication process followed the **glossy paper toner transfer method**, involving:

- Printing the PCB layout on glossy paper using a laser printer.
- Transferring the printed layout onto a copper-clad board using heat (iron or laminator).
- Soaking the board in water to remove paper and retain the toner design.
- Etching the board in **ferric chloride solution**, which removed excess copper and revealed the final track pattern.

ARDUINO PROJECT INTEGRATION

Throughout the course, students implemented several Arduino projects that demonstrated automation, control systems, and sensor-based applications. By integrating Arduino with their own PCBs, they experienced the process of creating real-world products—from coding to hardware design.

NSUT VISIT – 5TH APRIL 2025

A special **technical visit to Netaji Subhas University of Technology (NSUT)** was organized on 5th April. Students attended the **final lecture of the course** there, which included expert interactions and demonstrations of advanced PCB and embedded system projects. This visit greatly enriched the students' technical exposure and understanding.

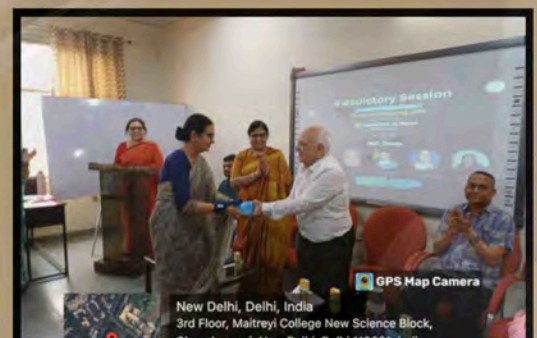


VALEDICTORY CEREMONY – 29TH MARCH 2025

The course concluded with a grand **Valedictory Session on 29th March**, attended by the **entire Department of Physics**, the **Principal**, and **Vice Principal** of Maitreyi College. Guest speakers and resource persons were **felicitated by the Principal**, and the ceremony celebrated the successful completion of the course. Students also shared their learnings and project experiences, making the event a memorable one.

KEY LEARNING OUTCOMES

- . Designing and simulating electronic circuits using KiCad
- . Creating custom component footprints and PCB layouts
- . PCB fabrication using toner transfer method
- . Microcontroller programming with Arduino
- . Integration of software and hardware in real-time applications

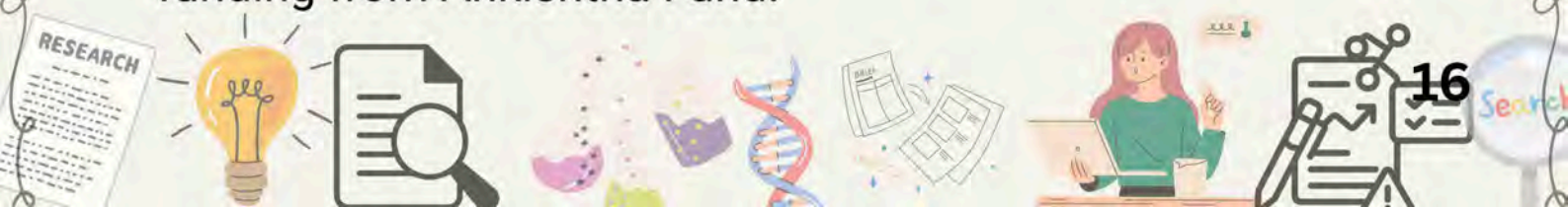




Center For Research

Centre for Research (CFR), established in 2019 at Maitreyi College, promotes undergraduate research in science and social science fields. It conducts two main programs: the Summer Internship Program (SIP) and the Annual Research Program (ARP).

CFR also organizes educational trips for students of various departments to ensure experiential learning and encourage research among students. special lectures and training workshop organized for students to make them competent in research proposal writing, learning new software, preparing effective presentations etc. CFR has been publishing a peer-reviewed open access e-journal, 'Vantage: Journal of Thematic Analysis', from the year 2020. It is a multidisciplinary and multilingual journal. This bi-annual journal is published in April and October. From the academic year 2023-24, CFR has started a new programme namely, Vocal for Local. In this programme, the project proposals that involve mapping, documentation or any such activity that enhances knowledge about the campus are supported by funding from Ankishtha Fund.





Summer Internship Project (SIP)

SIP, held from May to July, allows students to undertake research projects under faculty mentorship. An Orientation Programme is conducted to introduce CFR and guide proposal submissions. Students work on interdisciplinary topics, gaining research, analytical, and writing skills. Projects are reviewed by external experts, and selected ones are showcased in the Avlokan presentation session. The team for the year (2023-2024) was Systems of Knowledge in India: Moving Towards Self Reliance. This year two projects from the Department of Physics were selected in SIP.





Code- SIP23-24/31

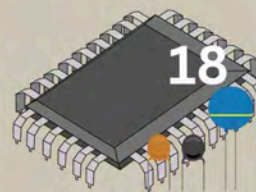
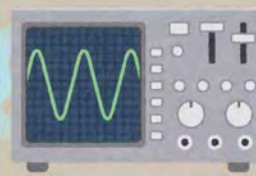
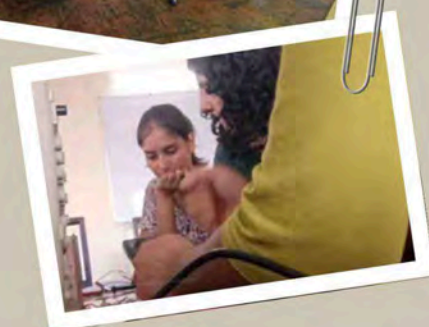
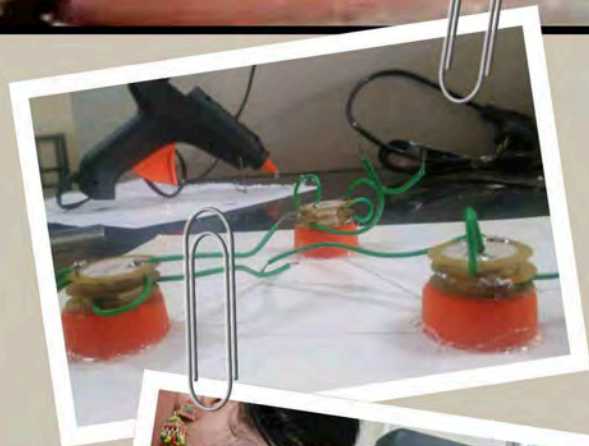
Topic- Empowering Individuals through Piezoelectric Energy Harvesting: Building Self-Reliance, One Step at a Time.

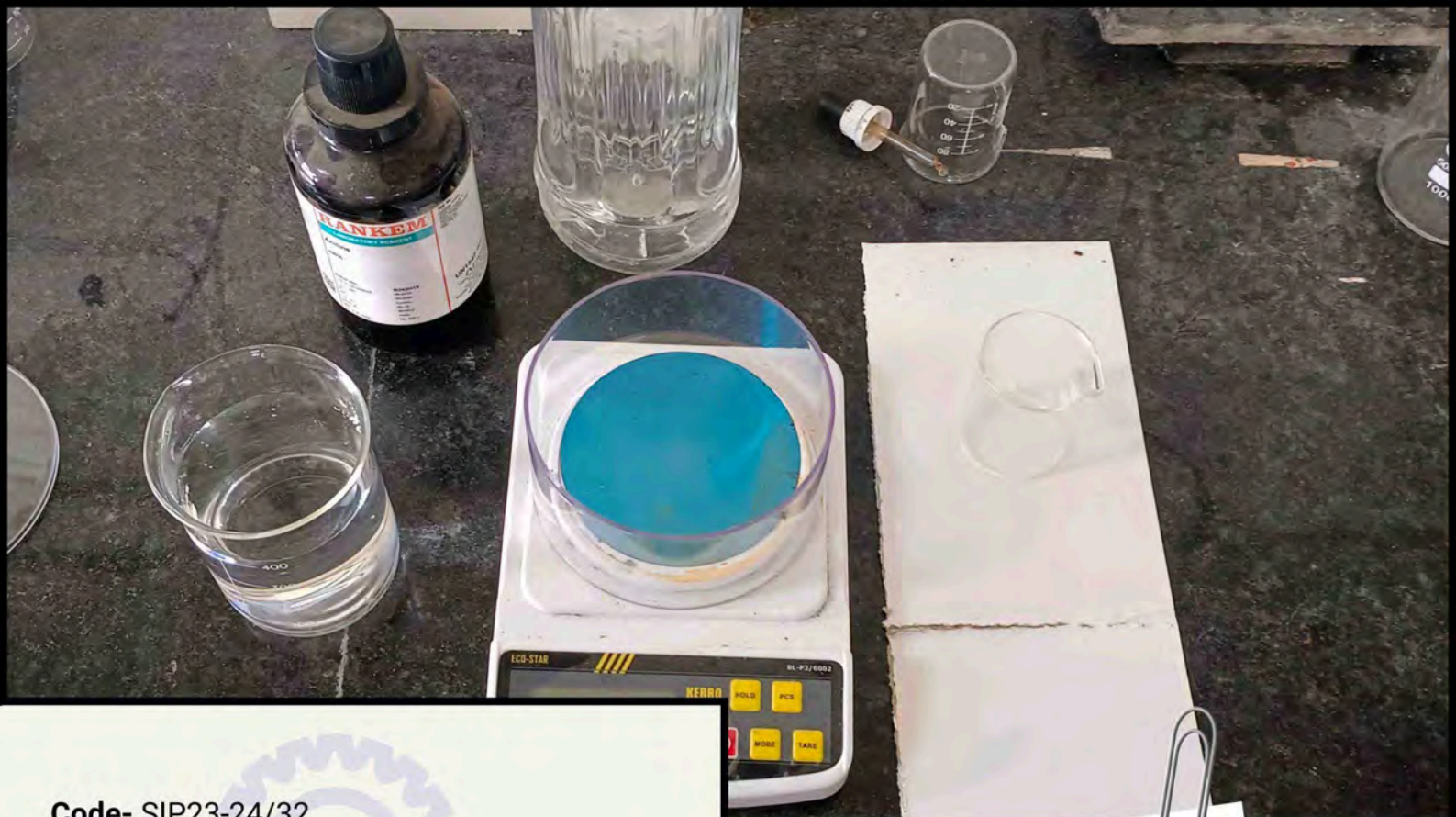
Mentors- Dr. Prajwalit Shikha & Dr Ritu Dhingra

Students-

- Ananya Matta, B.Sc. Physics (Hons.) 2nd Year
- Kashish Mishra, B.Sc. (H) Physics 3rd year
- Saniya, B.Sc.(H) Physics 3rd year
- Yashi kardam, B. Sc.(Hons.) Physics 2nd year

The research investigates the use of piezoelectric technology to convert ambient vibrations, from footsteps and machines, into a renewable energy source for low-power devices. A series-parallel transducer setup was used for energy capture and a self powered device was fabricated.





Code- SIP23-24/32

Topic- Optimization of Polyaniline (PANI) thin films for improved Electrochromic properties.

Mentors- Dr Mansi Dhingra & Dr Parul Yadav

Students-

- Aliya, B.Sc. (Hons) Physics, 3rd Year
- Anjali, B.Sc. (Hons) Physics, 3rd Year
- Karina, B.Sc. (Hons) Physics, 3rd Year
- Neelakshi Lakra, B.Sc. (Hons) Physics, 3rd Year

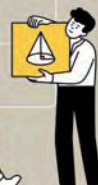
The thin films of Polyaniline were synthesized in the laboratory through electrochemical deposition. We have achieved films of different thickness by changing the polymerization conditions viz. dopant acids.





Equinox

Equinox, the Annual International Conference organized by CFR under Vantage: Journal of Thematic Analysis, provides a platform for multidisciplinary research in sciences and social sciences. With a broad theme and sub-themes, it welcomes diverse research abstracts. The conference includes expert talks, and platform and poster presentations by students and scholars, encouraging knowledge exchange and discussion on key scientific and social issues. The theme for the year 2023–2024 was “Systems of Knowledge in India: Moving Towards Self-Reliance.” Under this theme, the Department of Physics made significant contributions with one poster presentation and one research paper, showcasing its active engagement in interdisciplinary research and commitment to self-reliant knowledge systems.





Poster presentations

Topic- Tunable colour change with Polyaniline(PANI) based electrochromic coatings

Students -

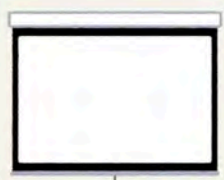
- Aliya, B.Sc. (Hons) Physics, 3rd Year
- Anjali, B.Sc. (Hons) Physics, 3rd Year
- Karina, B.Sc. (Hons) Physics, 3rd Year
- Neelakshi Lakra, B.Sc. (Hons) Physics, 3rd Year

Paper presentation-

Topic-Harvesting Ambient Vibrations for Sustainable Energy: Enhancing Low-Power Device Supply through Piezoelectric Materials and SECE Circuit Integration

Students-

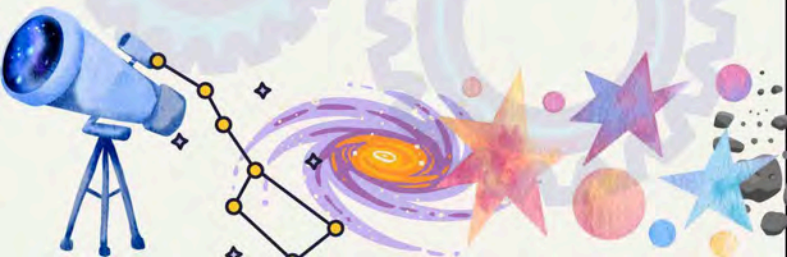
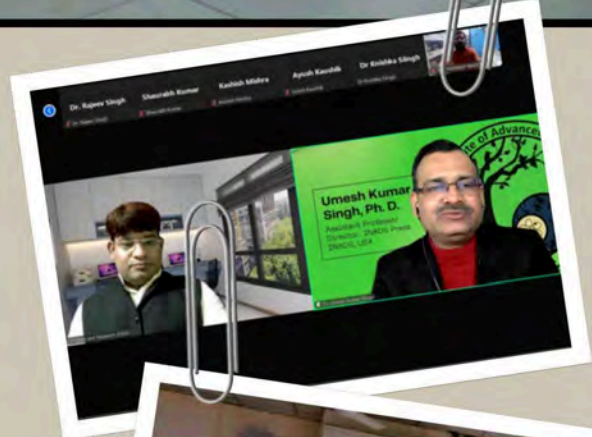
- Ananya Matta, B.Sc. Physics (Hons.) 2nd Year
- Kashish Mishra, B.Sc. (H) Physics 3rd year
- Saniya, B.Sc.(H) Physics 3rd year
- Yashi kardam, B. Sc.(Hons.) Physics 2nd year





International Sanskrit conference

The International Sanskrit Conference (ISC), an initiative by Maitreyi College, is dedicated to promoting Sanskrit and the Indian Knowledge System. Established in 2020 under the visionary leadership of Prof. Haritma Chopra, along with academic guidance from Prof. Ranjan Kumar Tripathi, Prof. Bal Ram Singh, Dr. Pramod Kumar Singh, Dr. Umesh Kumar Singh, Dr. Awanindra Kumar Pandey, and Ms. Niharika Khurana, the conference has grown into a globally recognized academic platform.





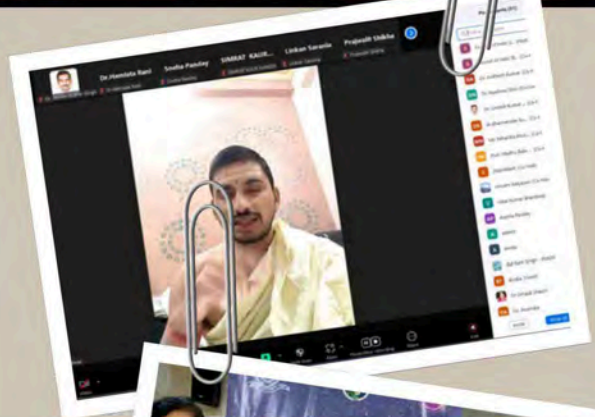
The Fourth ISC was held in hybrid mode from December 14 to 16, 2024, centered on the theme: **Exploring Literary and Scientific Perspectives in Cosmology** (सृष्टिविज्ञान विषयक साहित्यिक एवं वैज्ञानिक अन्वेषण).

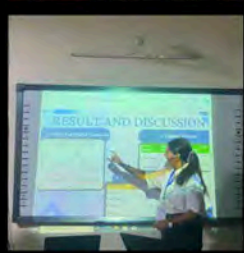
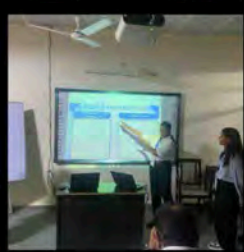
The Department of Physics had one of its papers selected for presentation at the Fourth International Sanskrit Conference (ISC). The paper critically examines the discrepancies in modern cosmological theories regarding the universe's age. It explores ancient Vedic perspectives, which propose a significantly older universe.

Topic - Challenges in Determining the Age of the Universe: Rethinking the Cosmological Timeline

Author- Dr. Prajwalit Shikha, Dr. Ritu, Dr. Poonam Juneja, Dhingra, Dewanshi, Kashish Mishra and Lakshita Dahiya

Presented by- Dr. Prajwalit Shikha

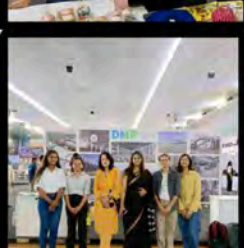
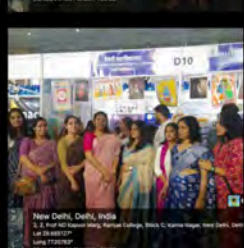
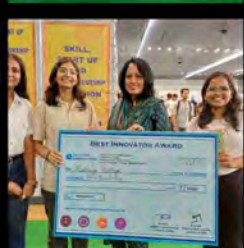
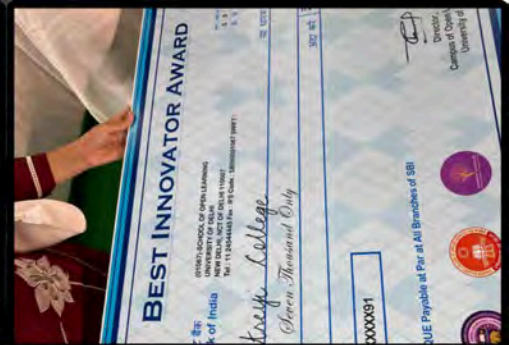




An Inspiring Feat

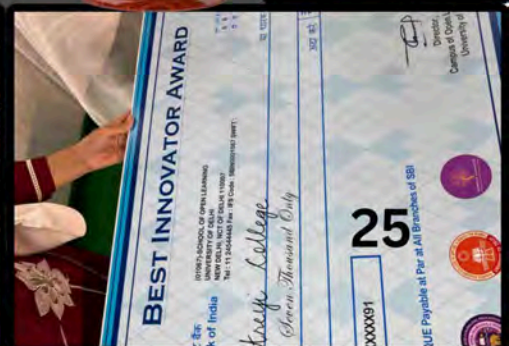
The Department of Physics celebrates the achievement of **Ananya, Kashish, Saniya, and Yashi**, whose paper titled "Harvesting Ambient Vibrations for Sustainable Energy: Enhancing Low-Power Device Supply through Piezoelectric Materials and SECE Circuit Integration" won **1st prize in Oral Presentation Session III at Equinox 2023–2024**. The project was carried out under the guidance of **Dr. Prajwalit Shikha** and **Dr Ritu Dhingra**. The project highlights an innovative approach to sustainable energy by developing a self-powered energy harvesting device that is both cost-effective and built using minimal components. The device was entirely designed and fabricated in-house by the students, reflecting their creativity, technical skills, and dedication to sustainable innovation.





An Inspiring Feat

The Department of Physics celebrates the achievement of Saniya, Neelakshi and Aliya for participating in **Skill, Start-Up and Entrepreneurship Expo-2024** organized by **Skill Enhancement Committee, University Of Delhi** on 4th, 5th and 6th **October 2025**. They demonstrated a PCB-based piezoelectric energy harvesting device, designed and fabricated in the Physics Department. The project won the **Best Innovation Award**, along with other projects from Maitreyi College. The project highlights an innovative approach to sustainable energy by developing a self-powered energy harvesting device that is both cost-effective and built using minimal components. The device was entirely designed and fabricated in-house by the students.



Dr. Savita Datta Memorial Lecture

UNIVERSITY OF DELHI

cordially invites you to the

The department of Physics, Maitreyi College organized a lecture on **"Higher Education: Challenges, Intent and Practices"** in honor of the 70th birth anniversary of our former principal Dr. Savita Datta on September 30, 2024 in the NSB Seminar Hall. **Prof. Sanjeev Singh** was invited to speak on the above topic. The lecture was conducted in hybrid mode (live streaming on YouTube). Along with Prof. Sanjeev Singh, several other guests, including Ms. Sangeeta Kalia (Dr. Savita's younger sister), Mr. Nishant and Mrs. Ruchika Datta (son and daughter-in-law) as well as Mr. Vikrant and Mrs. Nikhar Datta (younger son and daughter-in-law) were also present. Many relatives and close friends of Late Dr. Savita Datta also joined the event online.

The program commenced with Dr. Prajwalit Shikha and Dr. Savvi Mishra acknowledging our esteemed principal, Prof. Haritma Chopra, as well as the honorable guests, teaching staff, non-teaching staff and students. The program continued with a Sarswati Vandna by the students of the physics department, followed by a lamp lighting ceremony by esteemed Principal, guests and staff. Later, Dr. Ritu Dhingra, TIC of the Physics Department extended her warm welcome to the invited speaker and guests. She discussed the achievements of Dr. Savita Datta. Later, Dr. Parul Yadav introduced our speaker to the participants.

Venue

NSB Seminar Hall at 11:00 AM, September 30, 2024 (Monday)



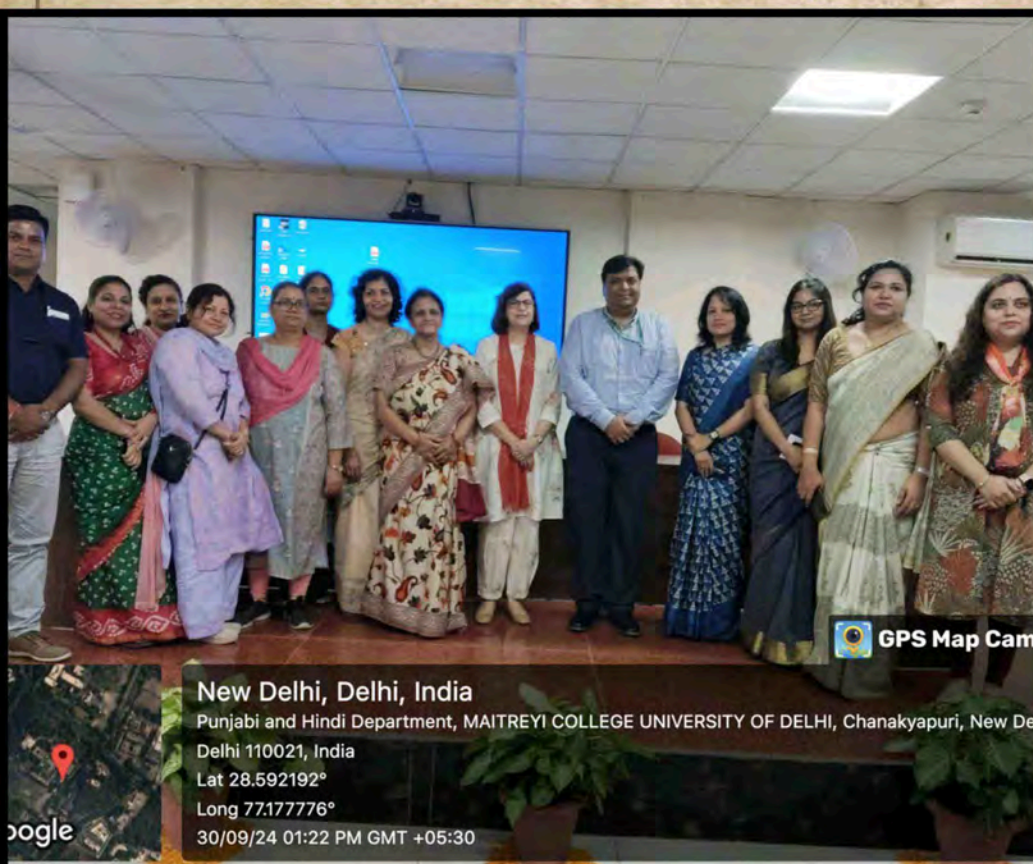
Dr. Savita Datta Memorial Lecture

Our renowned speaker Prof. Sanjeev Singh is currently the Joint Director of University of Delhi, South Campus. During the lecture, he discussed how we all are surrounded by technology, and it is impossible to escape it. He explained that technology is transforming education by connecting a vast audience worldwide, highlighting initiatives like e-Vidyalaya, a government program aimed at enhancing digital learning in India. He laid stress on building and using the local resources present in our university. He clarified the objective of education i.e. 'giving right information to the right person at right time'. He highlighted some of the innovations initiated by Delhi University, including virtual labs and e-libraries, all designed to digitize education and lighting up the academic standards.

The participants actively interacted with the speaker by asking various questions on AI and academics. Many participants along with non-teaching staff also raised their concern about the ill effect of AI on students. Ms. Karina of B.Sc. (Hons.) Physics, 3rd year and Ms. Bhumi Goyal of B.Sc. (Hons.) Physics, 2nd year were awarded for Best Question.

The event ended with a vote of thanks proposed by Dr. Ritu Dhigra on behalf of the Department of Physics.

NSB Seminar Hall at 11:00 AM, September 30, 2024 (Monday)



New Delhi, Delhi, India

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30/09/24 01:22 PM GMT +05:30

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Understanding Black Hole - The Dark Side of the Cosmos



Akashganga - the Astro Club of the Department of Physics, Maitreyi College organized an International Webinar on **"Understanding Black Holes – The Dark Side of the Cosmos"** through Google meet, on 1st April 2025, at 2:00 p.m. Prof. Poshak Gandhi from the department of Astrophysics, University of Southampton, U.K. delivered an insightful and engaging lecture. The session witnessed enthusiastic participation from over 80 students from across various colleges of University of Delhi.

The program commenced with a brief background by Dr. Prajwalit Shikha. Prof. Poonam Juneja introduced the distinguished speaker. The meeting was moderated by Dr. Savvi Mishra.

Prof. Poshak Gandhi began his talk by elaborating on the evolution of stars and delved into the fascinating realm of black holes, discussing their formation, characteristics, and immense power, including fusion and accretion processes.

**AKASHGANGA**
Astroclub of
DEPARTMENT OF PHYSICS
MAITREYI COLLEGE
(NAAC Accredited 'A++')
UNIVERSITY OF DELHI
Organizes an
Inaugural Webinar



Topic:
Understanding Black Holes - the dark side of the cosmos

Speaker:
Prof. Poshak Gandhi
Department of Astrophysics,
University of Southampton, U.K.

Date and Time:
April 1, 2025 (Tuesday) 2:00 PM onwards

Platform: Google Meet

Scan to register



Convenors
Prof. Poonam Juneja,
Prof. Ritu Dhangra (TIC),
Dr. Prajwalit Shikha
Department of Physics

Patron
Prof. Haritma Chopra
Principal, Maitreyi College

Organizing Committee:
Faculty members,
Department of Physics

Student Coordinators:
Ms. Lakshita Dahiya (President) (8920525372)
Ms. Yashi Kardam (Secretary) (8700983839)

Poshak Gandhi (Presenting)

"We Astronomers"

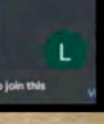
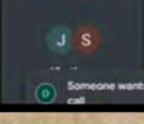
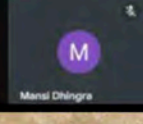
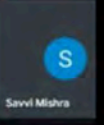
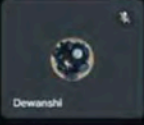
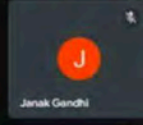
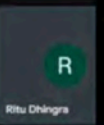
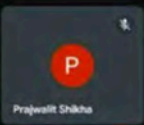


Dr. Rebecca Elson
(1960-1999)

We astronomers are nomads,
Merchants, circus people,
All the earth our tent.

