MANIPAL UNIVERSITY
JAIPUR

SEPTEMBER | 2025

PRATHAM

Issue: 6

Physics Research Advancements by Thoughtful Humankind and their Achievements Miscellany

Quarterly Newsletter

Department of Physics
School of Physical and Biological Sciences
Faculty of Science, Technology and Architecture

PRATHAM

Meet the Editors

Aashima Sharma
Research Scholar

Kritika Garg
Research Scholar

Sandeep Kumawat
Research Scholar

Shefali Pareek
Research Scholar

Editorial Advisor

Dr. Manoj Kumar Saini
Associate Professor

PRATHAM

Message from HoD

Dr. Kamakhya P. Misra
Head, Department of Physics
Manipal University Jaipur

Editorial

It gives me immense pleasure to present the latest issue of the Pratham aQuarterly 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

Out & About

Organized by the Department of Physics in collaboration with the Institute of Theoretical and Computational Physics, University of Crete, Greece, this international conference provided a dynamic platform for global researchers, academicians, and industry experts. It covered cutting-edge themes such as advanced nanomaterials, quantum field theory, spectroscopy, nuclear technologies, plasma physics, and more. Attendees presented posters and papers on outstanding research..

PRATHAM

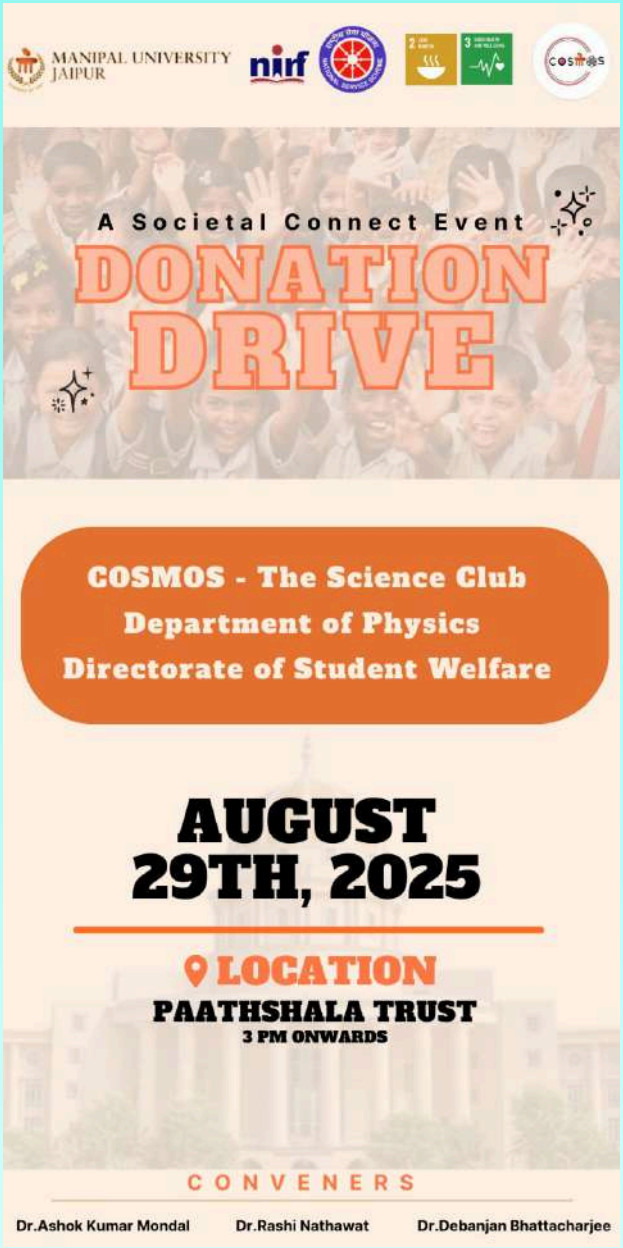
Insights

MANIPAL UNIVERSITY JAIPUR

PRATHAM

Numero Unos

PRATHAM



The Department of Physics in collaboration with COSMOS – The Science Club and the Directorate of Student Welfare, organised a Donation Drive at Paathshala Trust. This compassionate initiative aimed to support underprivileged communities by distributing essential items and spreading joy

