

Online one week Short Term Course  
on

# Antenna and Microwave Fundamentals, Theory, Modeling, Test and Applications for Space, Air and Ground Systems

26<sup>th</sup> Sept - 30<sup>th</sup> Sept 2020



Coordinator

Prof. K. R Subhashini

Organized by

Dept. of Electrical Engineering  
National Institute of Technology  
Rourkela

Sponsored by



IEEE Antennas and  
Propagation Society

TEQIP - III

## About the Institute

National Institute of Technology (NIT), Rourkela was founded as Regional Engineering College, Rourkela in 1961. It is a prestigious Institute with a reputation for excellence at both under graduate and post graduate levels, fostering the spirit of national integration among the students, a close interaction with industry and a strong emphasis on research, both basic and applied. It's been consistently ranked with in TOP 20 engineering institutes for 5 consecutive years as per MHRD's NIRF, Govt. of India. It is ranked 16 in the NIRF Rankings 2020 of Indian engineering universities.

## Dept of Electrical Engineering

Department of Electrical Engineering, NIT Rourkela was established in 1961. Since its inception, the Department is under dynamic progress and is reputed for imparting quality education both at B.Tech, M.Tech levels. The Department currently runs Four M.Tech programmes with the specializations in (i) Power Electronics and Drives, (ii) Electronic Systems and Communication, (iii) Control and Automation, (iv) Power Systems Engineering. Besides the undergraduate and postgraduate teaching, a good number of research scholars are working on different areas of Electrical Engineering towards the award of PhD degrees. The Department is identified as the host department for execution of two Centers of Excellence, namely CoE Industrial Electronics and Robotics and CoE in Renewable Energy Systems. The Department has well equipped modern laboratories such as Signal Processing & Communication, Image Processing & Computer Vision, Power Electronics & Drives, Control & Robotics, Embedded & Real Time System Lab for pursuing research in the emerging areas of Electrical Engineering.

## Course Objective and Outcome

Microwave antennas are the backbone of the wireless communications system. Basic knowledge of microwave components is essential to develop a reliable wireless communication system. This course attempts to refresh the fundamentals as well as recent developments in the field of microwave antennas and passive components. Detail design steps of the full-wave microwave antennas and passive components, starting from text book knowledge to implementation using commercial full-wave simulators in different planar printed circuit board guiding structures will be discussed. The course will include lectures sessions on the following broad topics:

- > Antenna Modeling and Simulation Techniques
- > Antenna Applications for Space, Air and Ground Systems
- > CubeSat Antennas - Mesh Reflectors and Reflect Arrays
- > Antenna Theory & Phased Arrays
- > Antenna Applications for Defense Industry
- > Theory and Design of Filters
- > Advances in Microstrip Filter technology
- > Antenna application to Health Monitoring
- > Substrate integrated waveguide
- > Low Profile Antennas on Metasurfaces
- > Microwave Integrated Circuits

## Resource Persons

Dr. Sudhakar Rao, Northrop Grumman Space Systems, USA  
Dr. C.J. Reddy, Altair, USA  
Dr. Nacer Chahat, NASA/JPL USA  
Prof. Animesh Biswas, Director, NIT Rourkela  
Shri Rajeev Jyoti, Deputy Director, Distinguished Scientist, SAC, ISRO, Ahmedabad.  
Prof. S. Raghavan, Professor (HAG), Retd. NIT, Trichy  
Prof. Amalendu Patnaik, Associate Professor, IIT Roorkee  
Dr. N N S S R K Prasad, ADA Bangalore  
Dr. Vamsi Krishna Veldi, Scientist E, URSC, ISRO  
Prof. Debabrati Sen, Associate Professor, IIT Kharagpur  
Mr. B Pavan Kumar, Scientist F, URSC, ISRO  
Prof. Debolina Ghosh, Assistant Professor, IIT Bhubaneswar  
Prof. Eva Rajo Iglesias, Professor, Carlos III University, Madrid, Spain  
Dr. Beenamole K S. Scientist G. Group Head, LRDE, DRDO  
Dr. Venkata Vanukuru, PMTS, IBM/GLOBALFOUNDRIES  
Dr. Gaurangi Gupta, Senior Research Associate, IIT Kanpur