We are industrious.
We breed enthusiasms,
Honour our responsibility to awe.

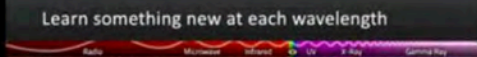
"Responsibility to Awe", Oxford Poets, Carcanet Press (2001)
Estate of Rebecca Elson; Anne Berkeley and Angelo di Cintio



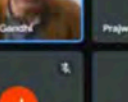
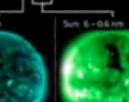
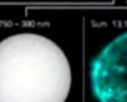
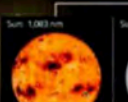
Blackboard (Powerpoint) Tuesday, 1 April 2025

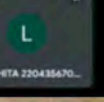
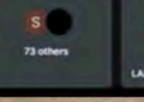
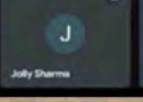
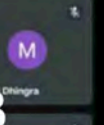
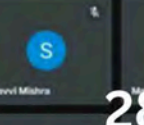
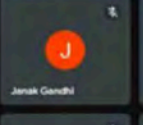
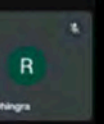
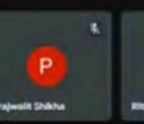
Poshak Gandhi (Presenting)

Learn something new at each wavelength



Sun: 1,000 nm Sun: 750 - 380 nm Sun: 13.1 nm Sun: 8 - 0.8 nm





Blackboard (Powerpoint) Tuesday, 1 April 2025



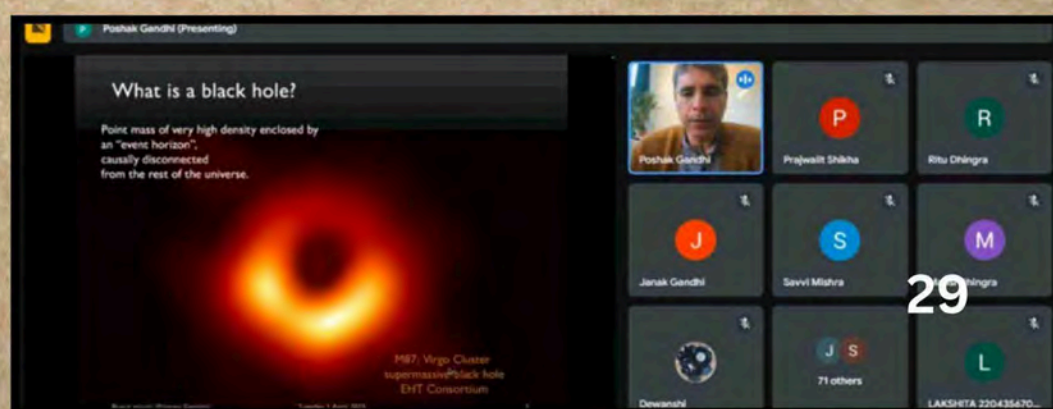
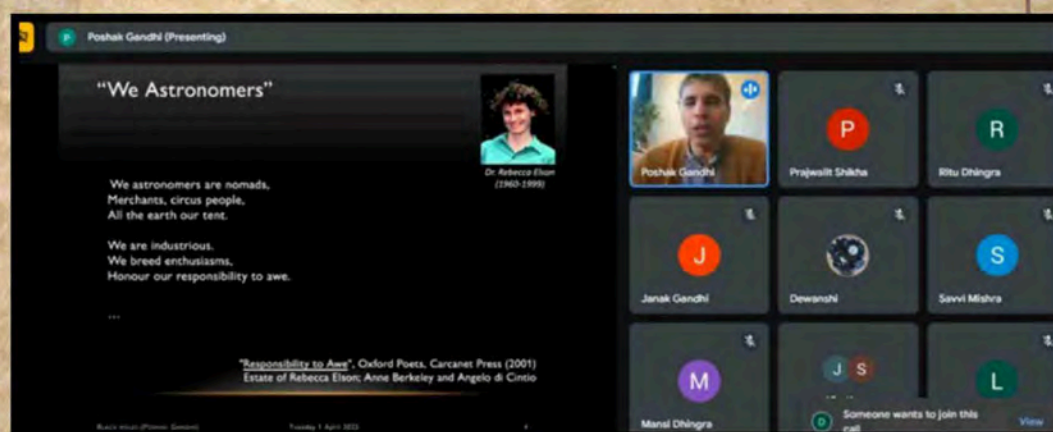
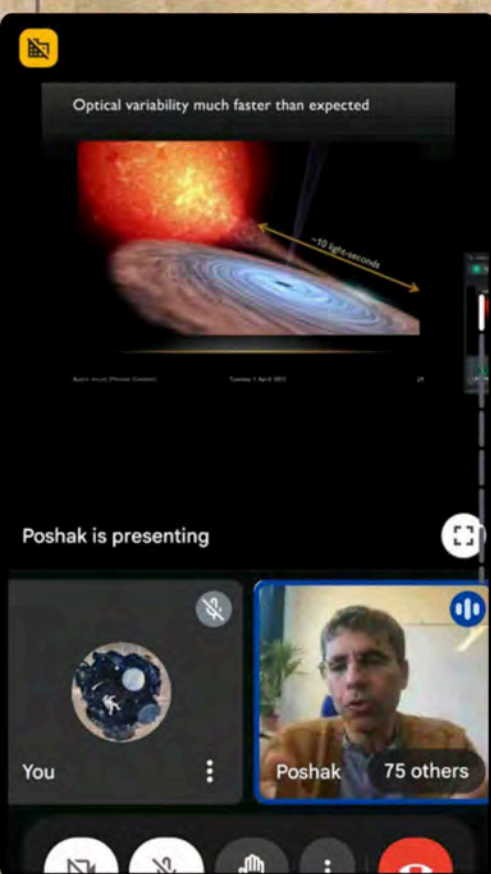
Understanding Black Hole - The Dark Side of the Cosmos



He elaborated on the study of accreting black holes through temperature-radius graphs and explained how variations in emitted light help determine the characteristic size of black holes. One of the key highlights of the session was his explanation of gravitational waves generated by the merging of black holes.

The participants actively interacted with the speaker by putting forward various questions related to gravitational waves, observational challenges faced by astronomers, and commonly misunderstood concepts about black holes. Prof. Gandhi addressed these with enthusiasm and encouraged students to explore astronomy as a promising and emerging field, especially in India. The lecture ended with a Vote of Thanks proposed by Prof. Ritu Dhingra (TIC, Physics Department).

In conclusion, the webinar was highly informative and engaging, sparking curiosity among students and deepening their understanding of black holes. It successfully inspired participants to explore the exciting field of astronomy and astrophysics.





Quest' 25- Annual Physics Fest



The Department of Physics, Maitreyi College, University of Delhi, organized its annual inter- college fest Quest '25 on 19th March 2025. With enthusiastic participation from students across various colleges, the fest celebrated creativity, intellect, and fun through four engaging events. Each event saw remarkable performances and competitive spirit. A lecture was conducted by our esteemed guest Mr. Satish Dahiya (senior Specialist, network engineering, Ericsson Global Service India PVT. LTD.) on optical communication in telecom networks.

Best Question Award

- Ankita, B.Sc Physics (H), 3rd Year, Maitreyi College
- Dewanshi, B.Sc Physics (H), 3rd Year, Maitreyi College
- Kashish Mishra, B.Sc Physics (H), 3rd Year, Maitreyi College

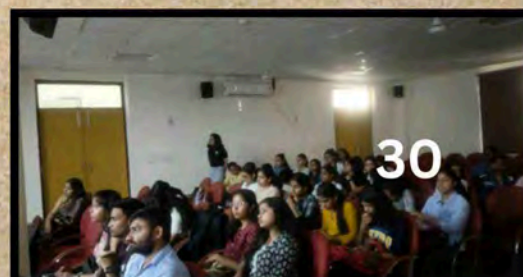
Below is a summary of the events and results:

1. Spotlight Saga – Talent Hunt

Winners:

- 1st Prize: Harshnath Jha, B.Sc Physics (H), 2nd Year, Motilal Nehru College
- 2nd Prize: Chithra Ramesh, BA (H) History, 1st Year, Maitreyi College
- Special Performance: M.S. Gourie Lakshmi, B.Sc Physics (H), 2nd Year, Maitreyi College

Time: 9:00 a.m. Venue: NSB Seminar Hall





Quest' 25- Annual Physics Fest



2. Newton's Knockout – Quiz Game

Winners:

- Akshat Singhal, B.Sc Physics (H), 2nd Year, Sri Venkateshwar College
- Tushar, B.Sc Physics (H), 1st Year, ARSD College

3. Huntomania – Treasure Hunt

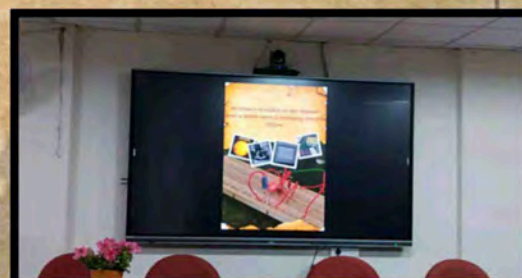
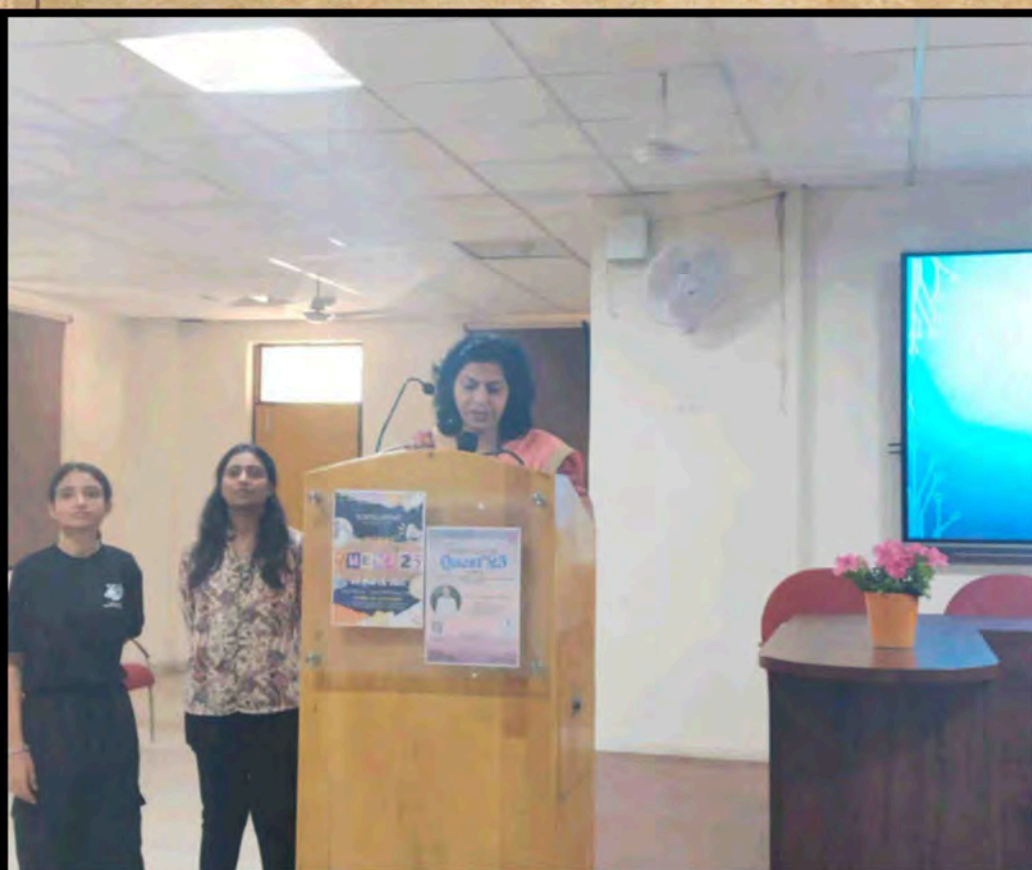
Winner team:

- Ruchi Yadav, B.Sc Physics (H), 2nd Year, Maitreyi College
- Priyal Sood, B.Sc Physics (H), 2nd Year, Maitreyi College
- Ishita Sharma, B.Sc Physics (H), 2nd Year, Maitreyi College

4. Binge Battle – Series Game Competition

Winners:

- Dhruv Mishra, B.Sc Physics (H), 1st Year, Motilal Nehru College
- Vashudha Sinha, B.Sc Physics (H), 2nd Year, Maitreyi College
- Sahil, B.Sc Physics (H), 1st Year, Motilal Nehru College



A Visit To IUAC

A visit was organised by Physics Department of Maitreyi College on National Science Day on 29th February 2025, to the Inter-University Accelerator Centre (IUAC), New Delhi. The event focused on the theme of scientific research and the significance of particle physics, particularly the origin of mass. The program included lectures, demonstrations, and a facility tour, providing great insights into advanced scientific concepts and technologies.

The program began with registration at 9:00 AM followed by high tea. The welcome address was given by Prof. Avinash Chandra Pandey, Director of IUAC. The main highlight of the event was a keynote lecture by Prof. Bedangadas Mohanty from NISER, Bhubaneswar on the topic "Origin of Mass of Fundamental Particles."

Sri Sunil Ojha gave a detailed overview of the accelerator systems at IUAC. He explained how these accelerators are used to generate and accelerate ion beams for advanced research in nuclear physics, materials science, and interdisciplinary studies.

Dr. R. P. Singh introduced the major experimental setups that are part of IUAC's research infrastructure. These are the facilities where ion beams produced by the accelerator are used for experiments.



A Visit To IUAC

We then grouped with the Motilal Nehru College for the guided tour and as part of the guided tour, we explored several facilities at IUAC .

The IUAC visit was a fascinating experience that deepened our understanding of particle physics, accelerator technologies, and the origin of mass. The lecture by Prof. Mohanty was particularly impactful in explaining complex concepts like the Higgs field in an engaging and understandable way. Visiting the facilities and interacting with scientists inspired us to appreciate and pursue scientific research more deeply.



A Visit To NSUT

On 5th April 2025, a special visit was organized to Netaji Subhas University of Technology (NSUT), Delhi. Students from various colleges, who attended short term course visited their along with students from Maitreyi College. They attend the final lecture of a short-term skill-based course. This visit was part of a broader educational initiative aimed at enhancing students' understanding and hands-on experience in Arduino programming and PCB (Printed Circuit Board) designing.

The visit offered a unique opportunity to interact with Professor Dhananjay Gadre, a renowned expert in electronics and embedded systems at NSUT, who guided the final demonstration and evaluation session. The students were accompanied by Dr. Savi Mishra and Dr. Prajwalit Shikha during the visit.

Students enrolled in the Arduino programming module presented and tested the projects they had developed during the course. These projects involved: Microcontroller-based automation, code and hardware testing and emphasis on real-world implementation of Arduino. The students visited to fully equipped PCB labs. The were introduced to the i industrial method of PCB fabrication.



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A Visit To NSUT

Various steps of fabrication was introduced to the students. This exposure provided insight into how theoretical circuit diagrams are transformed into real, functional boards used in consumer and industrial electronics.

The visit also marked the final lecture of the short-term course by Professor Dhananjay Gadre engaged with the students through an interactive session. He discussed real world application of PCB industries, the importance of interdisciplinary learning and career prospects in electronics. Students asked the questions, clarify concepts, and understand how to continue advancing their skills beyond the course.

The NSUT visit proved to be a transformative experience, effectively bridging the gap between academic learning and real-world application. Students were not only exposed to advanced labs and projects but also gained confidence in their technical capabilities. Through interactive sessions, expert mentorship, and hands-on demonstrations, the visit contributed significantly to building a strong foundation in arduino.





WNF: WHAT'S NEW IN PHYSICS?

2024-2025

Catch up on all the news from the World of Physics

Water mining on the Moon? Here is what Chandrayaan 3's Crucial Temperature Data has revealed.

With its successful soft landing near the Lunar South Pole, Chandrayaan-3, recorded India's name in history, making us the first country to land at 69°S, the southernmost lunar landing on 23 August 2023 at 18:04 IST. The mission consisting of the Vikram lunar Lander and the Pragyan Rover is a part of a series of lunar explorations conducted by ISRO Indian Space Research Organisation. As of March 2025, a team of scientists headed by Durga Prasad from the Physical Research Laboratory, Ahmedabad analyzed the lunar temperature data collected on site. The ChasTE (Chandra's Surface Thermophysical Experiment) recorded temperatures from the surface down to a depth of 10 centimeters, revealing highly variable conditions. These readings open up a great avenue to harvest lunar ice in the future and endless possibilities for ease of access of resources for astronauts.

66

A model developed by researchers suggests the possibility of particular lunar surfaces to be cool enough for near surface ice accumulation.

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The project aims to deploy indigenously designed small modular reactors for energy intensive industries and remote locations.

Passive safety and engineered systems to ensure nuclear safety during off-normal conditions, are key innovative features of the project

The Origin Story of BSMR-200

India has concluded the concept design of the Bharat Small Modular Reactor (BSMR-200) which is a 200 MWe pressurized water reactor jointly developed by the Bhabha Atomic Research Centre (BARC) and the Nuclear Power Corporation of India Limited (NPCIL). Union Minister, Dr. Jitendra Singh shared the details of . The lead demonstration unit is expected to be complete within the next six years after financial approval, with the estimated cost up to Rs. 5,700 crore. The development of BSMR-200 aligns with India's energy transition goals, decarbonization efforts, thereby, positioning India as one of the prominent contributors in nuclear technology.



WNF: WHAT'S NEW IN PHYSICS?

2024-2025

Catch up on all the news from the World of Physics

Jainendra Jain, 2025 Wolf Prize Laureate

Jainendra K. Jain, is an Indian-American physicist, the Evan Pugh University Professor, Erwin W. Mueller Professor of Physics. For his exceptional work in the field of Quantum Matter, he has been awarded the Wolf Prize, 2025 along with James P. Eisenstein and Mordehai Heiblum. Despite being born in a small rural village in Rajasthan, India and as a child, being involved in a severe accident which would leave him with a lifelong disability, through his determination Jain rose to global recognition. His discovery of composite fermions — a theoretical framework that allows electrons to behave as if they were quasi-particles, proves to have revolutionised the understanding of complex quantum systems. Alongside his many accolades on account of his significant contributions to physics, he was also a Foreign Fellow of the Indian National Science Academy, in 2024.

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For his work in the discovery of composite fermions — a theoretical framework allowing electrons to behave as if they were quasi-particles.

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The legacy that Prof. Rohini M. Godbole leaves behind is one of determination, teaching her students and young women scientists all over the world, to break barriers and leave a mark.

Loss of a Pioneer

October 25th, 2024, marked the loss of India's prominent particle physicist and a passionate advocate for gender equality in science, Prof. Rohini M. Godbole. A brilliant researcher, she had been academically involved in her work up until her passing, making groundbreaking contributions in the field of particle physics. The prestigious Padma Shri, awarded to her in 2019 and Satyendranath Bose Medal of Indian National Science Academy awarded in 2009, find their place among her many accolades. She was described to be "a champion for women in science" and will be remembered as a visionary leader for future generations to come.



On our journey in search of wisdom and an insight into life after graduation, the 'what to do' and 'what to absolutely never do' like manhandling apparatus, we interviewed the alumni of Maitreyi College's Physics Department, our seniors, people we look towards for guidance like a treasure trove.

We talked to Ex-Maitreyians: Rishika Mittal, batch of 2023 and Vaishali Bagauli, batch of 2024, and we asked them about their current professions, their graduation journey, their struggles and motivations, everything. Well, behold, the treasure chest shall be opened now!

IN CONVERSATION WITH

Myself Rishika Mittal. I was in the 2020-2023 batch in the College. Currently in IISER Pune, finishing my MS then will start my PhD. I am working under Prof. TS Mahesh on the topic of nitrogen vacancy center in diamond and NMR implementation of Quantum information and computing.

I am Vaishali Bagauli and am currently pursuing MSc (Physics) from IIT Delhi.



Can you share your journey from graduation to where you are today?

Rishika: On learning about competitive exams, I began to read a few books on topics like Quantum Mechanics, Electrodynamics, etc. It really helps in building the foundation of such courses. It helps me till today as well. So I kept reading and studying for two years then gave JAM and JEST which I cleared. Then I filled the forms of various institutes. Interviews happened and I cleared 4 out of 5 interviews of different institutions. In the end, IISER Pune matched my interests and goals, so I came here.

In February 2022, when things went offline, the excitement was at its zenith. From getting to meet the people I had met only across screens until now to taking classes in NSB28 instead of google meet, everything felt surreal.

I got to know about the competitive exams like JAM, JEST, TIFR. I started to prepare for them at the end of 1st year. My main goal had been to get admission into TIFR.

Vaishali: My graduation journey began in a way I had never expected! It was 2020 when I joined Maitreyi college for my graduation and for one and a half year, it went completely online due to Covid. Not being able to visit the beautiful campus, not being able to meet my classmates and professors in-person was an experience on its own. Then, I started preparing for Masters entrance exams during my third year and finally in 2024, I qualified for IIT JAM with AIR 47, JEST with AIR 43 and TIFR written exam. That's how, I finally landed up joining MSc (Physics) in IIT Delhi.

Did you participate in any clubs, societies, or sports? How did they shape you?

Rishika: I was in the core team of the Physics Society. My job was to write about the competitive exams and possible choices after BSc. It made me aware of various opportunities and expanded my knowledge of works that were undergoing in the physics field.

Vaishali: I was the Finance Team Head of Scintillations, the Physics society of Maitreyi college during my final year. During this period, I interacted, negotiated, made some major decisions, co-conducted departmental fest, made a few mistakes and took lessons from them, connected with a diversity of people and made a whole lot of memories.

Being in a position of responsibility shapes one's personality, it helps you communicate better and builds confidence.

Was there a failure or setback that later turned into a learning experience for you?

Rishika: There was a setback which later helped me. I was reading from books so it took me a long time to understand and study a topic. Due to which I used to feel that I couldn't do much after the end of the day. I was also taking online coaching so I was left behind in a few courses which was quite disappointing. Then during the interviews, I realized that the time it took was worth it as I don't have to study anything extra for the interview, I could answer them easily. So the time I have spent building the basic concepts of Quantum, Electrodynamics, Thermal and Statistical Physics, etc. was worth it and not the setback.

How did your time in college help you grow personally and professionally?

I would like to give credits to my teachers and batchmates. With them, I learned about the people and their mindset who come from different parts of India.

Vaishali: Besides classroom learning, interacting with people from different facets of life, knowing some of the great minds, everything contributed to making my graduation life full of lessons and memories that will stay with me forever.

Especially lab hours and a few research internships that I did in the college made my interest towards physics grow even stronger and hence my vision to pursue masters in physics became clearer.

Rishika: In college, I did the summer internship project (SIP) in my first year. This project helped in knowing the procedure and methodology of research work. Also there were many conferences about studying abroad which were held in my 3rd year. These were my eye opening experiences. It helped me in knowing what's going on outside India. That's how college helped me grow professionally. Now for my personal growth, my teachers should be credited. Aside from studies, they also helped me indirectly in understanding about the people whom I should avoid.

Lab hours and a few research internships that I did in the college made my interest towards physics grow even stronger.

What advice would you give to students about academics, networking, or career choices?

Rishika: My first and foremost advice would be exploring. Read about your field, say physics here, from google or anywhere. Really go through the websites of different colleges, companies. This will help in self investigating your interests and your potential. Now that you have your Career choices in hand, approach the people who work in this field. Ask from teachers about seniors if anyone is working on that topic or related to it. Most of the time, you get those people or they may transfer your request of conversation to their friends or known. Once you have the person, just talk. Mostly such people are happy to help you. Have conversations.

Vaishali: Networking is one such skill that everyone must try to acquire during their college lives. It helps you learn a lot of new things, gives you new perspectives, you get to know about various career options that you may not already know.

Make a few hours between your classes for self study so that even if you go home tired, it won't be like you haven't done anything during the day.

I have talked to many people from TIFR Hyderabad, TIFR Mumbai, IISER Pune, IISER Kolkata, HRI and outside India. Networking will help you. You can ask for their study schedule or how they learn things. All you have to do is just be brave and talk.

What's one thing you wish you had done differently in college? How can students make the most of their time at college?

Rishika: I didn't attend the events that college was organizing. I thought of them as time wasting. But I quite regret it. If I would have been there, I could have more memories with my friends. There are many nice places in college to study. Also, I know it seems hard to do so especially when friends around you are hanging out and having fun. But still try to make 2 hours per day in college for studying.

Vaishali: I regret not being part of some of the college societies. That could have shaped my personality even better and I could have got a chance to connect with people from different departments. One must not restrict oneself from trying new things. You may succeed or you may fail but you will definitely LEARN.

What is a message that you would like to share with your juniors at this college?

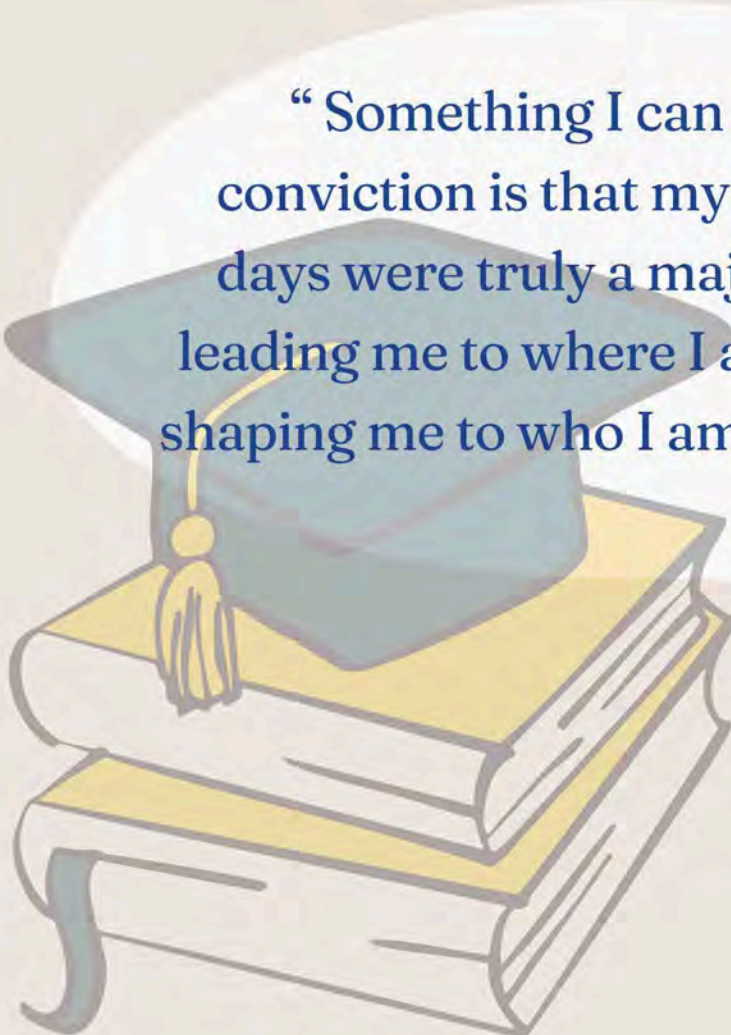
Rishika: First of all, you peeps are going great. Don't have low self esteem in a college environment. Even if you have an interest in Physics or not. Firstly, know your interests and what you like to do. Talk to people and seniors. The earlier you start to invest your time in your interest, it shines brighter after you graduate from Maitreyi.

