A Report on
Faculty Development Program in
Quantum Sensing, Imaging & Metrology (QSIM)

The Faculty Development Program on Quantum Sensing, Imaging & Metrology (QSIM) aims to introduce faculty and researchers to the transformative field of quantum technologies. The sessions are designed to build conceptual understanding and hands-on experience in quantum sensing, imaging, and precision measurement—key areas driving the next wave of innovation in science and industry.

Participants will gain exposure to Qmet Hub's vision and national roadmap, engage with leading quantum researchers, and explore collaborative opportunities that bridge academic research and industrial applications.

Objectives of the FDP:

- Gain foundational understanding of quantum principles underlying precision sensing, imaging, and metrology, along with insights into the Qmet roadmap and national quantum initiatives.
- Understand recent advances, architectures, and challenges in quantum imaging and precision metrology, including NV centre-based sensing approaches.
- Experience hands-on demonstrations and experimental setups related to quantum sensing, imaging, and metrology techniques.
- Interact and network with faculty, researchers, and experts working in the emerging quantum technology ecosystem.

Date & Day: 22nd June 2026 (Monday)
Time: 9:30 PM – 5:00 PM
Venue: Shailesh J Mehta School of Management (SJMSOM), IIT Bombay
Attendees from SCET: Dr. Jigisha Pandya, Dr. Niket Shastri, Dr. Nirali Nanavati.

Workshop Speakers

Project Director, Qmet Tech Foundation

Prof. Kasturi Saha

IISER Bhopal

Prof. Phani Kumar Peddibhotla

Professor - IIT Delhi

Prof. Kedar Khare

Key Takeaways

- An expert lecture on **"Quantum Principles for Precision Sensing & Qmet Roadmap"** was delivered by **Prof. Kasturi Saha**, Project Director of Qmet Tech Foundation and Associate Professor in the Department of Electrical Engineering at IIT Bombay. Prof. Saha is a leading researcher in quantum sensing and photonics, with extensive contributions to quantum-enabled sensing technologies, particularly nitrogen-vacancy (NV) center-based diamond sensors. She currently leads the Quantum Sensing, Imaging, and Metrology (Qmet) Hub under India's National Quantum Mission. The session provided an excellent overview of the scientific foundations of quantum sensing, the technological advancements being pursued through Qmet, and India's long-term strategy for becoming a global leader in quantum sensing and precision metrology. The talk was highly informative and inspiring, offering valuable insights into one of the most promising frontiers of modern science and engineering.
- The second technical session was delivered by **Prof. Kedar Khare**, Professor in the Department of Physics at the Indian Institute of Technology (IIT) Delhi. His lecture, titled **"Quantum Imaging: Concepts, Architectures & Challenges,"** provided an insightful introduction to the principles of quantum imaging, its underlying architectures, current technological developments, and the challenges associated with its practical implementation. The lecture was highly informative and broadened the participants' knowledge of how quantum technologies are transforming modern imaging systems and creating new opportunities for scientific discovery and technological innovation.
- The third technical session was delivered by **Prof. Phani Kumar Peddibhotla** from the **Indian Institute of Science Education and Research (IISER) Bhopal**. His lecture, titled **"Precision Metrology with Quantum Standards and NV Centres,"** focused on the role of quantum technologies in achieving highly accurate measurements and the growing importance of nitrogen-vacancy (NV) centers in diamond as versatile quantum sensors. The session provided a comprehensive understanding of precision metrology, quantum standards, and the role of NV centres in enabling highly accurate measurements. The lecture successfully demonstrated how quantum technologies are transforming modern metrology and paving the way for innovative applications in science, engineering, and industry.

- The final technical session was delivered by **Prof. Hardik Joshi**, **COO** of **Qmet Tech Foundation**. His lecture, titled **"Engagement, Collaboration & Growth Opportunities"** focused on fostering collaboration among academia, industry, startups, and government organizations to accelerate the development and adoption of quantum technologies in India. The session highlighted the importance of building a strong innovation ecosystem and creating opportunities for research, technology development, and entrepreneurship.

