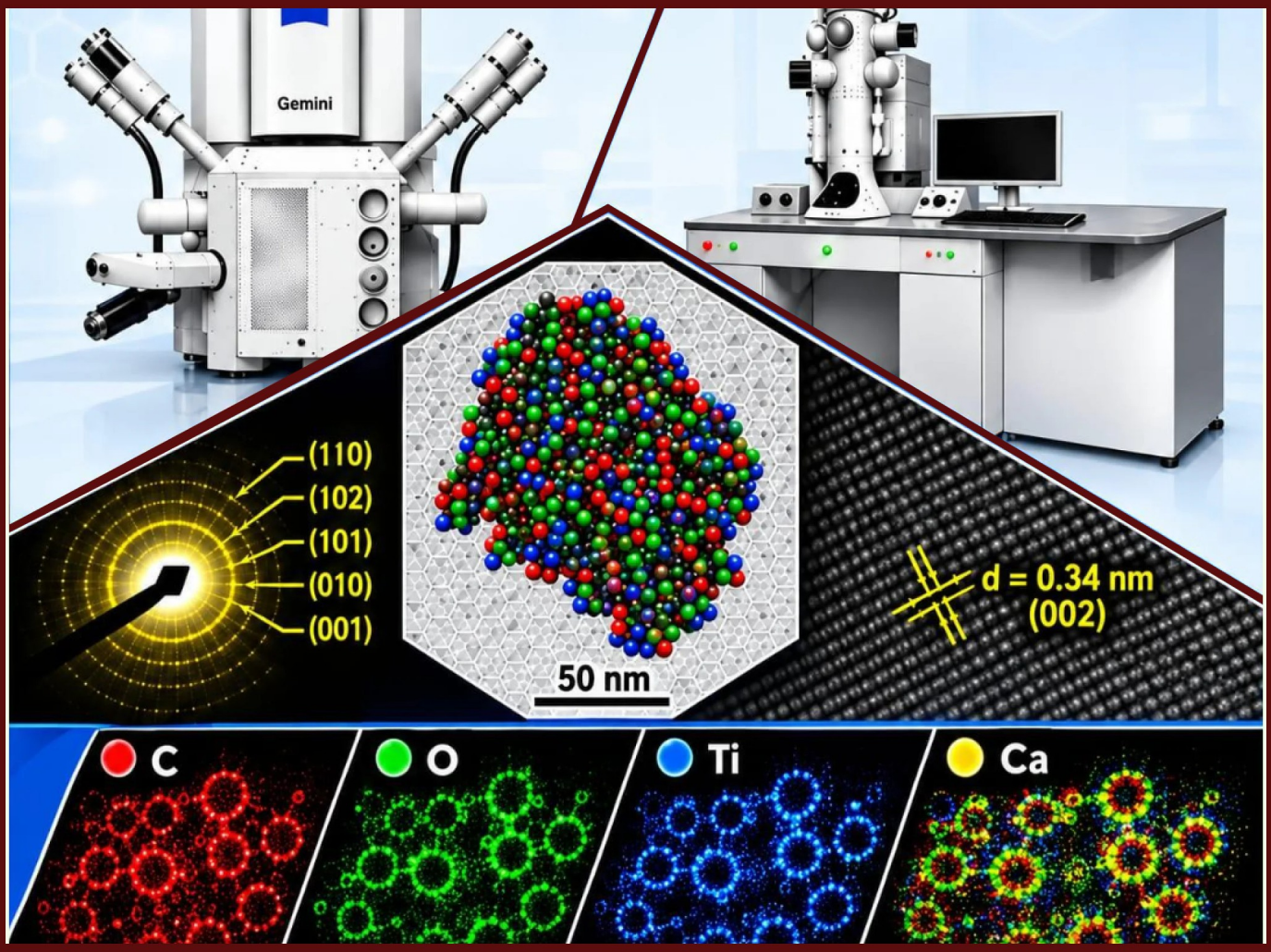
CENTRAL INSTRUMENTS FACILITY
INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI

NATIONAL CONFERENCE ON

Electron Microscopy

EM-2027: EXPLORING WHAT'S NEXT IN ELECTRON MICROSCOPY

From History to Modern Advances in Hardware, Software, and Applications



DATES
8–9 January 2027

VENUE
Conference Centre, IIT Guwahati

ABOUT EM-2027

Scientific questions often demand capabilities beyond those offered by current instruments. Addressing these challenges requires sustained dialogue between researchers who identify scientific needs and specialists who design, develop, manufacture, and apply microscopy technologies.

EM-2027 aims to connect emerging scientific requirements with advances in electron microscopy. The conference will provide a national platform to discuss developments in hardware, software, sample preparation, imaging, data analysis, and scientific applications; identify gaps between research needs and existing capabilities; and explore opportunities for innovation and collaboration.

Through expert lectures, instrument demonstrations, student research presentations, and industry interactions, EM-2027 will promote knowledge exchange, skill development, and academia–industry partnerships, creating opportunities for training, internships, mentoring, and career development. The conference also aims to strengthen electron microscopy research and enhance the visibility of advanced characterization facilities in Northeast India and across the country.

