ASSOCIATION OF ALL COMPUTER SCIENCE TEACHERS (AACST)
कॉम्प्यूटर विज्ञान शिक्षक संघ [Reg. No: Nagpur/0000492/2023] September 2023

REPORT

ON

NATIONAL WORKSHOP

Advanced Computational Tools for Physical Science

NWACTPS 2026

9TH TO 13TH March 2026

ORGANIZED BY

AACST

IN ASSOCIATION WITH

IAPT (RC-08)

PATRON & MENTOR

DR. ABHA KHANDELWAL

FOUNDER, AACST

WORKSHOP CONVENER

DR. BHAKTI PATANKAR RAJVAIDYA


NATIONAL WORKSHOP
ADVANCED COMPUTATIONAL TOOLS
for Physical Sciences
Organized by
Association of All Computer Science Teachers (AACST)
In Collaboration with
Indian Association of Physics Teachers (IAPT - RC08)
9th – 13th March 2026 | 6:30 PM – 8:30 PM (IST) | Online
For Postgraduate Students | Research Scholars | Faculty Members
Fees: Rs.600/-
Why Attend?
> Exposure to contemporary computational methods in physics
> Linking theory with simulations and selected AI-based data-centric approaches
> Strengthening research capability and advanced teaching practices
Patron & Mentor
Dr. Abha Khandebral Founder (AACST)
IAPT Dignitaries
Mahesh Shetti President (IAPT RC08)
Dr Rajesh Nimat Secretary (IAPT RC08)
Convener
Dr Bhakti Rajvaidya G H Raisoni College of Engineering, Nagpur
Contact Person
Dr Jayashree Bagmare Treasurer (IAPT RC08)
Resource Persons
Dr. Akshay Joshi Govt. Dungar College, Bikaner, Rajasthan
Dr Amol Nande Guru Nanak College of Science, Ballarpur
Dr. Praveen Parthasarathi Dr HN National College of Engineering, Bangalore
Dr Priya Mathur Poornima Institute of Engineering & Technology Jaipur
Dr Bhakti Rajvaidya G H Raisoni College of Engineering, Nagpur
34504615750@sbi
SCAN & PAY
Key Topics:
DFT TDDFT
Computational Luminescence
Optical Trapping
Physics-Informed AI
Monte Carlo Methods
For more details Contact 98505 62630 chimanpurejayu@gmail.com
Registration QR Code
https://forms.gle/QgX8bQ3V1VUSo3U46

NATIONAL LEVEL Online Workshop on
"Advanced Computational Tools for Physical Sciences (NWACTPS-2026)"

Dates: 9th – 13th March 2026

Time : 6:30 PM – 8:30 PM (IST)

Mode: Online

Organized by

Association of All Computer Science Teachers (AACST)
in collaboration with
Indian Association of Physics Teachers (IAPT – RC08)

Participants: The workshop witnessed **active participation from 56 participants**, comprising **faculty members, research scholars, postgraduate students, and professionals** interested in computational approaches in physical sciences.

Participants joined from **9 states across India**, including **Maharashtra, Karnataka, Haryana, Rajasthan, Odisha, Chhattisgarh, Assam, Arunachal Pradesh, and Goa**, reflecting the **national reach and academic relevance** of the workshop.

The representation spanned **more than 35 cities**, such as **Nagpur, Pune, Mumbai, Solapur, Nashik, Chhatrapati Sambhajinagar, Bengaluru, Mandya, Kalaburagi, Rohtak, Bhubaneswar, Keonjhar, Bikaner, Raipur, Jorhat, Itanagar, and Saligao**, among others.

This broad geographical participation highlights the **growing interest among the academic community in integrating computational tools with modern scientific research and interdisciplinary learning**.

Patron & Mentor

Dr. Abha Khandelwal
Retired Head, Department of Computer Science, Hislop College, Nagpur
Founder, Association of All Computer Science Teachers (AACST)

Workshop Convener

Dr. Bhakti Patankar Rajvaidya
Assistant Professor, Department of Physics
International Relations Officer
G. H. Raisoni College of Engineering, Nagpur

Resource Persons

• Dr. Priya Mathur – Research Faculty, Department of Mathematics, Poornima Institute of Engineering & Technology, Jaipur

• Dr. Amol Vitthal Nande – Assistant Professor, Department of Physics, Guru Nanak College of Science, Ballarpur

• Dr. Praveen Parthasarathi – Assistant Professor, Department of Physics, Dr. H. N. National College of Engineering, Bangalore

• Dr. Akshay Joshi – Assistant Professor, Department of Physics, Government Dungar College, Bikaner

• Dr. Bhakti Patankar Rajvaidya – Assistant Professor, Department of Physics, G. H. Raisoni College of Engineering, Nagpur

