One Day International
Workshop on Recent Advances in

# Wireless Communications and Antenna Technologies for Space, Air and Ground Applications

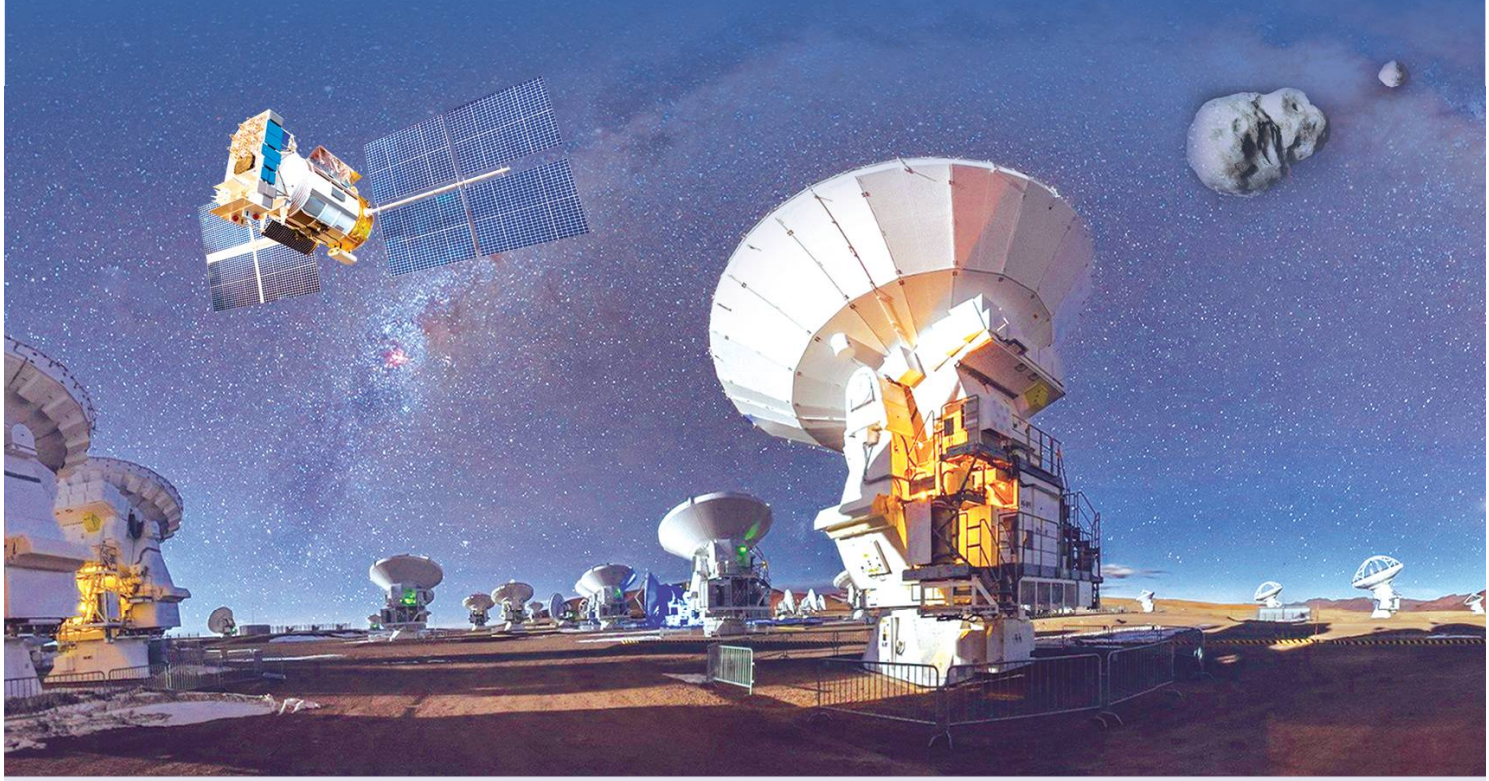
**14th June 2023 (8.30 AM to 6.30 PM)**

***Presentations by:***

**Seven World renowned experts from USA, Turkey, Taiwan & India with 3 IEEE Fellows, 2 IEEE APS Distinguished Lecturers, 1 IEEE APS YP Ambassador, 2 company CEOs, and 2 IEEE Senior Members among them**