Vaishali: College life is not just about academics but it is much more.

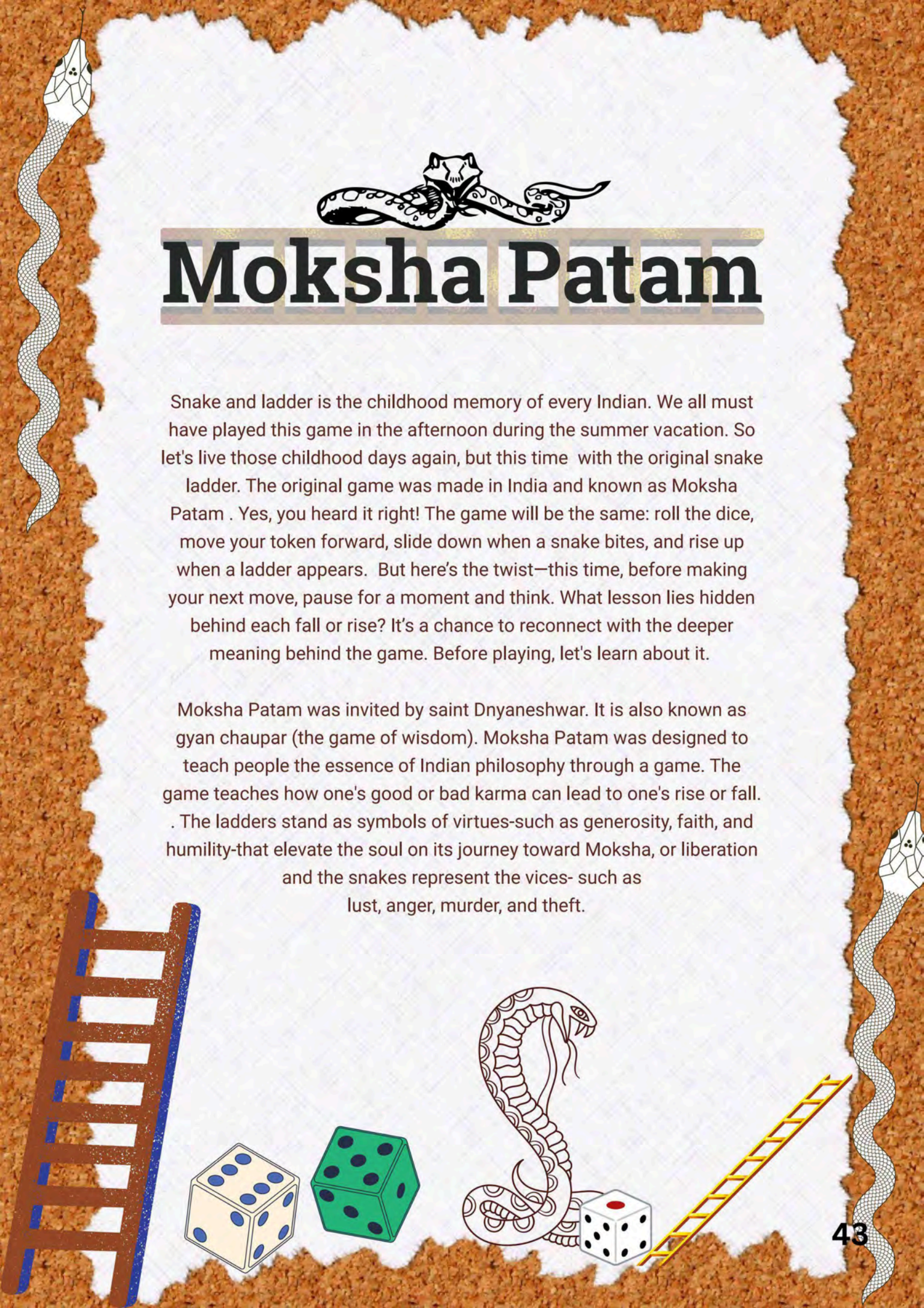
The person that you are when you enter the first year of college and the person you become during these 3-4 years of your college is definitely not the same.

Participate in the maximum things possible, without caring much about the results because no matter what the result is, one thing you will surely win is experience and that is what counts in the long run.

You may not get this platform again, so make the most of it.



“Something I can say with conviction is that my graduation days were truly a major factor in leading me to where I am today and shaping me to who I am as a person!”



Moksha Patam

Snake and ladder is the childhood memory of every Indian. We all must have played this game in the afternoon during the summer vacation. So let's live those childhood days again, but this time with the original snake ladder. The original game was made in India and known as Moksha Patam . Yes, you heard it right! The game will be the same: roll the dice, move your token forward, slide down when a snake bites, and rise up when a ladder appears. But here's the twist—this time, before making your next move, pause for a moment and think. What lesson lies hidden behind each fall or rise? It's a chance to reconnect with the deeper meaning behind the game. Before playing, let's learn about it.

Moksha Patam was invented by saint Dnyaneshwar. It is also known as gyan chaupar (the game of wisdom). Moksha Patam was designed to teach people the essence of Indian philosophy through a game. The game teaches how one's good or bad karma can lead to one's rise or fall. . The ladders stand as symbols of virtues-such as generosity, faith, and humility-that elevate the soul on its journey toward Moksha, or liberation and the snakes represent the vices- such as lust, anger, murder, and theft.





Unlike the modern snake and ladder game the purpose of Moksha Patam is not merely to pass time, but to enlighten the soul. It helps the people to make wise decisions in practical life. Traditionally the squares of virtue—Faith (12), Reliability (51), Generosity (57), Knowledge (76), and Asceticism (78)—lead the soul toward Moksha. In contrast, the squares of vice—Disobedience (41), Vanity (44), Theft (52), Lying (58), Drunkenness (62), Debt (69), Murder (73), Rage (84), Greed (92), Pride (95), and Lust (99)—pull the soul away, reminding players of the consequences of vices. The game is called by different names in different regions and languages. Apart from hindu culture the game is also used by other cultures for the same purpose. The number of squares may be different but the purpose is the same, i.e. enlightenment through knowledge.

SCAN ME



Download, Print
and Play



ABOUT: This is a thinking game. It's purpose is to empower the player by showing that no-cause goes without an effect. Meaning your life today is because of what you did yesterday. And quality of tomorrow depends on today's choices. Therefore every decision either leads to progression or regression throughout the board game of life.

Playing this game gradually teaches one how to master the art of successful living, intelligent problem solving and resilience to malicious influences.

Descriptions by Acharya Andre, and based on timeless wisdom of Upanisads and Bhagavad Gita. Game concept by anonymous rishis throughout the ages.

The Game of Classic Indian Boardgame

tama-guna Material from which entire universe is made, including atoms/particles, and subtle matter like prāna, emotions, thoughts. It's also veiling aspect of māyā (2). Eg: 72 puts whole world to sleep every night (total ignorance). So it's needed for sleep/relaxing. In excess causes: [1] Negligences. Making unintentional mistakes. [2] Fatigue. Unwillingness to act.
72 Continue counting dice from 51.

raja-guna To create anything, must have 3 factors: [1] Knowledge (of house: 70). [2] Material (wood: 72). [3] Labor (energy: 71). Hence 71 is power that puts-together knowledge & material. Needed to stay alert. In excess, it's felt as agitation, insistent inner dialogue, immoderate passion. Why here? Don't value enough 68 goal. Hence got preoccupied with daily activities & ambitions.
71

sattva-guna For context, Isvara has three powers. 70 is all-knowledge. Eg: Water is made of H₂O. If it was 1 part more/less on either side, it wouldn't be water. So what dictates this exact ratio? 70. What determines milk-teeth will fall out age 5-6? 70. It's done for you. Sattvic dominant mind is peaceful, happy & lucid. Why here? Living calmly, engrossed in sādhanā. Mind is now most qualified for 37 which leads to 45/68.
70

brahmā Refers to Isvara from standpoint of Intelligent Creator as all-knowledge. Eg: You are an intelligent creator while crafting art, code, music, poetry. Only difference is human has limited knowledge, while Brahma limitless. Why here? Earnest self-growth and willingness to attend to every aspect of life has paid off. You're blessed with a guru (teacher) who deliver brahmavidya (self-knowledge), which removes false identity of "I".
69

aham kāra Sense of individuality. Once upon a time, chair & table debated which is more superior. "I'm supportive", table argued. The wise shell intervened. "Name & form is different. But what does shell, chair & table depend on? Wood." Similarly the world (which includes me) resolve into One same cause. (68). Without 54, player neglects this fact, thus strengthens the illusion of ownership. "mine".
55

om Refers to One Total Reality from two standpoints (also see 64). 1st is Intelligence (Isvara/Māyā) that manifests, sustains and unmanifests the universe. 2nd is Consciousness (brahman) because of which intelligence can cause the three. Eg: In your body-mind, a cell thought is yet to be born. It's sustained. Then dissolves. Knowing 1 and total are not two, player simplifies life to chant & reflect on meaning of OM (more in mandukya upanishad).
56

vāyu Essence of Air. Makes possible breathing & gases moving inside the body. Also enables global climate through wind, cyclones and tornadoes. Why here? Passing through 56 player inquired into significant of OM. Once assimilated, the insights cause upliftment or lightness which are qualities of Air. Thus one enjoys freedom from feeling stuck. Recall a time when you felt stuck. How was it resolved?
57

tejah Essence of fire. Which is to illuminate or "throw light". Meaning player's inclination is to throw light by sharing wisdom. You are like one of few stars in sky who notably stands out amongst many. How got here? Inquiry (56) leads to inspiration (57), leads to illumining others (58). Why here? Connected the dots from rigorous scriptural study (37). Introspection & applying the insights to each thought, action and engagement with the world.
58

bhakti Devotion. Devotee owns up that all that is here is Isvara (devotee, devoted & act of devotion). Why here? How do we fall in love? More knowledge we have about the other (which takes time), more our sense of fondness expands. Similarly, more you know about Isvara (obtained in 37), more your devotion helplessly deepens. It's a delicate combination developed through all blocks, mostly 22, 28, 37, 46 & 60.
54

jalam Water. Purification practices in 47-50 can produce excess heat (arrogance, agitation, belittling others who aren't as pure as you are). To stabilize & integrate the development, one needs cooling water (calm, relaxing activities). 53 sticks together forms like cake ingredients or insights. Without it, progress feels impersonal/scattered. Water dissolves many (notions) into One whole (God) which is glory of a bhakti (54).
53

himsā Justified hurting. Even after so much growth, one may still exhibit irresponsibility or unfairness. Why? [1] Justifies. "World is an illusion. Nobody gets hurt." Based on 37-46. [2] Justifies. "You're a danger to self and others. I don't believe what I believe. Hence I must convert, change or kill you for your own good." Cause of jhat (holy wars). Discuss reasons why mind engages in unfair/unwise acts? Eg: Distorted 22.
52

prthivī Earth is a physical embodiment of highest compassion. One whom all species depend on in past, present and future. Making available resources to all, sustaining all. She doesn't judge low or high cast. Thus player forms fondness to Earth. Meaning, how you relate to Her gives away your connection to God and yourself. Why himsa next? If 22 is superficial & sees Earth as mere illusion, may engage in careless actions.
51

jñāna Self-knowledge is removing false notions about self, universe & God. We start sentences with "I", followed by thought/debate. Eg: "I learn, I enjoy". But what is the nature of subject "I"? Discovered by śravaṇa: hearing guru, manāna: self-inquiry. At first, it's intellectual. In time, converts to direct (45). What exactly is learned in 37? See 56/64. Also notice, high amount of 36 is needed before mind will be interested in 37.
37

prāna Intelligence in form of subtle energy sustaining body-mind functions. Just as photosynthesis sustains plants by transforming light to chemical energy. It maintains heartbeat, breathing, digestion, circulation. Also called Qi. Since 37 was skipped, player resorts to "doing actions" which are supposed to heighten sensitivity of mind to realities. One conducts practices like prāṇāyāma / Yoga.
38

apāna Elimination aspect of prāṇa (38) in body responsible for downward movement: Eg: urination, defecation, expelling baby, ejaculation, menstruation. When it's weak, body is susceptible to fatigue, mood swings, constipation, diarrhea, menstrual problems, bone density issues. Resides in lower intestines. Player boosts it with methods like mūlabandha (root lock) and kapālabhātī (forceful exhale from abdomen).
39

vyāna Distribution & circulation aspect of prāṇa (38), evenly throughout nervous system. Eg: Sweating is not isolated to one specific place, but occurs through all pores of body. Meaning vyāna is pervasive. Imbalances may show as breathlessness (poor O2 delivery from lungs to blood), blocked arteries, edema, heart attack. Improved with breath retention, āyurveda, Hatha Yoga.
40

svaccha Clear thinking. Comes from honesty. Meaning I am transparent and factual about my strengths & weaknesses. Eg: Bland rose among the fresh ones has no need to exaggerate it's colors to appear more striking. It accepts it's present state. Why here? 35 was fierce catalyst of maturing a man (child in adult body) into a Man (28). I choose to tackle future impurities & resist proliferation of 29. It's duty of all to protect 22.
36

nāraka Hell / Purgatory is not an unpleasant place as depicted in some religious texts. Reflects own suffering due to prolonged past irresponsible, hurtful, unfair actions unto self or others. Does not mean "punishment", but going through hard and long process of purification due to guilt of 29. So hell is a tough loving teacher. Other eg's of hell: Seeking validation for self-worth. Victim role. Addiction. Not standing up to abuse.
35

rasa Taste / Player is more sensitive to capturing subtler tastes (music, food, dance, art, poetry). That's often missed by grosser minds. Eg: We visually see rose, but few stop to appreciate it's smell. Even lower feel petals' soft texture. Hence player's dialog becomes more pleasing to listen, as it brings out the covious, commonly missed. Perceptive to finer pleasures. Less attracted to extreme spicy/salty/sweet foods.
34

gandha Fragrance plane. When cleansed of baser thoughts (violence, wanting to be dominated, dominating, libido), unpleasant odors in breath, stool, perspiration reduce. Body emits more pleasant smell like sandalwood, lotus. Player is turned off by artificial fragrances. In contrast to C1, smell of paraffin, petrol, cigars, alcohol is enjoyed. Thus one's evolution is reflected, even in what is considered pleasant aroma.
33

karma-yoga Taking responsibility for actions (karmas). More deliberate and thoughtful. Player starts to examine own decisions & relationship between present actions & future results (cause & effect). K.Y. definition matures from "I'm doing this for my own good", to evolved (27): I dedicate my actions to a higher altar, God, as nothing here is mine. What is cause-effect? Discuss.
19

dāna Anonymous type of charity. It's not coming from motive to show world what a goodie you are. Arises from 17. Dāna manages superiority generated in 19. Also it's the force behind institutionalized activities for worldly good causes. Relies on socializing. That's why karma-yoga is effective for outgoing, extroverted, active personalities. Can you remember a time of sincere donation? How did you feel contributing?
20

prāyaścitta Atonement. Admitting mistakes of past actions and willingness to correct them. Player takes voluntary responsibility to correct neglects, immaturity & carelessness. How to repent? Start incorporating 22 in actions. Eg: Do I live what I speak? Do I practice what I learn? Are my actions setting an example or reinforcing immorality and division in society. Respond to the troubled person and not their mischievous behavior.
21

dharma That which is always absolutely right and good. Impure mind distorts definition of "right" to it's favour, then justifies it's immoral deeds. Fact is, morality needs no rationalization. Whereas unethical actions do. How practice? Understand, none can cheat God's laws & orders. Eg: Gravity is law. Ignore it, you fall & suffer. Truth is law. Speak lies, guilt is felt. Non-hurt is inbuilt. Hurt another and I bear fear of being caught. Discuss meaning.
22

harsa Joy / excitement. Refers to that youthful innocence of "I'm becoming more than thought possible". In Maslow's hierarchy, called self-actualization (meeting one's full potential in life). Challenges & overcoming them fulfills the player. Eagerness to life is precursor to above C3 (karma yoga). Why here? Overcame baggage of 12, 13, 16. Also byproduct of 15, 17.
18

dayā Empathy (mercy) is love in action. It nullifies impulsive need to form conclusions without knowing all the facts. Requires a seasoned intellect (nurtured in 10). Eg: If someone hurts you, don't write them off instantly, because, "I may have also allowed it. So other is not entirely to blame". 17 for humanity sweeps egotism aside, removing need to experience 45 blocks. Discuss why dayā lifts player so high?
17

mātsarya Jealousy is a reaction to an imagined threat of losing something already owned. It's passive aggressiveness, which reinforces 29. Why here? [1] I see myself a separate entity from others. In reality, even this body isn't mine, let alone objects of enjoyment associated to this body. All belongs to God. [2] Unwise imagination (5) creates fantasy of suspicion & rivalry due to insecurities. [3] Fears abandonment.
16

nāga Fantasy. Player is absorbed in own imagination, which sparked in 14. Mind consumed in thoughts, creating what if? scenarios. No notion is too bizarre. Everything seems possible. This can make player disconnected from reality and socially unreliable. But positive aspect is all great arts, music, poems & innovations were born from 15, backed by reason/logic.
15

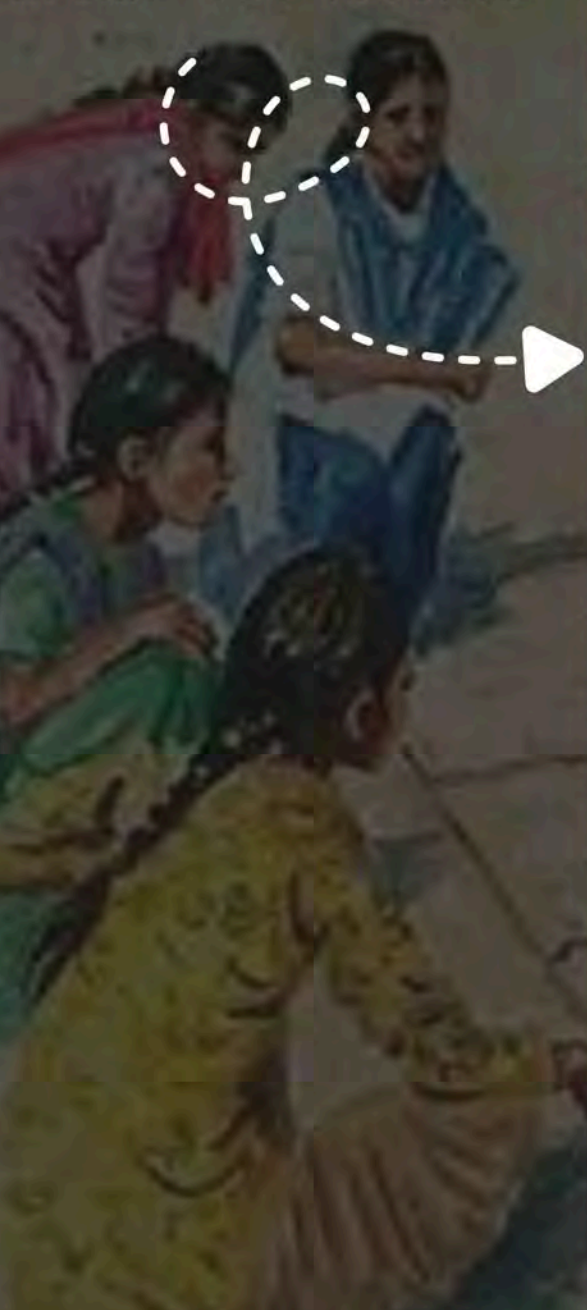
janma Birth. Why here? Yet to discover. Me & Brahman are not two (advaita). I see myself as a small/separate entity. I'm now bound by Law of karma (cause & effect) and dharma (morality, ethics). Throughout life my biases overshadow drama. Eg: Cheats for sake of protecting self-interest. Since every player is reborn with tendencies of 3-6 go to 6 NOW and read it out loud. Then next player rolls.
1

māyā All knowledge & power in potential. Cause of universe. Manifests individual names & forms (atom, cell, DNA, brain, body, tree, H2O, etc). Hence māyā is also the cause of limitation / ignorance. Eg: You don't have my talent, I don't have yours. Out of the One, many come. Thus many are never apart from One. Fell from 55? Time for humble reminder: I'm not the boss here. I'm finite entity seeking Lord's grace & help until last breath.
2

krodha Anger. Charged emotion arising when things don't match my should's & should be's. Mind projects biased notion of what a situation means. Solution: Calm yourself. Would I rather be angry OR happy right now? Do I want discord which will cost my intelligence and inner serenity OR learn to relate which will make me wiser in time? If give in to anger, then it will lead to 29, followed by 35. What is anger & how to manage it?
3

lobha What is Greed? Discuss. Why here? [1] Confusing my unfulfillment or insecurity with presence of material objects. [2] Like a child, yet to realize today's precious toys are tomorrow's scrap. Desires are insatiable. [3] Habituated to a single body-mind gratification. I don't understand, all that is here is mine. Everything belongs to Him alone. Nothing is mine. Not even this body which I arrogantly claim mine.
4

Credit- Yes Vedanta



Game of Self-Inquiry

Game of Moksha Patam - Paramapadham

HOW TO PLAY: Up to 4 players or alone. Place an object in 68. Roll dice. When get 6, go to block 1 and read it. Else, next player rolls. Can't start until get 6 on dice. Discuss each block. If playing with children, keep it short.

HOW TO FINISH: According to Vedās, the highest goal of human life is *moksha* (liberation). So as a general rule, aim for 68 or 45. Liberation can also take place in 41, 50, 54, 56, 60, 64-69. Don't get caught up "finishing". Rather treat the game as a learning opportunity for becoming wise.

LEGEND:

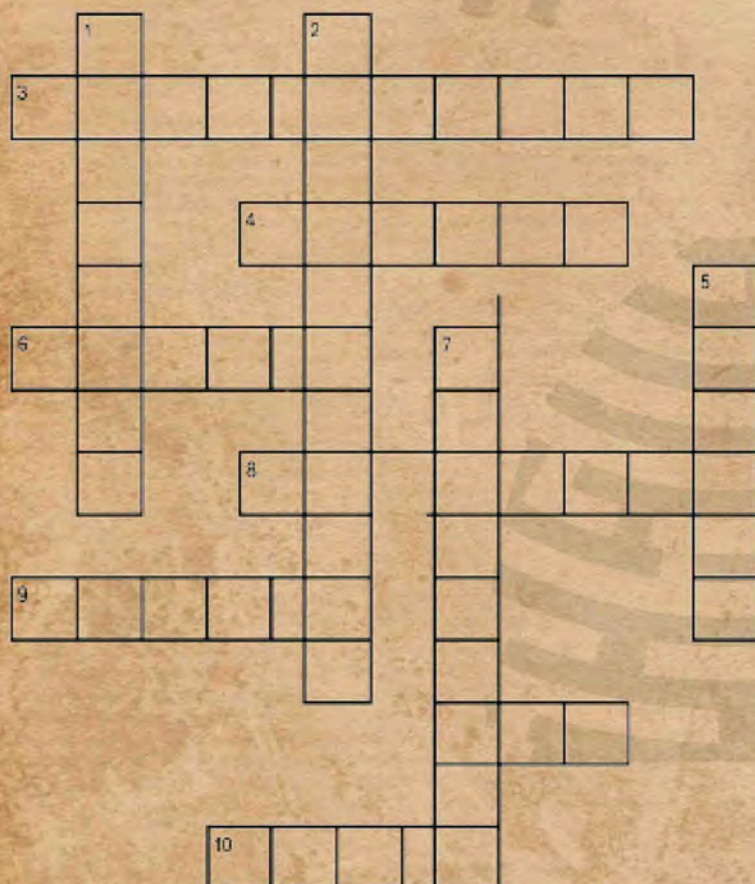
- 1) C3 means Cakra (row) 3. Each row is a milestone in one's spiritual evolution.
- 2) Just number "60" means block 60.