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Chair Persons

- Dr. SRINAG P, Advanced Research Scientist, Honeywell Technology, Bangalore
- Dr. Vikrant Yashwant Ganvir, HOD - Department of Applied Physics, Yeshwantrao Chavan College of Engineering, Nagpur
- Dr. Akhilesh A. Ugale, In-charge Registrar and Assistant Professor (Physics) G H Raisoni College of Engineering and Management, Nagpur
- Dr. Jyothi Manish Ghushe, PICT Model School, Pune
- Dr. Nilesh S. Ugemuge, Assistant Professor, Department of Physics at Anand Niketan College, Warora

Event Overview

The National Online Workshop on "Advanced Computational Tools for Physical Sciences (NWACTPS-2026)" was successfully organized by the Association of All Computer Science Teachers (AACST) in collaboration with the Indian Association of Physics Teachers (IAPT-RC08) from 9th to 13th March 2026, from 6:30 PM to 8:30 PM (IST). The workshop was conducted in online mode and attracted participation from postgraduate students, research scholars, faculty members and professionals from different parts of India.

The workshop was designed with the objective of introducing participants to modern computational techniques used in physical sciences research and teaching. The program aimed to bridge the gap between theoretical physics concepts and their practical implementation through computational simulations, modeling techniques and AI-driven approaches. Participants were exposed to emerging tools and methodologies that are increasingly shaping interdisciplinary research in physics and related domains.

The immersive workshop served as a dynamic learning platform, bringing together enthusiastic learners including students, academicians and researchers interested in computational physics. The sessions focused on strengthening the participants' research capabilities, analytical skills and understanding of computational modelling in physics.

The five-day workshop (9th–13th March 2026) consisted of expert lectures, demonstrations, and interactive discussions delivered by distinguished academicians and researchers from reputed institutions across the nation .

Workshop Sessions

Session 1: Physics-Informed Neural Networks (PINNs)

Resource Person: Dr. Priya Mathur

Topics Covered:

Introduction to Physics-Informed Neural Networks

Integration of physical laws with machine learning models

Applications of PINNs in solving differential equations

Role of AI in modeling complex physical systems

Discussion and conclusion

Session 2: Computational Luminescence

Resource Person: Dr. Amol Vitthal Nande

Topics Covered:

Fundamentals of luminescence phenomena

Computational methods used in luminescence studies

Simulation approaches in materials science

Applications in optical materials and devices

Conclusion

Session 3: Computational Methods in Optical Trapping (Photonics)

Resource Person: Dr. Praveen Parthasarathi

Topics Covered:

Introduction to optical trapping and photonics

Numerical techniques for modeling optical forces

Simulation of particle trapping using computational tools

Applications in biological and nano-scale systems

Conclusion

Session 4: Density Functional Theory (DFT)

Resource Person: Dr. Akshay Joshi

Topics Covered:

Introduction to Density Functional Theory

Quantum mechanical description of many-body systems

Computational approaches for electronic structure calculations

Applications in materials science and condensed matter physics

Conclusion

Session 5: Monte Carlo Methods in Physics

Resource Person: Dr. Bhakti Patankar Rajvaidya

Topics Covered:

Introduction to Monte Carlo techniques

Random sampling and stochastic simulations

Applications in statistical physics and computational modeling

Use of Monte Carlo methods in solving complex physical problems

Conclusion

Course Highlights

Sessions delivered by experienced academicians and researchers.

Exposure to advanced computational techniques in physical sciences.

Interactive sessions enabling discussion and knowledge exchange.

Participants gained insights into AI, simulation methods and modern computational physics tools.

Course completion certificates were provided to eligible participants.

Course Outcomes

By the end of the workshop, participants were able to:

Understand the role of computational methods in modern physics research.

Gain knowledge about AI-based modeling techniques such as Physics-Informed Neural Networks.
Understand computational approaches used in luminescence and optical trapping studies.
Learn the basics of Density Functional Theory for electronic structure calculations.
Understand and apply Monte Carlo simulation techniques in physics problems.

Supplementary Academic Material Shared with Participants

By Dr. Abha Khandelwal

- Introduction and applications of **Physics-Informed Neural Networks (PINNs)**
- Solved example assignment on **Simple Harmonic Motion using PINNs**
- Basic **Linux commands required for computational simulations**
- Link to **Python learning video series (Beginner to Advanced)** from Dr. Abha Khandelwal's educational channel **@drabhakhandelwal**
- Tutorial video on **how to work on Google Colab for running Python programs**
- **Density Functional Theory (DFT) computational workflow**
- Preparation of **DFT input files for graphene simulations**

By Dr. Akshay Joshi

- **Installation and setup of Quantum ESPRESSO using WSL**
- Program scripts for **Density Functional Theory (DFT) calculations using Quantum ESPRESSO** shared with participants for practice and reference.