## Who should attend the course

Faculty members of University and Engineering colleges, research scholars, M.Tech final year students, practicing RF and microwave engineers, professionals and functional managers, administrators in the mobile phone, satellite communication and radar industry who would like to go through guided tour of fundamentals, design and measurement of microwave antennas and passive components.

## Registration

After paying registration fee, kindly capture an image of proof for the payment. The participants have to register for the course online through the link provided below and provide the transaction id and upload the proof of payment.

Apply here : <https://tinyurl.com/yychxzwx>

**Registration Fee :** Industry /Faculty/Academic Staff : Rs. 1000/-  
UG, PG Students and Ph.D Scholars : Rs.500/-  
(For IEEE Members - Rs. 400/-)

**Account Details :** Account Name: DIRECTOR NIT ROURKELA  
Account Number: 37537622247  
IFSC Code: SBIN0002109 Swift Code: SBINBB137  
Bank: STATE BANK OF INDIA  
Branch: NIT CAMPUS ROURKELA

**Important Dates :** Last date for online registration : 25/09/2020  
Intimation to the candidates : 25/09/2020  
Course dates : 26/09/2020 - 30/09/2020

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# Online One-Week Short Term Course

On

## Antenna and Microwave Fundamentals, Theory, Modeling, Test and Applications for Space, Air and Ground Systems

Sponsored by TEQIP III

Organized by

Dept of Electrical Engineering, National Institute of Technology, Rourkela  
(26th September 2020 – 30th September 2020)

### Date-wise Schedule of the Workshop



Day	Session 1 (9:00 AM – 10:30 AM)	Break	Session 2 (11:00 AM – 12:30 PM)	Lunch Break	Session 3 (2:30PM – 3:45PM)	
<b>26/09/20 (Saturday)</b> Welcome, Introduction & Agenda (9:00–9:10AM) Prof K R Subhashini	<b>Topic :</b> Antenna Fundamentals and Applications for Space, Air & Ground Communications (9:10 AM – 10.30 AM) <b>Speaker:</b> Dr. Sudhakar Rao, Northrop Grumman Space Systems, USA		<b>Topic :</b> Substrate Integrated Waveguide and Dielectric Image Line Based Circuit Components and Antennas <b>Speaker:</b> Prof. Animesh Biswas Director, NIT, Rourkela		<b>Topic:</b> Antenna and Radar <b>Speaker :</b> Dr. Beenamole, LRDE, Bengaluru	Q & A and Feedback on all Antenna Topics(20mts)
<b>27/09/20 (Sunday)</b>	<b>Topic:</b> CubeSat Antennas: Mesh Reflectors & Reflect Arrays <b>Speaker :</b> Dr. Nacer Chahat, NASA/JPL, USA		<b>Topic :</b> Airborne Antenna Technologies for Combat Aircrafts: Challenges in Design, Development & Flight Testing <b>Speaker :</b> Dr. NNSR Prasad, ADA, Bengaluru		<b>Topic:</b> Antenna Technologies for Satellite Communication, navigation and Microwave Remote Sensing <b>Speaker :</b> Shri. Rajeev Jyoti, Deputy Director, SAC, ISRO	Q & A and Feedback on all Antenna Topics(20mts)
<b>28/09/20 (Monday)</b>	<b>Topic :</b> Antenna Modeling and Simulation Techniques <b>Speaker:</b> Dr. C.J. Reddy, Altair Inc., USA		<b>Topic:</b> Antenna design using gap waveguide technology <b>Speaker :</b> Dr. Eva Rajo Iglesias Carlos III University, Madrid.		<b>Topic:</b> Antenna and its application to health monitoring. <b>Speaker :</b> Prof. Debolina Ghosh, IIT Bhubaneswar (2 - 3 PM) <b>Topic:</b> Microwave integrated circuit components design essentials <b>Speaker:</b> Dr. S. Raghavan, Professor (HAG), Retd. NIT, Trichy (3 - 4 PM)	Q & A and Feedback on all Antenna Topics(20mts)
<b>29/09/20 (Tuesday)</b>	<b>Topic:</b> Reflector Antennas: Design for High Efficiency <b>Speaker :</b> Mr. B. Pavan Kumar, URSC, ISRO		<b>Topic :</b> Antenna Theory and Phased Arrays <b>Speaker :</b> Prof. Amalendu Patnaik, IIT Roorkee		<b>Topic:</b> Low profile antennas on meta surfaces <b>Speaker :</b> Dr. Gaurangi Gupta, IIT Kanpur	Q & A and Feedback on all Antenna Topics(20mts)
<b>30/09/20 (Wednesday)</b>	<b>Topic:</b> Microwave Filters, Passive Systems <b>Speaker :</b> Dr. Venkat Narayana, PMTS, IBM/GLOBALFOUNDRIES		<b>Topic:</b> Microwave Filters, Passive Systems <b>Speaker :</b> Dr. Vamsi Krishna Velidi, URSC, ISRO		<b>Topic :</b> Millimeter wave and Beamforming <b>Speaker :</b> Prof. Debabrati Sen, IIT Kharagpur	Q & A and Feedback on all Antenna Topics(20mts)

