

## Key-note Speakers / Resource Persons

- **Prof. Satish Kumar Sharma**  
Professor, San Diego State University, San Diego, CA, USA.
- **Prof. Gabriel M. Rebeiz**  
Professor, UC San Diego, Franklin Antonio Hall 9500 Gilman Drive, MC 0407, La Jolla, CA 92093, USA.
- **Prof. Gourab Banerjee**  
Professor, Department of Electrical Communication Engineering, Indian Institute of Science, Bangalore 560012, India
- **Prof. S. P. Singh**  
Professor (Retd.), Department of Electronics Engineering, IIT(BHU), Varanasi, U.P. India.
- **Dr. A. K. Singh**  
Dr Raja Ramanna DRDO Distinguished Fellow & Former Director, DLRL Hyderabad.
- **Dr. Milind B. Mahajan**  
Group Director, Antenna System Group, Space Application Centre (ISRO), Ambawadi Vistar P.O., Ahmedabad-380015, Gujrat, India
- **Dr. Prashant Vasistha**  
Scientist 'G' and HEAD DEST & Project Director, Defense Laboratory, Ratanada Palace, Jodhpur-342011
- **Dr. V. S. Gangwar**  
Scientist F, LRDE DRDO Bangalore, 560093
- **Dr. Prashant Kumar Mishra**  
Scientist F, RCI DRDO Hyderabad
- **Mr. Virendra Kumar**  
Scientist F, LRDE DRDO, Bangalore, 560093
- **Dr. Nimesh Kumar Sahu**  
Senior Engineer, RF Design Company: Amphenol Omniconnect India Pvt Ltd, Chennai.
- **Dr. Jayprakash Thakur**  
Principal Engineer, Antenna Design & Wireless System Integration Architect Intel Technology, Bangalore.
- **Mr. Marwin Coutinho**  
Senior Manager, Rohde & Schwarz, Hyderabad
- **Prof. Ravi Kumar Gangwar**  
Professor, Department of Electronics Engineering, IIT(ISM) Dhanbad, Jharkhand.



Patron  
**Prof. Sukumar Mishra**  
Director, IIT(ISM) Dhanbad

## CORRESPONDENCE

Program Coordinator

**Prof. Ravi Kumar Gangwar**  
Professor  
Department of Electronics Engineering,  
IIT(ISM) Dhanbad - 826 004, Jharkhand, India  
Phone : +91-326-2235903 ; M: +91-9771457994  
Email : ravi@iitism.ac.in



WORKSHOP ON

# Phased Array Antenna Systems: A Revolutionary Technology for Modern Communication and Defence Application

15<sup>th</sup>-19<sup>th</sup> February, 2025

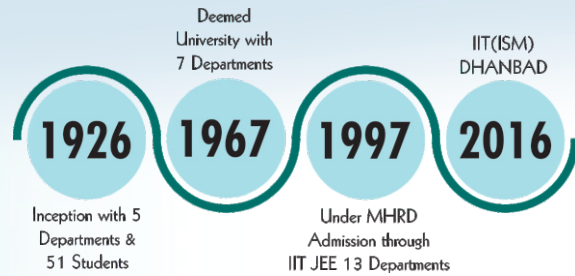


Organized by



Department of Electronics Engineering  
Indian Institute of Technology  
(Indian School of Mines)  
Dhanbad 826004, Jharkhand, India  
<http://www.iitism.ac.in>

## About the IIT(ISM) Dhanbad



Indian Institute of Technology (Indian School of Mines) Dhanbad was established on 9th June 1926 by the British government of India. It is a fully residential technical institute with all modern facilities located in the mineral-rich belt of India in the major coal city of Dhanbad, Jharkhand, India. IIT (ISM) Dhanbad, an Institute of National importance, has been rendering invaluable service to the cause of global education and societal development in its nine-long decades of existence. Keeping in tune with the changing times, a need has been realized for further expansion and diversification. IIT (ISM) has grown into a full-fledged technical institution with 17 faculty Departments offering a wide range of courses in Engineering, Science, Management, Humanities, and Social Sciences at UG, PG, and Ph.D. levels. IIT (ISM) admits students through the IIT-JEE and GATE/JAM Entrance Examinations in various courses in the respective departments.