YesVedanta.com/game - Ver 2.5

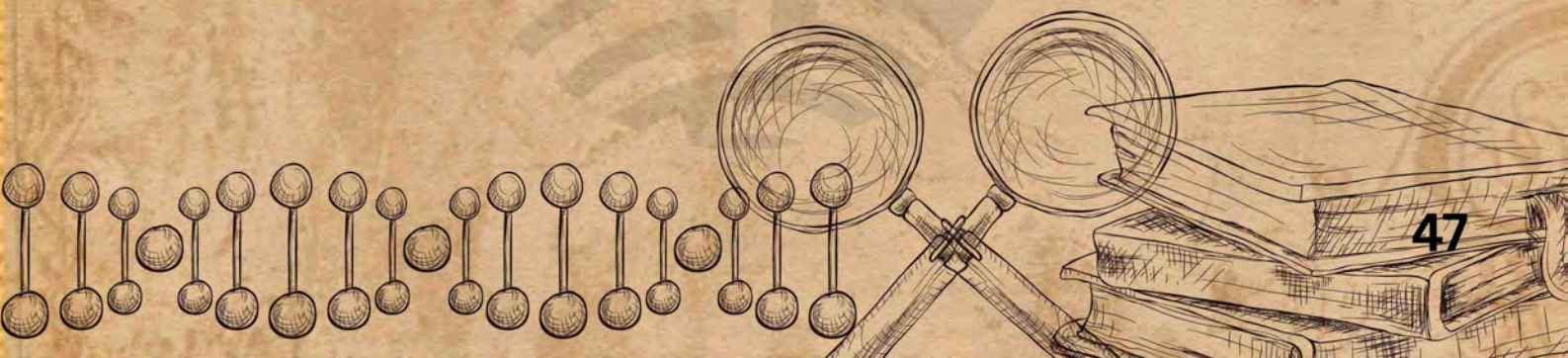
brahman / Īśvara That which is eternally existing (sat), Aware (cit) and limitless-complete (ānanda). Self (ātma). FINISHED THE GAME? I am here because of intelligently navigating all blocks (mostly 19/37/54/60). This is moksha: freedom & clarity while living-End of future births. 68 Accomplished through guru-śiṣya relationship.	śiva The One Reality called Īśvara (God) from standpoint of destruction (makes change possible). Removes prior moment to give way to the new. Can be understood as time itself. Eg: You're able to read this because of Śiva (time). Without it, ridding of impurities and growth is impossible. Eg: What removes ignorance? Knowledge (37/45). Thus to be rid of mind's impurities is to be blessed by Lord Śiva. It's symbolic in scriptures. 67	ānanda Not emotion, but assimilated knowledge. "Nothing is missing now. I am secure & content with what-is". Why here? [1] Fruit of passing through 64. [2] 37 helped me understand my identity is other than the 4 sheaths: body (1), prāṇa (38)-mind (emotions), intellect (thoughts). Result is ānanda or freedom from identifying with their limitations. Now what? Life goes on as usual but with attitude of 60 & more cheerfulness. 66	uranta Significantly dissolved the false notion "I am a separate individual with a limited body-mind". Similar to 45. Why here? Nature of reality (explained in 64), is intelligibly assimilated. I recognize the One content (prakṛti per 64) obtains in everything, just as wood alone is in all furniture. Player has reoriented thoughts about self, world and God. Addressed emotional insecurities. 65 Compare intellectual & assimilated knowledge.	prakṛti In BG CH7, the One non-dual Reality is explained from two standpoints (also see 56). Parā prakṛti is Awareness. Aparā-prakṛti is māyā (2), the material & intelligent cause of universe. Analogy: Parā is like electricity (it enlivens). Aparā is hardware & software. Both make up the whole PC. Understanding these standpoints, one sees deeper into Reality, just as artist sees not only colors, but big picture. 37 is nothing but integrating 64. 64
satya-loka Taking a stand in Truth. Only possible when learned to manage your thoughts & emotions. Else prejudices will insist opposite to what you know is Good. Meaning: I am earning honesty, my emotions are kept in check, I am contributing to society (28). My life is organized (19). Has a mentor/guru. Hence in 67, living and thinking 22 is natural (I don't continue 59/60). three more snakes can cause regression. 59	subuddhi Clear intellect. Meaning: I recognize my role and relationship to Lord and world. My existence is not insignificant. I have much to contribute. What imparts 60? Nidhidyāsana (contemplation). Living a thoughtful, disciplined and managed life. Combo of 22, 28, 37, 46. How long? Last breath, because small fire of saṁskāra (habit in potential) can turn into conflagration. Hence three more snakes to overcome: 61, 63, 72. 60	durbuddhi Clouded thinking & cognition. Why here? [1] Underestimated value of upholding 36/60 daily. When stop feeding mind wisdom, it soon reverts back to impure worldly affairs. Or it gets bored and defaults to former habits. [2] Spiritual over confidence. "World is ignorant". Scolding others induces bramhān. [3] Unrealistic expectations from events or sense of entitlement for my hard spiritual work. Evokes anger. 61	sukha Satisfaction. Why here? [1] Maintained 60, especially during hard times [2] You see the world through eyes of wisdom (46), while contently immersed in 28. Meaning mind is less on news & drama [3] Quiet life of devotion (bhakti) or absorption (samādhi). Danger: Spontaneous joy over time can make daily duties seem inferior, which makes player vulnerable to inaction (63). So persist engaging mind through 60. 62	tamah Inaction / Inertia. Why here? [1] Carelessly gave into 62. Consequence is neglect of duties (28). Causes idling, boredom & loss of motivation to act. It's same reason why drug users life can be ruined. Some totally give into it's pleasure. It's a blackhole. [2] Forget how quickly mind falls when not alert. Just as meditator's calmness can slip into sleep, so too can C7's lucidity slip to dullness. 63
tapa-loka Purification by putting yourself in environment that reinforces 28, mental cleanliness & sanctity. This is called austerity (self discipline). Prior C5 focus was acquiring 37. C6 focus is integrating 22 & 37 by carefully choosing your thoughts, actions. Eg: It's easy to say "There is only God", but does that vision remain towards politicians & heated confrontations? Your actions always speak louder than your philosophy or words. 50	gaṅga Represents the Lunar (moon) aspect of reality. Referring to essence of femininity. One discovers female aspect within. 49 is magnetic while 48 is electric/forceful. Extreme 49 is destructive, deceptive. While balanced is nourishing. Makes possible: devotion, poetry, removal of sorrow, receptivity. Indecisive left nostril (idā), source of psychic energy (sensitivity) in prāṇāyāma. Gaṅga is also symbol of veda-ānā (flows from top). 49	yamunā Represents the solar (sun) aspect of reality. Which refers to essence of masculinity. Player discovers male aspect within oneself. Extreme 48 is aggression, suffocation. Balanced is protective boundaries, positive expansion, order, simplicity. Induced via right nostril (pingalā; source of creative thoughts) in prāṇāyāma, and needs to be opened for proper meditation. If over identified with 49, then 48 serves as balance. 48	sarasvatī Neutrality. When player is neutral (Eg: judge or mediator), there is knowledge of pairs of opposites. Intellect is not invested in either side, remaining an observer to this & that. This is wisdom. Thus prayers to sarasvatī are often associated for gaining better learning capacity & wisdom. It also implies balance within oneself. Eg: Yin-yang, idā-pingalā in yoga. Left-right brain hemisphere. What is a balanced person? 47	viveka Discerning real & unreal, subtle/gross, true/false. To be human is to differentiate THIS from THAT. Also called Objectivity, meaning: not distorting experience with biases, seeing what-is. If not exposed to 37/45, viveka depends on conscience (22/43), rational thinking, research. If exposed to 37/45, viveka becomes a means of inquiry into nature of "I" through ātmā-anātmā (permanent / changing) discrimination. 46
jānalo Wisdom. Player's chief focus is staying aligned with Universal order by immersing oneself in 37. In C5 some take role of seer, saint, teacher, because urged to share inner profundity. This makes C5 source of most scriptural teachings. Player holds lucid & unbiased vision of human psychology and Whole Reality (56). Things become more transparent! Just how toddler's dishonesty is evident to parents. 41	agni Refers to: [1] One of 5 elements making up Universe. Eg: Earth began as ball of fire. Sweating is heat. Warmth of family. Desire. Sun (fire) sustains life. [2] Symbol of self (Awareness). Player realizes can deceive the world, but never myself, because I am never not present to my thoughts/actions. [3] Speech. Eg: Harsh words burn or hurt. Wise words bring light. Thus player begins to deliberately choose each word. 42	manuṣya Inauguration of an Evolved Man (thinking being). Most are children in adult bodies with private definition of a "Man". 43 is one who makes highest use of freewill "putting God (22) first. He or she cheerfully performs personal & social duties and realizes results are not entirely in own hands. I even do best you can. Shuns preference and actively analyzes whatever insecurities or emotional roadblocks arise. 43	avidyā Ignorance. Without suffice knowledge of reality (37), old mind narratives persist more or less. They feed fire of 9 (unfulfilled desires, "I must"). This compels player into attending to ongoing worldly affairs. Ignorance is sustained when we don't question our perceptions of thoughts and fail to set boundaries. Otherwise constant distraction. Small things become big. What is ignorance & how to remove it? Discuss. 44	suvidyā Direct knowledge. Truth and Total are not two. Why here? Serious study & inquiry of 37 (highest teachings of self, world, Brahman within Upanisad texts). Oneness vision is firm & integrated. Moksha is attained. Beginningless 44 is removed pertaining to subject "I". Highest human goal accomplished. No rebirth. What now? Still have a relative life to manage. Thus maintain 60 until last breath, else risk 72. 45
mahalo Balance. plane. Thoughts, words & actions are aligned. Head & heart are in balance. Neither dominant. Greater sensitivity to reality, thus more accommodative about differences. Pronounced passions stabilize. Voice is gentler & softer. Some find poetic articulation in C4. Spiritually becomes intimate and relevant. Inspires others. Why are you here? Give reason accounting for previous blocks. 32	yakṣa Sanctity or holiness. Quality of emotions and thoughts evolved in 30/A clear mind often turns it's focus to existence (big picture, origins of life, purpose of human birth, universe). Asks Q's like: What intelligence connects & sustains everything? Like, what keeps earth in orbit around the sun? How did that intelligence manifest? Why here? Combo of 25 (others sparked curiosity), 26 (pain leads to asking), 30. 31	uttamagati Morally good tendencies. Why here? You practiced constructive habits like 10/17/20/21/25/27. They endure even under stress. Eg: [1] I think before speak, breaks reaction habit. [2] Alert of breath, gauges anxiety & irrational thoughts. [3] temporarily routine; avoids addiction which is a precursor to own words what learned helps grasp more. 30	adharma Unrighteousness. That which is unjust, deceptive, unfair. Something you wouldn't want done thought onto you. It's 28 polluted by prejudices/biases, further reinforced by 24. Main concern is own profit/loss. Little regard of future repercussions. Root cause is strong attachment (conclusion that "this object/belief is my salvation"). Based on blind faith (logic & facts colored by assumptions). Guna (70-72) imbalance. 29	svadharma Backed by dharma (22), I respond and address to each situation according to my unique strengths & talents. Player discovers and sticks to own path of evolution and contribution to society, while minimizing 29. In C4, one starts to accommodate the Whole more often. Thus learns to be considerate. Rituals lessen because immersed in duty. Until 28, one is mostly a seeker, thus rebellious & doubts freewill. 28
svarga-loka Heaven. Not eternal as it's bound to time & space. Eventually player returns to earth after merits of 10/22 exhausted. Experience in heaven is level of thoughts. There are no base desires like, sensuality or lust; only enjoyment of being. I. This entire 3rd row (C3) is a catalyst for finding your place in the world through doing/actions. See each mistake as a lesson to do better, and you'll eventually reach C4. 23	kusāṅgati Adharmic. (29) company and friends. Mind is focused on self, prior to subjective likes & dislikes, disregarding future well-being of environment and impact on others. They praise my impurities, since they too are blind to ethics (22). It's how extreme cult groups, dishonest officials and money makers are made over time (71/72-dominant) title 70. Discuss consequences of staying too long with bad company. 24	susāṅga Good company. Activity within scope of 19-22 is bound to connect you to friends who strive to evolve. Typically called "seekers". Others serve as mirror of positive & negative tendencies which help loosen rigid identity of yourself. One of fastest ways to mature is to actively associate with like-minded people. Share a story of someone whose association has positively transformed your outlook about life. 25	duḥkham / cintā Experiencing sorrow, concern or overwhelm. Why here? [1] Much activity of C3 produces relationships which can be emotionally taxing [2] Realizes there's more to living than friends, pleasure, money [3] Self glorification lost it's potency from feedbacks given in 25. Hence egotism bubble (comfort zone) is starting to burst. Don't resist this transitioning time. Chicken is hatching out of it's shell. 26	paramārtha 3 Types of Actions: [1] Selfish: ignores needs of others. Protects self-interests. [2] Selfless: Always pleasing others, but neglects self. [3] Noble: Takes care of self but also considerate of others welfare. You've taken the hard, yet rewarding path of nobility. To be noble means thinking has shifted from "What can I take?" to "What can I give?" How can I serve? 27
bhūva-loka Lower astral plane. "Plane" means state of mind. Player is stimulated with possibilities. Starts to think "outside the box". Imagination and creativity blooms. In this stage of maturity, kāmā (eat/drink/marry) dominates purpose of being alive. Dwells in fleeting emotions & ideas, thus also unpredictable, ungrounded. Gullible to new opportunities. Day dreams & fantasizes. Catalyst for self discovery & innovation. 14	antarikṣa Nullity. Unable to make a firm decision. Feeling of stuckness. Sees little meaning or purpose in doing anything. "What's the point?". Resorts to victimhood or blaming others. Why here? [1] Over stimulated the body-mind in 3-9 and 11. This temporarily drains one's lifeforce. [2] Pushed life away in 63, thinking 62 will last forever. Long as you're alive, action is inescapable. How to get unstuck? Attend to 17 & 19, 20. 13	īrṣya Envy occurs when we lack a desired attribute enjoyed by another. It's a reaction of sorrow over an apparent lack which I falsely conclude exists in me. Why here? Insufficient 10 reckoned 6. Discuss why? Often causes impatience, intolerance & insensitivity. This snake repeatedly catches most players. Envy is counting another's blessings, instead of your own. Solution: ask: What am I grateful for? What do I have? 12	gandharva Entertainment. What is common inclination after completing necessary hard work? Celebrate. An outpouring of cheerfulness for having survived the challenges. In same way work in prior 10, tuned mind to become sensitive to subtler realities previously unknown (like falling in love). Player feels lighter after conquering fleeting allurements of 6-9. 11	tapah / śuddhi Austerity of Discipline. Focuses attention into the processes of the mind, as if your own psychologist. 9 extroverted the mind, producing fatigue. Now player is drawn to purification. How to purify a desire ridden mind? Stop exposing the 5 senses to things which trigger the desire. Cleanliness. Study the scriptures. Devote results of work to a higher Cause, because all belongs to God (68). 10
bhū-loka Physical plane. Noone is absolutely good, nor totally immoral. Every person born is a mixture of both. Uprighting isn't the only influence: there is also past life karma (saṁskāras). Mind is mainly extroverted, searching experiences "out there" to temporarily relieve oneself from sense of separation & insecurity. Most are C3 employees. Num 5 represents 5 organs of senses/action: 5 elements 5	moha Delusion. Giving all power away to world objects. Seeing things/people as absolute reality without living for. Pursuing them ongoingly reinforcing a binding like-dislike, which makes you invested in the game. Sense of entitlement (mine / my) is seen as "normal". Narcissism (in love with myself). I live to get stuff. Solution: Realize birth is limiting (disease, decay, death). Only born to end this game of rebirth. 6	māda / abhimāna Excessive pride (arrogance). Self intoxication of one's qualities, skills, possessions. Why here? [1] Sense of security placed in things I own. Yes, self-worth is needed, although becomes 7 when think you've done it all (eg: Ravana). Fact is, many contributed to your success. [2] Mind soaked up impurities of 24 and became just like them. Happens frequently in work environment. 7	mithyā Dissatisfaction or longing derived from an insatiable desire for wealth (status, privileges, money). Knows no end. Why here? Entranced by duality (mithyā). Concludes: I'm a separate being in this vast universe. The more I have, the bigger I am. Takes this empirical world of names-forms as final reality (68; satyām). Player dislikes those who seem to have more and thrives on comparing self to others. "I'm better, smarter, luckier". 8	kāma Any kind of desire or ambition (noble/ignoble). Generates punya (merits) & papa (sins) which keeps the player busy & enmeshed in cycle of life (work, family, goals, money). Produces disappointment when don't get what you want, and fleeting joys. Both compel follow-up actions, creating new punya-papa. Kāma is a catalyst for growth and best friend if guided intelligently by the scriptures. 9

VIGYAN PATH

"An educational crossword celebrating
Indian scientific achievements"



1. Which early device used in semiconductor research was based on thermionic emission principles?
2. Which Indian physicist received the Padma Vibhushan in 1954 for contribution to cosmic rays?
3. Which Indian state recently approved the country's first commercial semiconductor fabrication facility?
4. Jagadish Chandra Bose was the first to demonstrate the use of microwaves for what purpose?
5. Which type of high-energy particle did Bibha Chowdhuri discover through her experiments with cosmic rays?
6. What device invented by Jagadish Chandra Bose demonstrated plant responses to electrical stimuli?
7. Which physicist, known for work on quantum optics, was awarded the Padma Bhushan in 2021?
8. Which technique did Bibha Chowdhuri use to detect cosmic ray particles and contribute to early nuclear physics?
9. Which scheme under Atmanirbhar Bharat aims to boost domestic manufacturing through sector-specific financial incentives?



Penned

The main aim of our magazine was to give a tribute to our knowledge system, and to study the advancement of the ancient Indian knowledge system in the field of physics. The article session is divided into three sub- sessions:

Ancient India: A Treasure Trove of Knowledge: These articles uncover insights from ancient texts, time keeping devices, and early scientific observations.

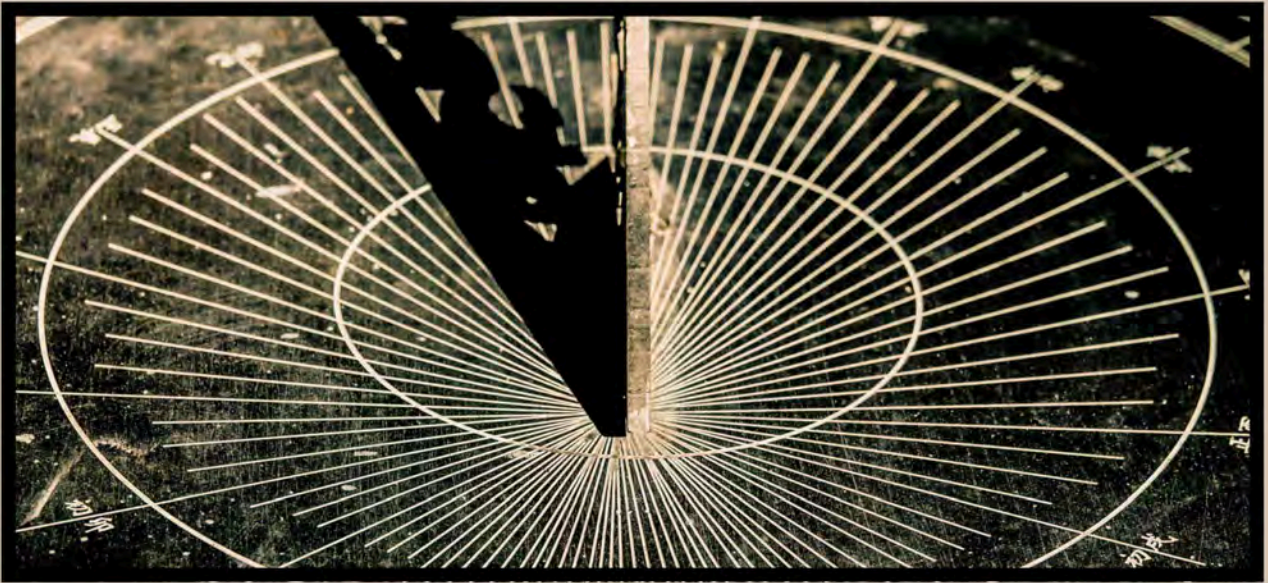
From Silicon to the Stars: India's Scientific Renaissance: This session shows a new beginning for India- a strong comeback of innovation, self-reliance, and scientific progress. It highlights how India is moving forward and becoming a global leader in science and technology.

The Forgotten Physicists of India: Unsung Heroes of Science- This segment brings to light the lives and work of lesser-known Indian physicists-from ancient sages to modern-era physicists, whose contributions to science and society. These articles celebrate their intellectual achievements and give them the recognition they truly deserve.

These sections not only celebrate our intellectual roots but also inspire a renewed respect for the depth and foresight of India's scientific past and powerful future.

EDITORIAL

ECHOES



PRANA: UNDERSTANDING THE ANCIENT UNIT OF TIME

- Kashish Mishra (Editorial Head)

Vedas are often called *apauruṣeya*. The word *apauruṣeya* means being unauthored. It is believed that the supreme power himself gave wisdom and various principles in the form of four vedas for the welfare of mankind. The knowledge was further delivered to *sūryadeva* then to Manu (मनु) and so on. The knowledge of veda was further explained by many sages of India. India is blessed with not only diverse culture but also diverse texts. We can find numerous works in the field of tantra, medicine, surgery, itihasa, politics, love, poetry, music, art, yoga, grammar, literature, mathematics, etc. We can find a number of research papers highlighting contributions of Indian minds in the above domain. But now the question arises, unlike philosophy did India also contribute to the field of science or whether this great land fosters profound discussion on science? The answer is yes. One can find extensive works related to astronomy and astrology. *Āryabhaṭīyaṃ*, *Vedāṅga Jyotiṣa*, *Siddhānta Śiromaṇi*, *Karaṇakutūhala* and many more. These treatises talk about planetary motion, position of planets, their moment, their orbital period and astronomical events. They also talk about time and space.

We can find a brief discussion about the universe and its age and various units of time (from atomic to cosmic level) not only in astronomical treaties but also in puranas and other books. In this article we will explore *Prāṇ*, a unit of time as mentioned in *Sūrya Siddhānta*. We will use *Sūrya Siddhānta* and *Āryabhaṭīyaṃ* some concept and definitions.

Kāla (time), in Indian philosophy is portrayed in the form of a wheel. According to this, time repeats itself over an interval of time. This cycle of creation, maintenance and destruction persisted through the ages and will continue endlessly. According to *Sūrya Siddhānta* time is multidimensional. *Sūrya Siddhānta* define time as:

लोकानामन्तकः कालः कालोन्यः कल्पनात्मकः।

स विधा सूक्ष्ममात्मानमसत्यामृत उच्यते॥

Sūrya Siddhānta categorise time into two types, first the destroyer of the world (संहारक) and the second is used for the calculations (गणनात्मक) The first category of time is beyond the human's imagination. It is called the destroyer, as the world is created, flourish and destroyed but time is eternal. The latter has a practical use and can be further divided into two, *mūrta* (very small, no device to measure) and *amūrta* (we can measure).

प्राणादिः कथ्यते मतः चयत्याद्योऽमृतसञ्ज्ञकः।

षष्टिः प्राणैः विनाड्याः स्थानतः षष्ट्या नाडिका स्मृता॥

According to Shloka 11 unit of time from *Prāṇa* and above is called *mūrta* and below *Prāṇa* to *Truṭi* is called *amūrta*. Six *Prāṇa* make one *Prāṇa* , sixty *Vināḍi* make one *Nāḍi*. Although the system of *Nāḍi*, *Vināḍi* and *Prāṇa*, is independent of hour, minute and second, still we can compare them.

Prāṇa refer to life energy, the vital breath (श्वास) as discussed in the *Padmasaṃhitā*, chapter 5 (*yogapāda*). In astronomy *prāṇa* is unit of time. It is also called *asu*. Time taken by a healthy person to breath in or out can be termed as *prāṇa* and was the smallest unit that can be measured at that time. Different texts define *prāṇa* differently. We will discuss three definitions of it in the article. The first definition is from *Sūrya Siddhānta*. It define *prāṇa* as one sixth of *vināḍi* as stated above.

The division of a sidereal day in terms of *Nāḍi*, *Vināḍi* and *Prāṇa* is can be summarized as:

1 Nakṣatra ahorātram (sidereal day) = 60 Nāḍi

1 Nāḍi = 60 Vināḍi

1 Vināḍi = 6 Prāṇa

One sidereal day contain 21600 *prāṇa*. Also, we know that one day contains 86400 seconds. Hence, one *prāṇa* is equal to 4 second (approx.). Let's consider shloka 2 of chapter 3 (*Kālakriyā Padā*) of *Āryabhaṭīyaṃ* written by Aryabhatta .

गुरुवक्षराणि षष्टिश्चविनाडिर्दिक्प्रकीर्तिता, षडेव वा प्राणाः ।

एवं कालविभागः क्षेत्रविभागस्तथा भगणात् ॥

Aryabhata define vināḍi as time taken to pronounce 60 long syllables with the moderate flow. Taking care of the definition of prāṇa as stated above we can define prāṇa as time taken to pronounce 10 long syllables (guru akshar). Here comes the second definition of prāṇa by Aryabhata. He defined it in terms of Chandaśāstra. Guru akshar are those letters in which long sound of vowels is required (example: संयुक्ताक्षर)

The third definition relates prāṇa to Nakṣatramaṇḍala. Nakṣatra is made up of two words naks (sky) and kshetra (region) or naksa (map) and tara (star). Hence, the Nakṣatra system is a way to divide the sky into the region. Moon our natural satellite, takes 27.3 days to complete one revolution around the earth. This is called Nakṣatramasa. A sidereal day (nakṣatra ahorātram) is the time it takes for the celestial sphere to complete one full rotation relative to the fixed stars, which is approximately 23 hours, 56 minutes, and 4 seconds. Taking into account the moon's revolution, ancient Indian astrologers divided the entire sky into 27 or 28 (sometimes) Nakṣatra. If we talk about Nakṣatramaṇḍala, Manthānabhairavatantra define it as circle of constellation. In simple words, we can say it is a sphere around earth containing all the constellations. Now we can define prāṇa in terms of movement of the Nakṣatramaṇḍala, one prāṇa is the time required by the Nakṣatramaṇḍala to traverse one minute of arc. "This is the method of division usually adopted in the astronomical text-books: it possesses the convenient property that its lowest subdivision, the respiration, is the same part of the day as the minute is of the circle. so that a respiration of time is equivalent to a minute of revolution of the heavenly bodies about the earth." This line is taken as it is from the The Sūrya Siddhānta A Text-Book of Hindu Astronomy, edited by Phanindralal Gangooly. The calculator part is done below:

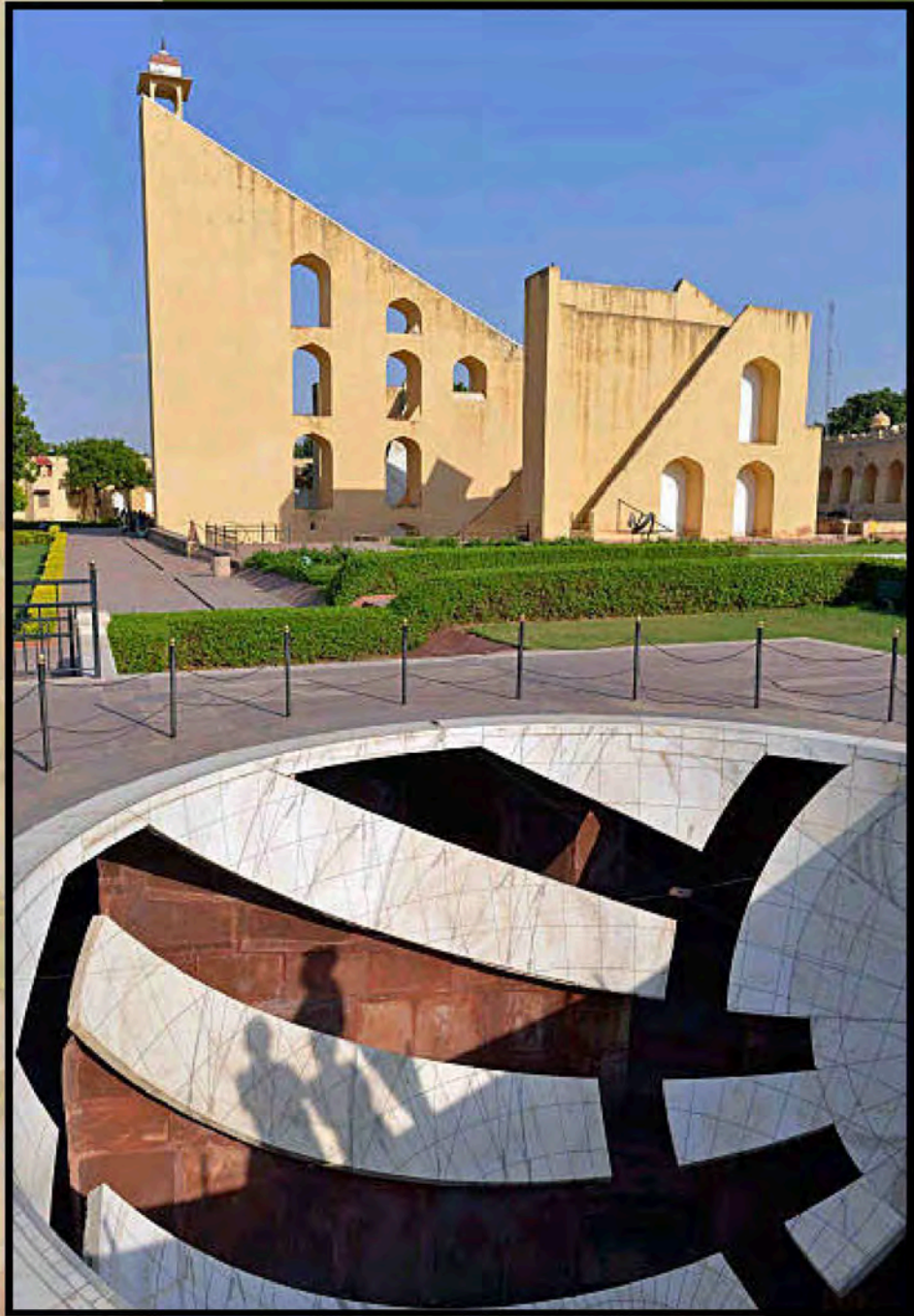
Nakṣatramaṇḍala = $360^\circ = 21600'$

Nakṣatr ahorātram = 21600 prāṇa

Therefore, 1 prāṇa = $0^\circ 1'$

So if we observe swati Nakṣatra on the Nakṣatramaṇḍala under powerful telescope or using some software we can observe that swati will move one arc minute in 1 prāṇa. Next time when you breath you may think the Nakṣatramaṇḍala moves 1 arc minute. This definition surely makes us question why ancient Indian astrologers were called mathematicians. The above relationship highlights the connection between human physiological processes and their cosmic moments as perceived in ancient India.. The article only describes one unit of time i.e. prāṇa used in ancient India using only two books, a lot more needs to be researched. Hope this article will inspire the young minds to research in the field of astronomy and explore the ancient astronomical treaties.