***Organized by:***
**IEEE Student Branch & IETE Student Branch**

***Sponsored by:***
**IEEE-APS & WAMS**



**VIGNAN'S**
Foundation for Science, Technology & Research
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-Estd. u/s 3 of UGC Act 1956

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*Organised by:* Dept. of **Electronics and Communication Engineering**
School of **Electrical, Electronics and Communication Engineering (SEECE)**

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## About our University

Vignan's Foundation for Science, Technology & Research is an institute, which provides quality education in a diverse and intellectually stimulating environment. It imparts value addition training to students to make them competent and inspired engineers. The Institute celebrates the power of knowledge, cultivates vision and encourages new ideas, besides aiming to inculcate human values and build awareness about the self and society around. The Institute is well known for its dedicated faculty, state-of-the-art infrastructure and excellent Placement Record. As a University, it is in the process of improving its standards to the level of a global technical institution. The latest curriculum has been prepared after consulting the institute's illustrious alumni working across the world, veterans from industry and distinguished academics possessing a rich teaching and research background. Living up to its motto, 'Technology with a Human Face', the institution imparts knowledge and skills, while instilling human values and awareness about self and society. In the recent nationwide survey of Indian universities carried out by NIRF, VFSTRU was placed at 95th rank. The University is ISO certified and has been accredited by NBA and NAAC 'A+'Grade.

## About the ECE Department

The Department of ECE was established in the year 1997 to start a B.Tech programme affiliated to the JNTUniversity, Hyderabad. The first batch of students graduated from the department in the year 2001. A PG, leading to M.Tech in 'Embedded Systems' was introduced in the year 2006. Consequent to the establishment of JNT University in Kakinada, the affiliations of both programmes were shifted to the new Deemed University from 2008 onwards. The undergraduate programme Electronics and Communication was accredited by NBA. Today, it is one among the leading educational institutions of the country in Electronics and Communication Engineering and is now named as Department of ECE. The department of ECE offers B.Tech, M.Tech and Ph.D programmes.

## About - VIGNAN'S - KEYSIGHT - CENTRE OF EXCELLENCE

Vignan's Keysight CoE was established in July 2017, it provides a world class infrastructure in the area of RF, Microwave and Wireless Communications. The CoE sponsored by Keysight Under University Grants Program and VFSTR. The CoE to Provide End-To-End RF, Microwave and Wireless Solutions, State of Art equipment in the field of advanced communications systems to the Research scholars, PG and UG students. The research carried out in Communication System Design Lab,RF system and Circuit Design lab and Antenna Design lab. The need of CoE lab is to analyse Real world System, Circuit and Antenna design, real time Communication System Measurements and real time communication system debugging.

## About the International Workshop

The international workshop is to provide the avenues to impart the knowledge about the advanced antenna design techniques for Space, planetary machines and vehicular communications through the subject expert talks. It covers portable and wideband antenna design using Deep Learning and machine learning techniques for the deep space communications, 5G Communications, Vehicular communications, Radar Systems, Radio telescope.

# RESOURCE PERSONS AND TOPICS

## Dr. Sudhakar Rao

IEEE Life Fellow, FIETE, WAMS Life Fellow
President & CEO, RaoS Consultants LLC, USA

*Topic 1: Advanced Antenna Designs for Space, Air & Ground Communications: "Simple is Elegant!"*

Biography: Dr. Sudhakar Rao is the president & CEO of RaoS Consultants LLC providing technical consultancy to several companies. Over the past 47 years of his professional career, he worked at Northrop Grumman Space Systems (2010-2022), Lockheed Martin (2003-2010), Boeing Satellite Systems (1996-2003), Spar Aerospace Ltd, Montreal (1983-1996), University of Manitoba (1982-1983), University of Trondheim, Norway (1981-1982), LRDE, Bangalore (1980-1981), IIT Madras (1977-1979) and ECIL, Hyderabad (1976-1977). He developed and successfully implemented antenna payloads for 90 different satellites and 10 aircraft, vehicular and ground communications programs. Dr. Rao's work on development of radiation templates for complex satellite antenna patterns for interference analysis was adopted and recommended by the International Telecommunication Union (ITU)/CCIR in 1992 as the world-wide standard for satellite manufacturers and operators. He authored over 230 technical papers and was awarded with 57 patents (51 US & 6 European) and 5 trade secrets. His fundamental work on the design of multiple beam antennas in 1999 has been used by satellite industry world-wide. He authored and co-edited three textbook volumes on "Handbook of Reflector Antennas and Feed Systems" that were published in June 2013 by the Artech House.

