



2nd International Workshop on Terahertz Technology- (IWTT2)

Co-organized by

*DRDO Industry Academia, Centre of Excellence
& DEAL, IRDE and GAETEC*

December 18-19, 2023

Indian Institute of Technology Delhi, New-Delhi, India

Day 1 – December 18, 2023

Venue: Auditorium Hall, R&I Park, IIT Delhi

Plenary Session I (8 am – 12 noon)

THz Communication and High Frequency Devices

Chairperson: Dr. Aparajita Bandyopadhyay, DIA-CoE, IIT Delhi

Time (IST)	Program
7.30-8.00	Registration checks of in-person participants; Link check for online participants
8:00-8:15	Welcome of Dignitaries and Lamp Lighting
8.15-8.25	Welcome and Inaugural Address by Director DIA-CoE, Dr. M H Rahaman
8.25-8.30	Introducing the keynote speaker Prof. Daniel M Mittleman, Brown University, RI, USA
8.30-9.30	Keynote Presentation (40 min + 20 min Q&A) Secure Terahertz Communication
9.30-9.50	Coffee Break
9:55-10.00	Introducing the plenary speaker Prof. Mona Jarrahi, University of California, Los Angeles, CA, USA
10.00-11.00	Plenary Presentation (40 min + 20 min Q&A) Terahertz Devices in Sensing, Imaging and Communication
11.00-11.05	Introducing the plenary speaker Prof. Kaushik Sengupta, Princeton University, NJ, USA
11.05-12.00	Plenary Presentation (40 min + 15 min Q&A) THz Comm: transitioning beyond 6G to THz arrays and metasurfaces
12.00-13.30	Lunch

Venue: Auditorium Hall, R&I Park
Technical Session I (1.30 pm – 3.50 pm)
Requirement in THz Communication Research and Development of High
Frequency Devices
Chairperson: Dr. Anant Naik, CEO, GAETEC

Time (IST)	Program List
13.30-13.45	Dr. Rajendra Singh, DEAL, DRDO – Requirement of THz Comm in strategic military applications
13.45-14.00	Dr. Sandeep Chaturvedi, GAETEC – Industry-led initiative for indigenous development of HF devices in the country
14.00-14.15	Dr. Satyajit Dubey, CSIR-NPL – Research challenges in accessing HF range beyond 6G
14.15-14.30	Prof. Nagendra P Pathak, Dept. of ECE, IIT Roorkee – Structuring of THz Comm MTech Program towards capability build-up in the country
14.30-14.45	Mr. Vishal Gupta, Keysight Technologies and Mr. Y P Singh, CPI India – Availing HF components in India for THz communication research
14:45-15.15	Dr. P. Hanumantha Rao, Director General SAMEER – Status of 6G Communication Research in India
15.15-15.20	Introducing the invited speaker Prof. Claudio Paoloni, Lancaster University, Lancaster, UK
15.20-15.50	Invited Presentation (20 min + 10 min Q&A) Sub-THz wireless links for new generation high-capacity X-haul architectures
15.50-16.30	Coffee Break; Reconvene at the Conference Hall of DIA-CoE, IIT Delhi

Venue: Conference Hall of DIA-CoE, IIT Delhi
Panel Discussion (4.30 pm – 6 pm)
Theme - THz Technology in India: Applications, Technology Assessments,
and the Way Forward through Collaborations

Chairperson: Dr. Samir V Kamath, Secretary, Department of Defence R&D and Chairman, DRDO

Dr. B K Das, DG (ECS), DRDO

Prof. Martin Koch, Philipps University of Marburg, Marburg, Germany

Prof. Daniel M Mittleman, Brown University, RI, USA

Dr. Chiko Otani, RIKEN, Japan

Prof. Claudio Paoloni, Lancaster University, Lancaster, UK

Prof. Hartmut Roskos, Goethe-Universität Frankfurt am Main, Frankfurt, Germany

Prof. Kaushik Sengupta, Princeton University, NJ, USA

Ms. Suma Varughese, DG (MED & CoS), DRDO

Day 2 – December 19, 2023

Venue: Auditorium Hall, R&I Park, IIT Delhi

Technical Session II (9.30 am – 12.30 pm)