Echoes of Astronomy in Jaipur's Observatory



Jaipur, a city known for its culture, craft and heritage also known as the pink city of India was founded by the Rajput king Sawai Jai Singh II in the early 18th century. The remarkable monarch of Jaipur, was a mathematician, an astronomer, and a town planner par excellence. While the rest of the world was engaged in winning battles of land, Maharaja was passionate to discover the secrets that the sky held. He was a great scholar which eventually led him to build the Jantar Mantar. It is a testament of the architectural brilliance and astronomical innovations of the Rajput era. The name Jantar Mantar is derived from Sanskrit language 'Jantar' from 'Yantra', meaning instrument or machine, and 'Mantra' from 'Mantrana' meaning to consult or calculate.

Therefore, in literal translation, Jantar Mantar means 'The instrument used for calculation'. Maharaja constructed total 5 Jantar Mantar across India - first one in Delhi then in Mathura, Varanasi, Ujjain, and lastly the largest and the most accurate one in the heart of Jaipur which was completed in 1734. It is one of the largest astronomical laboratories in the world. It is no longer a working science centre but is maintained as a monument. The monument is an imposing collection of nineteen astronomical instrument which were used in that time for determining weather, local time, planetary positions, eclipses and measuring the position and distance of celestial bodies. These instruments were mainly constructed out of local stone and marble as they do not get affected by the weather as metals do get, spread over about 18,700 square meters. Each of these astronomical instruments carries an astronomical scale, generally marked on the marble inner lining. Bronze tablets, bricks and mortar, were also used in the construction of these instruments. This stone observatory includes complex instruments whose settings and shapes are scientifically designed, illustrating the glorious past of the Indian Astronomy. These 19 instruments are structures carved out of stone, depicting interesting geometric shapes.

Popular structures inside the monument are -

- **Dhruvdarshak Pattika:** Here 'Dhruva' meaning Polar Star, and 'Dharshak Pattika' meaning Viewing plate. The Dhruvadarshak Pattika is perhaps the simplest of all the instruments found in the observatory. It is in the form of a small trapezoidal structure whose upper surface points towards the Pole Star on a clear dark night. The angle in the triangular wall is equal to the latitude of Jaipur which is 27degrees North. This instrument was the compass of an earlier age.
- **Yantra Raj:** Here 'Yantra' meaning instrument, and 'Raj' meaning king, translating to the "king of instruments". Yantra Raj was a large bronze astrolabe that projected a stereographic image of the sky onto the equator, as an alloy it does not get affected by the weather. It used naked eye sights to observe the sky and to fix a star in the frame of the cube and note the corresponding reading on the dial. It is used in the night to find the position of the constellation such as the sun, moon, stars, and planets. It was also used to calculate time and the Hindu calendar. It has the names of all 27 constellation around it, where central hole in it represents Jaipur and 27 degrees below it has the equator line and the hole above the central hole represents North Pole from where all the longitudinal and latitudinal lines pass through, and a circular scale is present around the disc of 360 degrees.
- **Nadivalaya:** The Nadivalaya is a sundial which was designed to measure time and the sun's movement across the equator. The Nadivalaya is made of two circular plates, one facing north and the other one facing south. Iron rods, called gnomons, are mounted at the center of each plate and point towards the poles. The gnomon's shadow on the dial indicates the local solar time. The Nadivalaya is used at different times of the year, depending on which face is sunlight. It is a six-month working clock. Nadivalaya symbolizes the two hemispheres of Earth. Although during the time of

equinox both the clocks do not work, hence Maharaja constructed a small sundial on the ceiling of the instrument.

- **Jaya Prakash Yantra:** Here 'Jaya' is the name of the Maharaja, 'Prakash' meaning light/sky, and 'Yantra' meaning instrument. This yantra includes two hemispherical bowls like sundials with graded marble slabs which are complementary to each other. Both the bowls work on the shadows casted on them by a metal plate which is why both the bowls are in working for one hour each. The elevation, azimuth, hour angles and exact position of heavenly bodies are detected using the inverted image of the sky, and the movement of the inverted shadows on the slabs. The bowls have segments cut out of them so that the observers could move around them to measure the position of the shadow of the star/planet being watched.
- **Ram Yantra:** Ram Yantra measures the elevation and azimuth of Sun and planets, and consists of a pair of tube-shaped structures, open to the sky. Each tube-shaped structure has a pole of equal height at the centre. Scales indicating angles of altitude and azimuth of the celestial bodies are inscribed inside the walls of these structures. Ram Yantra is only found in Jantar Mantar of Jaipur and New Delhi.
- **Chakra Yantra:** Here 'Chakra' meaning Circle/ring and 'Yantra' meaning Instrument. The chakra yantra as the name suggests is a ring instrument that measures the coordinates and the hour angle of Sun.
- **Laghu Smarat Yantra:** Here Laghu means 'Small', Smarat Yantra means 'Supreme Instrument'. It is a sundial used to calculate the time. This instrument is smaller in size, and measures the local time up to the accuracy of twenty seconds. The ramp of this sundial points towards the North Pole, so the local time in Jaipur can be easily calculated by measuring the position of ramp's shadow on the divisions of the carved scale.
- **Vrihat Smarat Yantra:** Here 'Vrihat' means Large/Great, 'Samrat Yantra' Supreme instrument an equinoctial sundial. This instrument can give the time to an accuracy of up to 2 seconds. This 27m long structure is the tallest sundial in the world. The shadow of the triangular wall, which is placed in the North-South direction with an angle equal to the latitude of Jaipur, moves equal distances in equal time intervals, on the eastern and western side quadrants. The western and eastern quadrants are divided into 6 hours each, for the morning and the afternoon segments respectively. Each hour is divided in 15 minutes and later in 1 minute parts. The minute part has ten subdivisions each of 6 seconds each of which again has three small divisions of 2 seconds each.

As we see this laboratory was designed almost 300 years ago with so much accuracy till today. It shows how India was not just astonishing people with its diverse cultural but also with its amazing scientific brilliance. From Aryabhata to Kalam, Indians have always shown remarkable achievements that reflects India's rich history in science and innovation. As once respected C.N.R. Rao said: "Build a strong base, The journey to peaks of excellence requires a strong base camp".

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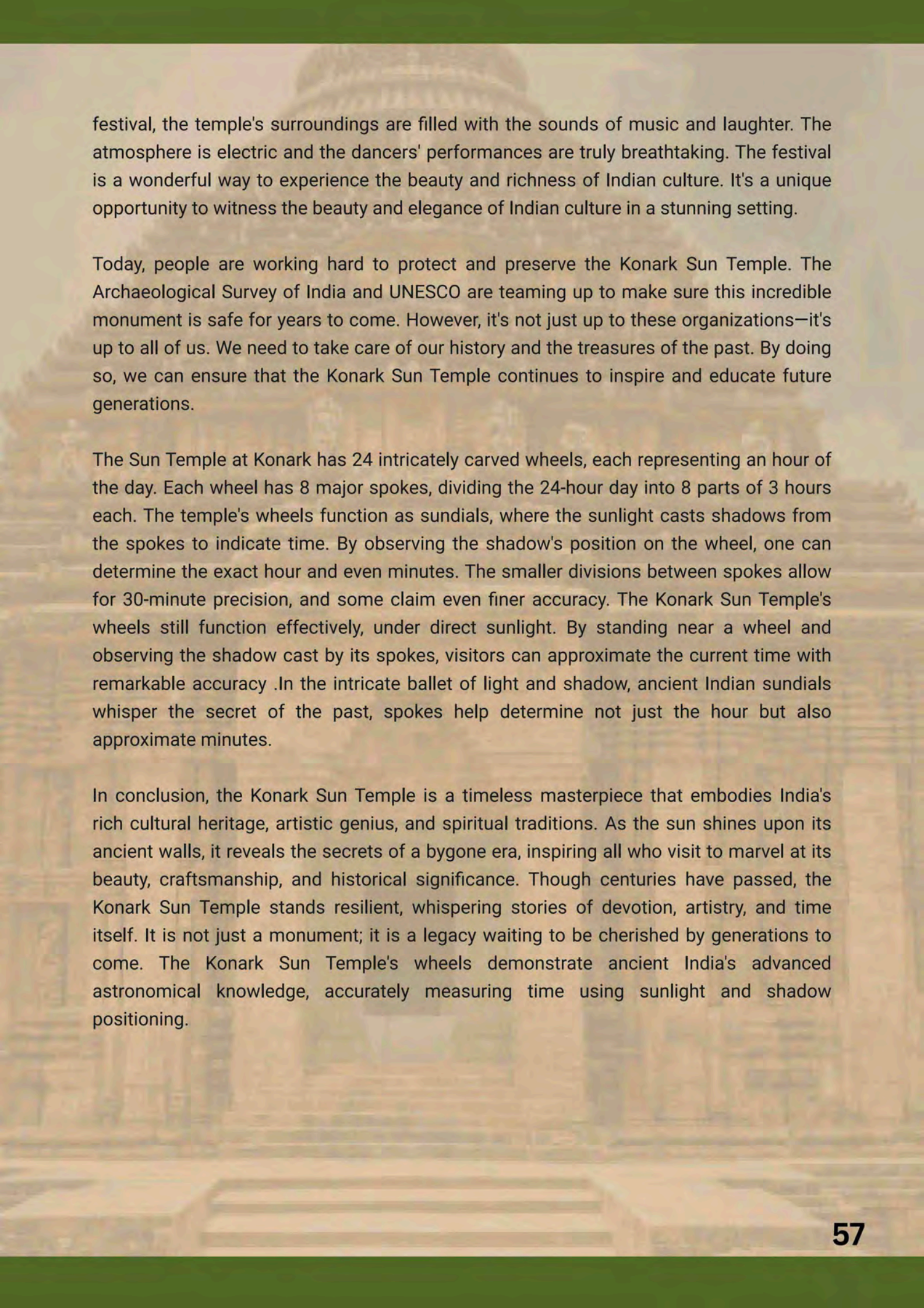
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Konark: The Temple That Told Time



A breathtaking aerial view, the first ray of the sun kisses the magnificent Konark Sun Temple in Odisha, India. The golden light bathes the temple, highlighting its beautiful sculpture. Rising from the sands of time, standing as a testament to India's glorious past, the Konark Sun Temple is an architectural marvel and a symbol of devotion to Suryadev, the Sun God. Built in the 13th century, this UNESCO, World Heritage Site, continues to mesmerize historians, artists and travelers from all over the world.

The Konark Sun Temple was built by "King Narasimhadeva I". According to legend, 1,200 skilled artisans spent 12 years creating this magnificent temple. The temple was designed to look like a giant chariot for the Sun God, Suryadev.



festival, the temple's surroundings are filled with the sounds of music and laughter. The atmosphere is electric and the dancers' performances are truly breathtaking. The festival is a wonderful way to experience the beauty and richness of Indian culture. It's a unique opportunity to witness the beauty and elegance of Indian culture in a stunning setting.

Today, people are working hard to protect and preserve the Konark Sun Temple. The Archaeological Survey of India and UNESCO are teaming up to make sure this incredible monument is safe for years to come. However, it's not just up to these organizations—it's up to all of us. We need to take care of our history and the treasures of the past. By doing so, we can ensure that the Konark Sun Temple continues to inspire and educate future generations.

The Sun Temple at Konark has 24 intricately carved wheels, each representing an hour of the day. Each wheel has 8 major spokes, dividing the 24-hour day into 8 parts of 3 hours each. The temple's wheels function as sundials, where the sunlight casts shadows from the spokes to indicate time. By observing the shadow's position on the wheel, one can determine the exact hour and even minutes. The smaller divisions between spokes allow for 30-minute precision, and some claim even finer accuracy. The Konark Sun Temple's wheels still function effectively, under direct sunlight. By standing near a wheel and observing the shadow cast by its spokes, visitors can approximate the current time with remarkable accuracy. In the intricate ballet of light and shadow, ancient Indian sundials whisper the secret of the past, spokes help determine not just the hour but also approximate minutes.

In conclusion, the Konark Sun Temple is a timeless masterpiece that embodies India's rich cultural heritage, artistic genius, and spiritual traditions. As the sun shines upon its ancient walls, it reveals the secrets of a bygone era, inspiring all who visit to marvel at its beauty, craftsmanship, and historical significance. Though centuries have passed, the Konark Sun Temple stands resilient, whispering stories of devotion, artistry, and time itself. It is not just a monument; it is a legacy waiting to be cherished by generations to come. The Konark Sun Temple's wheels demonstrate ancient India's advanced astronomical knowledge, accurately measuring time using sunlight and shadow positioning.

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खगोल विज्ञान और महाकुंभः अद्भुत ब्रह्मांडीय संयोग



भारतीय संस्कृति में महाकुंभ का एक विशेष महत्व है। यह न केवल आध्यात्मिक और धार्मिक दृष्टिकोण से महत्वपूर्ण है, बल्कि वैज्ञानिक दृष्टिकोण से भी यह एक रोचक विषय है। खगोल विज्ञान और महाकुंभ के बीच एक गहरा संबंध विद्यमान है, जो भारतीय ज्योतिष, ग्रहों की गति और ब्रह्मांडीय घटनाओं से संबंधित है।

महाकुंभ मेला प्रत्येक 12 वर्ष में आयोजित किया जाता है और इसका आयोजन चार प्रमुख स्थलों—हरिद्वार, प्रयागराज, नासिक और उज्जैन—में किया जाता है। इसका निर्धारण खगोल विज्ञान के सिद्धांतों पर आधारित होता है, जिसमें ग्रहों की स्थिति, विशेष रूप से बृहस्पति, सूर्य और चंद्रमा की स्थितियों का महत्वपूर्ण योगदान होता है। यह ज्ञात करना आवश्यक है कि खगोल विज्ञान महाकुंभ मेले के साथ किस प्रकार जुड़ा हुआ है और यह ब्रह्मांडीय संयोग कितना अद्भुत है।

महाकुंभ मेला 2025 का खगोलीय संयोग 144 वर्षों में एक बार होता है, जो इसे अत्यंत विशेष बनाता है।

कुम्भ क्या है ?

- कुम्भ मेला हिन्दू धर्म का एक महत्वपूर्ण पर्व है
- यह पवित्र आयोजन भारत में चार स्थानों - हरिद्वार, उज्जैन, नासिक और प्रयागराज में होता है और इनमें से प्रत्येक नगर पवित्र नदी के किनारे स्थित है।
- इनमें गंगा से लेकर क्षिप्रा, गोदावरी और प्रयागराज में गंगा, यमुना और पौराणिक सरस्वती का संगम है।
- जिसमें करोड़ों श्रद्धालु कुम्भ पर्व में एकत्र होते हैं और नदी में स्नान करते हैं।
- खगोल गणनाओं के अनुसार यह मेला मकर संक्रान्ति के दिन प्रारम्भ होता है, जब सूर्य और चन्द्रमा, वृश्चिक राशि में और बृहस्पति, मेष राशि में प्रवेश करते हैं।
- यह समय आध्यात्मिक स्वच्छता और आत्म-ज्ञान के लिए शुभ अवधि का संकेत माना जाता है।
- इनमें से प्रत्येक स्थान पर प्रति 12 वें वर्ष तथा प्रयाग में दो कुम्भ पर्वों के बीच छह वर्ष के अन्तराल में अर्धकुम्भ भी होता है।
- वर्ष 2013 का कुम्भ प्रयाग में हुआ था।

कुंभ मेल का इतिहास

- कुंभ मेले की जड़ें हजारों साल पुरानी हैं, जिसका प्रारंभिक उल्लेख वेदों तथा मौर्य और गुप्त काल (चौथी शताब्दी ईसा पूर्व से छठी शताब्दी ईस्वी) के दौरान मिलता है।
- इसमें पूरे भारतीय उपमहाद्वीप से तीर्थयात्री आते थे।
- गुप्तकाल के शासकों ने प्रतिष्ठित धार्मिक मंडली के रूप में इसकी स्थिति को और ऊंचा कर दिया।
- मध्य काल के दौरान, कुंभ मेले को विभिन्न शाही राजवंशों से संरक्षण प्राप्त हुआ, जिनमें दक्षिण में चोल और विजयनगर साम्राज्य, उत्तर में दिल्ली सल्तनत, मुगल और अन्य राजपूत शासकों का संरक्षण मिला।
- औपनिवेशिक काल में, ब्रिटिश प्रशासकों ने इस उत्सव को देखा और इसके विशाल पैमाने और इसमें आने वाली विविध सभाओं से आश्चर्यचकित होकर इसका दस्तावेजीकरण किया।
- स्वतंत्रता के बाद, महाकुंभ मेले को और भी अधिक महत्व प्राप्त हुआ, जो राष्ट्रीय एकता और भारत की समृद्ध सांस्कृतिक विरासत का प्रतीक है।

महाकुंभ का खगोल वैज्ञानिक आधार

बृहस्पति और कुंभ राशि का संबंध

महाकुंभ का आयोजन उस समय होता है जब बृहस्पति ग्रह कुंभ राशि में प्रवेश करता है। बृहस्पति, जिसे गुरु ग्रह के नाम से भी जाना जाता है, लगभग 12 वर्षों में सभी राशियों की परिक्रमा पूरी करता है। जब यह कुंभ राशि में होता है और सूर्य मकर राशि में होता है, तब प्रयागराज में महाकुंभ का आयोजन किया जाता है।

इसी प्रकार, अन्य स्थानों पर महाकुंभ के आयोजन के लिए विभिन्न ग्रहों की स्थितियों का विशेष ध्यान रखा जाता है। उदाहरण के लिए:

हरिद्वार कुंभ तब आयोजित होता है जब बृहस्पति कुंभ राशि में और सूर्य मेष राशि में होता है।

खगोल विज्ञान और पौराणिक कथाएं

भारतीय पौराणिक कथाओं के अनुसार, समुद्र मंथन के दौरान देवताओं और असुरों द्वारा अमृत कलश की प्राप्ति के लिए संघर्ष हुआ। इस प्रक्रिया में भगवान विष्णु ने अमृत की रक्षा हेतु उड़ान भरी, और उनकी यात्रा के दौरान अमृत की कुछ बूंदें चार स्थानों—हरिद्वार, प्रयागराज, नासिक और उज्जैन—में गिर गईं। इसी कारण इन स्थानों पर कुंभ मेले का आयोजन किया जाता है। इसके अतिरिक्त, इस पौराणिक कथा का खगोल वैज्ञानिक दृष्टिकोण से भी विश्लेषण किया जा सकता है। समुद्र मंथन को सौरमंडल में ग्रहों और तारों की गति तथा गुरुत्वाकर्षण बल के संदर्भ में देखा जा सकता है। ग्रहों की परिक्रमा

और गुरुत्वाकर्षण बल के प्रभाव से विभिन्न खगोलीय घटनाएँ उत्पन्न होती हैं, जो पृथ्वी के जल, समुद्र की लहरों और पर्यावरण पर प्रभाव डालती हैं। अतः अमृत कलश की धारणा को धूमकेतुओं (Comets) और उल्कापिंडों (Meteors) से भी संबंधित किया जा सकता है। प्राचीन खगोलविदों का मानना था कि अंतरिक्ष में विचरण करने वाले धूमकेतु और उल्कापिंड ब्रह्मांडीय ऊर्जा और जीवन के वाहक हो सकते हैं। यूनेस्को द्वारा 2017 में कुम्भ को मानवता की अमूर्त सांस्कृतिक विरासत के रूप में मान्यता प्राप्त है।

महाकुंभ और खगोलीय घटनाएँ

महाकुंभ के अवसर पर कई महत्वपूर्ण खगोलीय घटनाएँ घटित होती हैं, जो इसे और अधिक रोचक बनाती हैं:

(क) सूर्य और चंद्र ग्रहण: महाकुंभ के समय प्रायः सूर्य या चंद्र ग्रहण का अवलोकन किया जाता है। भारतीय परंपरा में ग्रहणों का विशेष महत्व है और इन्हें आध्यात्मिक दृष्टि से महत्वपूर्ण माना जाता है। ग्रहणों के दौरान मंदिरों में विशेष पूजा-अर्चना का आयोजन किया जाता है और संगम में स्नान का विशेष महत्व होता है।

(ख) धूमकेतु और उल्कापिंड वर्षा: महाकुंभ के आसपास धूमकेतु और उल्कापिंड वर्षा का अवलोकन भी किया जा सकता है। खगोल विज्ञानियों के अनुसार, जब कोई धूमकेतु सूर्य के निकट आता है, तो उसकी पूंछ में उपस्थित कण पृथ्वी के वायुमंडल में प्रवेश कर चमकदार उल्काओं के रूप में प्रकट होते हैं।

(ग) ग्रहों की युति और विशेष स्थितियाँ: महाकुंभ के दौरान विभिन्न ग्रहों की युति का विशेष महत्व होता है। जब दो या अधिक ग्रह एक सीध में आते हैं, तो उनका प्रभाव पृथ्वी पर अधिक अनुभव किया जाता है। इस समय वातावरण में ऊर्जा प्रवाह में वृद्धि होती है, जिसका प्रभाव मानवीय चेतना पर भी पड़ता है।

महाकुंभ: विज्ञान और आध्यात्म का संगम

महाकुंभ केवल एक धार्मिक आयोजन नहीं है, बल्कि यह विज्ञान और आध्यात्म का एक अद्वितीय संगम भी है। यह आयोजन यह स्पष्ट करता है कि प्राचीन भारतीय खगोलज्ञों को ग्रहों और तारों की गति का गहन ज्ञान था। वे यह समझते थे कि ब्रह्मांड में होने वाली घटनाएँ पृथ्वी और जीवों पर गहरा प्रभाव डालती हैं।

इस समय आधुनिक खगोल विज्ञान भी इस तथ्य को स्वीकार करता है कि ग्रहों और तारों की ऊर्जा का प्रभाव हमारे जीवन पर पड़ता है। सूर्य की गतिविधियाँ (जैसे सौर तूफान), पृथ्वी के चुंबकीय क्षेत्र में परिवर्तन और अंतरिक्षीय विकिरण सभी जीवों के स्वास्थ्य, मनोविज्ञान और पर्यावरण को प्रभावित करते हैं।

निष्कर्ष

प्राचीन भारतीय ऋषियों और खगोलविदों ने इस अद्भुत संयोग को हजारों वर्ष पूर्व ही समझ लिया था। वर्तमान में, जब आधुनिक विज्ञान ब्रह्मांड की गूढ़ रहस्यमयी घटनाओं को समझने का प्रयास कर रहा है, तब महाकुंभ जैसे आयोजनों में छिपे वैज्ञानिक तथ्यों की पुनर्व्याख्या करना आवश्यक हो जाता है।

अतः, महाकुंभ केवल एक धार्मिक अनुष्ठान नहीं है, बल्कि यह खगोल विज्ञान और ब्रह्मांडीय ऊर्जाओं का अद्भुत संगम भी है। यह हमें यह दर्शाता है कि ब्रह्मांड में सभी चीजें एक विशेष व्यवस्था के तहत संचालित होती हैं, और यह व्यवस्था न केवल हमारी आध्यात्मिक यात्रा में, बल्कि वैज्ञानिक खोजों में भी महत्वपूर्ण भूमिका निभाती है।

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EDITORIAL

ECHOES



ILMT: INDIA'S LEAP INTO ASTRONOMICAL FRONTIER

- Draksha Singh (Editorial Head)

India's firm resolve to widen the scope of its research endeavors is inspiring not only to the budding young scientists of the country but also to the rest of the world. A remarkable testament of this resolve is Asia's largest and India's first optical survey telescope, the International Liquid Mirror Telescope (ILMT). Located at an altitude of 2,450 metres atop Devasthal, a hill in Uttarakhand at the Devasthal Observatory Campus of Aryabhata Research Institute of Observational Sciences (ARIES) in Nainital, Uttarakhand. It has expanded the prospects of astronomical observations in the country.

Commissioned in 2022 and inaugurated in March 2023, ILMT is a collaborative project involving scientists from India (represented by ARIES), Belgium, Poland, Uzbekistan and Canada. The ILMT is fully operational now and has been primarily designed for exploring the deep sky to identify transient or variable objects such as supernovae, gravitational lenses, space debris, and asteroids.

Working

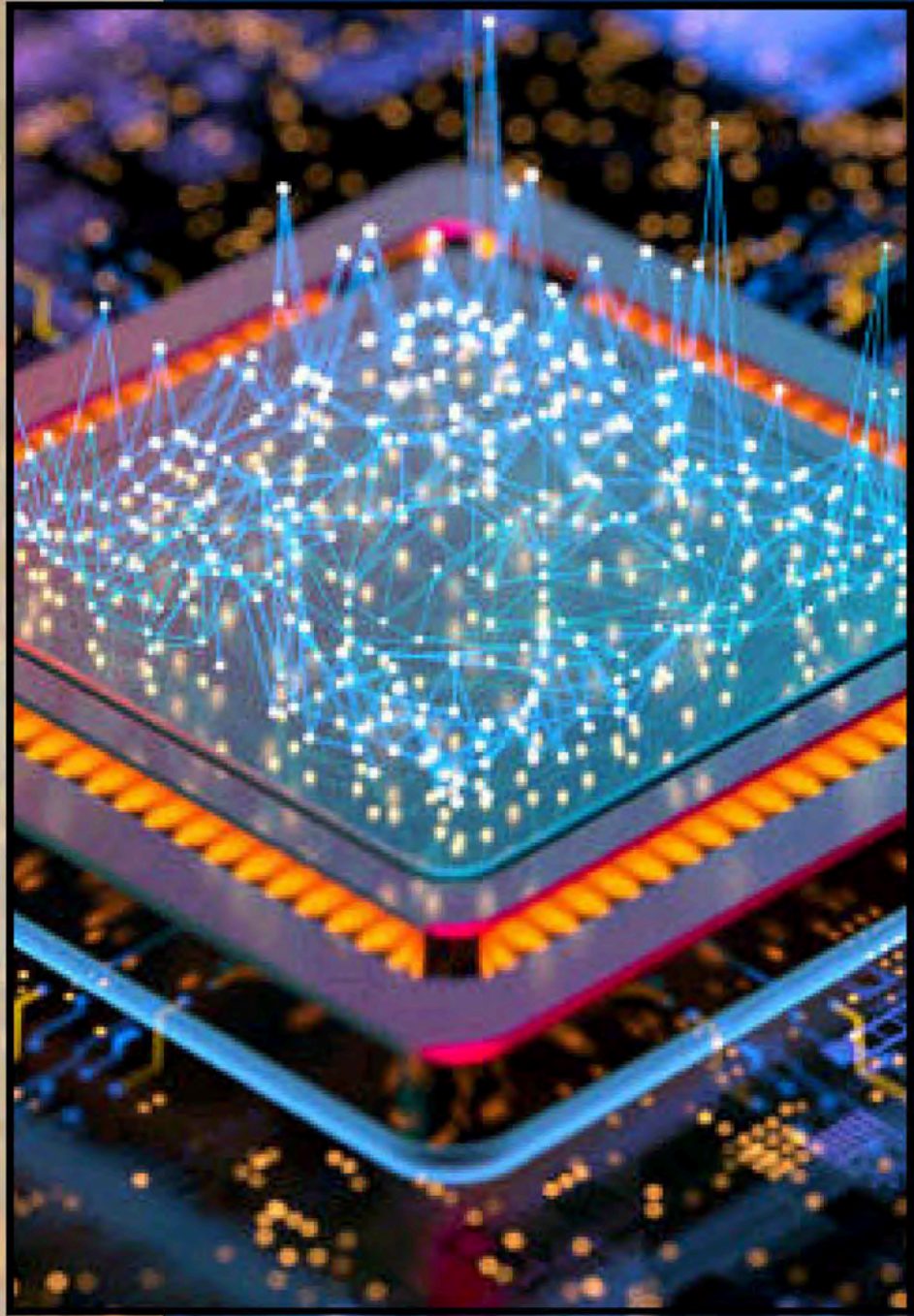
The instrument employs a 4 meter diameter rotating mirror consisting of a thin film of liquid mercury, which is a highly reflective metal, to collect and focus light. The parabolic mirror shape is ideal for focusing light. A thin transparent film of mylar is kept to protect the mercury from the wind. The reflected light passes through a sophisticated multi-lens optical corrector that produces sharp images over a wide field of view. A large-format electronic camera located at the focus records the images.