Assessment and Certification

Participants were assessed through a **multiple-choice question (MCQ) examination consisting of 60 questions to be completed within 60 minutes**. The assessment was conducted on **15th March 2026 from 6:30 PM to 7:30 PM**. In addition, participants were required to maintain **a minimum of 75% attendance** during the workshop. **Certificates of participation were awarded to those who successfully fulfilled these eligibility criteria.**

Key highlights of the workshop included:

- The workshop served as an important step toward strengthening computational thinking **and interdisciplinary research culture** among students, researchers and educators.
- Feedback collected through online forms indicated that most participants rated the sessions **Excellent and Very Good**, reflecting the overall success of the workshop.
- Assignments to work on were given to participants.
- Session Presentations were shared with the participants on their demand.
- **Recorded Lectures Were are made available on Google Drive for revision.**

Valedictory Function

The **Valedictory Function** of the National Level Online Workshop on **"Advanced Computational Tools for Physical Sciences (NWACTPS-2026)"** was held on **13th March 2026**, marking the successful completion of the five-day academic program. The session was attended by participants, resource persons, session chairpersons and distinguished dignitaries from AACST and IAPT.

Workshop Report by Convener

Dr. Bhakti Patankar Rajvaidya
Workshop Convener

The valedictory proceedings commenced with the **Workshop Convener, Dr. Bhakti Patankar Rajvaidya**, presenting a report on the workshop. She summarized the objectives, structure and outcomes of the five-day program and highlighted the key themes covered in the sessions.

She noted that the workshop successfully introduced participants to modern computational techniques used in contemporary physics research and provided an interactive platform for learners to explore interdisciplinary approaches in physical sciences. Dr. Rajvaidya also expressed gratitude to the Patron & Mentor, collaborating organizations, resource persons and participants whose active engagement contributed to the success of the workshop.

Remarks by Patron & Mentor

Dr. Abha Khandelwal
Founder, AACST

The **Patron and Mentor of the workshop, Dr. Abha Khandelwal**, shared her reflections on the successful completion of the program. She expressed appreciation for the dedication and commitment shown by the participants throughout the workshop.

She particularly acknowledged the **untiring efforts and meticulous planning of the Workshop Convener, Dr. Bhakti Patankar Rajvaidya**, whose coordination and perseverance ensured the smooth conduct of the workshop. **She also appreciated her sincere commitment and consistent efforts in managing the organizational responsibilities efficiently and contributing significantly to the successful execution of the program.** Dr. Khandelwal also encouraged participants to continue exploring advanced computational tools and emphasized the importance of integrating **computational approaches with modern scientific research and interdisciplinary learning**. She expressed her gratitude to **IAPT RC-08** for collaborating in this novel academic initiative and supporting the cause of promoting computational approaches in physical sciences.

Address BY

Mr. Mahesh Shetty
President, IAPT RC-08

The **Presidential Address** was delivered by **Mr. Mahesh Shetty**, President of **IAPT RC-08**. He appreciated the collaborative initiative undertaken by AACST and IAPT and emphasized the importance of academic partnerships that foster scientific learning and research.

He also thanked **Dr. Abha Khandelwal** for bringing the proposal to IAPT RC-08 for coordination and initiating the collaboration that made the workshop possible. He remarked that such initiatives strengthen academic networks and create meaningful opportunities for students, teachers and researchers.

Address by

Dr. Rajesh Nimat
Secretary, IAPT RC-08

Dr. Rajesh Nimat, Secretary of **IAPT RC-08**, congratulated the organizers for successfully conducting an academically enriching workshop. He specifically appreciated the **hard work, dedication and valuable time invested by Dr. Abha Khandelwal and the Workshop Convener, Dr. Bhakti Patankar Rajvaidya**, in planning and organizing the program. He acknowledged that their coordinated efforts played a crucial role in ensuring the success of the workshop.He also appreciated the contributions of the resource persons and participants who actively engaged in the sessions.

Feedback from Participants

Participants shared their reflections on the workshop and expressed their appreciation for the quality and clarity of the sessions conducted by the resource persons.

They highlighted that the workshop provided valuable insights into **computational modelling and modern research techniques in physics**, and they expressed interest in attending more advanced programs in the future.

Feedback collected through Google Forms indicated a highly positive response, with most participants rating the sessions as **Excellent** and **Very Good**.