## About the Workshop

Phased array antenna systems continue to be a rapidly evolving technology with steady advances motivated by the challenges presented to modern defence and advanced communication applications. This workshop will present the introduction and most recent advances in phased array antenna technology and offer a unique opportunity for participating members of the academic/defence/R&D laboratories/space communities to interact with renowned experts in the field of phased array antenna systems.

Phased Array Antennas are antenna arrays that have the unique ability to change the shape and direction of the radiation pattern without physically moving the antenna. Elements in an antenna array are placed in such a way that the signals transmitted by individual antennas sum up and provide better gain, directivity, and performance in a particular direction. Phased antenna arrays can transmit narrow-beam signals that can be digitally programmed to achieve desired frequencies and directions. Over the years, phased array antennas have evolved along with technological advances. Subsequently, phased array antennas have considerable applications – everything from military uses to 5G to important roles in DoT projects. This comprehensive workshop on Phased Array Antenna Systems provides an in-depth exploration of the principles, design, and applications of phased array

antennas. Participants will gain practical insights into radar and modern communication systems (5G/6G), mastering the intricacies of phased array technology. Through a combination of theoretical knowledge and hands-on exercises, this workshop offers a comprehensive understanding of their principles and applications in radar and modern communications field. Through a blend of theoretical insights and hands-on exercises, participants will acquire the skills needed to design, optimize, and troubleshoot phased array systems.

## Topics to be covered

Phased Array Antenna System: A Revolutionary Technology for Modern Communication and Defence Application is a 5-day workshop that covers the principles of phased array antennae, electromagnetic radiators, general properties of the radiation fields, and phased array radiation field patterns. Participants will learn the theory and practice of phased array antenna engineering, including phased array antenna types, applications, features, and properties. The details topics which will be covered are as follows:

### Introduction to Phased Array Antennas

- Basic concepts and principles
- Evolution of phased array technology
- Applications in defence and modern communications

### Antenna Array Fundamentals

- Array geometry and configurations
- Radiation patterns and beam steering
- Optimization of the Side lobe level

### Design and Characterization of Phased-Array Antenna Elements

- Selection of radiating element
- Selection of material and feeding mechanism
- Polarization considerations

### Beamforming Techniques

- Digital and analog beamforming
- Adaptive beamforming methods
- Beamforming challenges and solutions

### Signal Processing for Phased Arrays

- Signal modulation and demodulation
- Signal propagation in array systems
- Array signal processing algorithms

### Phased Array Antenna System Design

- System architecture and components
- Integration of phased arrays into radar and communication systems
- Design considerations for optimal performance
- Calibration & measurement of the Phase antenna array system
- FPGC for Phase array antenna system

## Advanced Topics and Emerging Trends

- MIMO (Multiple Input Multiple Output) applications
- RF SoC
- Full-Duplex Phased Array Antennas and Circuits
- Metamaterial Phased Arrays and phased array radome
- RCS reduction methods
- Beam steering controller

## Venue Location

The course will be conducted at the Department of Electronics Engineering, IIT(ISM) Dhanbad. Dhanbad has good railway connectivity from several parts of the country. The nearest airports are Durgapur and Ranchi, which are about 90 km and 180 km, respectively, from Dhanbad.

## Eligibility

Students (PG/Ph.D.), Faculty Members, and Industry Person.

## Registration Fee

SL	Category	Registration Fee
1	Students (PG/PhD)	₹ 3000.00 + 18% GST = ₹ 3540.00
2	Faculty/Scientist	₹ 5000.00 + 18% GST = ₹ 5900.00
3	Industry-sponsored participant	₹ 8000.00 + 18% GST = ₹ 9440.00

## Accommodation

Accommodation on a shared basis in the institute guest house is available for outstation participants only on a payment basis.

## How to Apply

Please fill out the Google form (Click here) on or before 30<sup>th</sup> January 2025.

**APPLY NOW**



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