PRATHAM

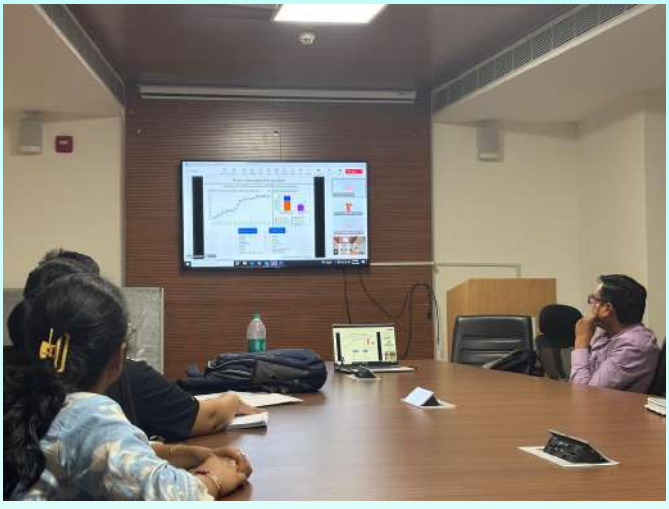
Glances from Donation Drive

PRATHAM

The Department of Physics organized an insightful Industry Expert Lecture on "Bridging Academic Research and Industry in Nanomaterials". The session was delivered by Ms. Vanshika Dixit from Tata Steel Limited, Jamshedpur, offering valuable perspectives on translating research into industrial applications. The event provided an enriching experience for students and researchers, fostering stronger academia-industry connections.

PRATHAM

Insights



PRATHAM

Scholars' Endeavours

Ranjeet Vishwakarma
Research Scholar

- **Publications:**

The effects of fluorine-substituted benzene rings in dimeric liquid crystal compounds: A DFT study
Journal: Journal of Molecular Liquids
Impact Factor: 5.2 Quartile: 1

- **Poster Presentation:**

Analysis of Natural Bond Orbitals and Density of States in Fluorinated Dimer Liquid Crystal Compounds: A DFT Study
Conference: International Conference on Applied Materials, Quantum and Nuclear Sciences (ICAQNS 2025)

Manoj Vishwakarma
Research Scholar

- **Publications:**

1. A temperature-dependent Raman study of 5CB, fully deuterated 5CB, and aromatically deuterated 5CB combining experimental and theoretical approaches
Journal:
Discover Applied Sciences
Impact Factor: 2.8 Quartile: 1
2. Exploration of a 7.O4O.7 dimeric liquid crystal using temperature- dependent Raman Spectroscopy and comparison with Density Functional Theory
Journal: Journal of Molecular Modeling
Impact Factor: 2.5 Quartile: 2

- **Poster Presentation:**

A Comprehensive analysis of the Spectroscopic and Computational properties of the Vibrational Characteristics of Dimeric Liquid crystal
Conference: International Conference on Applied Materials, Quantum and Nuclear Sciences (ICAQNS 2025)

- **Workshop:**

Effective documentation with LateX: from Basic to Professional writing

Kritika Garg
Research Scholar

- **Poster Presentation:**

An In-Depth Spectroscopic Analysis of a Binary Mixture of TB4A and TB7A
Conference: International Conference on Applied Materials, Quantum and Nuclear Sciences (ICAQNS 2025)

PRATHAM

Khushabu Shekhawat
Research Scholar

- **Publications:**

Enhanced visible-light-driven dye degradation via electron coupling between linear polymer nanoclusters and TiO_2 nanoparticles
Journal: Discover Applied Sciences
Impact Factor: 2.8 Quartile: 1

Aashima Sharma
Research Scholar

- **Oral Presentation:**

Ion acoustic shock waves in presence of charged space debris objects
Conference: International Conference on Applied Materials, Quantum and Nuclear Sciences (ICAQNS 2025)

