



ITC-Egypt 2026 – Keynote Speaker

MHz to THz Technologies Addressing Fundamental Science Questions Prof. Goutam Chattopadhyay



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ABSTRACT

Space exploration has long served as a powerful catalyst for inspiring the imagination of the next generation. The sight of rovers on Mars, images from distant galaxies, and the dream of humans returning to the Moon or reaching Mars ignite curiosity and a spirit of discovery in young minds. These missions are not just feats of engineering – they are stories that capture the human desire to explore the unknown and push beyond boundaries. By engaging students, educators, and the public in the wonders of space, exploration fosters STEM education, fuels innovation, and builds a generation that dreams bigger and reaches further.

Beyond its inspirational value, space exploration offers a unique lens through which we can better understand ourselves and our place in the cosmos. As we study other planets and moons, we gain valuable insight into planetary evolution, atmospheric behavior, and the potential for life beyond Earth. Observing Earth from space also provides critical data on climate change, environmental degradation, and the fragile systems that sustain life. In this way, space science not only fuels our search for extraterrestrial life but also deepens our understanding of Earth's past, present, and future. Ultimately, exploring the universe is a journey inward as much as outward – it challenges us to think about our shared humanity, our responsibility to protect our planet, and our collective future among the stars.

In this lecture, we will explore the technological innovations in the MHz to THz frequency domain driving the next generation of instruments and highlight specific instrument developments along with the fundamental science questions they aim to address.

BIO



Dr. Goutam Chattopadhyay is a Senior Scientist at NASA's Jet Propulsion Laboratory (JPL), California Institute of Technology (Caltech), and a Visiting Professor at Caltech in Pasadena, USA. He previously served as the BEL Distinguished Visiting Chair Professor at the Indian Institute of Science, Bangalore, and as an Adjunct Professor at the Indian Institute of Technology, Kharagpur. Dr. Chattopadhyay received his Ph.D. in Electrical Engineering from Caltech in 2000.

He is a Fellow of the IEEE (USA), the National Academy of Inventors (NAI), and the Institution of Electronics and Telecommunication Engineers (IETE, India), and an Associate Fellow of the AIAA. He served as the 2025 President of the IEEE Microwave Theory and Technology Society (MTT-S), is a Track Editor for the IEEE Transactions on Antennas and Propagation, and is an IEEE Distinguished Lecturer. His research interests include microwave, millimeter-wave, and terahertz receiver systems and radars, as well as space instrumentation for the search for life beyond Earth.

Dr. Chattopadhyay has authored over 450 publications in international journals and conferences and holds more than 25 patents. He has received over 35 NASA Technical Achievement and New Technology Invention Awards. In 2026, he received the NASA Group Achievement Medal for groundbreaking work on terahertz instruments for planetary exploration. In 2025, he was awarded the NASA-JPL North Star Award, the highest honor bestowed upon a JPL scientist. Additional honors include the Armstrong Medal from the Radio Club of America (2024), the NASA-JPL People Leadership Award (2023), IEEE Region 6 Engineer of the Year (2018), and the Distinguished Alumni Award from the Indian Institute of Engineering Science and Technology (IIEST), India (2017). He is also a two-time recipient of the Best Journal Paper Award from IEEE Transactions on Terahertz Science and Technology (2020 and 2013), received the Best Paper Award for Antenna Design and Applications at EuCAP (2017), and has been honored with the IETE Biman Bihari Sen Memorial Award (2022) and the IETE Prof. S. N. Mitra Memorial Award (2014).