The rotation of the earth causes the images to drift across the camera, this motion is compensated electronically by the camera. Such a methodology of operating increases the observing efficiency and makes the telescope particularly sensitive to faint and diffuse objects. It is also the first telescope in India to have been equipped with an artificial intelligence (AI) system which is able to classify objects in the sky.

Prof. Dipankar Banerjee, Director, ARIES, stated, "I am hopeful that this project will attract and motivate several young minds from scientific and engineering backgrounds to take up challenging problems." During the period of its commission, in June 2022, the ILMT was estimated to produce about 10 GB of data every night when the science operations began. This data would be quickly analyzed to reveal variable and transient stellar sources. In June 2022, Project Director Prof. Jean Surdej (University of Liège, Belgium and University of Poznan, Poland), had noted, "The data collected from ILMT will be ideally suited to perform a deep photometric and astrometric variability survey over a period of typically 5 years."

The inauguration of the Indian Liquid Mirror Telescope (ILMT) marks the beginning of a notable era of scientific exploration and new and determined ventures for India. It shines like a ray of promise and hope to the dreamers, researchers in India that aspire to solve difficult challenges and carve their niche in the world.

India's Chip Mission: Powering Self-Reliance



Electronics are ubiquitous in our lives and are constant companions to our lifestyle choices. They are powered by the humble semiconductor, acting as the powerhouse of all electronics products we use today. The semiconductor industry is the aggregate of companies engaged in the design and fabrication of semiconductors and semiconductor devices, such as transistors and integrated circuits.

In the early twenty-first century; foreign investment, government regulations and incentives promoted growth in the Indian electronics industry. The semiconductor industry, which is its most important and resource-intensive sector, profited from the rapid growth in domestic demand. Many industries, including telecommunications, info-

telecommunications, information technology, automotive, engineering, medical electronics, electricity and solar photovoltaic, defence and aerospace, consumer electronics, and appliances, required semiconductors. However, as of 2015, progress was threatened by the talent gap in the Indian sector, since 65 to 70 percent of the market was dependent on imports.

“Atmanirbhar Bharat” (Self-Reliant India) is significantly driving India’s push to boost its domestic semiconductor industry, aiming to reduce reliance on imports and establish itself as a major player in the global semiconductor market by actively promoting domestic manufacturing and building a robust semiconductor ecosystem.

Semiconductors are the backbone of electronics manufacturing, a sector targeted by the **Indian Government's initiative to establish India as a global leader in semiconductor manufacturing :**

- **INDIA SEMICONDUCTOR MISSION (ISM) :** The ISM was launched in 2021 with a total financial outlay of Rs76,000 crore under the aegis of the Ministry of Electronics and IT (MeiTY). It is part of the comprehensive program for the development of sustainable semiconductor and display ecosystems in the country. The programme aims to provide financial support to companies investing in semiconductors, display manufacturing and design ecosystem. Envisioned to be led by global experts in the Semiconductor and Display industry, ISM will serve as the nodal agency for efficient, coherent and smooth implementation of the schemes. Four schemes have been introduced under the India Semiconductor Mission: Modified Scheme for setting up of Semiconductor Fabs in India: It offers 50% fiscal support for Silicon CMOS-based semiconductor fabs, aiming to attract large investments and strengthen the country’s electronics manufacturing ecosystem and value chain panels, strengthening the country's electronics manufacturing ecosystem. Modified Scheme for setting up Compound Semiconductor and ATMP facilities in India: The 'Modified Scheme for setting up Compound Semiconductor and ATMP facilities in India' provides 50% fiscal support for capital expenditure on establishing Compound Semiconductor, Silicon Photonics, Sensors, and Discrete Semiconductor fabs. Semicon India Future Design: Design Linked Incentive Scheme: The 'Semicon India Future Design: Design Linked Incentive Scheme' offers financial support for semiconductor design, providing up to 50% incentives on expenses (₹15 crore limit) and 6%-4% on net sales turnover over five years (₹30 crore limit).
- **Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS):** This scheme aims to enhance India’s manufacturing ecosystem for electronic components and semiconductors. With a growing market that reached \$20.8 billion in 2018-19 and is expected to hit \$200 billion by 2025, India is well-positioned to become a global hub, supported by skilled labor, improved infrastructure, and government initiatives.

The scheme will boost domestic demand, increase value addition, and create jobs in the sector.

- **Production Linked Incentive Scheme (PLI) for Large Scale Electronics Manufacturing:** The PLI for Large Scale Electronics Manufacturing proposes a financial incentive to boost domestic manufacturing and attract large investments in the electronics value chain including mobile phones, electronic components and ATMP units.
- **Production Linked Incentive Scheme (PLI) for IT Hardware:** The Production Linked Incentive Scheme for IT Hardware proposes a financial incentive to boost domestic manufacturing and attract large investments in the value chain. The scheme seeks to incentivise companies to utilise the existing installed capacity to fulfill the increasing domestic demand.
- **Modified Electronics Manufacturing Clusters (EMC 2.0) Scheme:** EMC 2.0 Scheme aims to enhance infrastructure for India's electronics industry, promoting supply chain efficiency and reducing logistics costs. It offers financial incentives for building quality infrastructure and common facilities for manufacturers.

Emerging Startups:

India's startup ecosystem is thriving, and it's making significant inroads into semiconductor-related fields. Startups are developing innovative solutions in areas such as semiconductor design, analog and mixed-signal design, and semiconductor IP development. This entrepreneurial spirit is vital for fostering innovation.

Semiconductor startups are pivotal to India's aspirations of becoming a global semiconductor manufacturing and design hub. Their role in driving innovation, creating jobs, and promoting technological self-reliance is crucial for the nation's semiconductor goals. These startups act as engines of innovation, developing advanced silicon designs that cater to emerging technologies such as AI processors, IoT-enabled devices, and 5G/6G chips. By pushing the boundaries of technological advancements, they address domestic needs and global market demand. Their innovation ability positions them as key players in India's efforts to become a global semiconductor industry leader.

Mindgrove Technologies, for example, specialises in System-on-Chip (SoC) design and has received support from government programmes and private investors. With this backing, the company has developed high-performance SoCs for consumer electronics and defence industries, focusing on power-efficient designs for AI and IoT applications.

Similarly, InCore Semiconductors has made a name for itself with its RISC-V based processors, pivotal in edge computing and AI chip design for sectors like automotive and telecommunications. Supported by venture capital and Government initiatives, InCore has successfully developed custom silicon solutions using open-source architectures. Reducing reliance on expensive proprietary technologies. This highlights how well-directed funding can fuel technological innovation and scalability, enabling startups to compete globally.

Importance of Semiconductor :

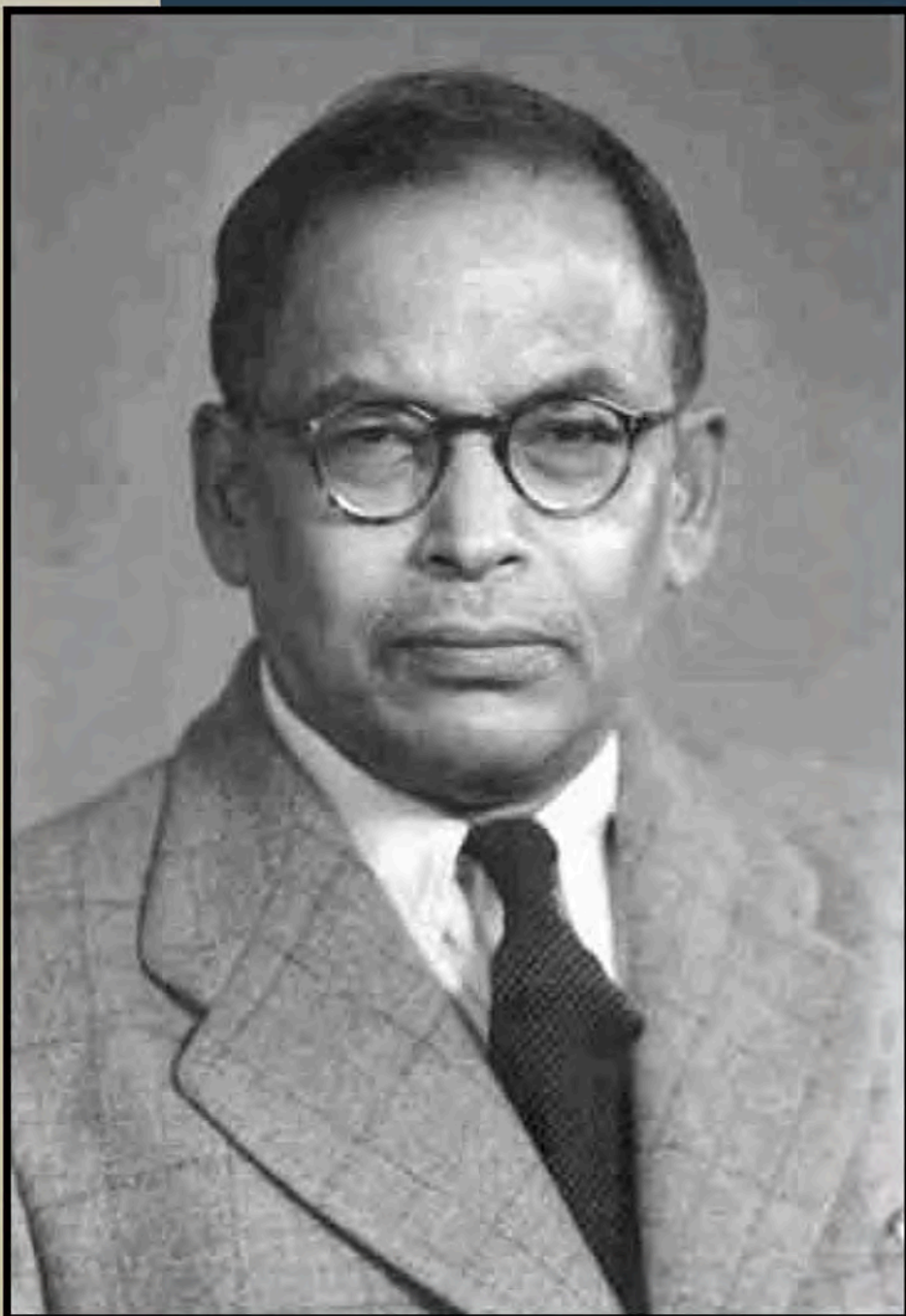
A critical strategic importance of semiconductors in achieving self-reliance is that they are the foundational building blocks of modern technology, allowing a nation to control its own critical infrastructure, defence systems, and communication networks, thus reducing dependence on foreign suppliers and enhancing national security by ensuring a stable supply of essential components; essentially, developing domestic semiconductor capabilities fosters technological sovereignty and independence.

- **Economic Growth and Industrial Development:** Semiconductors are crucial for India's economic growth, particularly in the electronics manufacturing sector.
- **National Security and Strategic Autonomy:** Semiconductors are vital for national security, especially in defence and telecommunications sectors. By developing domestic semiconductor capabilities, India can ensure a stable supply for critical defence systems and secure communication networks.
- **Technological Self-Reliance and Innovation:** Developing a robust semiconductor ecosystem can significantly enhance India's technological self-reliance.
- **Job Creation and Skill Development:** The semiconductor industry, while capital-intensive, has the potential to create high-quality jobs and drive skill development in India.

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Meghnad Saha: The Luminary of India



Physics is the quest to uncover the laws that shape the fabric of existence and our place within it. It is a culmination of the thoughts, ideas and observations of generations of men and women, some who have even dedicated their lives to it. Many of them contributed to physics despite the social challenges of their time. From the Catholic church banning anti-Christian ideas like the heliocentric model of the solar system, or sexism, homophobia, racism or casteism of the time prohibiting scientists from sharing their thoughts, getting credit or acknowledgement or just exercising their basic rights. Unfortunately, science, despite being the most objective form of understanding the natural world, has historically been riddled with societal evils which has hindered the

growth of the progression of society and our understanding of the world by decades. People of favourable ethnicities, castes, colour, race, genders, sexualities and even political ideologies have been the ones who were and still are considered to be the pioneers of physics. It is now time we acknowledge and talk about the contributions of the unsung physicists who were from historically marginalised communities and have received little to no acknowledgement of their work in the past or the present. In the current relatively progressive society we live in, it becomes important to finally commemorate their efforts and contribution to physics. These physicists have clearly pursued their education not for financial or personal gain but to find the laws that shape our existence. Their view of physics is the true essence of the subject. Thus, the stories and contributions of the forgotten physicists of the world must be brought to the attention of the present and the future generations of physicists.

One such forgotten physicist, despite his significant contribution to astrophysics and statistical mechanics, is just a page in the books. Dr. Meghnad Saha. Born in a low caste Hindu Bengali family to a poor shopkeeper in Sheoratali, Gazipur (present day Bangladesh) in 1893, Saha was born into a life of prejudice. From untouchability to the severe lack of basic amenities, he had weathered every storm. The superstitious religious ideologies of the orthodox Brahmins of the time, made Saha develop a rebellious heart and a hatred for Hinduism from a very young age which isolated him socially. He faced discrimination due to his caste throughout his education. Communal students at the Eden Hindu Hostel objected to him sitting and eating in the same dining hall as the rest of the students. He was even forced to leave his school after his participation in the Swadeshi movement. Despite these challenges he persisted nonetheless through his sheer determination and undying passion for physics.

At the age of thirty he became a professor at Allahabad University and later a Dean of Faculty of Science at the University of Calcutta. In 1927 he became a Fellow of the Royal Society. A groundbreaking discovery made by Dr. Meghnad Saha was his equation on the first and second ionisation of elements in thermal equilibrium according to temperature and pressure more famously known as the "Saha equation". This was a huge breakthrough in the astrophysics community as this equation helped us begin to understand the stellar spectrum and equilibrium ionization (described by the Saha equation) which explained evolution in the early universe. After the Big Bang, all atoms were ionized, leaving mostly protons and electrons. According to Saha's approach, when the universe had expanded and cooled such that the temperature reached about 3000 K, electrons recombined with protons forming hydrogen atoms. At this point, the universe became transparent to most electromagnetic radiation. That 3000 K surface, red-shifted by a factor of about 1000, generates the 3 K cosmic microwave background radiation, which pervades the universe today. He is also responsible for the invention of an instrument that can measure the weight and pressure of solar rays.

Dr Meghnad Saha helped establish several scientific institutions, including the Physics Department at Allahabad University. He founded the journal “Science and Culture” and was its editor until his death. He was the leading figure in organising several scientific societies, such as the National Academy of Science, the Indian Physical Society, and the Indian Institute of Science. He was the director at Indian Association for the Cultivation of Science. The Saha Institute of Nuclear Physics, founded in 1943 in Kolkata, is named after him.

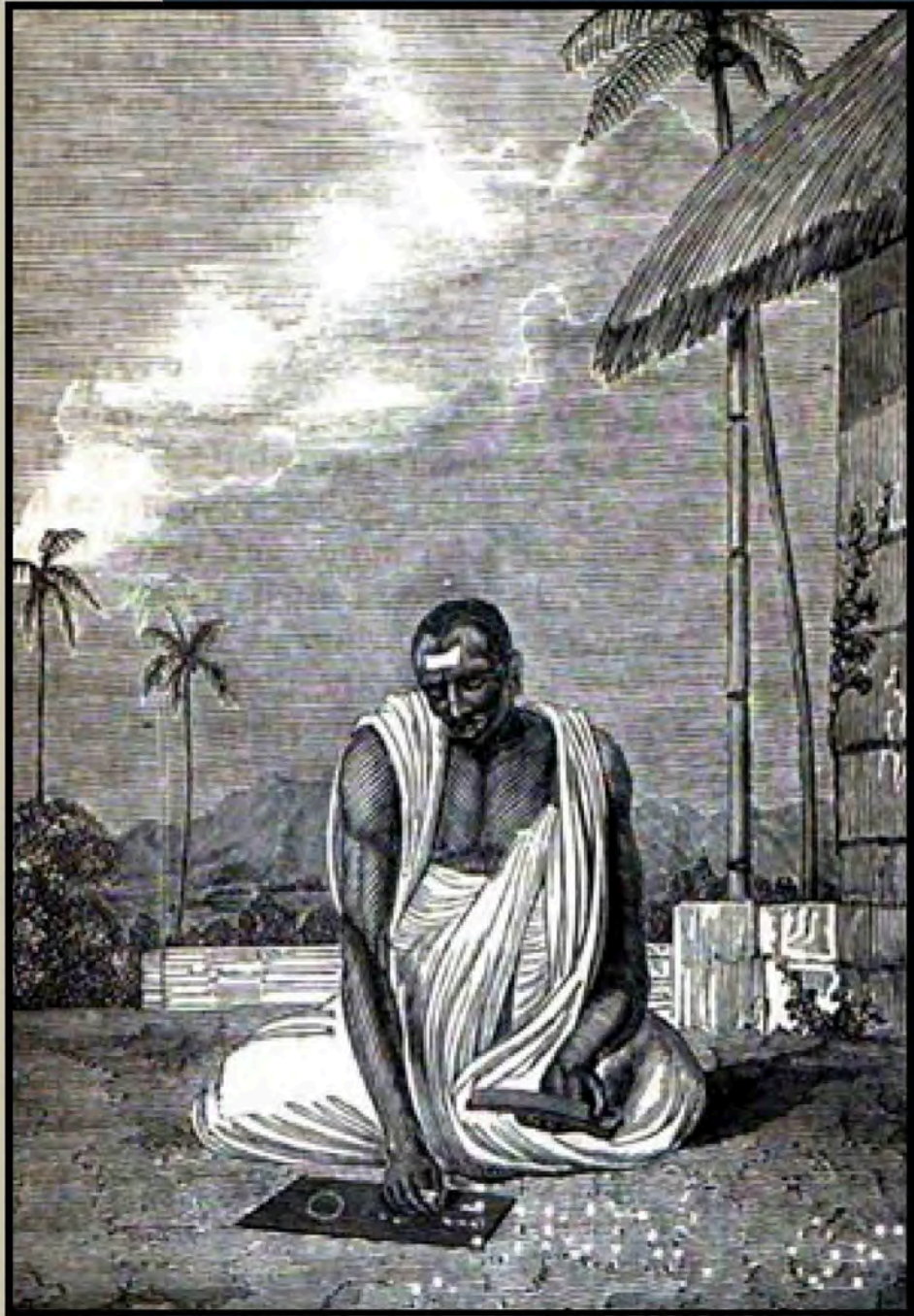
Saha was very active in Indian politics as he believed that science and technology are as important for administration as law and order and gradually glided into politics wanting to be of some use to the country in his own humble way. He even served as the president of the 21st session of the Indian National Congress and later participated in the areas of education, refugees, rehabilitation, atomic energy, multipurpose river projects, flood control, and long-term planning.

Dr. Meghnad Saha has made a huge contribution to society with his involvement in politics and to astrophysics and statistical mechanics with the Saha equation. Dr. Jayant Narlikar described Saha’s contribution to stellar astrophysics as one of the top ten achievements of 20th century Indian science and considered it to be Nobel Prize class. Saha has helped India, a country once labelled as backward and illiterate, get recognised internationally for its greatness in science restoring its former glory. Despite having dealt with severe discrimination by his own country and its people, he still made a huge contribution to the country in the field of science. As Dr. Daulat Kothari said, he was a man of undaunted spirit, resolute determination, untiring energy and dedication. Saha is a true inspiration to people of all ages and backgrounds, both in our country and around the world, especially those denied their rights and privileges.



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Brahmagupta's Legacy in Astronomy



Brahmagupta was an Indian mathematician and astronomer. He is the author of two early works on mathematics and astronomy: The Brahmasphutasiddhanta and The Khandakhadyaka.

He was born on C.598 CE Bhillamala, Gurjaradesa, Chavda kingdom(Modern day Bhinmal, Rajasthan,India) during the reign of the Chavda dynasty ruler Vyagrahamukha. He was the son of Jishnugupta and was a Hindu by religion, in particular , a Shaivite. He lived and worked there for a good part of his life. Prithudaka Swamin, a later commentator, called him Bhillamalacharya , the teacher from Bhillamala. Bhillamala was the capital of the Gurjaradesa, the second largest kingdom of western India. It was also a

centre of learning for mathematics and astronomy. He became an astronomer of the Brahmapaksha school. He studied the five traditional siddhantas on Indian astronomy as well as the work of other astronomers including *Aryabhatta*, *Latadev*, *Pradyumna*, *Varahamihira*, *Simha*, *Srisena*, *Vijaynandin* and *Vishnuchandra*.

The concept of gravity:

Brahmagupta in 628 first described the gravity as an attractive force, using the term “gurutvakarsanam” to describe it. He describes gravity like this: **The earth on all its sides is the same; all people on the earth stand upright, and all heavy things fall down to the earth by a law of nature, it is the nature of the earth to attract and to keep things, as it is the nature of water to flow.** If a thing wants to go deeper down than the earth, let it try. The earth is the only thing, and seeds always return to it, in whatever direction you may throw them away, and never rise upwards from the earth.

Astronomy:

In chapter seven of his *Brahmasphutasiddhanta*, entitled Lunar crescent. Brahmagupta rebuts the idea that the Moon is farther from the earth than the sun. He does this by explaining the illumination of the Moon by the Sun. He explains this as:

- If the moon were above the sun, how would the power of waxing and waning etc. be produced from calculations of the longitude of the moon? The near half would always be bright.
- In the same way that the half seen by the Sun of a potential standing in sunlight is bright, and the unseen half dark, so is (the illumination) of the moon (if it is) beneath the sun.
- The brightness is increased in the direction of the sun. At the end of a bright half-month, the near half is bright and the far half dark. Hence, the elevation of the horns [of the crescent] can be derived from calculations.

He explains that since the moon is closer to the earth than the sun, the degree of the illuminated part of the moon depends on the relative positions of the sun and the moon, and this can be computed from the size of the angle between the two bodies. Further work exploring the longitudes of the planets, diurnal rotation, lunar and solar Eclipses, risings and settings, the moon's crescent and conjunctions of the planets, are discussed in his treatise *Khandakhadyaka*. Brahmagupta formulated rules for calculating the positions of celestial bodies. He calculated the length of the solar year to be 365 days, 5 minutes and 19 seconds, predicted the positions and the motion of the planets and calculated lunar and solar eclipses by his extraordinary mathematics skills.

The zero

Brahmagupta's *Brahmasphutasiddhanta* is the first book that provides rules for arithmetic manipulations that apply to zero and to negative numbers. The *Brahmasphutasiddhanta* is the earliest known text to treat zero as a number in its own right, rather than as simply

placeholder digit in representing another number as was done by the babylonians or as a symbol for lack of quantity as was done by the ptolemy and the Romans. In chapter 18 of his *Brahmasphutasiddhanta*, Brahmagupta describes operations on negative numbers. He first describes addition and subtraction, in the following manner:

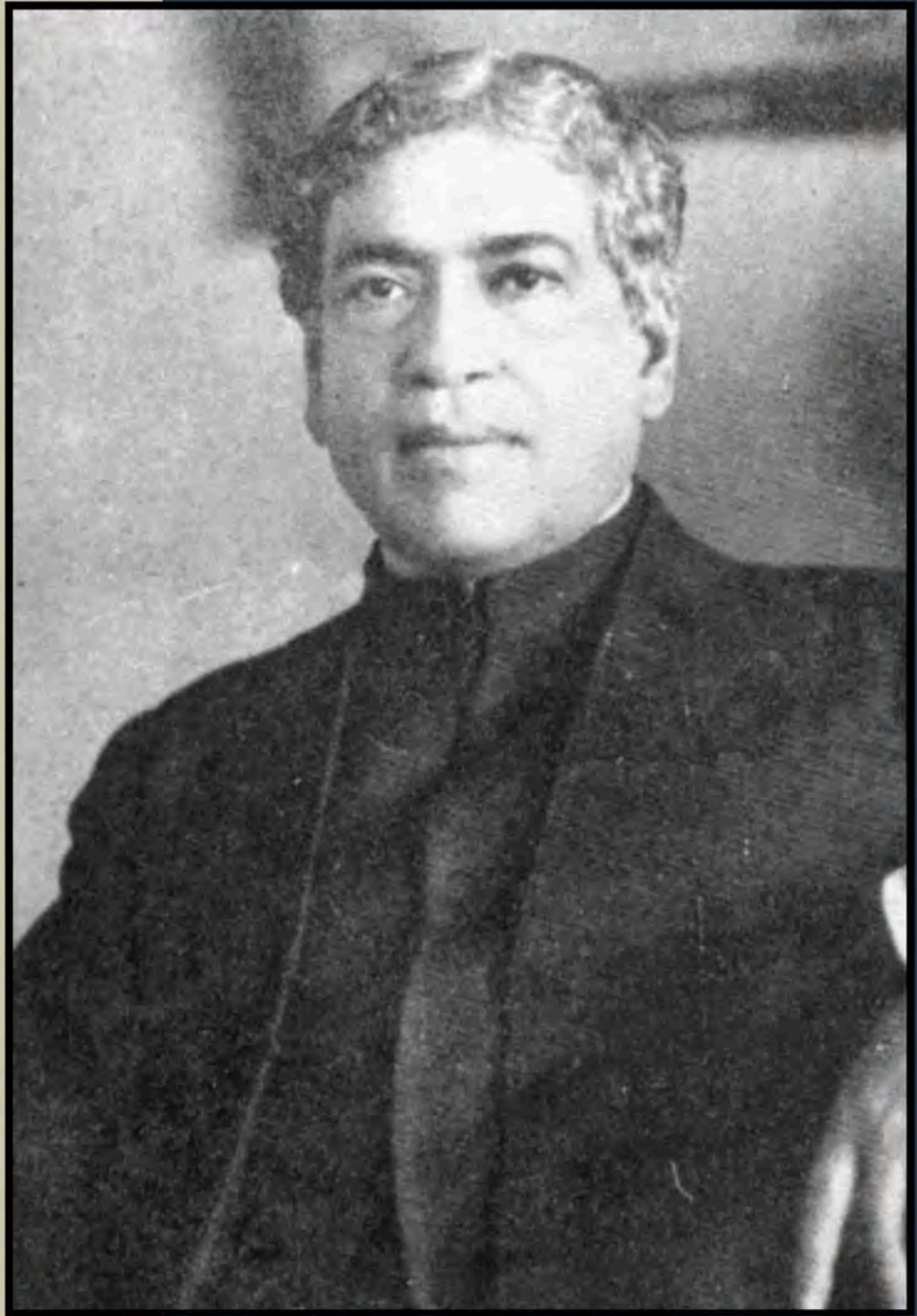
- [The sum] of the two numbers is positive, of two negatives is negative; of a positive and a negative [the sum] is their difference; if they are equal, it is zero. The sum of a negative and zero is negative; of a positive and zero is positive; of two zeroes is zero
- A negative minus zero is negative; a positive is positive; zero minus zero is zero. When a positive is to be subtracted from a negative or a negative from a positive, then it is to be added
- The product of a negative and a positive is negative; of two negatives positive and of positives is positive; the product of zero and a negative, of zero and a positive, or of two zeroes is zero.

In the year 628, at the age of 30, he composed the *Brahmasphutasiddhanta* ("improved treatise of Brahma") which is believed to be a revised version of the received Siddhanta of the Brahmapaksha school of astronomy. Scholars state that he incorporated a great deal of originality into his revision, adding a considerable amount of new material. The book consists of 24 chapters with 1008 verses in the arya metre. A good deal of it is astronomy, but it also contains key chapters on mathematics, including algebra, geometry, trigonometry and algorithmics, which are believed to contain new insights due to Brahmagupta himself. Later Brahmagupta moved to Ujjaini, Avanti, a major centre for astronomy in central India. At the age of 67, he composed his next well-known work *Khandakhadyaka*, a practical manual of Indian astronomy in the karana category meant to be used by students. Brahmagupta died in 668 CE, and he is presumed to have died in Ujjain.