The conference will also encourage students to present innovative research ideas and explore their potential industrial applications. It will facilitate interactions among researchers, instrument developers, manufacturers, and application specialists to identify future technological needs and collaborative opportunities. Ultimately, EM-2027 seeks to translate scientific challenges into practical directions for future microscopy research.

ELECTRON MICROSCOPY IN FOCUS



TEM



FESEM · GEMINI 300

FROM SCIENTIFIC VISION TO NEW CAPABILITIES

WHY ELECTRON MICROSCOPY?

Electron microscopy has evolved from a fundamental imaging technique into an indispensable tool for modern scientific research and technological innovation. Transmission electron microscopy (TEM) and scanning electron microscopy (SEM) enable high-resolution imaging, elemental mapping, crystallographic analysis, and in-situ characterization at micro- and nanoscale levels. These capabilities play a vital role in advancing research in materials science, nanotechnology, physics, chemistry, biology, and interdisciplinary fields.

WHY NOW?

Rapid advances in electron optics, detectors, automation, software, and analytical techniques are continuously expanding the capabilities of electron microscopy. At the same time, increasingly complex scientific challenges demand improved instrumentation, advanced characterization methods, and innovative approaches to data acquisition and analysis. Bridging the gap between emerging research requirements and available technological capabilities has therefore become increasingly important. EM-2027 provides a timely platform to bring together researchers, scientists, instrument developers, manufacturers, and application specialists to exchange knowledge, address emerging challenges, and explore future directions in electron microscopy.

A CENTRAL MOTIVATION

Bridge scientific ambition and instrumental capability—turning emerging research needs into practical directions for future microscopy.

CONFERENCE OBJECTIVES

01 EXPLORE THE FIELD

Review the evolution of electron microscopy and examine modern TEM and SEM capabilities.

02 SHARE INNOVATION

Discuss advances in hardware, software, detectors, automation, and analytical methods.

03 CONNECT COMMUNITIES

Bring instrument users, developers, manufacturers, and application specialists into dialogue.

04 OPEN NEW DIRECTIONS

Identify unmet research needs and opportunities for next-generation microscopy approaches.

SCIENTIFIC AND APPLICATION SCOPE

A proposed student innovation pitch forum will let students present microscopy-related research, projects, or technology ideas to industry representatives and receive feedback. The interaction can open conversations about skills training, mentoring, internships, career pathways, and potential recruitment.

OUR TEAM



PATRON

Prof. Devendra Jalihal

Director, IIT Guwahati



CHAIRMAN

Prof. Subhendu Sekhar Bag

Head, CIF



CONVENER

Dr. Sidananda Sarma



CO-CONVENER

Mr. Sujit Kumar Deb

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ADVISORY & MEMBERS

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- Prof. G. Pugazhenthi
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- Mr. Biswajyoti Bhuyan
- Mr. Dipangkar Sharma

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- Dr. Yogesh S. Sanghvi, Rasayan Inc.
- Prof. Dipanjan Pan, Penn State University
- Dr. Pritam Ganguly, Rochester Institute of Technology

PLENARY & KEYNOTE SPEAKERS

ACADEMICIAN



IACS KOLKATA

Prof. Narayan Pradhan



IIT KHARAGPUR

Prof. Rahul Mitra



NEIST JORHAT

Prof. Binoy Kumar Saikia

AND MORE...

INDUSTRY



ZEISS FESEM TECHNOLOGY

Dr. Subhranshu Chatterjee

Product and Application Specialist



JAIN SCIENTIFIC SOLUTIONS

Dr. Lokendra Jain

Application Scientist



AMETEK INSTRUMENTS

Mr. Raju Datla

Hardware and Software Engineer

AND MORE...

A FORUM FOR SCIENCE, SKILLS, AND PARTNERSHIP

100–120	~20	2 days
EXPECTED PARTICIPANTS	INVITED EXPERTS	TALKS, DEMOS & EXCHANGE

WHAT PARTICIPANTS CAN EXPECT

01	**INVITED TALKS AND EXPERT LECTURES**	Scientific and technical insights from eminent scientists, electron microscopy experts, application specialists, and industry professionals.
02	**TEM/SEM AND ADVANCED INSTRUMENT DEMONSTRATIONS**	Demonstrations of advanced electron microscopy systems and analytical facilities at CIF, IIT Guwahati, highlighting their capabilities, operational features, and applications.
03	**STUDENT POSTER AND ORAL PRESENTATIONS**	A platform for students and researchers to present their scientific findings, share innovative research, and engage in academic discussions.
04	**INDUSTRY EXHIBITION AND TECHNOLOGY SHOWCASE**	Exhibition stalls, product displays, technical presentations, and demonstrations by leading instrument manufacturers and industry representatives.
05	**PANEL DISCUSSIONS AND FUTURE RESEARCH DIRECTIONS**	Expert discussions on emerging technologies, scientific challenges, evolving research requirements, and future developments in electron microscopy.
06	**ACADEMIC–INDUSTRY INTERACTION AND COLLABORATION**	Opportunities to strengthen partnerships between academic institutions, research organizations, instrument manufacturers, and industry through collaborative initiatives.
07	**SOFTWARE AND ADVANCED DATA ANALYSIS DEMONSTRATIONS**	Demonstrations of specialized software for image processing, data acquisition, microscopy analysis, visualization, and scientific interpretation.
08	**NETWORKING AND PROFESSIONAL DEVELOPMENT**	Interaction among researchers, scientists, faculty members, engineers, and industry professionals to facilitate knowledge exchange, professional networking, and future research collaborations.