Address by Guest of Honour

Prof. Rekha Ghorpade
General Secretary, Central Indian Association of Physics Teachers (IAPT)

The **Guest of Honour, Prof. Rekha Ghorpade**, appreciated the collaborative efforts of **AACST and IAPT**, observing that the workshop stands as an excellent example of how academic institutions and organizations can work together to create meaningful learning opportunities.

She acknowledged the efforts of both organizations in successfully conducting the workshop and appreciated **Dr. Abha Khandelwal** for transforming the vision of the workshop into a meaningful academic venture and bringing the initiative to fruition.

Chief Guest Address

Prof. Kamal Singh
Former Vice Chancellor
Sant Gadgebaba Amravati University

The **Chief Guest, Prof. Kamal Singh**, delivered the concluding address of the valedictory function. She appreciated the academic initiative undertaken by AACST and emphasized the importance of integrating **computational approaches with physical sciences** in modern education and research.

Prof. Kamal Singh also expressed special appreciation for the **Patron and Mentor, Dr. Abha Khandelwal**, acknowledging her visionary leadership in conceptualizing such academic programs.

She observed that **Dr. Abha Khandelwal, originally trained as a physicist and later transitioning into computer science, represents a rare and valuable blend of knowledge from both disciplines**. She remarked that, true to the meaning of her name *"Abha"*, she possesses a remarkable ability to perceive the evolving needs of the academic community and bring forward relevant topics that address contemporary scientific challenges.

Prof. Kamal Singh further appreciated her dedication in working towards **bringing computational physics and modern scientific tools to students, teachers and researchers**, thereby creating platforms that promote interdisciplinary learning and scientific exploration.

Vote Of Thanks

Dr. Bhakti, Workshop convener proposed the vote of thanks. She thanked the Chief Guest and Guest of Honor of the Valedictory function, as well as dignitaries from IAPT and AACST family along with mentor of workshop for her continuous support and being the driving force, Chairpersons of all sessions, Resource persons of all sessions and all the participants for their active participation and engagement.

Conclusion:

The National Online Workshop on "Advanced Computational Tools for Physical Sciences (NWACTPS-2026)", organized by the Association of All Computer Science Teachers (AACST) in collaboration with the Indian Association of Physics Teachers (IAPT-RC08) from 9th to 13th March 2026, proved to be a highly enriching and intellectually stimulating program. The workshop successfully brought together students, research scholars and faculty members from diverse academic backgrounds to explore modern computational techniques that are increasingly shaping research in physical sciences.

Through a series of well-structured expert sessions, the workshop provided participants with valuable insights into advanced topics such as Physics-Informed Neural Networks, Computational Luminescence, Optical Trapping, Density Functional Theory, and Monte Carlo Methods in Physics. The resource persons delivered comprehensive lectures that effectively connected theoretical foundations with practical computational approaches, enabling participants to appreciate the role of simulations, artificial intelligence and numerical methods in solving complex physical problems.

The interactive discussions during the sessions encouraged participants to actively engage with the speakers, exchange ideas and clarify concepts. The workshop significantly contributed to enhancing participants' understanding of contemporary computational tools and their applications in interdisciplinary research.

Overall, the workshop achieved its objective of promoting awareness and strengthening knowledge in computational physics and modern research methodologies. The enthusiastic participation and positive feedback from attendees reflected the success of the program. The organizers expressed their gratitude to the mentor, resource persons, participants and organizing team whose collective efforts ensured the smooth conduct and success of the workshop. The event also inspired participants to further explore advanced computational techniques and apply them in their research and academic pursuits.

Report Prepared By:

AACST EDITORIAL TEAM

GALLERY

SPEAKERS VALEDICTORY FUNCTION - 13TH March 2026 8:00 TO 8:30 PM

Chief Guest

Dr Kamal Singh
Former Vice Chancellor,
former Sant Gadgebaba Amravati University

Guest of Honor

Dr Rekha Ghorpade,
General Secretary, IAPT.

Patron & Mentor

Dr Abha Khandelwal

President IAPT RC 08

Prof Mahesh Shetty

Special Thanks

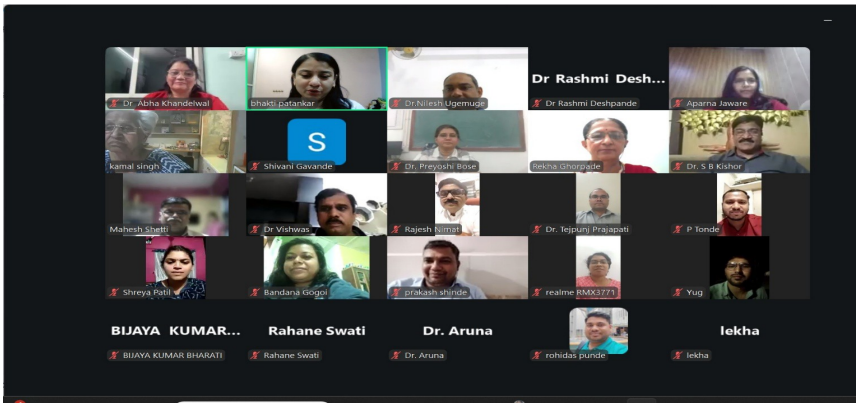
Dr. SB Kishore
President AACST

Convener

Dr Bhakti Patankar

Secretary IAPT RC 08

Dr Rajesh Nimat



Patron & Mentor

Dr. Abha Khandelwal
Founder,
(AACST)

