Guest Lecture Report

"Frozen Light: A Unique State of Matter and its Importance for Quantum Computing"

By Prof. Subhash Kondawar
Date: 07 April 2026
Venue: C4, Department of Physics

The Department of Physics, Shri Shivaji Education Society's Science College, Congress Nagar, Nagpur, successfully organized a guest lecture on the topic *"Frozen Light: A Unique State of Matter and its Importance for Quantum Computing."* The lecture was delivered by eminent physicist **Subhash Kondawar**, former Pro-Vice Chancellor. The program was conducted under the presidentship of Hon'ble Principal **O. S. Deshmukh**.

The event was graced by the presence of **Prof. S. W. Anwane**, Head of the Department of Physics, and Convener of the Physics Society **Mr. Bhupendra Kumbhare**, along with other distinguished faculty members.

Lecture Highlights

In his highly insightful and intellectually stimulating lecture, Prof. Kondawar began with a discussion of the classical three states of matter—solid, liquid, and gas—and gradually introduced the audience to an advanced and recently discovered state known as **Photonic Supersolid**, commonly referred to as *frozen light*.

He elaborated that in March 2025, researchers in Italy achieved a significant scientific breakthrough by realizing this exotic state of matter, wherein light exhibits a dual character:

- a **crystal-like ordered structure** (solid-like behavior), and
- **frictionless flow** (superfluid-like behavior).

Prof. Kondawar explained the underlying physical mechanism involving semiconductor materials such as aluminium gallium arsenide (AlGaAs), laser excitation, and the formation of quasiparticles known as **Polaritons**. Under high-density conditions, these polaritons undergo condensation into a **Bose-Einstein Condensate**, resulting in a stable, structured, and coherent state of light.

Relevance to Quantum Technologies

Prof. Kondawar emphasized the profound implications of this discovery in the domain of quantum technologies, particularly **Quantum Computing**. He highlighted that frozen light systems can:

- Enable the realization of **more stable photonic qubits**
- Facilitate **lossless data transmission**
- Support the development of **all-optical computing architectures**, which are significantly faster than conventional electronic systems

Furthermore, he discussed broader applications, including:

- **Quantum simulations**
- **Ultra-sensitive sensing technologies**
- Development of **advanced smart materials controlled by light**

He concluded by stating that the concept of frozen light represents a transformative step toward the realization of efficient, scalable, and practical quantum technologies.

Conclusion of the Program

The lecture was attended by several distinguished members, including retired Head of Department **Prof. Dharmadhikari** and **Prof. Khasare**.

The introductory address was delivered by **Prof. S. W. Anwane**, while the vote of thanks was proposed by **Mr. Bhupendra Kumbhare**.

The program was further graced by the presence of **Dr. Shahin Sayyad, Dr. Sugandha Khangar, Mr. Parag Bramhanakar, and Dr. G. L. Jadhav**. The event was skillfully anchored by M.Sc. students **Mr. Shubham Zalke** and **Ms. Vishakha Ninave**.

The lecture concluded on a highly successful note, witnessing enthusiastic participation from students and faculty alike, and proved to be an enriching academic experience for all attendees.