Dr. Rao is an IEEE Life Fellow, a Fellow of IETE, and a Life Fellow of WAMSS. He received several awards including the IEEE Benjamin Franklin Key Award in 2006, Delaware Valley Engineer of the Year in 2008, Asian American Engineer of the year award in 2008, IEEE Judith Resnik Technical Field Award in 2009 for pioneering work in aerospace engineering, Boeing's Special Invention awards in 2001 & 2002, Lockheed Martin's President Award in 2005, IEEE Region 6 Outstanding Engineer Award for 2017 and the 2017 Northrop Grumman's President Award for innovations and contributions to key programs. He received Distinguished Alumni Professional Achievement Award from his alma mater NIT Warangal in 2016, IETE's Prof. S.N. Mitra Memorial Award in 2016, and the 2020 IETE's Biman Behari Sen Memorial Award. Dr. Rao served as the Distinguished Lecturer for the IEEE APS and as an AdCom member for IEEE APS. He was the founder and Chair for the IEEE APS "Industry Initiatives Committee" during 2011-2015, IEEE APS Fellow Evaluation Committee member during 2015-2017, founder and Editor of the IEEE Antennas & Propagation Magazine's "Antenna Applications Corner", Associate Editor for the IEEE Transactions on Antennas & Propagation, and Associate Editor of IEEE AWPL. He is the founding executive committee member of the WAMS series of conferences in India. Dr. Rao delivered invited and keynote talks for more than 50 conferences world-wide. He served as the IEEE Fellow Committee member for 2020 & 2021 and now serving for 2023 & 2024. He instituted IETE – Dr. Sudhakar Rao Award in 2020 to recognize and honor outstanding antenna engineers.

## Dr. Nacer Chahat

IEEE Fellow, Senior Engineer
NASA/JPL, USA

### Topic 2: *Mars Helicopter communication link and innovative antenna for Cubesats, Landers, and Rovers.*

Biography: Nacer Chahat received the Master's degree in electrical engineering from the Ecole Supérieur d'ingénieurs de Rennes (ESIR), Rennes, France, in 2009; the Master's degree in telecommunication and the Ph.D. degree in signal processing and telecommunications from the Institute of Electronics and Telecommunications of Rennes (IETR), University of Rennes 1, Rennes, France, in 2009 and 2012, respectively. He is a Senior Antenna/Microwave Engineer with the National Aeronautics and Space Administration (NASA) Jet Propulsion Laboratory (JPL), California Institute of Technology, Pasadena, CA. Since 2013, he has been a Microwave/Antenna Engineer with NASA's Jet Propulsion Laboratory and he has been Technical Section Staff and Product Delivery Manager since 2017.

He has authored and coauthored more than 100 technical journal articles and conference papers, has written four book chapters, and also holds several patents. He also wrote the textbook entitled "CubeSat Antenna Designs" published by Wiley describing all of his innovative work on CubeSat antennas developed at JPL.

He has developed key antenna technologies enabling new types of mission for Deep Space Exploration. He is co-inventor of the iconic deployable reflectarray used on the Mars Cube One (MarCO) mission, the world's first interplanetary CubeSat.

He also co-invented the award-winning Raincube mesh reflector antenna used on the first active radar on a CubeSat. He also invented the Europa Lander antenna enabling direct communication from the surface of Europa (600 million km away), capable of surviving the harsh environment of icy moon of Jupiter.

Dr. Chahat was the recipient of the 2011 CST University Publication Award, the 2011 Best Paper Award from the Bioelectromegnetics Society, and the IEEE Antenna and Propagation Society Doctoral Research Award in 2012.

He was awarded by Foundation of Rennes 1, Best Ph.D. of University of Rennes. In 2013, he received the Best Ph.D. thesis in France in electrical engineering awarded by club EEA. In 2013, he was awarded the Airbus Group Foundation's Best Thesis Prize in France. In 2015, he received a French Early Career Award for Researchers (Prix Bretagne Jeune Chercheur) for his significant scientific contribution in his early career. In 2017, he received the IEEE A. Schelkunoff Transactions Prize Paper Award. In 2017, he also received the prestigious Lew Allen Award for Excellence awarded by NASA's Jet Propulsion Laboratory "for demonstrated unique talent as a leader in rapid spacecraft antenna development and telecom systems engineering". In 2018, he was awarded the Future Technology Leader Award by the Engineers' Council and the NASA Early Career Achievement Medal Award. In 2020, he received the IEEE Outstanding Engineer of the Year from IEEE Region 6. In 2022, he received the IETE Dr. Sudhakar Rao award and he became Fellow of IEEE.