IAPT Dignitaries

Mahesh Shetti
President
(IAPT RC08)

Dr Rajesh Nimat
Secretary
(IAPT RC08)

Convener

Dr Bhakti Rajvaidya
G H Raisoni College of Engineering, Nagpur

Contact Person

Dr Jayashree Bagawade
Treasurer
(IAPT RC 08)

TEAM OF RESOURCE PERSONS

Dr. Akshay Joshi
Govt. Dungar College, Bikaner, Rajasthan

Dr Amol Nande
Guru Nanak College of Science, Ballarpur

Dr. Praveen Parthasarathi
Dr HN National College of Engineering, Bangalore

Dr Priya Mathur
Poornima Institute of Engineering & Technology Jaipur

Dr Bhakti Rajvaidya
G H Raisoni College of Engineering, Nagpur

TEAM OF CHAIR PERSONS

Dr. SRINAG P
Advanced Research Scientist Honeywell Technology

Dr. Vikrant Yashwant Ganvir
HOD - Department of Applied Physics, Yeshwantrao Chavan College of Engineering, Nagpur

Dr. Akhilesh A. Ugale
In-charge Registrar and Assistant Professor (Physics) G H Raisoni College of Engineering and Management, Nagpur

Dr. Jyothi Ghushe, PICT Model School, Pune

Dr. Nilesh S. Ugemuge
Assistant Professor, Department of Physics at Anand Niketan College, Warora

TEAM OF IAPT COORDINATORS

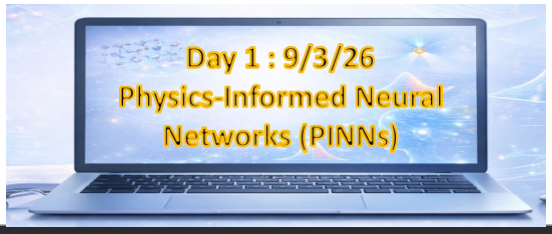
Dr Jayashree Bagawade
Treasurer, (IAPT RC 008)

Dr K G Bhole,
President, IAPT SRC,

Dr Mansing Takale,
President, IAPT SRC

Dr Gajanan Jadhav
Treasurer IAPT SRC

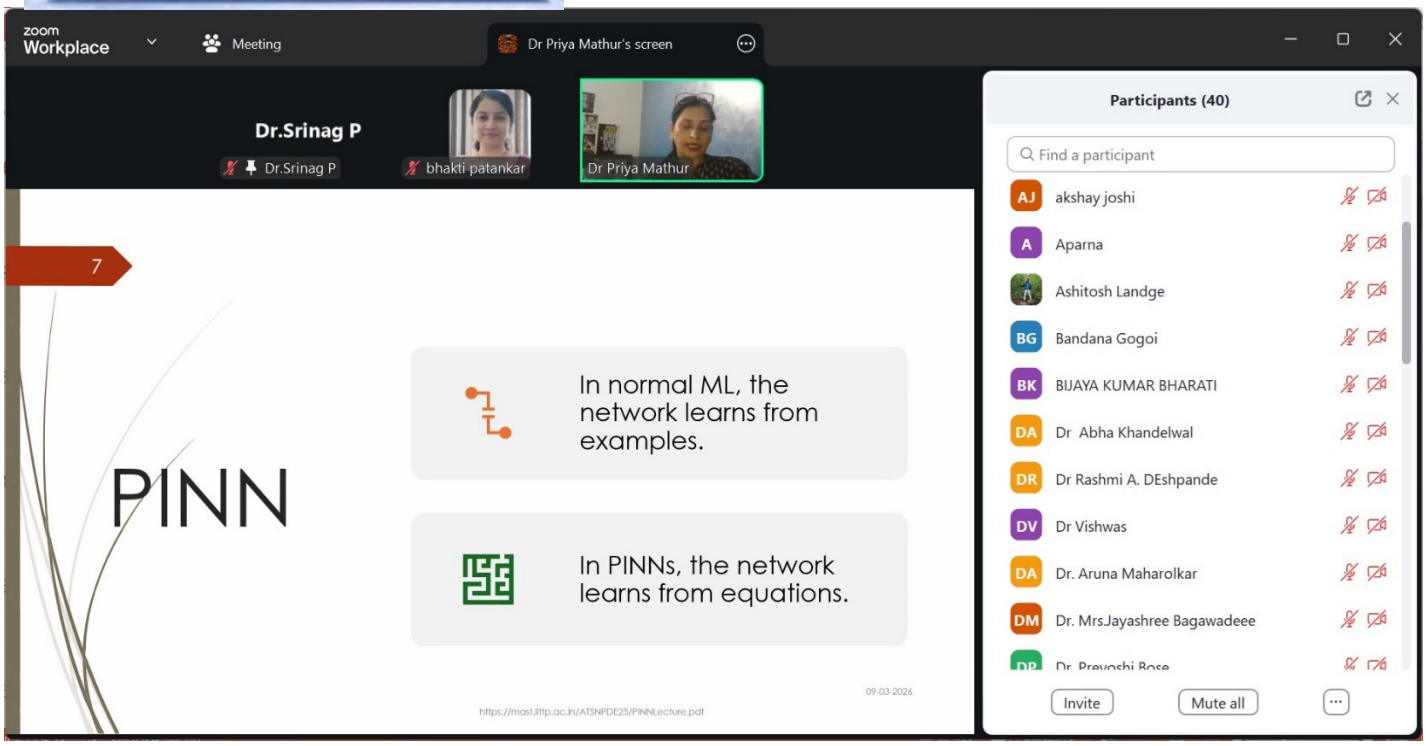
Dr Rajesh Nimat
Secretary
(IAPT RC08)



