



MANIPAL UNIVERSITY
JAIPUR



Issue: 9

JUNE | 2026

PRATHAM

Physics Research Advancements by Thoughtful Humankind and their Achievements Miscellany
Quarterly Newsletter





PRATHAM

Meet the EDITORS



Shefali Pareek
Research Scholar



Kritika Garg
Research Scholar



Sandeep Kumawat
Research Scholar



Amandeep Kour
Research Scholar

Editorial Advisor



Dr. Manoj Kumar Saini
Associate Professor

PRATHAM

Message from HoD

Dr. Kamakhya P. Misra

Head, Department of Physics &
BioSciences (I/C)
Manipal University Jaipur



Editorial

It gives me immense pleasure to present the latest issue of the Pratham a Quarterly Newsletter of Department of Physics, Manipal University Jaipur. This publication reflects the collective energy, enthusiasm, and achievements of our faculty, students, and collaborators who continue to uphold the department's tradition of academic excellence and research innovation.

In recent months, our department has made significant strides in both teaching and research. From fostering curiosity-driven learning in the classroom to advancing cutting-edge investigations in materials science, photonics, nanotechnology and nuclear sciences, we continue to cater to the vibrant scientific community. The engagement of our students, particularly the research scholars, in attending and organizing the conferences, workshops, and outreach activities is highly encouraging. It underscores our commitment to experiential learning and holistic development.

This newsletter highlights contributions of our faculty colleagues through publications, conferences, and collaborations, which strengthen the department's reputation as a hub of intellectual growth. As we move forward, our focus remains on expanding interdisciplinary research, enhancing laboratory infrastructure, and encouraging innovative teaching methods that inspire the next generation of physicists.

I extend my heartfelt appreciation to the editorial team for their dedicated efforts in bringing together this issue. I hope the readers will find it both informative and inspiring. Let us continue to work together towards excellence in physics education, research, and societal impact.

PRATHAM

Vision

Excellence in Physics education that deepens its foundation and cultivates critical skills, while advancing the cutting-edge research.

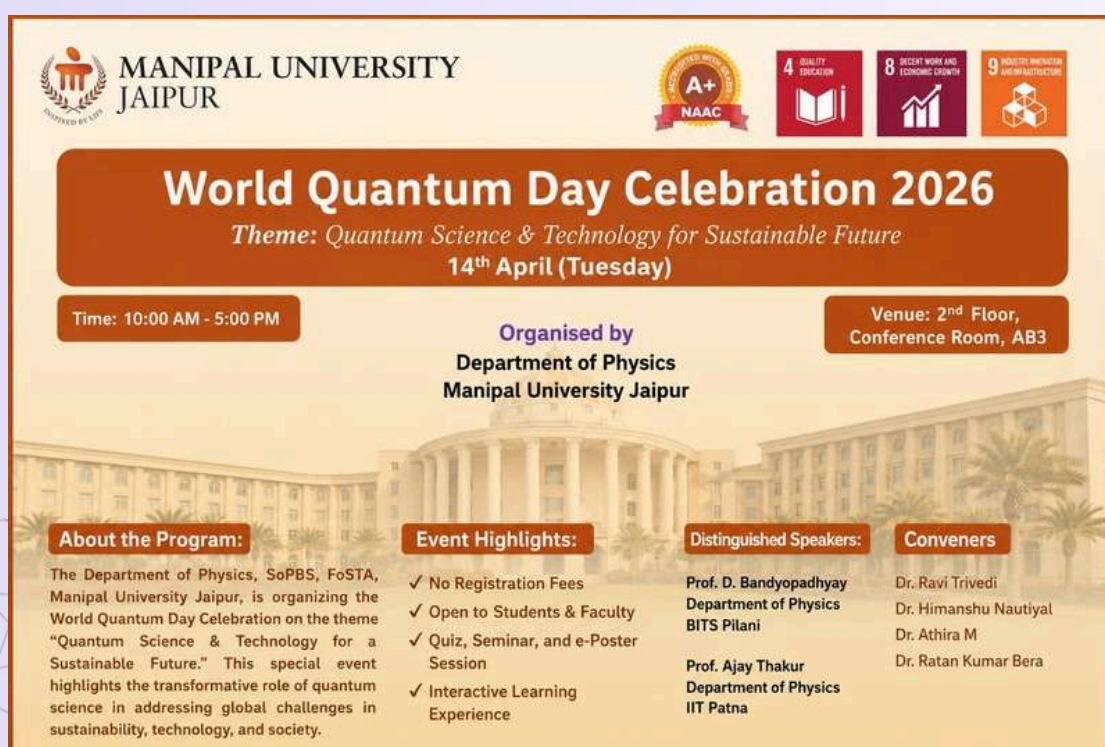
Mission

- To offer a transformative learning experience that equips students with a solid foundation in Physics, preparing them for successful careers in academia, industry, and beyond.
- To foster a research culture among students, enabling their contribution to the scientific enterprise.
- To apply Physics research to innovate for advancing industries and enhancing lives.
- To promote Physics and scientific literacy through community engagement, public lectures, and outreach programs.