List of Feedback provided attendees

1. Mr. Parag Ankush Bramhankar	Faculty	Science College Congress Nagar Nagpur
2. Mr. Yugansh Kanoje	Student	Shivaji Science College
3. Jayshree prakash yadav	Student	Shri shivaji science college ajni nagpur
4. Mr. Mayank Prashant Dongre	Student	Shivaji science college nagpur
5. Sejal Tandekar	Student	Shri Shivaji Science college Nagpur
6. VIhang Meshram	Student	Sri shivaji science college
7. Sanika Varpatkar	Student	SSESA's Science college, Nagpur
8. Ashish R Deurkar	Student	Shri Shivaji Science Collage Congress Nagar , Nagpur
9. Divya Watkar	Student	Shivaji science college nagpur
10. Serena alick	Student	Shri Shivraj science college
11. Arya Borkar	Student	Shri Shivaji Science college
12. Krutika Khapre	Student	Shri Shivaji Science College, Nagpur
13. Mr. Paras Atram	Student	Shri Shivaji Science College Nagpur
14. Ms.Sampada Zoldeo	Student	Shri shivaji science college, nagpur
15. Vishakha Rajesh Ninave	Student	Shri Shivaji Science College
16. Ms. Vanshika Kailash Gajbe	Student	Shri Shivaji Science College
17. Miss. Niharika Dinesh Thaware	Student	Shri. Shivaji science college
18. Pratik upasak	Student	Shri Shivaji Science college congress nagar nagpur
19. Mr. Shubham Arun Zalke	Student	Shri Shivaji Science College Congress Nagar Nagpur
20. Hansika jamgade	Student	Shri shivraji science clg
21. Dr Shyamkant Anwane	Faculty	Department of Physics, Shri Shivaji Science College, NAGPUR

Shri Shivaji Education Society Amravati's
SCIENCE COLLEGE
CONGRESS NAGAR, NAGPUR.
SCIENCE ASSOCIATION
PHYSICS SOCIETY 2024-25

Dr. O S Deshmukh
Principal

Dr. S W Anwane
Professor & Head
9422122711 swanwane2000@yahoo.com

Mr. B T Kumbhare
Convener
9028195613

Co-conveners
Dr. Mrs R N Pathare
Dr. S. V. Khangar
Dr. (Ms) Shahin K. Sayyad
Mr. P.A. Bramhankar
Dr. Gajanan L. Jadhav
Ms. Kanchan Jivnapurkar
Ms Devyani Nage
Mr Bhashit Shinde

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(B.Sc. I) 9226718733
Mr. Archhit Wagh
(B.Sc. I) 9022632854
Ms. Serena Alick
(B.Sc.I) 9834868606
Ms. Arya Borkar
(B.Sc. I) 7771984718

NOTICE - GUEST LECTURE

Date:- 25/03/2026

The Physics Society is pleased to announce Guest Lecture scheduled as following.

SPEAKER: Prof S B Kondawar, Former Pro VC
Former Professor,
PGTD Physics, RTMNU, **Nagpur**

Title:- "Frozen Light: A Unique State of Matter and its Importance for Quantum Computing"

Date: 7th April 2026 Tuesday 2:00 pm

Venue: C4

All the teachers, students of UG and PG are invited to assemble in C4. All the office bearers should make it to attend the function and fulfil the responsibility assigned.

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Mr. B T Kumbhare

Dr. S W Anwane

Shri Shivaji Education Society Amravati's

SCIENCE COLLEGE

CONGRESS NAGAR, NAGPUR.

SCIENCE ASSOCIATION

PHYSICS SOCIETY 2025-26

Program Schedule

Program: Guest Lecture on " **Frozen Light: A Unique State of Matter and its Importance for Quantum Computing** "

Speaker: Prof Subhash Kondawar former Pro VC, RTMNU

Date: 07-04-2026 2pm **Venue: Dept. of Physics C4**

SN	Time	Program
1.	2.00 pm	Welcome of Guest by Words (Master of Ceremony)
2.	2:02 pm	Tribute/ Garland to Portraits
3.		Welcome of Guests
	2:05 pm	i) Guest Speaker: Prof Subhash Kondawar - Dr O S Deshmukh ii) Hon'ble Dr. O. S. Deshmukh- Prof. S. W. Anwane
4.	2:10 pm	Introductory Speech by Prof. S. W. Anwane
5.	2:20 pm	Introduction of Guest by Shumbham Zalke
6.	2:25 pm	Deliberation by Prof Subhash Kondawar + QA Session Feedback form QR Code Display and announcement
8.	3:25 pm	Presidential Adress by Hon'ble Dr. O. S. Deshmukh
9.	3: 30 pm	Vote of Thanks by Mr. B. T. Kumbhare
10		Refreshment

Master of Ceremony: Shumbham Zalke & Vishakha Ninave (Dr. G. L. Jadhav)