- As part of the technical program, participants were given the opportunity to visit several advanced research laboratories and experimental facilities at **IIT Bombay**. The laboratory tour provided valuable exposure to state-of-the-art infrastructure supporting research in quantum technologies, nanoscience, materials engineering, and precision measurements. The demonstration and laboratory visit at IIT Bombay was an enriching learning experience.

Event Summary

The Faculty Development Program 2026 on Quantum Sensing, Imaging & Metrology (QSIM) concluded successfully at Indian Institute of Technology, Bombay, bringing together faculty members, researchers, and academicians for an engaging day of learning and knowledge exchange.

The program featured expert-led sessions by distinguished speakers:
• Prof. Kasturi Saha, Project Director, Qmet Tech, IIT Bombay
• Prof. Kedar Khare, Professor, Indian Institute of Technology, Delhi
• Prof. Phani Kumar Peddibhotla, Professor, IISER Bhopal
Participants gained valuable insights into the latest developments, applications, and research opportunities in quantum sensing, imaging, and metrology, while engaging in discussions on the future of quantum technologies in India.

We thank all the speakers and participants for making the program a success and contributing to the growth of India's quantum ecosystem.

Acknowledgment:

We sincerely express our heartfelt gratitude to Dr. Utpal Pandya, Dean - Research & Development, for his constant encouragement in enabling us to attend the Faculty Development Programme on Quantum Sensing, Imaging & Metrology (QSIM) held at IIT Bombay on 22 June. We also extend sincere thanks to Dr. Hiren Patel, Principal, for his continuous support, which made our participation in this FDP possible.

Attending this programme provided valuable insights into emerging advancements in quantum technologies, and we are grateful for the opportunity to enhance our knowledge and skills. We look forward to applying the learning gained from the FDP for future academic initiatives.

Photos of the FDP:


FACULTY DEVELOPMENT PROGRAM


Quantum Imaging : Online video resource


IIT Bombay
FACULTY
DEVELOPMENT
PROGRAM
Quantum Sensing, Imaging & Metrology (QSIM)
Workshop Date:
Monday 22nd June 2026
Venue:
EMBA Classroom, 4th floor, IIT Bombay


DEVELOPMENT


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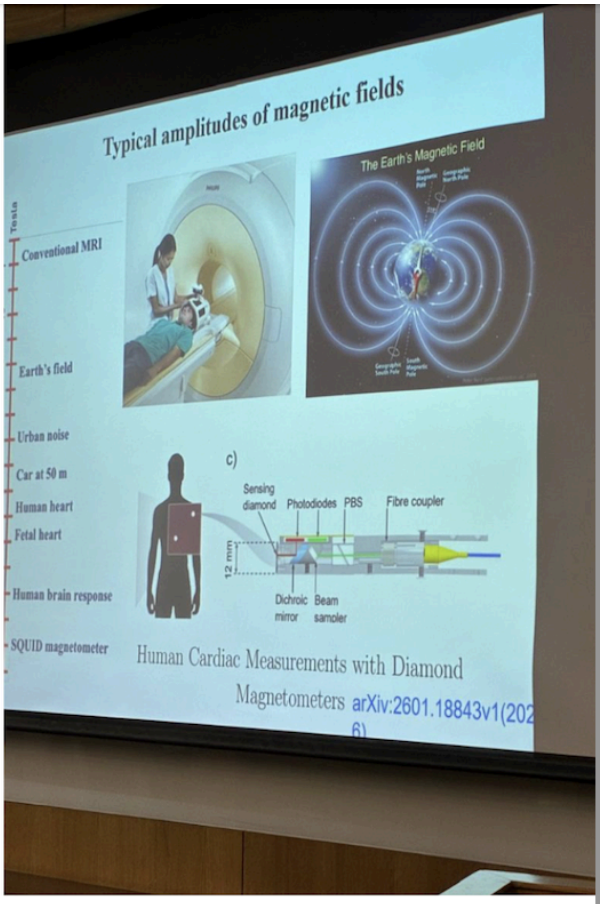
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arXiv:2601.18843v1(202


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