PRATHAM

EVENTS

1. Celebrating the Quantum Revolution World Quantum Day Celebration 2026



MANIPAL UNIVERSITY JAIPUR

World Quantum Day Celebration 2026
Theme: Quantum Science & Technology for Sustainable Future
14th April (Tuesday)

Time: 10:00 AM - 5:00 PM

Organised by
Department of Physics
Manipal University Jaipur

Venue: 2nd Floor,
Conference Room, AB3

About the Program:
The Department of Physics, SoPBS, FoSTA, Manipal University Jaipur, is organizing the World Quantum Day Celebration on the theme "Quantum Science & Technology for a Sustainable Future." This special event highlights the transformative role of quantum science in addressing global challenges in sustainability, technology, and society.

Event Highlights:

- ✓ No Registration Fees
- ✓ Open to Students & Faculty
- ✓ Quiz, Seminar, and e-Poster Session
- ✓ Interactive Learning Experience

Distinguished Speakers:

Prof. D. Bandyopadhyay
Department of Physics
BITS Pilani

Prof. Ajay Thakur
Department of Physics
IIT Patna

Conveners:

Dr. Ravi Trivedi
Dr. Himanshu Nautiyal
Dr. Athira M
Dr. Ratan Kumar Bera

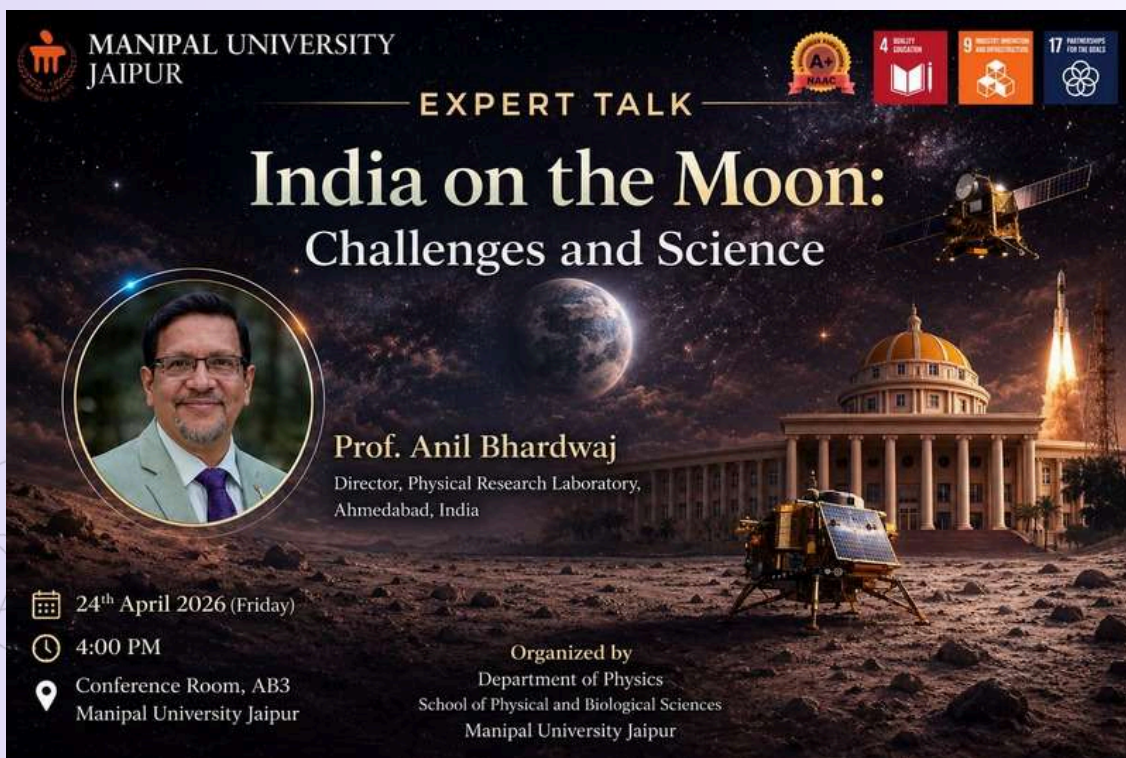
The Department of Physics, Manipal University Jaipur, celebrated World Quantum Day 2026 on 14 April 2026 under the theme **"Quantum Science & Technology for a Sustainable Future."** The event featured distinguished talks by **Prof. D. Bandyopadhyay, BITS Pilani**, and **Prof. Ajay Thakur, IIT Patna**, highlighting the role and emerging applications of quantum science and technology. The celebration also included interactive academic activities such as a quiz, seminar, and e-poster competition, providing students and researchers a platform to showcase their ideas and engage in scientific discussions. The event promoted awareness, learning, and academic interaction in the rapidly advancing field of quantum science.