- **Workshop:**

Effective Documentation with LaTeX: From Basics to Professional Writing

Ekta
Research Scholar

- **Oral Presentation:**

Systematic review of the Alpha induced nuclear reaction cross-section on La and As to produce radio-isotopes.
Conference: International Conference on Applied Materials, Quantum and Nuclear Sciences (ICAQNS 2025)

- **Workshop:**

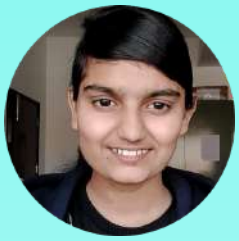
1. **IUAC School on Nuclear Reactions - 2025, IUAC, New Delhi**
2. **Biological effects in Radiation Physics - 2025, IUAC, New Delhi**
3. **Effective Documentation with LaTeX: From Basics to Professional Writing**

Shefali Pareek
Research Scholar

- **Oral Presentation:**

Biogenic Nanogels for Articular Cartilage Regeneration
Conference: International Conference on Empowering Women in Science, Technology, Engineering, Arts and Management (ICEWSTEAM 2025)

PRATHAM



Vishakha Sharma
Research Scholar

- **Poster Presentation:**

Enhanced visible-light-driven dye degradation via electron coupling between linear polymer nanoclusters and TiO2 nanoparticles
Conference: International Conference on Applied Materials, Quantum and Nuclear Sciences (ICAQNS 2025)

Surendra Singh
Research Scholar

- **Oral Presentation:**

Effect of Synthesis Process on the Properties of GO-Ca(OH)2 Nanocomposite and Dye Removal Efficiency
Conference: International Conference on Applied Materials, Quantum and Nuclear Sciences (ICAQNS 2025)

Vandana Choudhary
Research Scholar

- **Oral Presentation:**

Influence of Copper Doping on the Structural and Optical Properties of Cerium Oxide Nanoparticles
Conference: International Conference on Empowering Women in Science, Technology, Engineering, Arts and Management (ICEWSTEAM 2025)

- **Poster Presentation:**

Cu Incorporated CeO2 Nanoparticles for Rapid Degradation of Rhodamine-B Dye
Conference: International Conference on Applied Materials, Quantum and Nuclear Sciences (ICAQNS 2025)

- **FDP:**

1. **Five Days online Faculty Development Programme on Cytometry**
2. **Effective Documentation with LaTeX: From Basics to Professional Writing**

PRATHAM

Lalit Kumar
Research Scholar

- **Publication:**

Enhanced adsorption characteristics of different modified biochars derived from biomass pyrolysis for the removal of textile effluents
Journal: Chemical Engineering and Processing- Process Intensification
Impact Factor: 3.9 Quartile: 1

Sanjay Kumar
Research Scholar

- **Publication:**

Field dependent magnetic and dielectric properties of the Triangular Lattice Antiferromagnet: Ba3CoSb2O9
Journal: Journal of Alloys and Compounds
Impact Factor: 6.3 Quartile: 1

Nihal Kumawat
Research Scholar

- **Oral Presentation:**

Calculation of the astrophysical S-factor of the $^{12}C(p,\gamma)^{13}N$
Conference:
International Conference on Applied Materials, Quantum and Nuclear Sciences (ICAQNS 2025)

- **Workshop:**

1. **IUAC School on Nuclear Reactions - 2025, IUAC, New Delhi**
2. **Effective Documentation with LaTeX: From Basics to Professional Writing**

Sandeep Kumawat
Research Scholar

- **Oral Presentation:**

Exploring the unverified dipole sequence in ^{139}Pm
Conference: International Conference on Applied Materials, Quantum and Nuclear Sciences (ICAQNS 2025)

- **Workshop:**

1. **Biological effects in Radiation Physics - 2025, IUAC, New Delhi**
2. **Effective documentation with LateX: from Basic to Professional writing**