Palak
B.Sc. (Hons.) Physics,
1st year

Jagadish Chandra Bose: Pioneer of Wireless



A forgotten genius, Sir J. C. Bose defied norms in science and life. A co-inventor of radio and pioneer in semiconductors and wireless communication, he fascinated Einstein yet faded from memory.

Acharya J.C. Bose was a man of many talents. Born on 30 November, 1858 in Bikrampur, West Bengal, he was a polymath, physicist, biologist, botanist and archaeologist. He pioneered the study of radio and microwave optics, made important contributions to the study of plants and laid the foundation of experimental science in the Indian sub-continent. He was the first person to use semiconductor junctions to detect radio signals, thus demonstrating wireless communication for the first time. Even the most eminent of

scientists would find it hard to match his strides, spanning various disciplines. Remarkably, these were realised under the colonial yoke amidst severe constraints and well-documented instances of racism.

Bose's Galena detector was the first semiconductor device and photovoltaic cell, whose significance was not missed by Walter Brattain, Nobel laureate in physics. Sir Neville Mott, another Nobel laureate, noted ... "J.C. Bose was at least 60 years ahead of his time" and "In fact, he had anticipated the existence of P-type and N-type semiconductors". He also designed the earliest waveguide and Horn Antenna, an integral part of present day microwave engineering and astronomy. What's more, he is also probably the father of open technology, as he made his inventions and work freely available for others to further develop. His reluctance for patenting his work is legendary. Another of his well known inventions is the crescograph (a device for measuring growth in plants), through which he measured plant response to various stimuli and hypothesized that plants can feel pain, understand affection etc. While most of us are aware of his scientific prowess, we might not be aware of his talent as an early writer of science fiction! This Indian Scientist is in fact considered the father of Bengali science fiction.

A crater (a bowl shaped hole formed by the impact of a meteorite or a comet) on the Moon was named in recognition of his significant contributions to the field of wireless telecommunication. He founded the Bose Institute, a premier research institute in India and also one of its oldest. Established in 1917, the institute was the first interdisciplinary research centre in Asia. He served as the Director of Bose Institute from its inception until his death.



Diviya
B.Sc. (Hons.) Physics,
1st year

Bibha Chowdhuri : Rise of Women in Physics



Bibha chowdhuri was a pioneering particle physicist and conduct significant research on cosmic rays, particularly in detecting mesons using photographic nuclear emulsion. Bibha chowdhuri was an Indian particle physicist known for her investigations into cosmic rays. Working with D M Bose, she utilized photographic nuclear emulsion to become the first to detect and identify mesons. The IAU named the star HD 86081 Bibha after her.

Bibha Chowdhuri was born in 1913 in Kolkata, India. Chowdhuri stayed in Kolkata to continue her schooling and earned her Bachelor of Science in Physics with Honors from

Calcutta University. She was the only woman in her class. Upon earning her Masters, Chowdhuri was just the third woman to have ever received a postgraduate degree in physics from Calcutta.

In 1936, Chowdhuri began her research career under Dr. Debendra Mohan Bose, commonly known as D. M. Bose, who originally turned her away because his research wasn't "suitable for women." Under Dr. Bose at the Bose Institute, Chowdhuri focused on studying cosmic rays. They were pioneers in the subject, having to ride mules high into the Himalayas to reach stations where they could conduct their experiments. There, they exposed photographic plates to the cosmic rays for long periods of time and analyzed the particle tracks left behind. Their experiments picked up that there was an unknown particle, but their plates weren't sensitive enough to provide accurate measurements.

They were pioneers in the subject, having to ride mules high into the Himalayas to reach stations where they could conduct their experiments. There, they exposed photographic plates to the cosmic rays for long periods of time and analyzed the particle tracks left behind. Their experiments picked up that there was an unknown particle, but their plates weren't sensitive enough to provide accurate measurements. While they were advocating for better resources, World War II broke out and led to an embargo on the photographic plates that they needed from England. After the war ended, Cecil Powell, a British physicist, continued the research in England using similar methods with more sensitive plates, detecting a new particle and winning him the Nobel Prize in 1950. Chowdhuri and Bose's work was acknowledged in his book, but their recognition quickly faded.

In 1945, Chowdhuri moved to the University of Manchester's cosmic ray research lab under Patrick M. S. Blackett to earn her PhD. Leading the research charge for cosmic rays, Blackett invented a new type of cloud chamber that was more sensitive to the particles being studied- earning him a Nobel Prize in 1949. It's unknown how much of Chowdhuri's research contributed to the invention and discoveries found with it. Chowdhuri submitted her thesis, titled "Extensive Air Showers Associated with Penetrating Particles," a few months later. Her thesis examiners recommended her for a position at the Tata Institute of Fundamental Research in Mumbai (TIFR), India, newly formed by Dr. Homi J. Bhabh. While at the University of Manchester, she received the first public acknowledgment of her work in a local newspaper. Titled "Meet India's New Woman Scientist: She has an eye for cosmic rays," the article explored the work Chowdhuri was doing and her feelings on physics as a whole.

At TIFR, Chowdhuri was the first female faculty member. She continued her research on cosmic air showers with notable names in particle physics like Appa Rao and M.G.K. Menon for nearly ten years. She joined the Physical Research Laboratory (PRL) in Ahmedabad in 1957, headed by Prof. Vikram Sarabhai and joined by her TIFR colleagues. Many of her research works were published by journals such as Nature and proceedings

of the physical society of London, while her doctoral research work was going on at the laboratory of Patrick maynard stuart blackett, the renowned physicist and Nobel Laureate, in the UK.

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Muskan Yadav
B.Sc. (Hons.) Physics, 1st year



Secret star of India: Prof Jayant Vishnu Narlikar



Jayant Vishnu Narlikar is an Indian astrophysicist, an emeritus professor and founding director at the Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune. He is internationally known for his distinguished work in cosmology, primarily his exceptional conformal gravity theory with Sir Fred Hoyle.

Narlikar was born in Kolhapur, Maharashtra on July 19, 1938. His father, Vishnu Vasudeva Narlikar was the Head of the Mathematics department in the Banaras Hindu University (BHU), which was the same institute where Prof. J.V. Narlikar received his B.Sc. degree in 1957. His mother Sumati Narlikar was a Sanskrit savant. He continued his higher studies in Cambridge where he received the Wrangler and Tyson Medal in Mathematical Tripos.

He received four Cambridge degrees in Mathematics, namely, B.A.(1960), Ph.D. (1963), M.A. (1964) and Sc.D. (1976), while specializing in Astronomy and Astrophysics. He excelled at Cambridge with the Smith's Prize (1962) and the Adams Prize (1967). He later stayed on at Cambridge till 1972, as Fellow of King's College (1963-72) and Founder Staff Member of the Institute of Theoretical Astronomy (1966-72). During this period he laid the foundations of his research work in cosmology and astrophysics in collaboration with his mentor Fred Hoyle.

In the year 1972, Prof. Narlikar returned to India to join the Tata Institute of Fundamental Research (1972-1989). Under his guidance, he broadened the Theoretical Astrophysics Group and helped it attain international standing. In 1988, the University Grants Commission invited him to set up the proposed Inter-University Centre for Astronomy and Astrophysics (IUCAA) as its Founder Director. He held the Directorship of IUCAA until his retirement in 2003. Under his direction IUCAA has acquired a world-wide reputation as a centre for excellence in teaching and research in astronomy and astrophysics. He is now Emeritus Professor at IUCAA. In 2012, the Third World Academy of Sciences awarded him their prize for setting up a centre for excellence in science.

Narlikar has advanced alternative models to the widely accepted Big Bang model. He was the President of the Cosmology Commission of the International Astronomical Union (IAU) from 1994 to 1997. His work has been on the frontiers of gravity and Mach's Principle, quantum cosmology and action at a distance physics. He has also worked on problems related to quasars, black holes, etc. He has received several national and international awards and honorary doctorates. He is a Bhatnagar awardee, as well as recipient of the M.P. Birla award. He has also bagged the Prix Janssen of the French Astronomical Society and has been an Associate of the Royal Astronomical Society of London. He is a Fellow of the three national science academies as well as of the Third World Academy of Sciences.

Apart from his scientific research, Narlikar is also an author of various scientific books and articles, and has appeared on many radio and TV programmes, while also being a notorious science fiction story writer. He was honoured by the UNESCO with the Kalinga Award in 1996 for his eminent scientific contributions.

One of his most prominent works is the Hoyle-Narlikar Theory of conformal gravity, named after him and his then mentor, Sir Fred Hoyle. Going into further details about this theory, it is a Machian and conformal theory of gravity that originally fits into the quasi steady state model of the universe. Their theory was said to be inspired by the Wheeler-Feynman absorber theory for electrodynamics. In 1965, it was shown by Stephen Hawking that the Wheeler-Feynman theory is incompatible with an expanding universe as the advanced solution of their theory would diverge. However, at that time the

accelerating expansion of the universe was not known, which resolves the divergence issue because of the cosmic event horizon. Excellently, the Hoyle–Narlikar theory reduces to Einstein's general relativity in the limit of a smooth fluid model of particle distribution constant in time and space. This theory is also consistent with some cosmological tests.

Differing from the standard cosmological model, the quasi steady state hypothesis implies the universe is eternal. According to Narlikar, multiple “mini bangs” would occur at the center of quasars, with various creation fields (or C-field) continuously generating matter out of empty space due to local concentration of negative energy that would also prevent violation of conservation laws, in order to keep the mass density constant as the universe expands. The low-temperature cosmic background radiation would not originate from the Big Bang but from metallic dust made from supernovae, radiating the energy of stars.

Narlikar has done revolutionary work in the field of space research. Since the year 1999, he has been heading a multi-institutional team of scientists pioneering experiments designed to sample air at heights of up to 41 km, to look for microorganisms. Biological studies of the samples collected in 2001 and 2005 led to the findings of live cells and bacteria, thus opening out the intriguing possibility that the Earth is being bombarded by microorganisms some of which might have seeded life itself here.

Narlikar was decorated with the Padmabhushan in 1965, at the young age of 26. In 2004, he was awarded the Padmavibhushan. Moreover, in 2011, the Government of the State of Maharashtra honoured him with the State's highest civilian award – the Maharashtra Bhushan. In 2014, the Sahitya Akademi, the premiere literary body in India, selected his autobiography for its highest prize in regional language writing in Marathi.



Lakshita Dahiya
B.Sc. (Hons.) Physics, 3rd
year

The Poetry Corner

In a tribute to India's rich cultural and linguistic diversity, this issue includes self-composed poems in regional languages, alongside Hindi and English. These creative poems were composed by students of the Department of Physics.

The collection includes poems in Malayalam, spoken predominantly in Kerala and known for its classical beauty; Awadhi, a dialect rich in folklore and tradition, spoken in central Uttar Pradesh; Khari Boli, considered the foundation of modern Hindi, spoken in western Uttar Pradesh and across regions such as Nepal, Fiji, Guyana, and Suriname; Shekhawati, spoken in Shekhawati region of north-eastern Rajasthan and Maithili, a language with deep literary roots, spoken in eastern Bihar and the Terai region of Nepal.

The main aim is to highlight the unity in diversity that defines India, and encourage young minds to connect with their roots and language.

The Silence

His silence was abusive...

Like death to an old man

And when the deathbed

Decorated in his backyard ..

His soul shattered apart, as

the death note got circulated by a card...

His silence remains the same...

His silence remains the same...

Like jews blood on the German wall...

Years went by, the stain got vanished by the pain...

Yet the wounds still appear, whenever the history calls...

His absence dictionary still lingers in my thoughts, as

Some evidence portrayed by oath...

The jury of my heart, persuade some laws...

As the death card bestowed the evidence cause...

The history of my shattered soul, vanished his dictionary notes...

Yet his silence never replenish a single hole...

In front of his absence, I got buried whole...

Even, my name got engraved on the death wall...

But his silence remain unmarried to my calls ...

Harshita (Editorial sub- Head)
B.Sc. (Hons.) Physics, 2nd year

माई के ममता

माई के ममता
माई के ममता छाँव घनेरी,
दुखवा भागे, सुखवा डेरी।
झुला झुलावै, लोरी गावै,
हमरा दुख सब माई भुलावै॥

भूख लगे जब पेट हमारे,
पहिले खुवावै, खुदै बिसारे।
तन झुलसै, घाम जरावै,
माई अँचरा छाँव बनावै॥

कबहूँ डाँटे, कबहूँ समझावै,
बचपन से हर सीख सिखावै।
दुनिया मा चाहे जो भी होई,
माई बिना जग सूना होई॥

ममता तोहार सागर गहरा,
तू बिन कुछ कहे सब समझा।
ईश्वर भी तोहसे हार मानी,
माई, तू जगत के रानी॥

Laxmi Rajput
B.Sc. (Hons.) Physics,
1st year



മാറിയ മണ്ണിലെ മണം

പുനോത്ഥമാണെൻ കരുതി,
പുതിയ മണ്ണിലെക് പെരുമാറിയ ഞാൻ,
എന്റെ മണ്ണും കാട്ടും മാതും അറിയുന്,
ഒരു ചെറുപാവയിരുന്നു, ഒരൊറ്റപ്പെൺമോട്ട്.

എന്റെ ഭൂമിയും മണ്ണും മാരി,
അമ്മയുടെ കയ്യിലെ ചുടില്ലാത്തതൊരു മടിയിൽ,
ഒറ്റപ്പെട്ടപ്പോഴെ ചടിയെപ്പോലെ
ഞാനിവിടെ നിന്നു കുളിർമയിൽ വീഞ്ഞു.

മഴയും കാട്ടും എന്റെ ഭയം ആയിരുന്നു,
കരിന സൂരന്റെ താപവും
എന്റെ നിൻഗൾ സഹിപ്പിക്കുമോ?
ഞാൻ വാടിപ്പോകുമോ?

എന്നിരുന്നാലും, ഒരു ചെറിയ പ്രതീക്ഷ,
എന്റെ ഉള്ളിൽ മുളച്ചിരുന്നു -
ഒരു ദിവസം ഞാൻ പുഷ്പിച്ചു
എന്റെ നിൻഗളോട് ലോകം
നിരീക്ഷിക്കുമെന്ന പ്രതീക്ഷ.
പ്രതീക്ഷ, മഴയും നിൻതനാറു വാക്ക്.

നിമിഷങ്ങളില്ലാ,
കാലങ്ങൾകഴിഞ്ഞാലേ,
പുതിയ മണ്ണിൽ ഞാൻ പുതുതായി.
അവിടെ നില്ക്കുന്ന അഗ്നിക്കാറ്റിനോട്
പൊരുതാനായിരുന്നു,
മഴത്തുള്ളികളിൽ
പെയ്തുതിളക്കാനായിരുന്നു.

മനുഷ്യൻ എപ്പോഴും പൊരുത്തപ്പെടലിന്റെ
യജമാനൻ,
ദിവസം പടിഞ്ഞാറോട്ടുബോൾ
രാത്രി തനിച്ചത്തുബോൾ,
ആരോ കരയുന്നതുണ്ടോ?
ഒരു പാടെ കരുതലുകൾ ഉള്ള,
ഒരു പുതിയ ഉഷസ്സിന്റെ പ്രതീക്ഷയോടെ.

അതിനാൽ, ഞാൻ പിടിച്ചു,
ഈ മണ്ണിൽ കഴിയുക,
മാറുന്ന ലോകത്തിന്റെ ഭാഗമാകുക,
ഒരിക്കലും പ്രതീക്ഷ നഷ്ടപ്പെടാതിരിക്കുക.
മഴയും കാറ്റും കടന്നുപോകുമ്പോൾ,
ഞാൻ വീണ്ടും
എന്റെ നിറങ്ങളും സ്വപ്നങ്ങളും
വിരിയിക്കുന്നു.



M S Gourie Lakshmi
B.Sc. (Hons.) Physics, 2nd year

समयक संग यात्रा

यात्रामे कतौ हेरा गेल छी हम, अखन अपनसँ दूर भ' गेल छी हम।
केतबा केँ हारलौं, केतबा केँ छोड़लौं, केतबा केँ पएलौं, केतबा केँ जोड़लौं।

ओ वादा, ओ यादद कतौ दफन अदछ, जे आइयो बहुत सतबैत अदछ।
दजनका जेबाक छल, से चदल गेलाह, बस हम यात्रा मे ठमदक गेलौं।

हाँ, ठमदक गेलौं, मुदा रोकाएल नै, अपनकेँ मंदिर मानने रही।
जँ मंदिर अपनेकेँ मानने रही, तँ बस पाबय छल, पाबय छल।

ओ भोली, अनजानी, नादान सन एकटा लड़की छल।
जखन यात्रा करय दनकलल, तखन संदेश सन एकटा लड़की छल।

हाँ, यात्रा ओकर सुहावन अदछ, केछु हेरौल, केछु पेलौ।
मंदिर अखनो आगाँ अदछ, मुदा समय बहुत दसखौलक।

ओ मनमौजी सन लड़की, जेकर मुस्कान सददखन खखलैत छल।
अखन नादप-तोदल क' हँसैत अदछ, हँसब सँ सेहो डरै त अदछ...



Anjali
B.Sc. (Hons.) Physics,
3rd year

म्हारो शहर राजस्थान

राजस्थान री बात करा तो उगतो दिन छिपजा
राजस्थान री लुगाया रो बोलरो |
आदमी धोती और पगड़ी म डोलरयो
बा छाछ और राबडी |
और लुगायां री बिंदी और राखडी
बा बाजरा री रोटी और चटनी |
बो लुगायां रो घाघरो और नथली
बो खेतां म गायां रो राज |
बो खेतां न छोड़ आदमियां प लुगायां रो राज
बो मेहमान न छाछ को गिलास और बाजरी री रोटी
बा शान बढ़ाव आदमियां की मूंछ और धोती |

Ruksar Sayyed
B.Sc. (Hons.) Physics,
3rd year



Her Fire

There were days she couldn't rise,
Lost in the storm behind her eyes.
When the world screamed, "You'll never be,"
And hope felt like a distant sea.

She stayed in bed, heavy with pain,
As doubt and fear poured like rain.
Her dreams seemed too far, too high to climb,
And her heart sank with the weight of time.

But deep within, a spark remained,
A quiet strength she couldn't explain.
Through the noise of failure and endless tries,
She heard a whisper: "You'll still rise."

Step by step, though slow, she grew,
Through tears, through scars, she fought for truth.
She sought the help she knew she'd need,
And healed the wounds that made her bleed.

Bharleena Hazarika
B.Sc. (Hons.) Physics,
1st year



Dear girls, This is For You

Yakeen h mujhe ki,
Ek din mera har khwab poora hoga.
Vo bt aur hai ki meri kitab m ek alfaaz adhoora hoga.

Ek din maii muskuraungii,
Saree hade paar krke,
Aur ek kahani mukammal kr jaungi m drd ko aazar karke.

Ki fr khwaishe kisi ki gulaam n hongii,
Apni marzi ke malik hoge hm,
Hmare raste m Aavam n hogi.

Sb kch chhod maii bss dil ki sunugiii,
Safar mera hamsafar bhi mera,
Maii khud chunugii.

Gazal Singh Rathaur
B.Sc. (Hons.) Physics,
2nd year



घर से दूर

कुछ बताना चाहती हूँ!!
अपने दिलों की बातें लोगों को सुनाना चाहती हूँ!!!
पर किसको बताऊं किसको सुनाऊं अब यहां घर से दूर
मैं किसको अपना बनाऊं

वो मम्मी को पूरा दिन का किस्सा सुनाना
मेरा बेकार से डिजीजन पर भी पापा का हां बोल जाना
बाबा जी से बिना कहे उनके द्वारा खाना के चीजें लाना
यहां मैं किसको बताऊं किसको सुनाऊं!!!!
बिना जज हुए लोगों को अपना दिल का हाल कैसे बताऊं ???
यहां घर से दूर मैं किसको अपना बनाऊं

भाई के साथ वो घर पर खेलना
यहां पर सिर्फ फोन से उससे दो बातें करना
वो दिन दोबारा कब आयेगा ये रात भर सोचना
फिर उन्हीं पलों के यादों में थोड़ा सा वक्त गुजरता
यहां घर से दूर किसको अपने किसे सुनाऊं मैं???

वो ना पढ़ना पर दाद मांगना 1 घंटा और खेलना है
उसके लिए मम्मी को बार बार मानना...
यहां बस सोचते रह जाना पढ़ना है या नहीं
और ऐसे ही पूरा दिन बीत जाना...

वो मम्मी के हाथों से बने खाना पर नाक चढ़ाना
फिर मार खाकर उसी खाने को खाना
पर अब यहां घर से दूर उसी खाने को सबसे ज्यादा मिस करना
वो दुनिया का सबसे अच्छा खाना था ये बस फोन पर बोलते रह जाना
किसको बताऊं मैं किसको सुनाऊं
यहां घर से दूर किसको अपना बनाऊं

वो बिना मतलब की दोस्ती यहां कहां ढूंढूं मैं
जैसी स्कूल में होती थी वैसा दोस्त अब यहां कहां बनाऊं मैं...
इस मतलबी दुनिया में किसको खुशी और किसको ग़म बताऊं मैं....
यहां घर से दूर मैं किसको अपना बनाऊं मैं
किसको अपनी बातें सुनाऊं मैं.....

Isha Trar
B.Sc. (Hons.) Physics,
3rd year



Maklub

Looked around in silence
I saw someone far away

Similar but unfamiliar he was
The closer yet farther I went
Losing my breath

I tried to catch up to him
Hysterically
I laughed at my situation

Freezing in despair
I stared him down
Disheartened I sat
Alone with my agony

Making peace with it
I understand only to fail over again
Tired
I look for him again

Only to get back
To the place I lost myself
It's all written, the God's plan
I tell myself over and over again



Aliya
B.Sc. (Hons.) Physics,
3rd year

Friendship

School m nayi nayi aayi thi
Kiine mujhe pareshaan kiya to kisine mera majak banaya
Phir aise shaks se mulaqaat hui jisne tb se lekar aaj tak mera saath
nibhaya
Koi mujh pr ungli uthaaye, mere dost kbhi ye sah na paaye
Aisa vakt bhi aaya jb logo ne mujhse muuh moda
Bhagwan ne mujhe aise dost diye jisne mera saath kbhi nahi chhoda
Rabb ka shukriya krti hu jo mujhe aise dosto se milvaya
Sach m mere dosto ko bhagwan ne bdi fursat m hai banaya
Jinse roz milna hota tha pr unka aaj chehra bhi nhi dekh paati
Jinse roz ladna hota tha unse aaj baat bhi nhi ho paati
Milne ki khwahish hoti h Mann m pr vo mann m he rah jaati hai
Haa mere dost tere he baat kr rhi hu tumhe dekhne ke liye mere aankhe
taras jaati hai



Priyanshi Solanki
B.Sc. (Hons.) Physics,
3rd year

Guest Column

ਤੇਰਾ ਅਤੇ ਮੇਰਾ

ਕਦੇ ਕਦੇ ਮੈਂਨੂੰ ਬੈਠਿਆਂ
ਖਿਆਲ ਆਉਂਦਾ ਤੇਰਾ ਤੇ ਮੇਰਾ,
ਖਿਆਲ ਆਉਂਦਾ ਤੇ ਤਿੰਨ ਦਿਲ ਨਾ ਕਰ ਇਨਾ
ਨਕਲੀ ਜਿਹਾ ਮੇਰਾ,
ਜਦ ਸੂਰਜ ਟਲਣ ਤੋਂ ਪਹਿਲਾਂ
ਚੰਦ ਤੇ ਸੂਰਜ ਕਦੇ ਹੁੰਦੇ ਮੈਂਨੂੰ
ਖਿਆਲ ਆਉਂਦਾ ਤੇਰਾ ਤੇ ਮੇਰਾ,
ਉਹ ਇਕ ਅਸਮਾਨ ਚ ਰਹਿ ਕੇ ਵੀ
ਇੱਕੋ ਦਿਨ ਵਿੱਚ ਵੀ ਦੂਰ ਪੈਂਦੇ ਨੇ,
ਸਾਡੇ ਹੱਸੇ, ਦੁੱਖ ਤੇ ਯਾਦਾਂ ਭੁਲ ਜਦ ਲਿਖਣ ਬੈਠਾ
ਮੈਂਨੂੰ ਖਿਆਲ ਆਉਂਦਾ ਤੇਰਾ ਤੇ ਮੇਰਾ।

Gunpreet Singh
B.Sc. (Hons.) Physics, 1st year,
Motilal Nehru College



Guest Column

Reflection

I saw the mirror
I saw it in my eyes
I saw the bulb that used to glow
I saw it, the shadow, a window?

Thus spoke the mirror,
I see the forsaken future
The impending shatter
The reflection of your portion

Shivam
B.Sc. (Hons.) Physics, 1st year,
Motilal Nehru College



The Photo Gallery

The theme **When you look up at the sky, what do you see?** was chosen for the photography section of the magazine as tribute to the extensive work of India in the field of astronomy and to the Indian astronomers from ancient to modern era. India is blessed with great scholars, philosophers and astronomers. They all wrote about planetary motions, unit of time, the age of universe, speed, orbital period, eclipse, etc. The major astronomy treatises are Vegnaga Jyotisha, Aryabhatiya, Aryabhatiyabhashya, Karanottama, Venvaroha, Surya Siddhanta etc. Indians have used panchangam since ages to keep track of the tithi and the festival. The panchangam system is based on the lunisolar calendar. The lunisolar calendar incorporates both, the cycle of the moon (lunar) and sun (solar). The concept of adhik maas, which is an additional month added to the lunar calendar to synchronize it with the solar calendar. This maas is added roughly after 2.5 years. Aryabhata proposed Earth's rotation and calculated the year length accurately in Aryabhatiya. Modern Indian astronomers have made significant contributions to astrophysics and space exploration. Meghnad Saha advanced stellar studies with his Ionization Equation, while Subrahmanyam Chandrasekhar won a Nobel for his work on stellar evolution. Vainu Bappu helped establish key observatories, and Satish Dhawan led India's space program, including launching critical satellites. Jayant Narlikar worked on cosmology and the Quasi Steady State Theory, and Govind Swarup played a pivotal role in developing the GMRT, a leading radio telescope. The successful landing of Chandrayaan-3 on the Moon's south pole made India proud and the Aditya-L1 Solar Mission aims to understand solar dynamics. We call for awe-inspiring photographs of stars, sunrise, sunset or the celestial event.