PRATHAM

EVENTS

2. *India on the Moon: Challenges and Science*

*Expert Talk by Prof. Anil Bhardwaj, Director,
Physical Research Laboratory*



MANIPAL UNIVERSITY
JAIPUR

EXPERT TALK

India on the Moon: Challenges and Science

 **Prof. Anil Bhardwaj**
Director, Physical Research Laboratory,
Ahmedabad, India

24th April 2026 (Friday)
4:00 PM
Conference Room, AB3
Manipal University Jaipur

Organized by
Department of Physics
School of Physical and Biological Sciences
Manipal University Jaipur

The Department of Physics, Manipal University Jaipur, organized an **Expert Talk on “India on the Moon: Challenges and Science”** on 24 April 2026, delivered by **Prof. Anil Bhardwaj, Director, Physical Research Laboratory, Ahmedabad**. A renowned space physicist and recipient of the Shanti Swarup Bhatnagar Prize and Infosys Prize in Physical Sciences, Prof. Bhardwaj shared his expertise in planetary and space sciences and insights from his involvement in major Indian space missions, including Chandrayaan-1, Mars Orbiter Mission, and Chandrayaan-2. The talk provided valuable insights into India’s lunar exploration efforts, scientific challenges, and advancements in space research.

PRATHAM

EVENTS

3. *Bridging Academia & Industry through Advanced Characterization*

Training-cum-Awareness Session on DSC and Rheology under AISA



The poster is for an event organized by the Department of Physics, Manipal University Jaipur. It features the university's logo and name at the top left. To the right are accreditation logos: NAAC A+, THE World University Rankings 2024 (Overall World: 1201-1500), and NIRF Ranking 2023 (Overall Ranking: 91). The main title is "Academia-Industry Symbiotic Alliance (AISA)" in large red letters, followed by "Department of Physics, Manipal University Jaipur" and "Presents Training-cum-Awareness Session on 'Differential Scanning Calorimetry and Rheology'". A circular portrait of Mr. Mayank Varshney is shown next to his name and title: "Mr. Mayank Varshney, Sr. Technical Support Specialist, Waters India Pvt. Ltd.-TA Division". An "Event Details" box on the left lists the date as 8th May 2026, Friday, from 10:00 AM to 1:00 PM, in the Conference Room, 2nd floor, AB3. The bottom left provides the department's address and contact number. The bottom right lists the conveners, Dr. Nilanjan Halder and Dr. Manoj Kumar Saini, and a website link. The background of the poster shows a large, ornate building with a dome.

MANIPAL UNIVERSITY
JAIPUR

NAAC
A+

THE
WORLD UNIVERSITY
RANKINGS 2024
Overall (World):
1201-1500

World University Ranking
2024 by Subject
Engineering: 801-1000
Computer Science: 801-1000
Business & Economics: 801-1000
Physical Sciences: 801-1000

nirf
Ranking 2023
Overall Ranking: 91
University: 91 | Engineering: 58
Management: 81 | Law: 21 | Architecture: 31
Pharmacy: 11-50 | DCE: 11-50

4 QUALITY
IMPROVEMENT
AWARDS

9 INNOVATION
INDEX

Academia-Industry Symbiotic Alliance (AISA)
Department of Physics, Manipal University Jaipur
Presents
Training-cum-Awareness Session
on
"Differential Scanning Calorimetry and Rheology"

Mr. Mayank Varshney
Sr. Technical Support Specialist
Waters India Pvt. Ltd.-TA Division

Event Details
8th May 2026, Friday
10:00 AM to 1:00 PM
Conference Room
2nd floor, AB3