## Mr. C.S. Rao

President & CEO
QuadGen Wireless, Bangalore

Topic 3: *Digital Transformation in Public 5G Nw Architectures w.r.t. AAS, AAU, RAN, Tx & Core Layers.*

Biography: Professional Career: QuadGen Wireless Solutions Inc, USA & India 2010 - till date, Chairman, WiMAX Forum India, 2007 till 2016 , Member Governing Board Member, Cloud Computing Council of India 2009-2013, Fmr. President, Reliance Communications Ltd & Telecom Operators Association of India., Fmr. Mg. Dir. BT (British Telecom) India & Fmr. Mg. Dir, Intel India, Fmr V.P of LUCENT USA & Bell Labs USA, 1995-2003, Fmr. PRESIDENT & CEO, Lucent Technologies India & Bell Labs India, 2003-2008, Fmr. V.P Engg ,Tellabs ,USA and Mg Dir. Tellabs India, 1990-1995 and Former GM, CDOT (Centre for Dev of Telematics), 1986-1990. Honors: Fellow of Bell Labs, USA, Masters Graduate from IIT, India 1977,Business Leadership Award, ASSOCHAM, a National Chamber of Commerce, National Research &Development Council award from Hon'ble President of India, Corporate Leadership Awards,Tellabs, USA,Intel USA. LUCENT, USA AT&T & ASSOCHAM, India and Indian Telecom Person of the year Award 2012.

Significant Achievements: Digital Transformation IT Applications in m-Gov, e-Gov & on -line Learning Panel of Govt. of India. Led the Launch of US $ 3B Telecom NW Infra in India in my leadership • Made contributions at ASSOCHAM, CII and FICCI for driving Telecom Policies. • Key role in Cloud Computing Policy recommendations at Dept of IT, Govt of India. • One of the 5 Member team of Smart City Policy of Niti Aayog & MUD, Govt. of India. • Member of 5 Member HLF for DOT, Govt. of India on 5G NW Roll out Policy. • Honorary Member of Smart City Council of India.

## Prof. Chow-Yen-Desmond

IEEE Senior Member, Feng Chia University
Taichung, Taiwan

Topic 4: *The Development of Wideband Antenna for Vehicular Applications*

Biography: Chow-Yen-Desmond Sim received a Ph.D. degree from the Engineering Department, University of Leicester, in 2003. In 2007, he joined the Department of Electrical Engineering at Feng Chia University (Taiwan) and was promoted to Distinguish Professor in 2017. He has authored/co-authored over 200 SCI papers, and his current research interests include 5G/laptop/vehicular antenna designs and RFID applications. He is a Fellow of the IET and a Senior Member of the IEEE AP Society. He is now serving as the technical consultant of SAG (Securitag Assembly Group) and Avary Holding (the world's largest PCB manufacturer).