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Nagpur, Maharashtra, India
Shivaji Science College Congress Nagar, Opp Ajni Rly Station, Dhantoli, Nagpur, Maharashtra 440012, India
Lat 21.128113° Long 79.081921°
Tuesday, 07/04/2026 02:20 PM GMT +05:30
Google


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Frozen Light: A Unique State of Matter and its Importance for Quantum Computing
LIGHT HAS BEEN FROZEN?!
Subhash Kondawar
Pro-Vice Chancellor & Senior Professor
Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
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Nagpur, Maharashtra, India
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LIGHT HAS BEEN FROZEN!!
Subhash Kondawar
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Shri Shivaji Education Society Amravati's
Science College Nagpur
PHYSICS SOCIETY
Guest Speaker - Prof. Subhash Kondawar
Program - Guest Lecture on "Bose Gas"
A unique state of matter and its importance
for Quantum Computing
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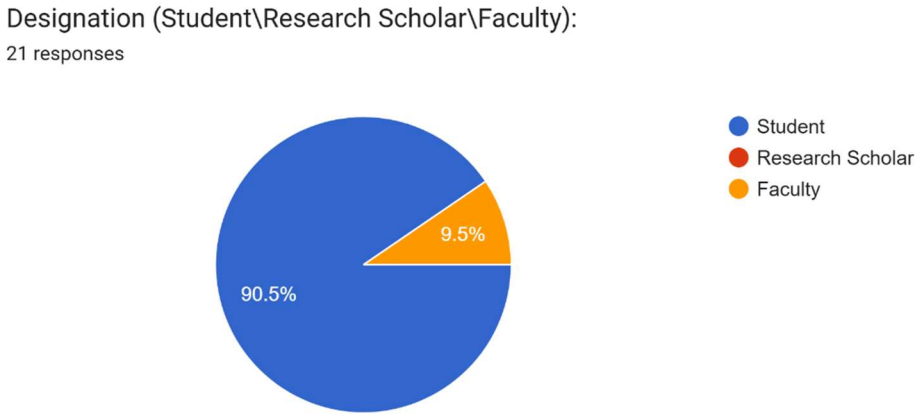
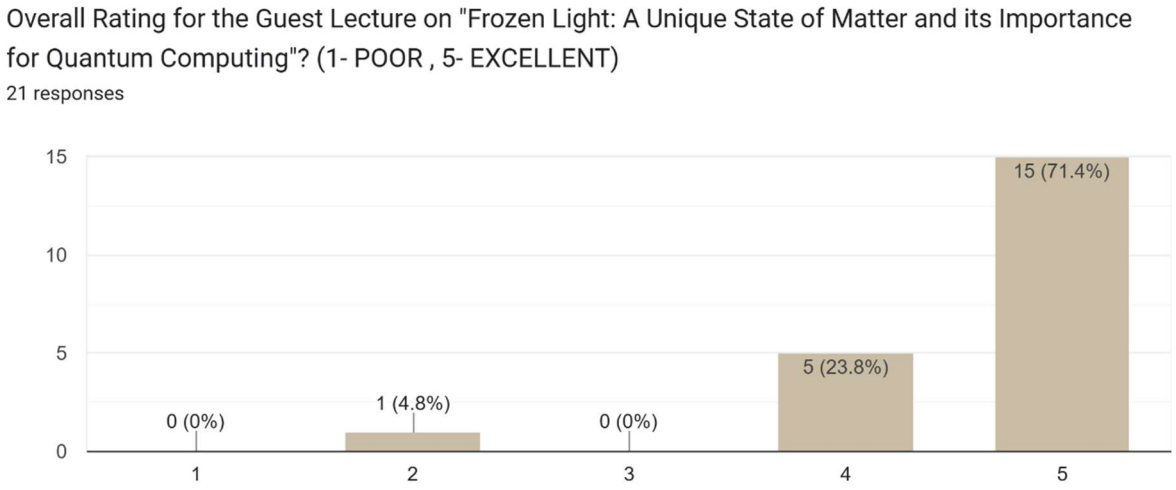
Group Photo