Department of Physics
Manipal University Jaipur

Dehmi Kalan, Jaipur-Ajmer Express Way, Jaipur-303007, Rajasthan
0141-3999100

Conveners:
Dr. Nilanjan Halder
Dr. Manoj Kumar Saini

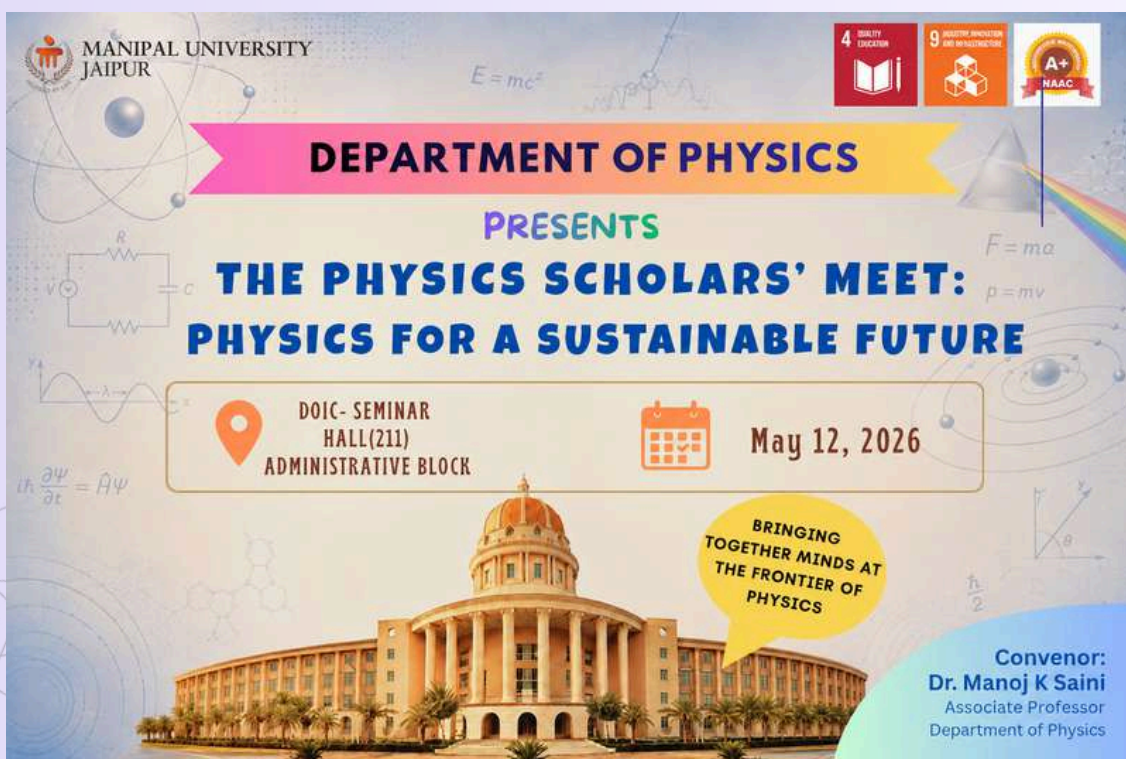
<https://jaipur.manipal.edu/fosta/departement-of-physics.php>

The Department of Physics, Manipal University Jaipur, organized a **Training-cum-Awareness Session on Differential Scanning Calorimetry (DSC) and Rheology** on 8 May 2026 under the Academia-Industry Symbiotic Alliance (AISA) initiative. The session was delivered by **Mr. Mayank Varshney**, Waters India Pvt. Ltd., and aimed to strengthen academia-industry interaction and enhance awareness of advanced material characterization techniques.

PRATHAM

EVENTS

4. *Connecting Minds, Strengthening Research* *Physics Scholars' Meet 2026*



The poster features the Manipal University Jaipur logo at the top left. It includes accreditation logos for Quality Education (4), Institute Assessment and Infrastructure (9), and MAAC A+. The main title is "DEPARTMENT OF PHYSICS PRESENTS THE PHYSICS SCHOLARS' MEET: PHYSICS FOR A SUSTAINABLE FUTURE". The location is "DOIC- SEMINAR HALL(211) ADMINISTRATIVE BLOCK" and the date is "May 12, 2026". A yellow speech bubble says "BRINGING TOGETHER MINDS AT THE FRONTIER OF PHYSICS". The convenor is "Dr. Manoj K Saini, Associate Professor, Department of Physics". The background is decorated with physics diagrams like $E=mc^2$, $F=ma$, $p=mv$, and $i\hbar \frac{\partial \psi}{\partial t} = \hat{H} \psi$.

The Department of Physics, Manipal University Jaipur, organized **The Physics Scholars' Meet: Physics for a Sustainable Future** on 12 May 2026. The event brought together research scholars to present their ongoing research and exchange innovative ideas for a sustainable future. Organized entirely by the scholars, the meet provided a platform for scientific discussions, knowledge sharing, and peer learning, strengthening the department's research culture.

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EVENTS

5. *Building the Future: Advances in Concrete & Materials Science*

Industry Expert Talk on Advanced Concrete and Material Science



MANIPAL UNIVERSITY
JAIPUR
(University under Section 2(f) of the UGC Act)

Department of Physics & Centre for Water Research
and Sustainable Technologies

Is Jointly Organizing
Industry Expert Talk on
"Advanced Concrete and Material Science"

Resource Person:
Dr. Vandana Gupta
Assistant Manager
Research and Development
ConChem Labs LLP,
Turbhe, Navi Mumbai, Maharashtra, India

Date: May 13th, 2026
Time: 3:45 PM to 4:30 PM
Venue: Conference Room, Faculty Block 6, AB2

Convener:
Dr. Himmat Singh Kushwah

The Department of Physics and Centre for Water Research and Sustainable Technologies, Manipal University Jaipur, jointly organized an Industry **Expert Talk on "Advanced Concrete and Material Science"** on 13 May 2026. The session was delivered by **Dr. Vandana Gupta, Assistant Manager-R&D, ConChem Labs LLP**, who shared insights from her expertise in nanotechnology and materials science. The talk highlighted advanced materials research and the development of nano-additives and admixtures for creating smarter, sustainable, and self-healing infrastructure.