## Prof. Dr. L. Sevgi

IEEE Fellow, IEEE AP-S Distinguished Lecturer,
Istanbul ATLAS University

### Topic 5: *From Engineering Electromagnetics to Electromagnetic Engineering*

Biography: Prof. Dr. Levent Sevgi is a Fellow of the IEEE (since 2009) and the recipient of IEEE APS Chen-To Tai Distinguished Educator Award (2021). He received his B. Eng., M. Eng., and PhD degrees in Electronic Engineering from Istanbul Technical University (ITU) in 1982, 1984 and 1990, respectively. In 1987, while working on his PhD, he was awarded a fellowship that allowed him to work with Prof. L. B. Felsen at Weber Research Institute / New York Polytechnic University York for two years. His work at the Polytechnic concerned the propagation phenomena in non-homogeneous open and closed waveguides. He was with Istanbul Technical University (1991–1998), TUBITAK-MRC, Information Technologies Research Institute (1999–2000), Weber Research Institute / NY Polytechnic University (1988–1990), Scientific Research Group of Raytheon Systems Canada (1998 – 1999), Center for Defense Studies, ITUV-SAM (1993 –1998 and 2000–2002) and with University of Massachusetts, Lowell (UML) MA/USA as a full-time faculty (2012 – 2013), with DOGUS University (2001-2014) and with Istanbul OKAN University (2014 - 2021). He has been with Istanbul ATLAS University Since Sep 2022. He has been an IEEE AP-S Distinguished Lecturer for the term 2020-2022. He served one-term in the IEEE AP-S AdCom (2013-2015) and one-term and as a member of IEEE AP-S Field Award Committee (2018-2019). He was the writer/editor of the “Testing ourselves” Column in the IEEE AP Magazine (2007-2020), a member of the IEEE AP-S Education Committee (2006-2021), He has also served in several editorial boards (EB) of other prestigious journals / magazines, such as the IEEE AP Magazine (since 2007), Wiley’s International Journal of RFMiCAE (2002-2018), and the IEEE Access (2017-2019 and 2020 - 2022). He is the founding chair of the EMC TURKIYE International Conferences (www.emcturkiye.org).

His research study has focused on propagation in complex environments; electromagnetic scattering and diffraction; RCS prediction and reduction; EMC/EMI modelling, simulation, tests and measurements; multi-sensor integrated wide area surveillance systems; surface wave HF radars; analytical and numerical methods in electromagnetics; FDTD, TLM, FEM, SSPE, and MoM techniques and their applications; bio-electromagnetics. He has given dozens of seminars, invited/keynote talks, organized/presented several tutorials, training sessions and short courses from half-day to three-days in universities/institutes all around the World. He has published more than a dozen special issues / sections in many journals as a guest editor and/or a co-guest editor. His recent keynote talks / distinguished lectures are: (i) From Engineering Electromagnetics towards Electromagnetic Engineering: Teaching, Training Next Generations, MIT Massachusetts Institute of Technology, Nov 9, 2021, MA-USA (ii) Radiowave Propagation Modeling and Simulation, University of Toronto, Oct 29, 2021, ON-CA, and (iii) Electromagnetic Diffraction Modeling and Simulation, University of Syracuse, Nov 11, 2021 NY-USA. He has published many books/book chapters in English and Turkish, over 180 journal/magazine papers/tutorials and attended nearly 100 international conferences/symposiums. His three books Complex Electromagnetic Problems and Numerical Simulation Approaches, Electromagnetic Modeling and Simulation and Radiowave Propagation and Parabolic Equation Modeling were published by the IEEE Press - WILEY in 2003, 2014, and 2017, respectively. His fourth and fifth books, A Practical Guide to EMC Engineering (Sep 2017) and Diffraction Modeling and Simulation with MATLAB (Feb 2021) were published by ARTECH HOUSE.

## Dr. Gaurangi Gupta

IEEE APS YP Ambassador
Antenna Engineer, NASA/ JPL, USA

Topic 5: *Innovative Antennas for Satellite Telecom, Radar systems and Radio TelescopeEngineering*