Feedback Analysis

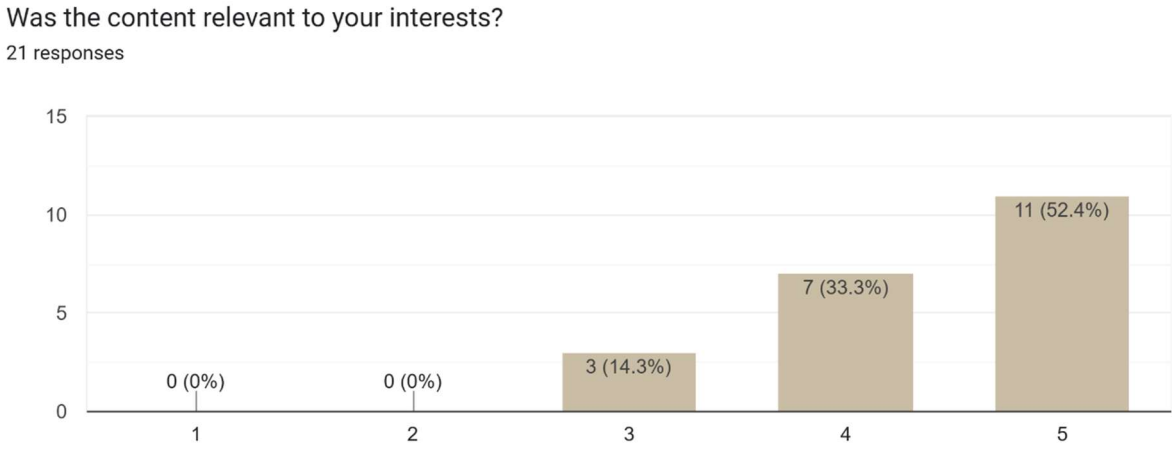
Designation (Student\Research Scholar\Faculty):



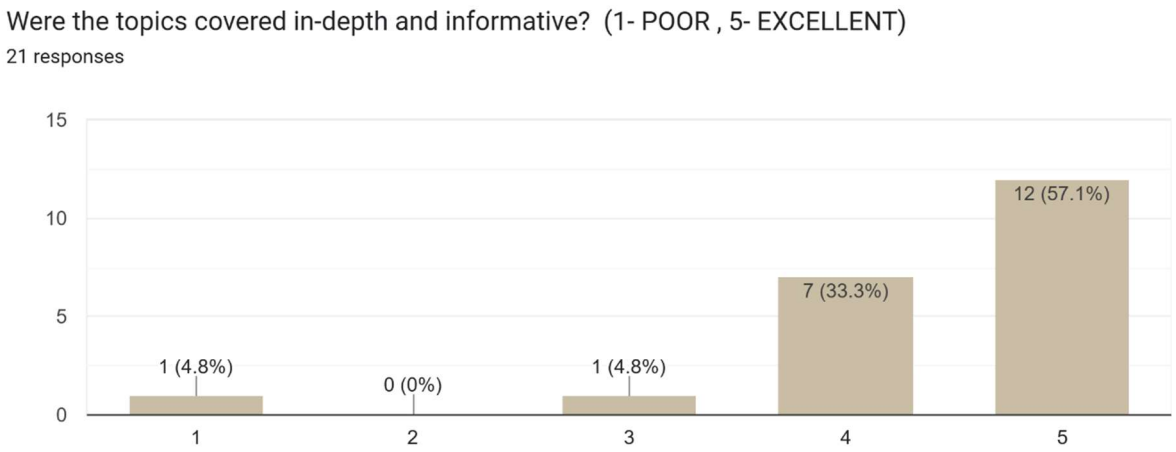
Overall Rating for the Guest Lecture on "Frozen Light: A Unique State of Matter and its Importance for Quantum Computing"? (1- POOR , 5- EXCELLENT)