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EVENTS

6. *Exploring the Frontiers of Quantum Science & Advanced Materials*

Five-Day Faculty Development Programme



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JAIPUR

ACCREDITED BY NAAC
A+

9 INDUSTRY PROMOTION AND INFRASTRUCTURE
4 QUALITY EDUCATION
17 PARTNERSHIPS FOR THE GOALS

Faculty Development Program on
Frontiers in Quantum Science and Advanced Materials Technology
Organised by
Department of Physics
SoPBS, Manipal University Jaipur

25-29 May, 2026
Hybrid Meeting

Conveners:
Dr. Athira M. | Dr. Sathi Sharma | Dr. Ashok Kumar Mondal

The Department of Physics, Manipal University Jaipur, organized a five-day Faculty Development Program (FDP) on “**Frontiers in Quantum Science and Advanced Materials Technology**” from 25–29 May 2026 in hybrid mode. The program brought together experts from academia, research institutions, and industry to share insights into quantum metrology and sensing, quantum computation, emerging memory technologies, the quantum Hall effect, quantum dots, and advanced materials. The sessions also highlighted India’s evolving quantum research ecosystem, national initiatives, and real-world applications.

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MOMENTS & MEMORIES

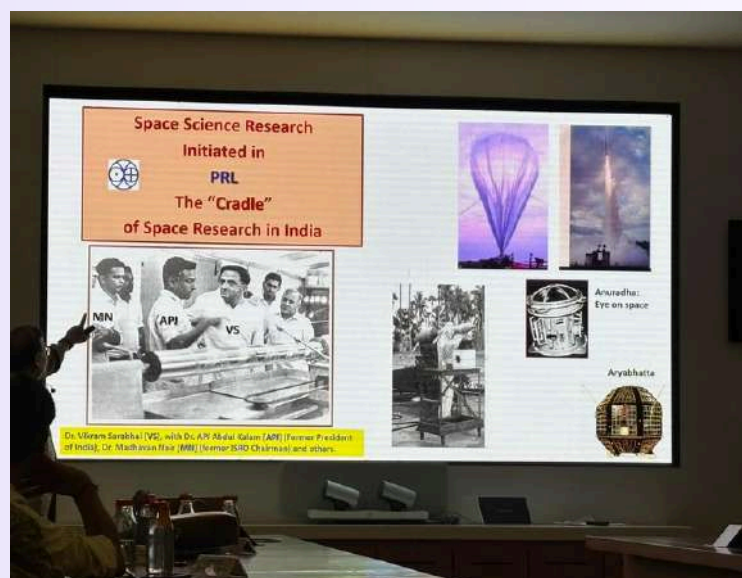
Celebrating the Quantum Revolution
World Quantum Day Celebration 2026



