

# Scientific Innovations for the Antennas, by the Antennas

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**Abstract :** The wireless technology is now stepping in the domain of the world of 5G promising a fantastic feature of 100% coverage and as usual, it demands more sophisticated devices including the RF front ends, commonly known as ‘*antennas*’. An antenna is actually a specially designed component of the electrical circuit in any wireless transmitter and receiver which is able to serve as a mediator between the electrical phenomenon inside and the electromagnetic phenomenon outside. Such a requirement was beyond the dream of the scientists involved in justifying ‘*The dynamical theory of electromagnetic field*’ proposed by J C Maxwell in 18860s. Finally, a physicist Heinrich Hertz came with his innovative eyes and looked into something beyond the theory which laid the foundation of antenna engineering. This talk is aimed to address that longstanding quest through a personal drive of understanding Hertz’s own experiments by visiting his own Institute at Karlsruhe and also through investigating his original equipment located at Deutsches Museum, Munich. This talk will present some evidences of remarkable innovations in technology which were made possible by the success of antenna engineering in the beginning of the last century. With time, material science has grown like anything and the antenna engineers have taken the advantages in different formats, geometries, and applications covering up to the optical frequencies. This talk intends to cover all this aspect including some recent state-of-the-art innovations based on the personal experiences.



**Biography:** Debatosh Guha is a Professor in Radio Physics and Electronics, University of Calcutta. He is the former HAL Chair Professor of IIT Khargapur, present Head of the Radio Physics and Electronics Department, and Director of the Centre for Research in Nanoscience and Nanotechnology (CRNN), Calcutta University. He received the B. Tech. and M.Tech. degrees from the University of Calcutta in 1987 and 1989, respectively and started his career in a Wireless Industry. After graduating with a Ph. D. in microwave engineering from Calcutta University, he joined the same institute as an Assistant Professor in 1994. He spent about two years with the Royal Military College of Canada, Kingston, Ontario as Visiting Research Professor.

He has researched in developing microstrip and dielectric resonator antenna technologies. Defected Ground Structure (DGS) -inspired antenna is one of his major areas of contribution. He has published over 200 technical papers and articles in top Journals and Conferences along with a Book on microstrip and printed antenna from Wiley,UK.

Professor Guha is a Fellow of IEEE, the Indian National Academy of Engineering (INAE), National Academy of Sciences, Indian (NASI), West Bengal Academy of Science and Technology (WAST), and the Institution of Electronics and Telecommunication Engineers (IETE). He is the recipient of some notable awards which include IETE Ram Lal Wadhwa Award 2016 (New Delhi), Raj Mittra Travel Grant Award 2012 (Chicago); URSI Young Scientist Award 1996 (Lille, France); and Jawaharlal Nehru Memorial Fund Prize 1984 (New Delhi). He is an Associate Editor of *IEEE Transactions on Antennas and Propagation* & *IEEE Antennas and Wireless Propagation Letters* and serves the Field Awards Committee of IEEE AP-Society.

He is the present Chair for Commission B of the Indian National Committee for URSI (INCURSI). He served the IEEE Kolkata Section as a Chair (2013-2014) and also the AP-MTT local Chapter as its Founding Chair (2004) and Chair (2010-2011). He has mentored more than a dozen doctoral students and his current research interests include defected ground structure (DGS) for antenna application, unresolved issues of microstrip antenna design, UWB hybrid antennas, unconventional radiating modes and new feed concepts for dielectric resonant.