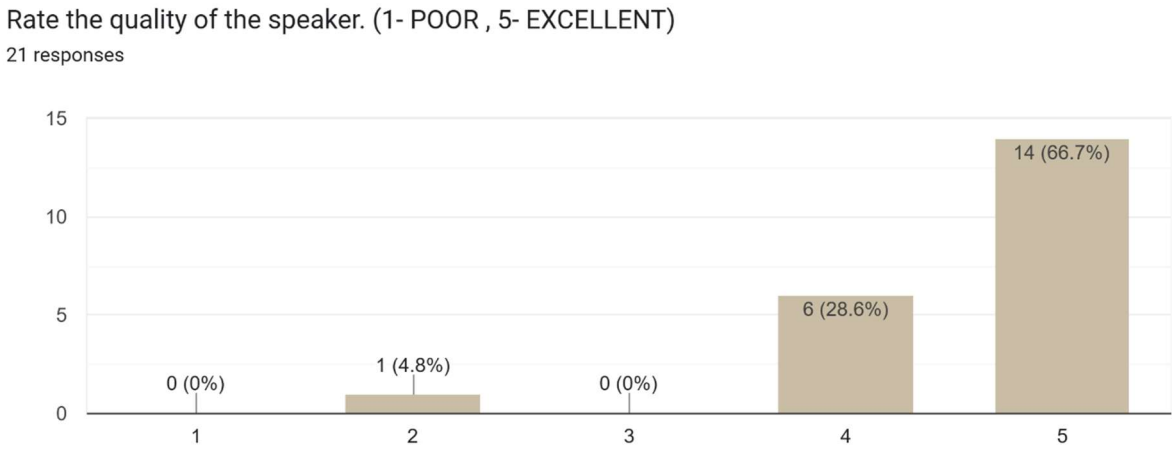
<u>Was the content relevant to your interests?</u>



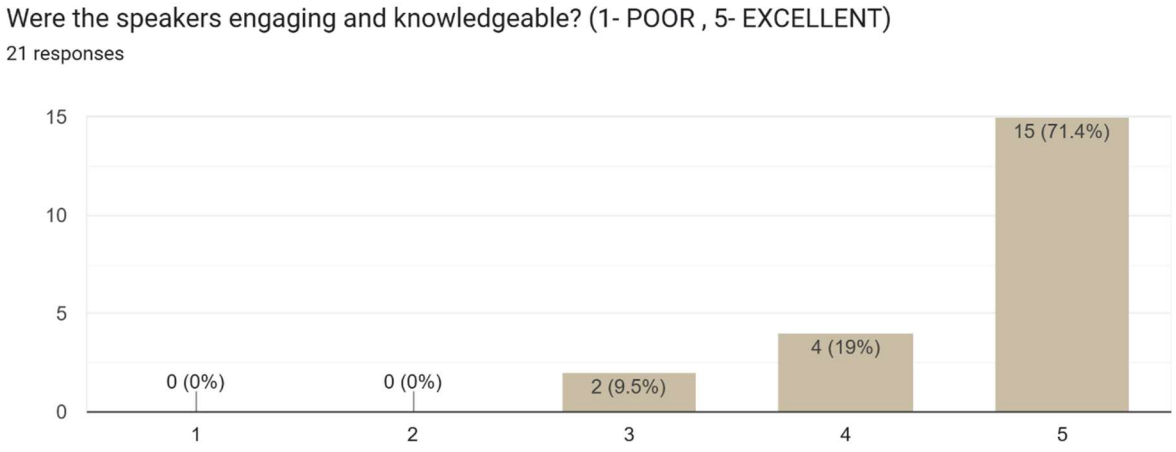
Were the topics covered in-depth and informative? (1- POOR , 5- EXCELLENT)



Rate the quality of the speaker. (1- POOR , 5- EXCELLENT)