Dr Priya Mathur

Research Faculty, Department of Mathematics

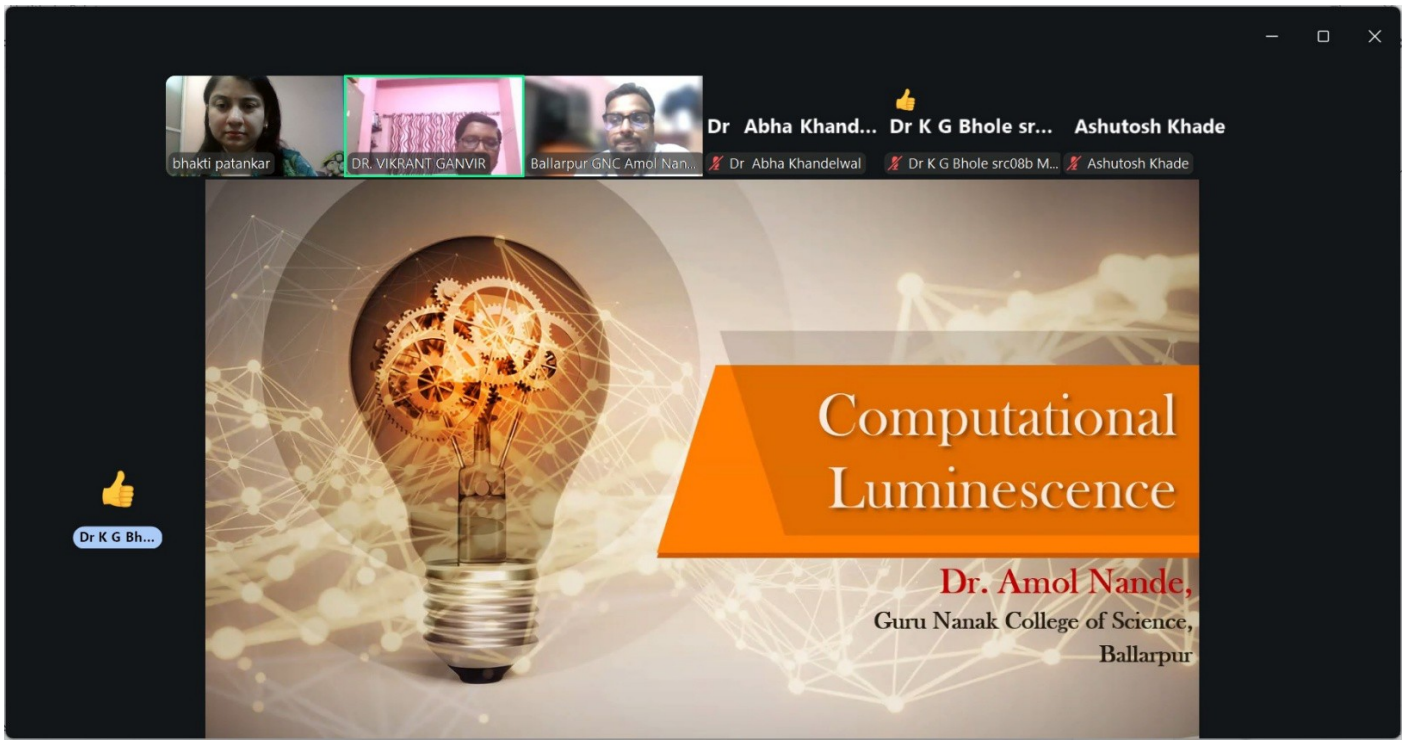
Poornima Institute of Engineering & Technology, Jaipur