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MOMENTS & MEMORIES

India on the Moon: Challenges and Science



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MOMENTS & MEMORIES

*Bridging Academia & Industry through Advanced
Characterization*



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MOMENTS & MEMORIES

Scholars' Meet 2026



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MOMENTS & MEMORIES

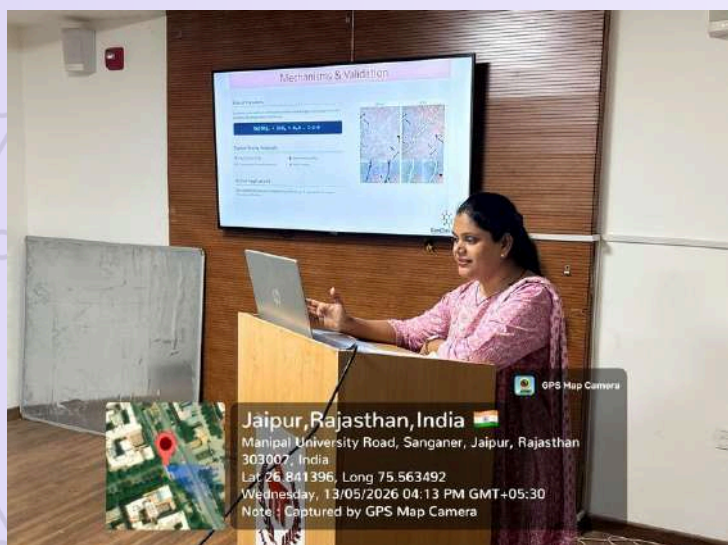
Winners of Scholars' Meet 2026



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MOMENTS & MEMORIES

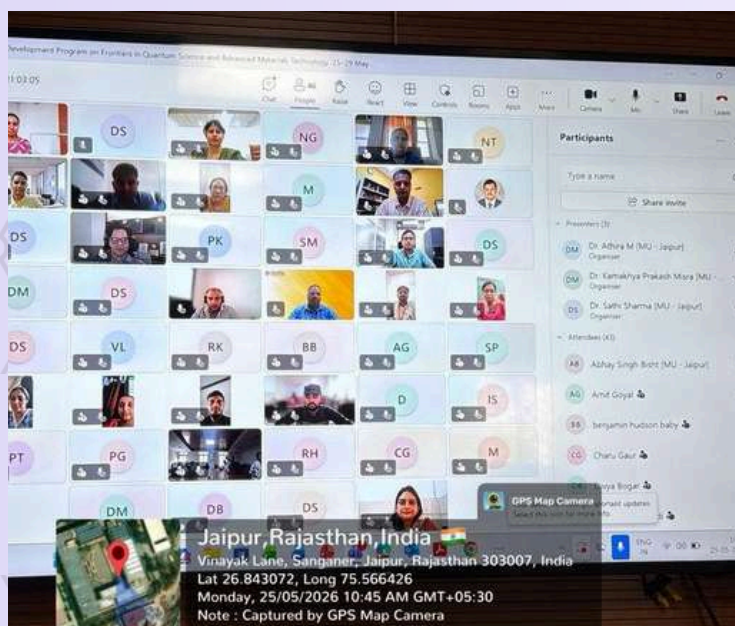
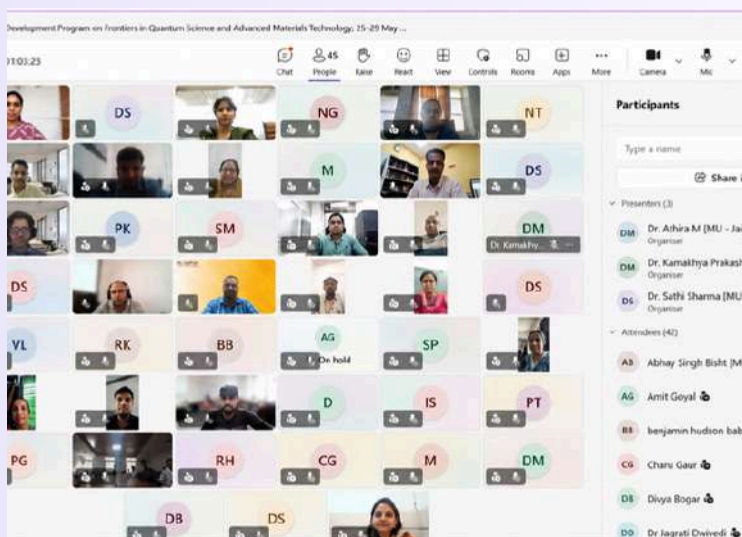
Building the Future: Advances in Concrete & Materials Science



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MOMENTS & MEMORIES

Exploring the Frontiers of Quantum Science & Advanced Materials



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INNOVATION SPOTLIGHT



Awardee

Dr. Praveen Kumar Singh

Awarding Authority

The Alexander von Humboldt Foundation (AvH)

The Department of Physics proudly congratulates **Dr Praveen Kumar Singh** being awarded the prestigious **Alexander von Humboldt Research Fellowship, Germany**. Recognized globally, the Humboldt Fellowship supports outstanding researchers by providing opportunities to collaborate with leading institutions in Germany and advance cutting-edge research.

This remarkable achievement reflects Dr Praveen's dedication to excellence in research and brings great pride to our Department and the University. We extend our heartfelt congratulations and wish him continued success in his future endeavors.