## Our Speakers



**Dr. Sudhakar Rao** is currently working as the Senior Technical Fellow at Northrop Grumman Space Systems providing technical leadership for all divisions of Northrop Grumman in the areas of antennas and payload development for various key programs, proposals and IRAD. Dr. Rao received B. Tech from REC Warangal (now NITW) in 1974, M. Tech from IIT Kharagpur in 1976 and Ph. D in electrical engineering from Indian Institute of Technology Madras in 1980. He worked at ECIL Hyderabad (1976-1977), at LRDE Bangalore (1980-1981), was the post-doctoral fellow at the University of Trondheim, Norway (1981-82) and then worked as a research associate at University of Manitoba, Canada during 1982-1983. Over the past 37 years, he worked at Spar Aerospace Limited, Canada, Boeing Satellite Systems, Lockheed Martin and now at Northrop Grumman and contributed to antenna & payloads for more than 80 different satellites. His 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 210 technical papers and was awarded with 56 US & European patents and 5 trade secrets. He authored and co-edited three text book 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 and a Fellow of IETE. He received several awards and recognitions that include IEEE Benjamin Franklin Key Award in 2006, Delaware Valley Engineer of the Year in 2008, and 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, 2007 & 2008, IEEE Region 6 Outstanding Engineer Award for 2017 and the 2017 & 2020 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 and IETE’s Prof. S.N. Mitra Memorial Award in 2016. Dr. Rao served as the Distinguished Lecturer for the IEEE APS for a three-year period (2015-2017) and before that he served as the AdCom member for IEEE APS during 2011-2013. 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, Associate Editor for 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 Executive Committee Member and IEEE APS Liaison for the InCAP series of conferences in India. Dr. Rao delivered invited and keynote talks for more than 50 conferences world-wide. Recently, he was appointed by the IEEE Board of Directors to serve as the IEEE Fellow Committee member for 2020 & 2021.