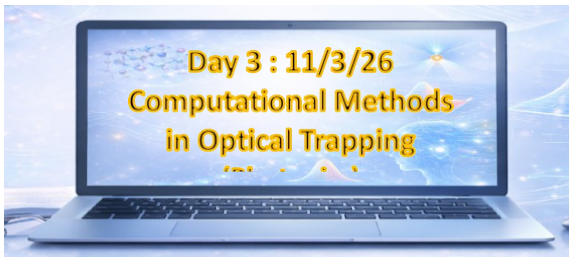


Dr. Amol Vitthal Nande

Assistant Professor, Department of Physics,

Guru Nanak College of Science, Ballarpur

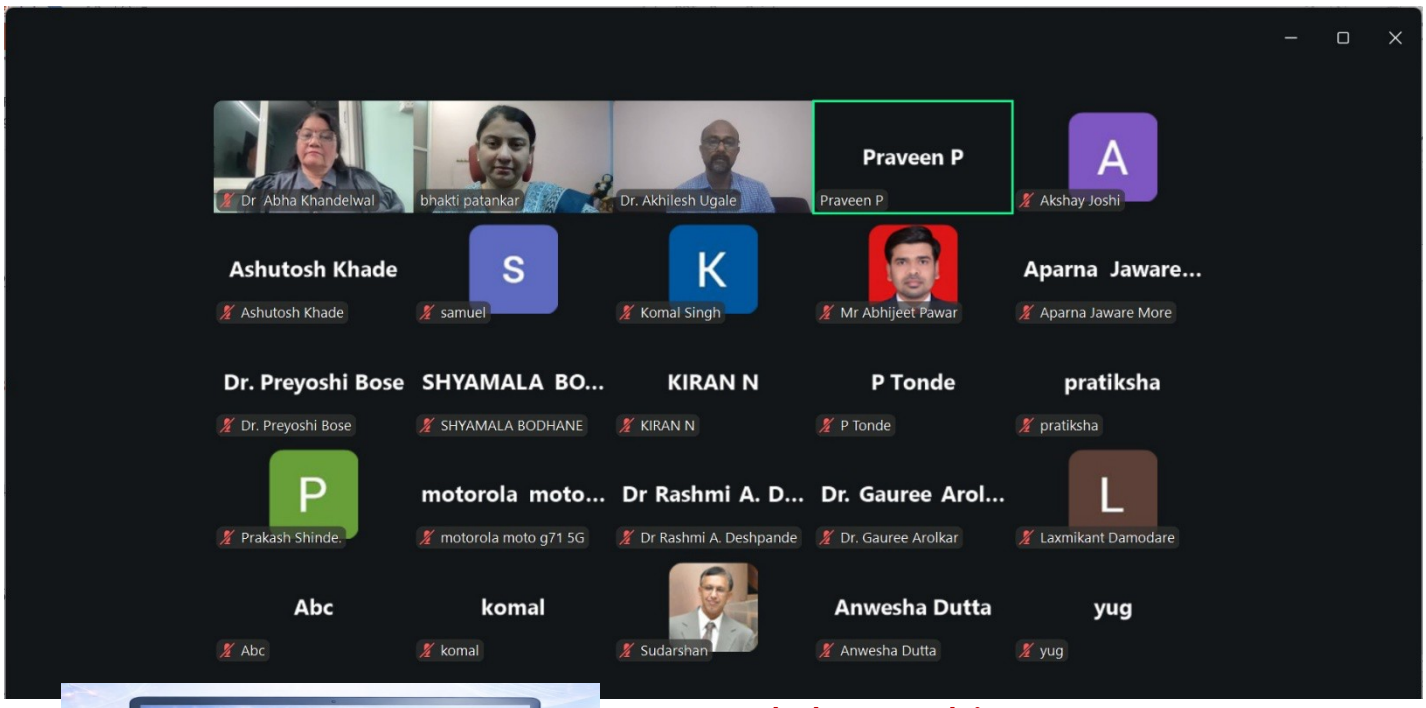


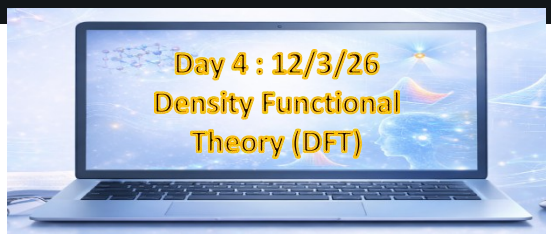


Dr Praveen Parthasarathi

Assistant Professor of Physics