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INNOVATION SPOTLIGHT

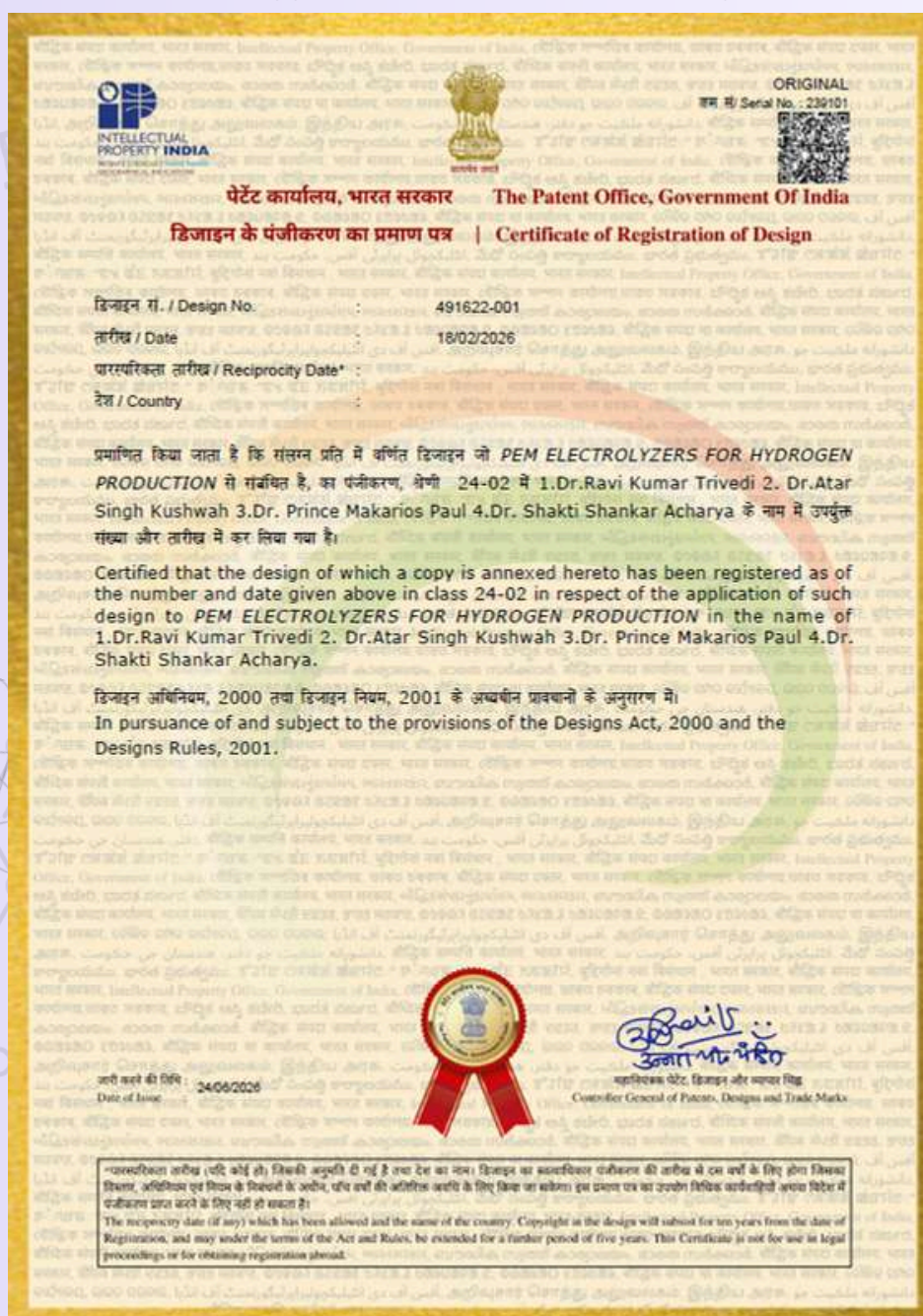
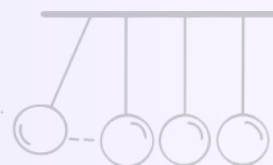
Patent Granted by the Government of India

Awardee

Dr. Ravi Kumar Trivedi

Awarding Authority

The Patent Office, Government of India



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SCHOLARS' MILESTONES & ENDEAVOURS



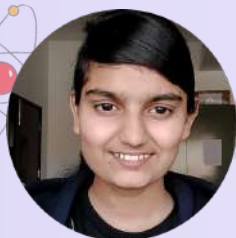
Khushabu Shekhawat
Research Scholar

Publications:

Rapid visible-light-driven Rose Bengal dye degradation over a hydrothermally assembled g-C₃N₄-MXene composite

Journal: Discover Applied Sciences

Impact Factor: 3.8 **Quartile:** 1



Vishakha Sharma
Research Scholar

Publications

Surface Wettability Engineering of Ga₂O₃ Thin Films by Oblique Angle Electron Beam Deposition for Transparent Self-Cleaning Photovoltaic Coatings

Journal: Physica B Condensed Matter

Impact Factor: 3.2 **Quartile:** 2



Manoj Vishwakarma
Research Scholar

Publications:

Temperature-dependent Raman spectroscopy and density functional theory analysis of CB60.O8 dimeric liquid crystal exploration

Journal: Discover Applied Sciences

Impact Factor: 3.8 **Quartile:** 1



Vandana Choudhary
Research Scholar

Faculty Development Program

on AI and its Multidisciplinary Applications: Bridging Theory and Practice & Artificial Intelligence for Sustainable Innovation: A Multidisciplinary Research Perspective



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SCHOLARS' MILESTONES & ENDEAVOURS



Palak Gupta
Research Scholar

Oral Presentation:

Title: Wavefunctions of hidden strange pentaquarks

Conference: PHYCON-26: The National Physics Conference



Karishma Jain
PhD Graduate

Publications

Comparative insights into photo-degradation of methylene blue and methyl orange dyes utilizing Sulfur/ MWCNT nanocomposites

Journal: Indian J Phys

Impact Factor: 3.2 **Quartile:** 2



Deepika Maan
Research Scholar

Publications:

Comprehensive characterizations and enhanced photocatalytic performance of zirconium based metal-organic framework integrated with multiwall carbon nanotubes under UV light irradiation

Journal: Scientific Reports

Impact Factor: 3.9 **Quartile:** 1



Kritika Garg
Research Scholar

Publications:

Synergistic DFT and temperature-dependent Raman profiling of fluorinated mesogens

Journal: Scientific Reports

Impact Factor: 3.9 **Quartile:** 1

Oral Presentation:

Title: Structural and vibrational dynamics of a fluorinated Schiff-base liquid crystal: An analytical discourse via DFT

Conference: International Conference on Frontier Areas of Science and Technology for Sustainable Development

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SCHOLARS' MILESTONES & ENDEAVOURS



Iram
Research Scholar

Faculty Development Program:
on Ethical Use of AI in Research and
Studies



Lalit Kumar
Research Scholar

Publications

Synergistic adsorption-photocatalysis in TiO_2 /activated carbon composites: optimization of p-nitrophenol degradation and application to real textile wastewater treatment.