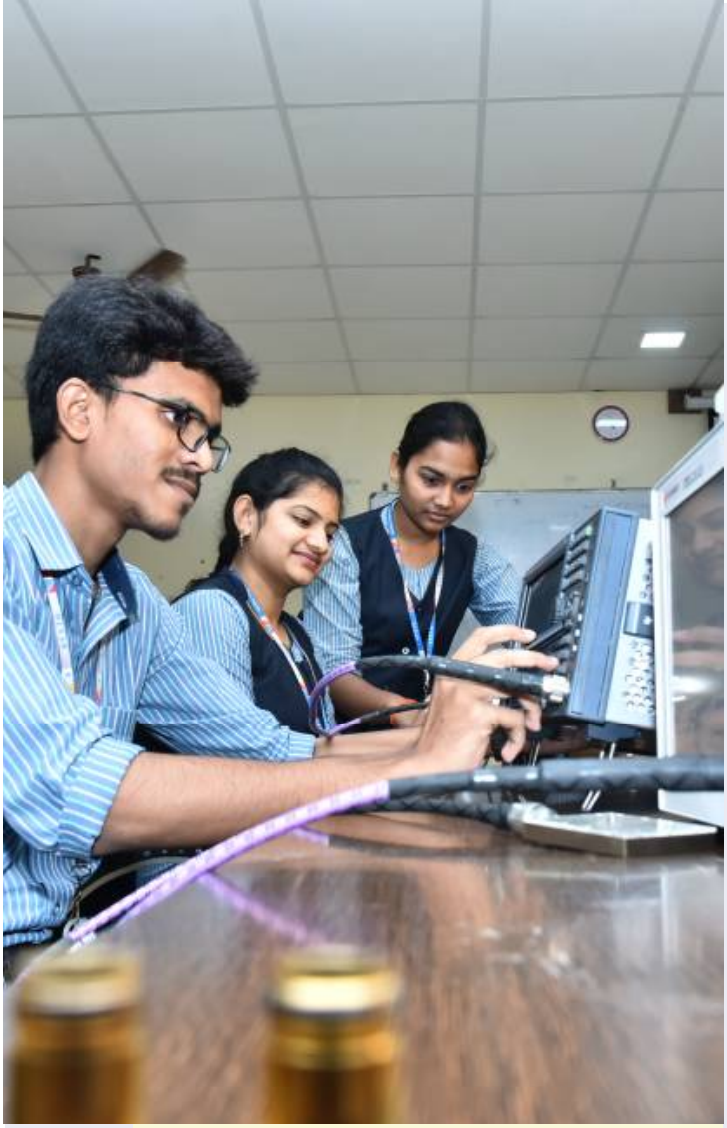
Biography: Dr. Gaurangi Gupta is working as an antenna engineer at NASA / JPL, Pasadena, USA. She is currently working on the antenna development for radio telescope and satellite communication applications. She completed her Masters and PhD in Electrical Engineering from the Indian Institute of Technology (IIT) Kanpur, India in 2014 and 2020, respectively. During her PhD, she worked on the design and development of low-profile antennas with meta-surface reflectors. She worked as a research associate at IIT Kanpur during 2020-2021, where she worked on phased array antennas for satellite on the move application under an industry collaborated project. Under the Indo-US Fellowship during 2018-2019, she worked as a visiting scholar at the Remote Sensing Center, University of Alabama, where she contributed to the ongoing radar development. She has published multiple papers in journals and conferences, and is a recipient of best paper awards and travel grants in IEEE conferences.

## Prof. Ramana Reddy

Vice Principal & Professor, JNTUACEP,
Chairman BoS & Head, Dept. of ECE
JNTUA College of Engineering Pulivendula

Topic 5: *Design of Portable, Wideband Antennas using Machine learning approach*

Biography: Dr. R. Ramana Reddy did M.Tech (I&CS) from JNTU College of Engineering, Kakinada in 2002, MBA (HRM & Marketing) from Andhra University in 2007 and Ph.D in Antennas in 2008 from Andhra University. He is presently, Vice Principal - JNTUACEP, Professor, Chairman BoS & Head, Dept. of ECE in JNTUA College of Engineering Pulivendula. Guided 32 M. Tech projects and 1 Ph.D scholar, guiding 5 Ph. D research scholars. Consultant for Phytec Embedded System Pvt. Ltd, Bangalore. Published FIVE Patents. Authored two books for School of distance Education, Andhra University. Convener of several national level conferences and workshops. Chaired many technical sessions and delivered guest lectures. Published about 118 technical papers in National/International Journals/ Conferences. Reviewer of IEEE Transactions on Antennas and Propagation, IEEE Antennas and Propagation Magazine, IEEE Antennas and Propagation letters, Elsevier Journal and many International Conferences. BoS Member of PG Courses Department of ECE, JNTUK, Kakinada, Department of Instrumentation, JNTUA, Department of ECE, JNTUA. Special sessions committee member for InCAP -2018, TPC Member of INCAP 2019. Awards committee chair WAMS 2022, Executive Committee member WAMS, TPC Chair for WAMS 2023. He is Fellow of IETE, IE, Senior member of IEEE, member of ISTE, SEMCE (I), and ISOI. His research interests include Phased Array Antennas, Slotted Waveguide Junctions, EMI/EMC, VLSI and Embedded Systems.



## WHO SHOULD ATTEND?

Students, Research Engineers, Academicians and industry professionals.

## Registration Details :

Indian Deligates : Rs. 250/-
Abroad Deligates : US $25
Registration Link: https://vignan.ac.in/WCATSAG2023

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