**Dr. C. Jagadeswara Reddy** is the Vice President, Business Development-Electromagnetics for Americas at Altair Engineering, Inc.(www.altair.com). Dr. Reddy received his B.Tech degree in Electronics and Communication Engineering (ECE) from Regional Engineering College, Warangal, India, M.Tech. and Ph.D. degrees in Electrical Engineering from Indian Institute of Technology, Kharagpur, India. He worked as Scientific Office at SAMEER (Society for Microwave Electronics Engineering and Research), Mumbai during 1987-1991. Dr. Reddy was awarded the Natural Sciences and Engineering Research Council (NSERC) of Canada Visiting Fellowship to work at Communications Research Center in Ottawa during 1991-1993 and was awarded the US National Research Council (NRC) Resident Research Associateship in 1993 to work at NASA Langley Research Center in Hampton, Virginia. While conducting research at NASA Langley, he developed various computational codes for electromagnetics and received a Certificate of Recognition from NASA for development of a hybrid Finite Element Method/Method of Moments/Geometrical Theory of Diffraction code for cavity backed aperture antenna analysis. Dr. Reddy was the President of Applied EM, Inc (2000-2017) where he led several Phase I and Phase II SBIR projects for the DoD and NASA. He was also the President of EM Software & Systems (USA) Inc (2002-2014) and led the marketing of the EM Simulation tool, Feko in North America. EM Software & Systems (USA) Inc was acquired by Altair in 2014.

Dr. Reddy is a Fellow of IEEE, Fellow of Applied Computational Electromagnetics Society (ACES) and a Fellow of Antenna Measurement Techniques Association (AMTA). Dr. Reddy served on ACES Board of Directors from 2006 to 2012 and again from 2015 to 2018. Dr. Reddy was awarded Distinguished Alumni Professional Achievement Award by his alma mater, National Institute of Technology (NIT), Warangal, India in 2015. He published 37 journal papers, 77 conference papers and 18 NASA Technical Reports to date. Dr. Reddy is a co-author of the book, “Antenna Analysis and Design Using FEKO Electromagnetic Simulation Software,” published in June 2014 by SciTech Publishing (now part of IET). Dr. Reddy is serving as an Associate Editor for the newly introduced, IEEE Open Journal of Antennas and Propagation. He is appointed by IEEE Board of Directors to the position of IEEE Fellow Committee Member for the term 2020-2021. Dr. Reddy is elected as a member of AMTA Board of Directors for a three-year term starting Jan 2020 and is the Technical Coordinator for AMTA 2020 Conference.



**Dr. S. Raghavan**, Professor in Electronics and Communication Engineering Department, National Institute of Technology (N.I.T.), Trichy has about 40 years of teaching and research experience. Dr. S.Raghavan has done his B.E from College of Engineering, Guindy, Madras in 1977, M.Sc.(Engg.) College of Engineering, Trivandrum, Kerala in 1980 and Ph.D from IIT. Delhi in 2001. His interest includes Microwave Integrated Circuits, RF MEMS, BioMEMS, Metamaterial and Microwave Engineering. Won Best Teacher award twice and conferred with Honorary Fellowship of Ancient Sciences and Archaeological Society of India. Dr.Ragavan was a Short time visiting Fellow in California State University, North Ridge, USA. Has to his credit 130 research papers in national and International Journals, 99 in IEEE Explore, 140 International conferences, 28 National conferences. Also, filed 3 patents. Guided 16 PhD scholars. Senior Member/Fellow in more than 20 international and national Professional Societies including IEEE, BES, IEI, IETE, CSI, TSI, ISTE, ISSS, NPC ISOI, ILA, IELTS and ASI. He received several awards few of which are LIFE Time Achievement (In Microwave Engineering) Award Winner and 'BEST FACULTY AWARD' for Electrical and Electronics division (P.K.Das Memorial Award) for the year 2010-11. Bharat Jyoti Award in 2013, Smt. RANJANA PAL IETE Award for The Contribution to Microwave Integrated Circuits by IETE and DRDO-Dare to Dream innovation Contest Award in 2019. Participated and conducted Workshops/ Symposia/ Conferences/ Colloquia /Seminars/ Schools etc. He has authored two books RF & Microwave Engineering, Charulatha (National) press, October2016 and MICROWAVE INTEGRATED CIRCUIT COMPONENTS DESIGN THROUGH MATLAB published by CRC press,2019. He made an impact in MICROWAVE ENGINEERING EDUCATION among the student community at large.