Journal: Applied Water Science

Impact Factor: 5.7 Quartile: 1



Ugrasen Singh
Research Scholar

Publications

Review of Methods for Tuned Frequency Generation Using Optical Parametric Oscillators Based on Periodically Poled Lithium Niobate

Journal: Journal of Optics

Impact Factor: 2.6 Quartile: 2

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FROM SCHOLAR TO DOCTOR

The Department of Physics extends heartfelt congratulations to the following scholars for successfully earning their PhD degrees. Their commitment, groundbreaking research, and academic excellence have made remarkable contributions to the scientific community.



Dr. Ashish Kumar
Kumawat

Thesis Title - Study of Metal Modified Vanadium Oxide for Functional Applications

Supervisor - Dr. Rashi Nathawat



Dr. Karishma Jain

Thesis Title - Tuning of Photocatalytic Response of Sulfur-Based Graphene Oxide and Reduced Graphene Oxide Nanocomposites

Supervisor - Prof. (Dr.) Sushil Kumar Jain

Co-Supervisor - Dr. Balram Tripathi



Dr. Umesh Kumar
Singh

Thesis Title - Descriptions of Superheavy Nuclei Using Relativistic Mean Field Theory

Supervisor - Prof. (Dr.) Sushil Kumar Jain

Co-Supervisor - Dr. Gaurav Saxena

PRATHAM

In her words

Karishma Jain

Ph.D. Graduate

Department of Physics



With profound gratitude, I sincerely thank my Supervisor, Prof. (Dr.) Sushil Kumar Jain, and my Co-Supervisor, Dr. Balram Tripathi, whose constant guidance, unwavering faith, and encouragement shaped every step of my Ph.D. journey and made the successful completion of my thesis possible. I am equally grateful to all the physics research scholars—especially Ms. Deepika Maan, Mr. Ashish Kumar, Ms. Nisha Chandnani, Mrs. Anuja Mathur, Dr. Bhawna Rathi, and Ms. Vishakha Sharma—as well as the entire faculty of the Department of Physics for their continuous support, kindness, and inspiration. My heartfelt appreciation also extends to the SAIF and CAF research facilities for providing invaluable research support throughout my work. Every interaction, every lesson, and every word of encouragement has left a lasting imprint on my life. These years will always remain among the most cherished chapters of my journey, filled with learning, gratitude, meaningful friendships, and memories that I will carry with me forever.

PRATHAM

Beyond the Horizon: Recent Breakthroughs in Modern Physics.

Explore two fascinating research developments that highlight the power of experimental physics and advanced computing in solving some of science's greatest challenges.

HAWKING RADIATION SIMULATED IN THE LAB

A MAJOR STEP TOWARD UNDERSTANDING BLACK HOLES

Scientists have reproduced Hawking radiation—the theoretical radiation predicted to be emitted by black holes—using a tabletop experiment with laser light in an optical fiber.

THE EXPERIMENT

Laser Input → Optical Fiber → Event Horizon (Analog Black Hole) → Hawking-like Radiation

KEY FINDINGS

- Hawking-like radiation was observed for the first time in a controlled laboratory setting.
- The experiment also captured the expected back-reaction, an important aspect of black hole dynamics.
- Provides a new way to study quantum effects of gravity that are otherwise impossible to observe directly.

WHY IT MATTERS

This breakthrough offers scientists a powerful tool to explore extreme cosmic phenomena and brings us closer to unifying quantum mechanics and Einstein's theory of gravity.

“Laboratory experiments like this allow us to test ideas about the universe that were once purely theoretical.”
– Inspired by Stephen Hawking's vision

QUANTUM COMPUTING POWERING FUSION ENERGY RESEARCH

A STEP CLOSER TO A CLEAN, LIMITLESS FUTURE

Researchers are combining quantum computing, advanced modeling, and high-performance computing to model and produce tritium, a rare isotope essential for future nuclear fusion reactors.

HOW IT WORKS

Quantum Computing + Advanced Modeling + High-Performance Computing → ^3H Tritium Production

WHY TRITIUM IS IMPORTANT

- Tritium fuels fusion reactions that produce vast amounts of energy.
- It is rare in nature and difficult to produce.
- Efficient production is one of the biggest challenges for commercial fusion power.

IMPACT ON THE FUTURE

- Clean Energy
- Reduced Carbon Emissions
- Sustainable Electricity
- Energy Security for Future Generations

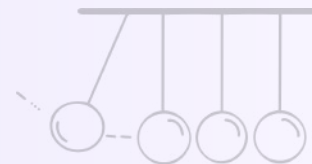
THE BIG PICTURE

This hybrid quantum-HPC approach can dramatically speed up and de-risk, bringing us closer to a future powered by safe, abundant, and sustainable fusion energy.



PRATHAM

Meet the Team!



United by Curiosity, Bound by Physics !