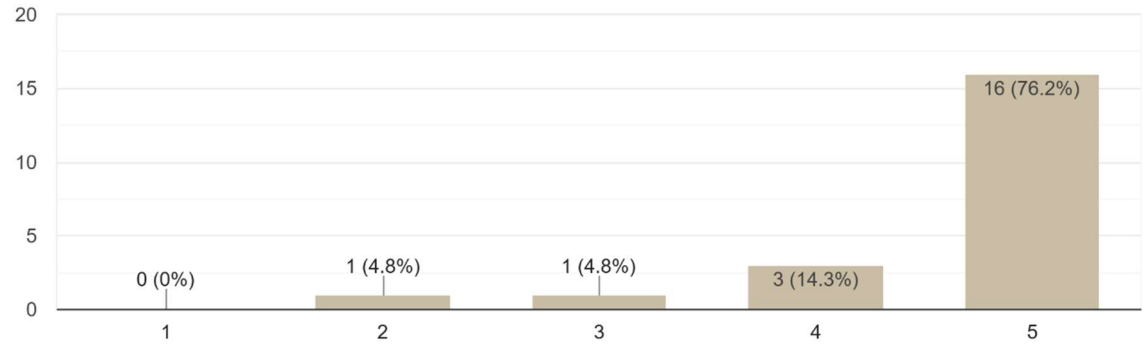
Were the speakers engaging and knowledgeable? (1- POOR , 5- EXCELLENT)



How would you rate overall organization of the Guest Lecture organized by Department of Physics, Shri Shivaji Education Society Amravati's SCIENCE COLLEGE, Nagpur? (1- POOR , 5- EXCELLENT)

How would you rate overall organization of the Guest Lecture organized by Department of Physics, Shri Shivaji Education Society Amravati...IENCE COLLEGE, Nagpur? (1- POOR , 5- EXCELLENT)

21 responses



Any suggestion or comment you want to give for improvements of such activity?

There should be AC in C4

Good 😊

None

It's Very Good Lecture

Good

A more elaborate session could have been better

Such insightful lectures should be frequently arranged.

topic should be explain easy to deliver

There should be AC in C4 .

No

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No

News ITEM

Frozen Light Concept Explained at Shri Shivaji Science College Lecture

Nagpur, April 7:

The Department of Physics at *Shri Shivaji Education Society's Science College, Congress Nagar*, organized an insightful guest lecture on "Frozen Light: A Unique State of Matter and its Importance for Quantum Computing" on Tuesday at the C4 hall.

The lecture was delivered by eminent physicist **Prof. Subhash Kondawar**, former Pro-Vice Chancellor, under the presidentship of Principal **Prof. O. S. Deshmukh**. The program was attended by Head of the Physics Department **Prof. S. W. Anwane**, along with faculty members and students.

In his address, Prof. Kondawar introduced the audience to the emerging concept of *photonic supersolid*, also known as "frozen light." Beginning with the traditional states of matter—solid, liquid, and gas—he explained how recent research has revealed a new state where light behaves simultaneously like a solid and a superfluid.

Referring to a major scientific breakthrough achieved in Italy in March 2025, he elaborated that light, under special conditions, can form a structured and coherent state exhibiting crystal-like order and frictionless flow. He further explained the role of semiconductor materials such as aluminium gallium arsenide and the formation of quasiparticles called polaritons, which condense into a Bose-Einstein Condensate to produce this unique phenomenon.

Highlighting its applications, Prof. Kondawar stated that frozen light could play a crucial role in the advancement of quantum technologies. It has the potential to enable stable photonic qubits, lossless data transmission, and ultra-fast optical computing systems. He also pointed out its significance in quantum simulations, precision sensing, and the development of advanced smart materials.

The program was attended by distinguished guests including retired Head of Department Prof. Dharmadhikari and Prof. Khasare. The introductory remarks were delivered by Prof. S. W. Anwane, while the vote of thanks was proposed by Physics Society Convener Mr. Bhupendra Kumbhare.

The event was also graced by Dr. Shahin Sayyad, Dr. Sugandha Khangar, Mr. Parag Bramhanakar, and Dr. G. L. Jadhav. The proceedings were smoothly conducted by M.Sc. students Mr. Shubham Zalke and Ms. Vishakha Ninave.

The lecture concluded with enthusiastic participation from students and faculty, making it a highly enriching academic experience.