Glimpse of the Moon's Craters

Dolly Narayan 1st year



Aditi Rawat 3rd year



Crescent Serenity at Twilight

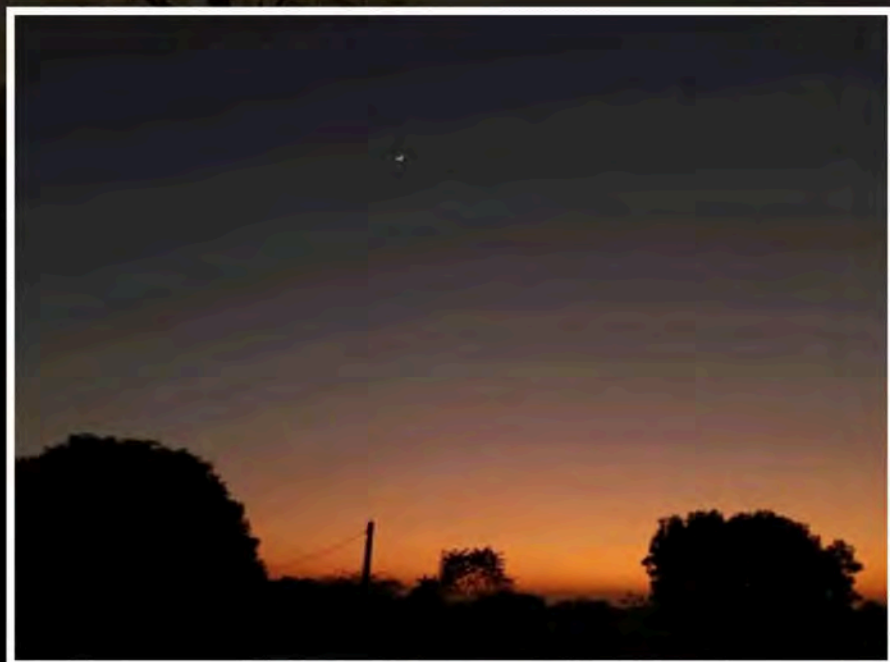


Capturing moments under
city lights

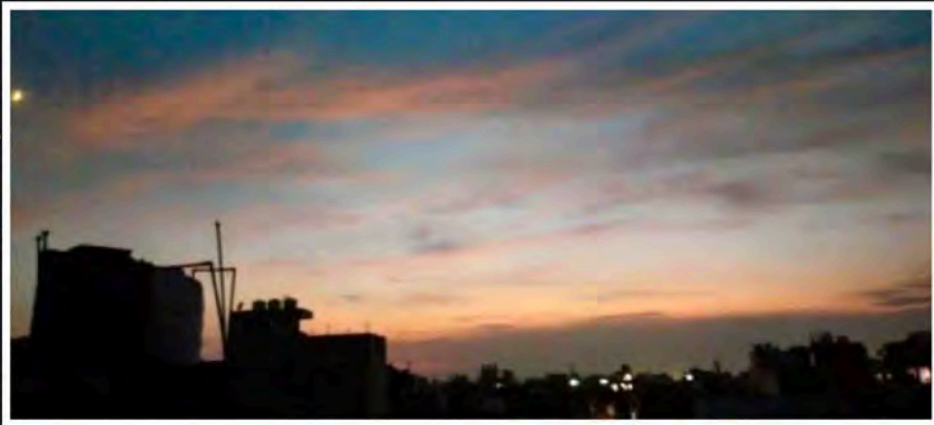
Tripti Patwa 3rd year



Ravina 3rd year



Smiling with the setting sun



Divya, 1st year



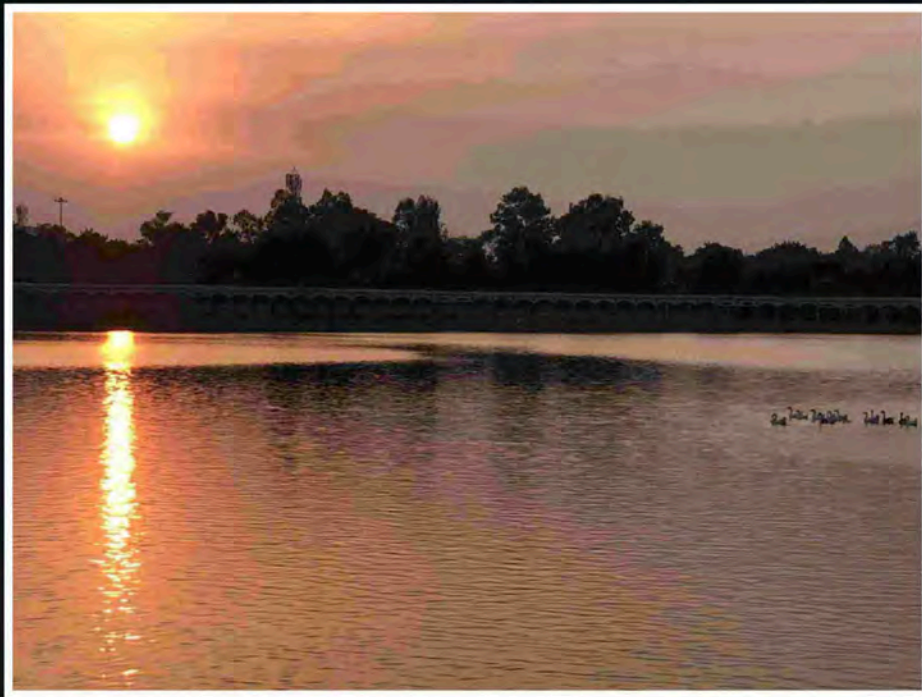
Framing the calm before the stars



Anjali, 3rd year



Moonlit dreams and
starlit thoughts.



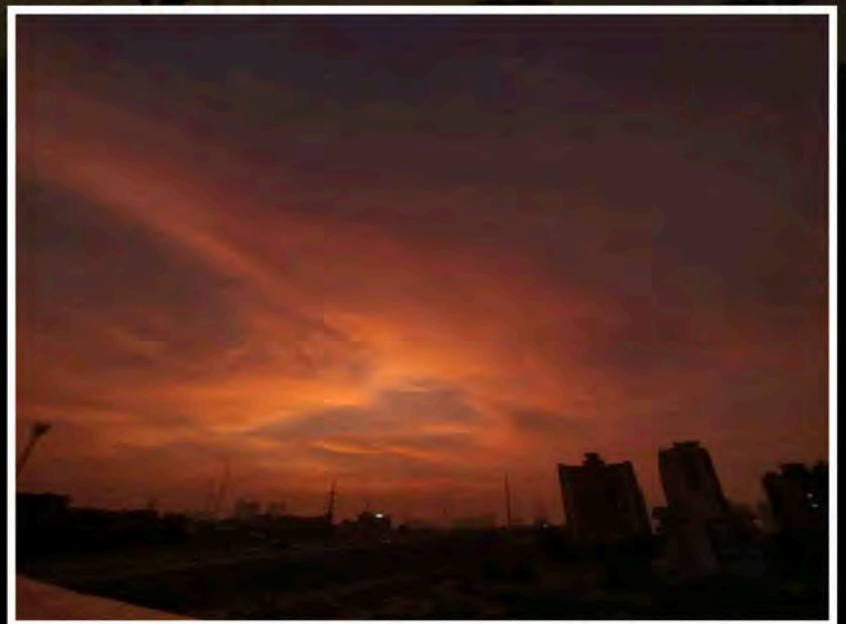
Ankita 3rd year



Reflecting the sunrise in every step



Harshita 2nd year



Dressed in hues of dawn



ARTIST section



Lakshita,
(3rd year)



ARTIST section



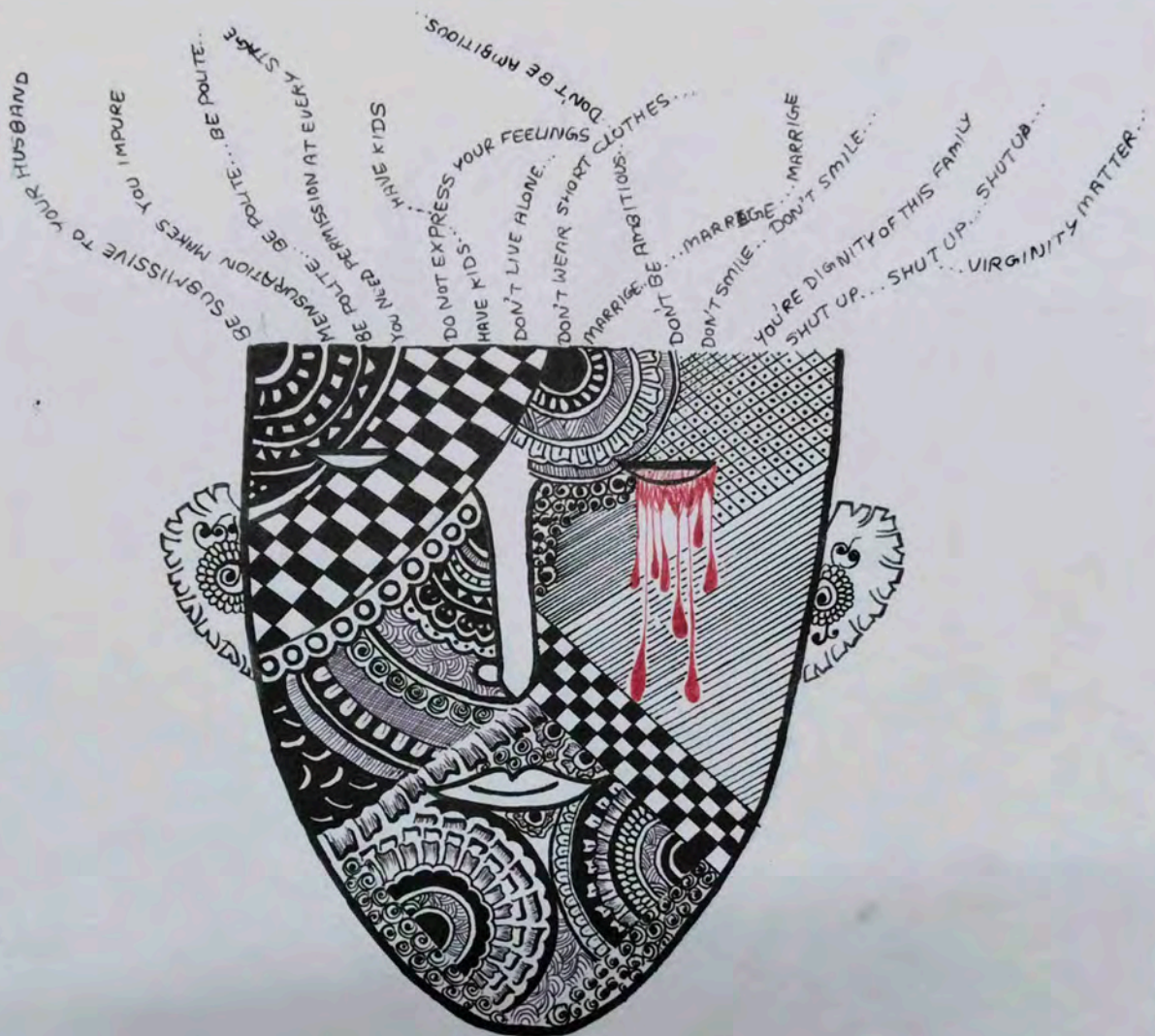
Rishika Verma,
(3rd year)



ARTIST *section*



***Tripti Patwa,
(3rd year)***



SOCIETY..

ARTIST section



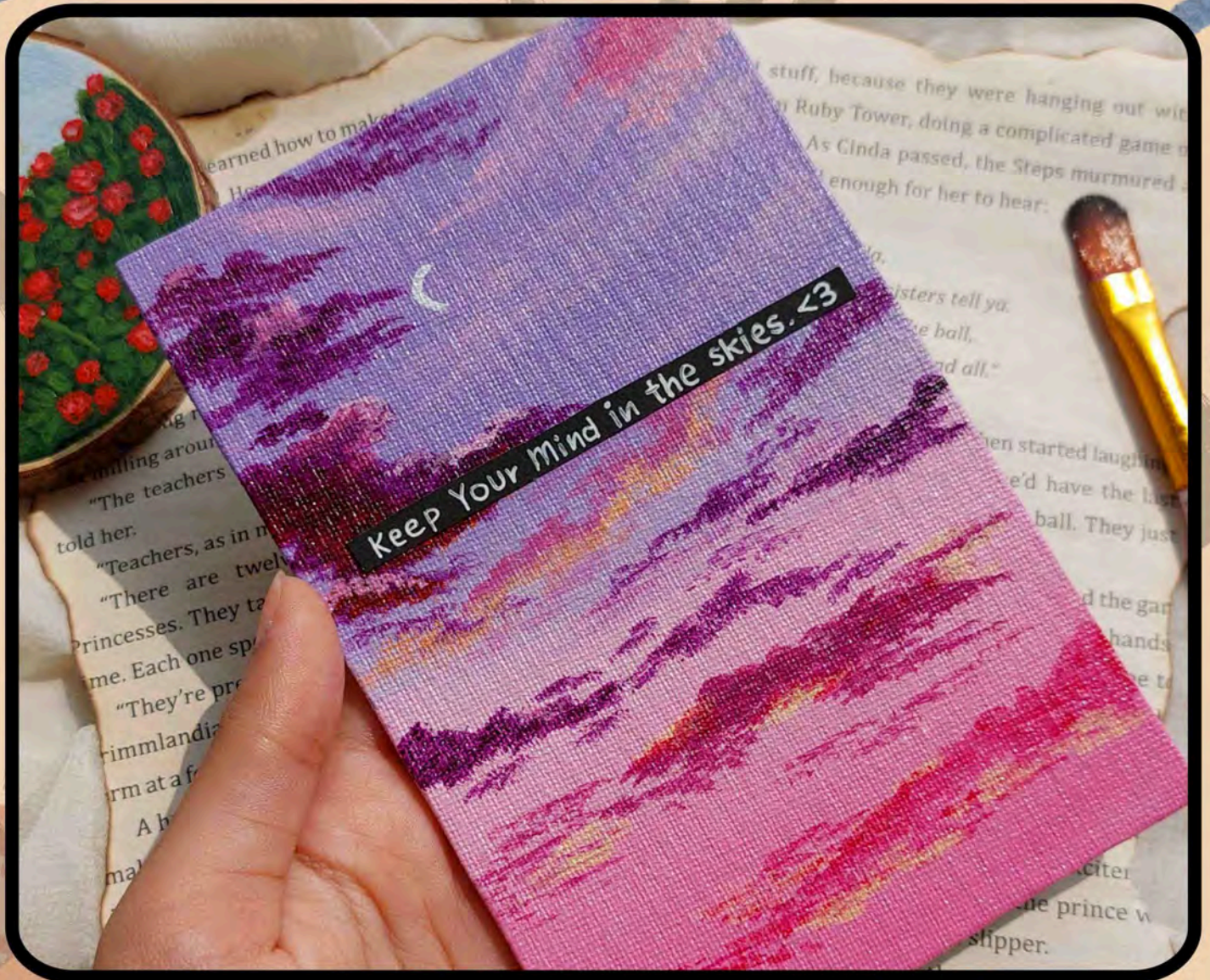
Ruchi yadav,
2nd year



ARTIST section



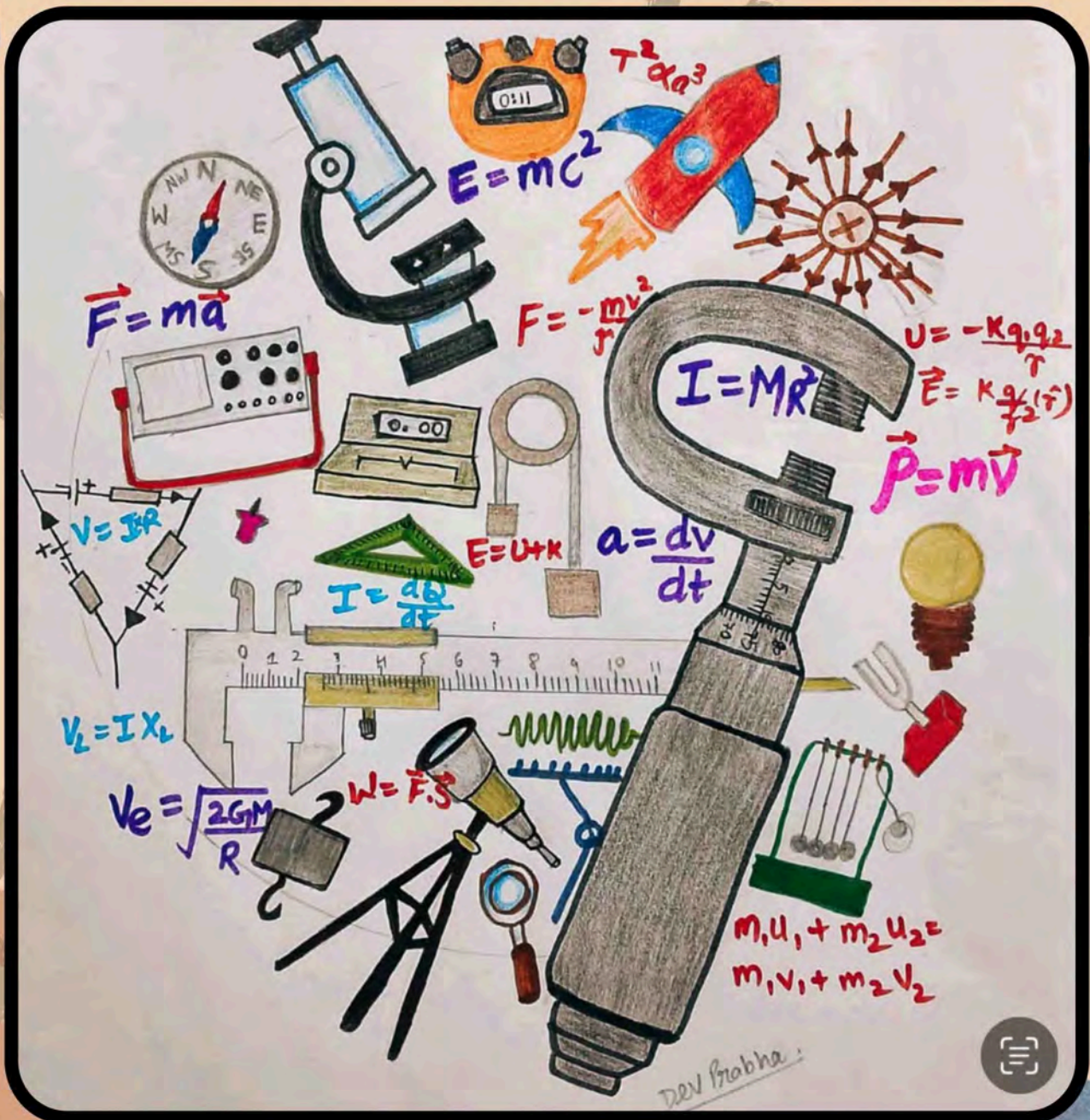
Ishita Sharma
(2nd year)



ARTIST section



DevPrabha,
(1st year)



ARTIST section



Bharleena Hazarika,
(1st year)



ARTIST section



Abhijna Bhatt,
(1st year)



ARTIST section



Harshita pant



ACHIEVEMENTS



Abhijna Bhatt
1st year

She was selected as a member of the MUN wing of the prestigious Trenchant Debating Society of Maitreyi College, reflecting her strong analytical thinking and communication skills. As part of her active involvement, she participated in the Perpetuum Summit's Model United Nations under the United Nations Human Rights Council (UNHRC) Committee, where she engaged in critical discussions on global human rights issues, showcasing her diplomatic acumen and commitment to international awareness.

She showcased her eloquence and analytical thinking by securing the third position in a debate competition organized by the Economics Society of Maitreyi College on 12th November 2024. Her achievement highlights her ability to engage with contemporary issues through well-structured arguments and confident public speaking, reflecting the spirit of intellectual curiosity and academic excellence.



Shubhra verma ,
1st Year

ACHIEVEMENTS



Arpita Choudhary
2nd year

She was selected as a NIUS Astronomy 2024 Fellow at HBCSE, Mumbai,. As a volunteer at the National Space Day held at Nehru Planetarium, Delhi, she worked diligently with the backend team to conceptualize and construct a moon colony model, which was presented in front of the esteemed Ex-ISRO Chairman, Shri S. Somanath. Her dedication to science outreach continued as she volunteered at the State-Level Science Camp organized by Indraprasth Vigyan Bharti. These enriching experiences reflect her commitment to expanding scientific awareness and engaging with the community at both the state and national levels.

She actively contributed to the cultural vibrancy of Maitreyi College as a member of Abhivyakti, during her first year. She showcased her talent in stage performance by participating in inter-college competitions held at Shivaji College and Dayal Singh College, where the team secured the second position. Her versatility extended to street theatre as well, earning third position in a Nukkad Natak competition at Jaipuria School of Business. One of her most notable achievements includes receiving the Best Production Award at the prestigious stage play competition organized by IIT Roorkee.



Bhumi Goyal
2nd year

ACHIEVEMENTS



Draksha Singh
2nd year

She is an active member of the Writing Wing of Trenchant, the Debating Society of Maitreyi College, and contributes to the content department of Nepenthe, the Animal Welfare Society of the college. She was awarded first prize in Penned, the creative writing competition held as part of JOUST'24 by JIIT, and received a Special Mention at DSCMUN 2025, organized by Dyal Singh College.

She is an enthusiastic member of Nrityakriti – The Indian Dance Society of Maitreyi College, where she embraces the vibrancy of cultural expression through classical and folk dance forms. As part of the group, she performed at the College Dandiya Event and Sammalit 2024, showcasing her dedication to preserving and promoting Indian traditions through the art of dance.



M S Gourie Lakshmi
2nd year

ACHIEVEMENTS



Anjali
3rd year

She has shown a dynamic blend of creativity and academic enthusiasm through various achievements and responsibilities. Her active participation in Avgaahan—in both Physics and Computer Science—led her to qualify for the second round, showcasing her multidisciplinary interest. On National Science Day, she secured third position in the Science Quiz Competition, a testament to her knowledge and quick thinking.

She has served in the Creative Department of her institution, first as a sub-head and later rising to the position of department head due to her dedication and innovative contributions.

Serving as the President, she has consistently exemplified strong leadership and academic commitment within the college community. Her dedication to intellectual pursuits was recognized through outstanding performances at Avgaahan. She secured the first position in the Mathematics competition, displaying exceptional analytical skills and precision. Additionally, she achieved third position in the Physics competition, reflecting her versatility and depth of knowledge across disciplines. Her achievements stand as a testament to her dedication toward academic excellence and active involvement in the scholarly life of Maitreyi College.



Dewanshi,
3rd year

ACHIEVEMENTS



Isha Trar
3rd year

An active member of the National Cadet Corps (NCC) since her first year, Her initial year also saw her involvement with the National Service Scheme (NSS). Alongside her co-curricular engagement, she explored her creative side by writing and performing four original poems during her time at Maitreyi College, reflecting a deep passion for literature and self-expression.

Her artistic inclination extended into design as well, serving as a member of the Graphics Team in the Marketing Society of the college. Professionally, she gained valuable industry experience through an internship with Web Bytes.

As a core team member of the Students' Union since the beginning of her third year, she has played an integral role in organizing major college events such as Orientation, Freshers, Sparkles, and Rhapsody, contributing to the vibrant campus life of Maitreyi College. Her organizational skills and leadership were further recognized through her role as the Event and Logistics Head of the Women Development Cell (WDC).

In addition to her co-curricular involvement, she also contributed to academia by participating in a research project under the guidance of Dr. Prajwalit Shikha for the International Sanskrit Conference



Lakshita Dahiya
3rd year

ACHIEVEMENTS



Rukhsar Sayyed
3rd year

She actively volunteered with NSS Maitreyi (2023–2024) as a core member of the Creative and Organizing Committees. She contributed to initiatives like a Health Check-Up Camp with Max Hospital, the Purple Fest at Rashtrapati Bhavan, and Cure India's awareness drive. Academically, she attended lectures on quantum information, employability skills, and completed courses in logical reasoning and communication. She participated in multiple quizzes and supported Global Roti Day. In the cultural sphere, she served in Scintillation and Rhapsody committees and took part in competitions. She is currently pursuing a Web Designing course with ACMEGRADE.

She has consistently excelled academically with a CGPA of 8.5 and demonstrated leadership as HR/PR Head (2024) and current Vice President of the Physics Society. She completed a Summer Research Internship, winning the Best Paper Award at Equinox and publishing one of two research papers in an international journal. She won First Prize in a Physics animation video contest at Avgaahan 2024, and the Best Innovation Award at DU's Skills Expo. She enhanced her skills through courses in Arduino-based product design and actively contributes to DAKSHI Maitreyi's social media team.



Saniya, 3rd year

ACHIEVEMENTS



Tripti Patwa
3rd year

She has shown commendable social commitment through active NSS work at Maitreyi College, contributing to the Swachh Bharat Mission, Health Check-Up Camp, Clubfoot Awareness, and work with Cure India and The Blind Relief Association. She represented Cure India at the Purple Fest at Rashtrapati Bhavan and supported a national workshop on air pollution and health. She also volunteered at Avgaahan, Rhapsody, and various academic events. Creatively inclined, she completed a certified Canva workshop and served as Social Media Core Member of NSS and Social Media Head of the Physics Society.

She attended the Asian Winter School (2023 & 2024) by Sokendai University, Japan, and REYES Summer School 2024 by UC Berkeley. She hosted and organized departmental events including "Quiz-o-Mania," an alumni meet on quantum information, and NEP orientations. As General Secretary (2023–24), she led and volunteered in events like Quest 2023 and Cultural Academic Fiesta 2024. She completed SIP under the Centre for Research, presenting projects at Equinox 2023 and 2024. She secured 3rd place in her college's National Science Day Quiz and ranked 5th among 200 at IUAC Delhi's national-level quiz.



Aliya , 3rd year

FACULTY



Prof. Poonam Juneja



Prof. Ritu Dhingra



Prof. Shalini Lumb Talwar



Ms. Polly Biswas



FACULTY



Dr. Mansi Dhingra



Dr. Savvi Mishra



Dr. Vasudha Agarwal



Dr. Parul Yadav





FACULTY



Dr. Rohtash Singh



Dr. Rinku Kumar



Mr. Dinesh Kumar



Mr. Vivek Prajapati





FACULTY



Dr. Bharti Rohila



Dr. Prajwalit Shikha



LAB STAFF



VINOD KUMAR



MOHIT KUMAR



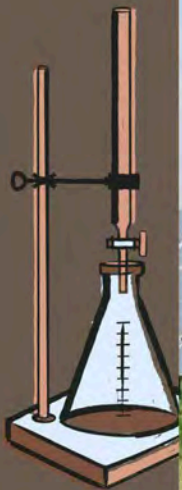
RAVI KUMAR



HEMANT LAMBA



RINKU



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LAB STAFF



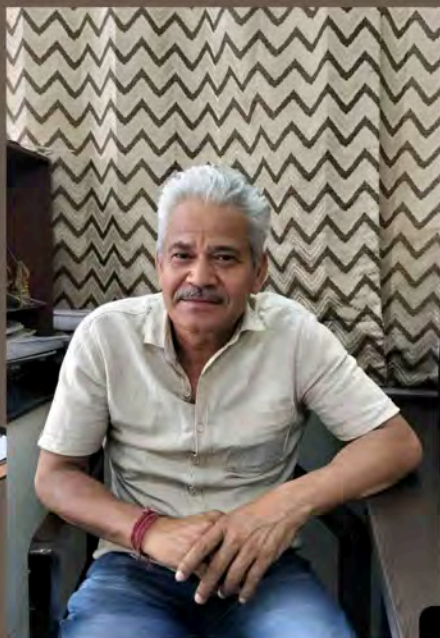
SATYADEV SINGH



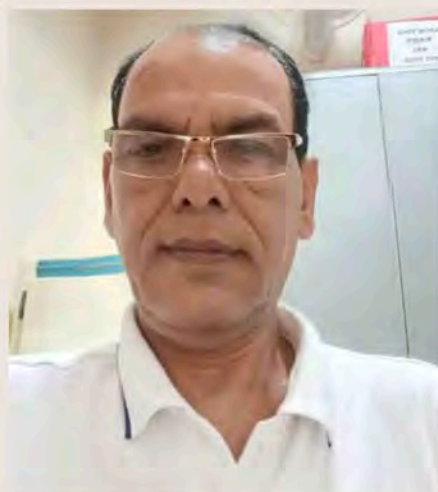
VIJAY KUMAR



NISHCHAY SAINI



HARI SHANKER SINGH



K.K. PUROHIT

STUDENT Photos



FIRST YEAR



SECOND YEAR



THIRD YEAR



*No crown is as radiant as self-reliance—
when a nation wears it, prosperity and pride
follow.*