THz Technology in Security Imaging and Space Applications

Chairperson: Dr. Sudhir Kamath, Director DIARCOE, IISc, Bangalore

Time (IST)	Program
9.30-9.40	Welcome-back Address by THz Vertical Coordinator of DIA-CoE, IIT Delhi, Dr. Aparajita Bandyopadhyay
9.40-9.55	Dr. Nimish Dixit, IRDE, DRDO – Requirement of Advanced THz Spectroscopy and Imaging for Defense and Space
9.55-10.00	Introducing the keynote speaker Dr. Chiko Otani, Team Leader, Center for Advanced Photonics Terahertz Sensing and Imaging Research, Riken, Japan
10.00-11.00	Keynote Presentation (40 min + 20 min Q&A) Walk-through security body scanner
11.00-11.20	Coffee Break
11.20-11.25	Introducing the invited speaker Prantik Chakraborty, Head, Terahertz Sensors Development Division, Space Applications Centre, ISRO
11.25-11.55	Invited Presentation (20 min + 10 min Q&A) Terahertz Sensors for Space-driven Spectroscopy and Imaging Applications
11.55-12.00	Introducing the invited speaker Dr. Nimish Dixit, Terahertz Division, Instruments Research and Development Establishment, DRDO
12.00-12.30	Invited Presentation (20 min + 10 min Q&A) THz Security Scanner: Instrumentation to Implementation
12.30-13.50	Lunch

Venue: Auditorium Hall, R&I Park

Plenary Session II (1.55 pm – 6 pm)

Advanced THz Spectroscopy and Imaging

Chairperson: Dr Subrata Rakhshit, DG (TM), DRDO

Time (IST)	Program List
13.55-14.00	Introducing the plenary speaker Dr. Fabian Friederich Group Director, Materials Characterization and Testing Lab, Fraunhofer ITWM, Kaiserslautern, Germany
14.00-14.55	Plenary Presentation (40 min + 15 min Q&A) Advanced Terahertz Imaging in Industrial Applications
14.55-15.00	Introducing the keynote speaker Prof. Martin Koch, Philipps University of Marburg, Marburg, Germany

15.00-16.00	Keynote Presentation (40 min + 20 min Q&A) Application of Advanced Terahertz Spectroscopy
16.00-16.25	Coffee Break
16.25-16.30	Introducing the keynote speaker Prof. Hartmut Roskos, Goethe-Universität Frankfurt am Main, Frankfurt, Germany
16.30-17.30	Keynote Presentation (40 min + 20 min Q&A) Application of Advanced THz Imaging Techniques
Venue: Auditorium Hall, R&I Park Concluding Session (17.30 pm – 18.00 pm) Workshop Outcome Chairperson: Ms. Suma Varughese, DG (MED & CoS), DRDO	
17.30-18.00	Concluding Address by Ms. Suma Varughese, DG (MED & CoS), DRDO
18.00- 18.10	Vote of Thanks by Director DIA-CoE, IIT Delhi, Dr. M H Rahaman

How to Participate in IWTT2:

- [1]. **There is NO REGISTRATION FEE to participate in the workshop.**
- [2]. **Pre-register using the google-form link given here (<https://forms.gle/aRKxHEiBMnRvbHYSA>) by December 08, 2023, 23:59 hours IST. Please ONLY provide your official/business/academic email IDs for pre-registration. Pre-registration through google form is mandatory for all participants (Indian and International).**
- [3]. **PARTICIPATION FROM INDIA MUST ONLY BE IN-PERSON for both the days of the workshop.** Due to the limited availability of the in-person spots, preferences will be given to the organizing institutes. For the rest of the spots, roughly 65, first-come-first serve basis will be adopted as per the pre-registration. No travel or local logistic support would be provided by the organizers for in-person participants.
- [4]. **For international registered participants, separate links will be provided for both days of the workshop.** To provide quality and efficient experience for international participants, online participation will be limited to roughly 70 (again first-come-first serve basis will be adopted) to ensure **optimal bandwidth management of the connection.**
- [5]. The final list of participants (both Indian and International) will be notified via email by December 13, 2023 23:59 hours IST.