STUDENTS, INDUSTRY, AND PARTNERSHIP

SPECIAL EVENTS

STUDENT TALENT MEETS INDUSTRY NEED

A proposed student innovation pitch forum will let students present microscopy-related research, projects, or technology ideas to industry representatives and receive feedback. The interaction can open conversations about skills training, mentoring, internships, career pathways, and potential recruitment.

WHO SHOULD ATTEND?

- SCIENTISTS
- ACADEMICS
- RESEARCHERS
- STUDENTS
- ENGINEERS
- INSTRUMENTATION EXPERTS
- INSTRUMENT DEVELOPERS
- MANUFACTURERS
- APPLICATION SPECIALISTS
- INDUSTRY PROFESSIONALS

PARTNER OPPORTUNITIES

01

SHOWCASE TECHNOLOGIES

Exhibition stalls, product presentations, and technical demonstrations.

02

ENGAGE WITH RESEARCHERS

Meet an expected 100–120 participants from academia and industry.

03

CONNECT WITH EMERGING TALENT

Hear student pitches and explore training, internships, and career pathways.

PARTNER WITH PURPOSE

Support instrumentation innovation, connect student talent with industry, and contribute to microscopy research and capability-building in Northeast India and beyond.

ABOUT CENTRAL INSTRUMENTS FACILITY (CIF)

VISION

To be a world-class center of excellence in scientific instrumentation and analytical research, fostering innovation, interdisciplinary collaboration, and impactful discoveries that contribute meaningfully to India's scientific growth — with a special focus on empowering the North-East region through advanced research infrastructure and capacity building.

MISSION

- To provide state-of-the-art analytical instrumentation and expert technical support for cutting-edge research in science, engineering, and technology.
- To serve as a national hub for collaborative research by offering access to premier instrumentation for academic institutions, R&D organizations, and industries.
- To strengthen the scientific ecosystem of the North-East by supporting regional universities, colleges, and startups in their pursuit of high-quality research and innovation.
- To promote hands-on training, workshops, and skill-building initiatives for researchers, students, and professionals in advanced scientific techniques.
- To continuously upgrade and expand facilities in response to emerging research needs and global scientific trends.

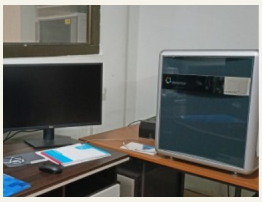
INSTRUMENTS



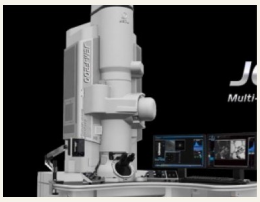
ICPMS



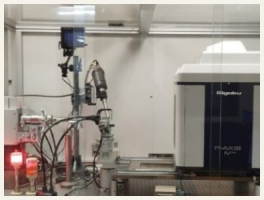
HRMS



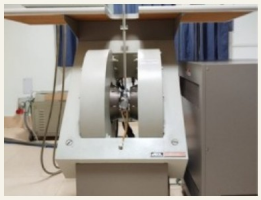
CHNSO Analyzer



JEM-F200



LMXRD



ESR



600MHz NMR



Powder/thin-film XRD



XPS



5kN UTM



FESEM



RAMAN



MALDI-TOF



AFM

CONTACT INFORMATION

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VENUE	Conference Center, IIT Guwahati
WEBSITE	www.iitg.ac.in/cif/conf



IIT GUWAHATI MAIN BUILDING



CENTRAL INSTRUMENTS FACILITY (CIF)

POST CONFERENCE ATTRACTIONS

NEAR IIT GUWAHATI



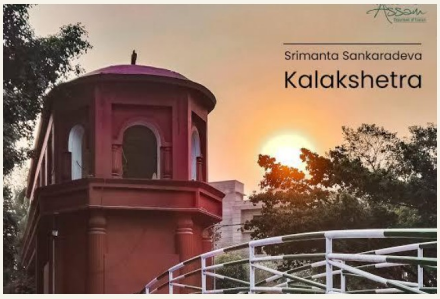
Maa Kamakhya Temple
Distance from IITG: 14 km



Brahmaputra River Heritage
Distance from IITG: 18 km



Guwahati Ropeway
Distance from IITG: 18 km



Srimanta Sankaradeva Kalakshetra
Distance from IITG: 25 km



Assam State Zoo cum Botanical Garden
Distance from IITG: 25 km



Dipor Bill
Distance from IITG: 15 km

EXPLORE ASSAM & MEGHALAYA



Chandubi Lake



Sivasagar (Sibsagar)



Kaziranga National Park



Double-Decker Living Root Bridge



Laitlum Canyons



Markham Valley