PRATHAM

Ashish Kumar
Research Scholar

- **Oral Presentation:**

High-Performance Photocatalytic Degradation of Methylene Blue by a Bi203/Graphite Nanocomposites Under Solar Irradiation
Conference: International Conference on Applied Materials, Quantum and Nuclear Sciences (ICAQNS 2025)

Neha Bishnoi
Research Scholar

- **Workshop:**

Three Days Workshop on qRT-PCR and Flow Cytometry

Jogendra
Research Scholar

- **Workshop:**

Three Days Workshop on qRT-PCR and Flow Cytometry

Ugrasen Singh
Research Scholar

- **Oral Presentation:**

Electro-Optically Tunable segmented QPM devices for Dynamic Control of Second Harmonic Generation
Conference: International Conference on Applied Materials, Quantum and Nuclear Sciences (ICAQNS 2025)

PRATHAM

Guru Kishore B
Research Scholar

- **Oral Presentation:**

Impact of Gold Electrode Thickness on Quasi-Hemispherical CdZnTe Detector: A Simulation-Driven Optimization for Room Temperature Gamma Detection
Conference: International Conference on Applied Materials, Quantum and Nuclear Sciences (ICAQNS 2025)

Jyoti Kumari
Research Scholar

- **Oral Presentation:**

Novel, Soft Synthesis and Characterization of Calcite Thin Films on Plasma-Etched Silicon Substrates
Conference: International Conference on Applied Materials, Quantum and Nuclear Sciences (ICAQNS 2025)

Deepika Maan
Research Scholar

- **Oral Presentation:**

Photo-Catalytic Study of Rose Bengal Dye using Sol Gel Synthesized Titanium Dioxide Incorporated with Transition Metal Elements
Conference: International Conference on Applied Materials, Quantum and Nuclear Sciences (ICAQNS 2025)

Ashish Somvanshi
Research Scholar

- **Poster Presentation:**

Recent Advances in Molecular Gears on a Two-Dimensional Nanosheet
Conference: International Conference on Applied Materials, Quantum and Nuclear Sciences (ICAQNS 2025)

Karishma Jain
Research Scholar

- **Oral Presentation:**

Water Purification using Carbon-Based Material for Environmental Sustainability and Water Conservation: A Review
Conference: International Conference on Applied Materials, Quantum and Nuclear Sciences (ICAQNS 2025)

PRATHAM

Shining Moments

The Department of Physics, proudly congratulates the following scholars on the successful completion of their PhD degrees. Their dedication, innovative research, and academic excellence have made significant contributions to the scientific community

1. 👨‍🎓 Dr. Prarbdh Bhatt

📝Thesis Title: "Synthesis And Characterization of Transition Metal Doped WS2 Nanostructures "

🎓 Supervisor: Dr. Nilanjan Halder

Current Organization:
Research Associate (Consultant)
TERI-Deakin Nanobiotechnology Centre,
Sustainable Agriculture Division,
The Energy and Resources Institute,
New Delhi 110003 I India.

2. 👨‍🎓 Dr. Richa Sharma

📝 Thesis Title: "Detection of Cancer Biomarkers using MoS2-Based Electrochemical Sensor"

🎓 Supervisor: Dr. Ashima Bagaria

Current Organization:
PGT Physics
Jaipuria Vidyalaya
Jawaharlal Nehru Marg, Jaipur, Rajasthan 302018

PRATHAM

Faculty Awards - 2025

Dr. Ashima Bagaria
Awareded as - Dr Ramdas M Pai
for Research & Professional excellence

Dr. Kamakhya Prakash Misra
Awareded as - Dr Ramdas M Pai
for professional excellence

Dr. Sushil Kumar Jain
Awareded as - Dr Ramdas M Pai
for professional excellence

PRATHAM

Dr. Rashi Nathawat
Recognized as - Focus Collection Editor in IOP
Science : Materials Research Express
&
Guest Editor in Frontiers in physics