Dr H N National College of Engineering, Bangalore

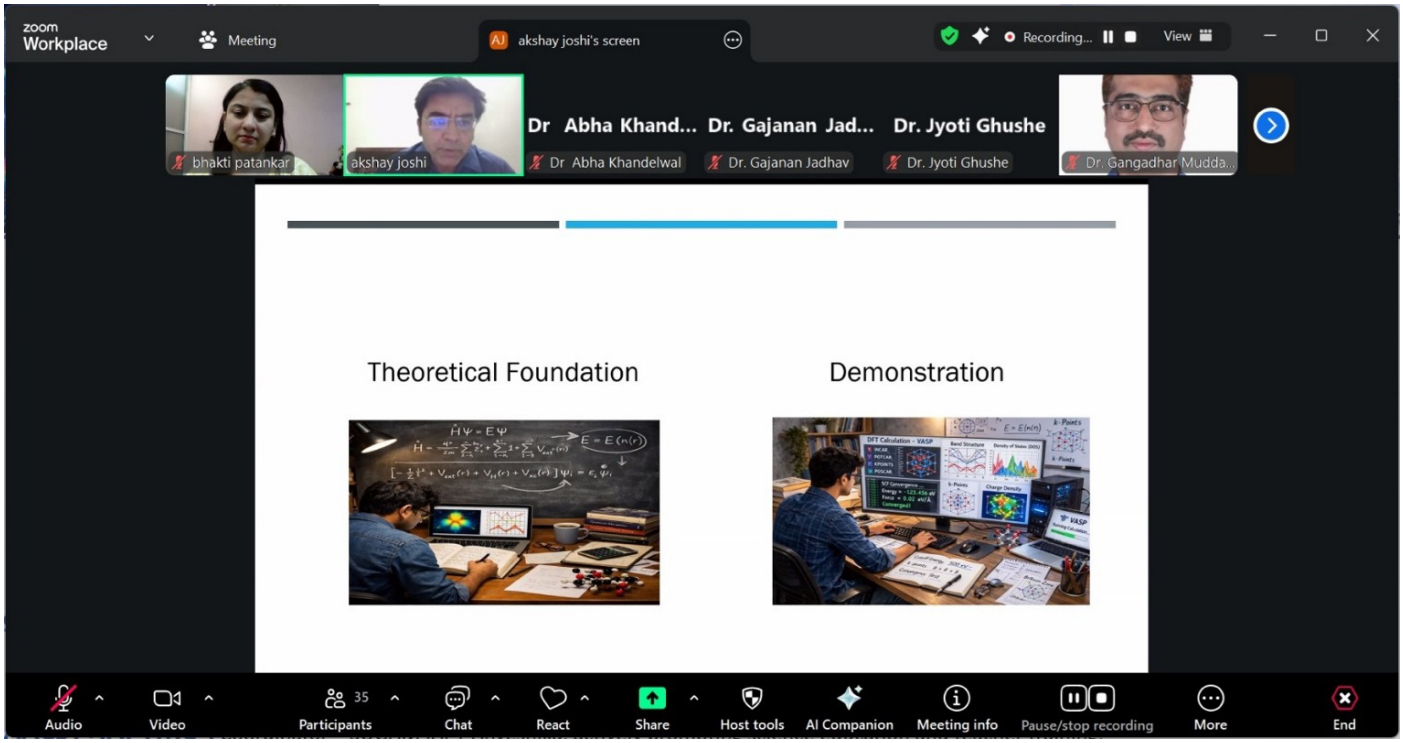


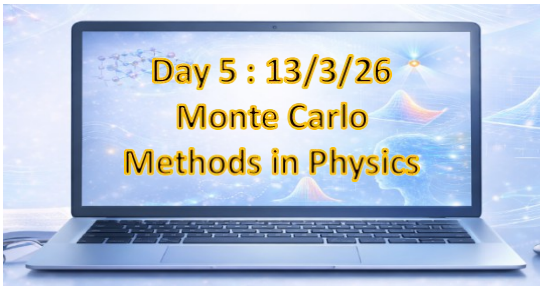


Dr. Akshay Joshi

Assistant Professor of Physics

Government Dungar College, Bikaner





Dr. Bhakti Patankar Rajvaidya

International Relations Officer,
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