Dr. Saikat Chattopadhyay
Awareded as - Dr Ramdas M Pai
for Research & Professional excellence

Dr. Abhik Mukherjee
Awareded as - Young Teacher Award

Dr. Debanjan Bhattacharjee
Awareded as - Young Researcher Award

PRATHAM

New Additions

1. Dr. Himanshu Nautiyal, Assistant Professor

Educational Qualifications:

- PhD: University of Trento, Italy
- M.Sc.: Central University of Haryana
- B.Sc. honours: Bhaskaracharya College of Applied Sciences, University of Delhi

Area of Expertise:

- Condensed Matter Physics
- Computational Material Science
- Density Functional Theory
- Molecular Dynamics

---

2. Dr. Athira M., Assistant Professor

Educational Qualifications:

- Postdoc: CeNSE, IISc, Bengaluru followed by teaching/ teacher training (STEM Lead) at Aavishkaar Centre, Palampur, Himachal Pradesh
- PhD: Centre for Nano and Soft Matter Sciences (CeNS), Bengaluru
- M.Sc.: Nehru Arts and Science College, Kannur University, Kerala

Area of Expertise:

- Thin films synthesis using vapour deposition methods (Ebeam, Thermal evaporation, Sputtering, ALD, PECVD)
- Thin film characterisations
- Device fabrication (p-n and p-i-n junction solar cells, photodetectors) and characterisations
- Semiconductor Physics, Optoelectronics, Material Science

PRATHAM

3. Dr. Subrata Karmakar, Assistant Professor (Research)

Educational Qualifications:

- Postdoc: Texas State University, USA
- PhD: National Institute of Technology Rourkela
- M.Sc.: Indian Institute of Technology Bhubaneswar
- B.Sc. honours: Burdwan University

Area of Expertise:

- Q-carbon, Diamond
- Ultrawide Bandgap Materials Thin Film (Epitaxial)
- Dielectric, Ferroelectrics, Multiferroics
- Supercapacitor, Electric Field Emission
- High Pressure Study, Magnetic Study

4. Dr. Ratan Kumar Bera, Associate Professor

Educational Qualifications

- Ph.D., Institute for Plasma Research(IPR), Gandhinagar, India, 2018
- M.Sc. Physics, IIT Bombay, Mumbai, India, 2012
- B.Sc. Physics(H), Ramakrishna Mission V. C. College Rahara, University Of Calcutta, 2010

Area of Expertise

- Theoretical and Computational Plasma Physics
- Solar Wind-Local Interstellar Medium Interaction
- Laser/Beam-Plasma Interaction
- Fluid and Particle-In-Cell (PIC) simulations
- Computational Fluid Dynamics and MHD

PRATHAM

5. Dr. Ravi Kumar Trivedi, Associate Professor (Research)

Educational Qualifications

- Post-Doc ANRF Delhi.
- Post-Doc IIT Bombay.
- Post-Doc Institute Ruder Boskovic, Zagreb, Croatia, Europe.
- PhD institute BITS Pilani, Rajasthan.

Area of Expertise

- Computational designs of functional materials for energy, environment, and quantum technologies.
- Hydrogen storage and energy conversion.
- Carbondioxide reduction and environmental catalysis.
- Ammonia and gas sensing applications.

PRATHAM

A Note

Nihal Kumawat
Research Scholar,
Department of Physics

Life at Manipal University Jaipur as a Research Scholar

It has been a year since I started my Ph.D. journey at Manipal University Jaipur, and this period has been a blend of learning, challenges, and growth. Life as a research scholar is not always predictable some days bring exciting results and new insights, while others test one's patience and persistence.

The Department of Physics provides a strong research atmosphere with well-equipped laboratories, approachable faculty, and frequent academic discussions that encourage critical thinking. The peaceful and green campus adds to the focus and motivation needed for research work.

Over this year, I have learned that research is not just about reaching conclusions or publishing papers it is about developing curiosity, discipline, and resilience. Every day adds to my understanding and helps me grow as a learner and as a researcher.