**Dr. Nasar 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 Bioelectromagnetics 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.



**Dr. Naga Satya Sri Rama K Prasad Nalli** has more than 32 years of Experience in Research, Design and Development. Presently working as Scientist ‘H’ (Outstanding Scientist) in Aeronautical Development Agency (ADA). He is currently the Project Director of LCA AF Mk1A program & Associate Technology Director of Avionics & Weapon Systems Directorate. He joined ADA in 1998 from SAMEER-Mumbai (former group of Tata Institute of Fundamental Research (TIFR)-Mumbai), where he was working since 1986. Dr. Prasad obtained his Ph.D. in Communication Engineering from IIT-Bombay in 2003. M.Tech., in Controls and Instrumentation and B.Tech., in Electronics and Communication engineering and from JNTU College of Engineering, Kakinada, (A.P.) in 1987 and 1985 respectively. He had worked and contributed for Prestigious and very important National Projects like MST Radar for atmosphere research of ISRO (NARL), Opto-electronic Integrated Circuits project for Ministry of Information Technology, RF Networking of Indian Light Houses & Radio Beacon projects of Ministry of Surface Transport, Active Seeker project of DRDO etc. during his tenure at SAMEER-Mumbai. Currently, he is working for another prestigious project of the nation i.e. Tejas- Indian Light Combat Aircraft (LCA) project, its variants for Indian Air Force (IAF) and Indian Navy (IN). He is also working for Medium Weight Fighter (MWF) and Advanced Medium Combat Aircraft and other projects of ADA.

He has more than 100 publications in national and international conferences and journals. He is a senior member of IEEE, USA, Fellow of IETE, IE, AeSI, OSI, VEDA, Life Member of ISOI, SEMCEI, ASCI, ISSE and CSI and Member of IET, UK and AOC, USA. He was awarded 'DRDO Scientist of the Year' in 2015. He guided independently many under graduate and post-graduate projects. Under his guidance, four PhD programs completed for VTU, Belgaum, Karnataka and one for MIT, Chennai, Tamilnadu. He is the reviewer for Journals of AeSI-India, IEEE-USA and IEE (IET)-UK. He is also the thesis evaluator / External examiner for PhD/Post Graduate programmes of IIT-Bombay, DIAT (DRDO)-Pune, VIT-Vellore (Tamilnadu), VTU-Belgaum (Karnataka) and MIT-Chennai.

## Our Speakers



**Shri. Rajeev Jyoti** received his M.Tech Degree in Microwave electronics from Delhi University, India in 1986. He is a Distinguished Scientist and Deputy Director of Space Application Centre (SAC), Ahmedabad, India. He holds more than 32 years of experience in space-based Microwave systems including antennas for communications, navigation and microwave remote sensing applications at SAC, ISRO. His research towards the development and betterment of ISRO is unparalleled. Along with his contribution towards ISRO, he holds Chair for IEEE AP/MTTS (Gujarat), IAIM- 2018 international workshop at Ahmadabad, IEEE Indian Conference on Antenna and propagations (InCAP-2019) (Ahemedabad). He holds key interest in Physics and Microwave System.



**Dr. K. S. Beenamole** received her Ph. D in Electronics from Osmania University in 2009, M. Tech in Electronics in 1996, from Cochin University of Science and Technology and B.Tech from Mahatma Gandhi University in 1992. Presently She is Heading the Radiating Elements and RF Manifold Group of Radar Antenna and Microwave Division of LRDE. Her work contributions are in the area of Microwave Integrated Circuits for Active Phased Array Radar. She has contributed towards the Design and Realization of Antenna Units and Active Antenna Array Units for different types of Radar systems. She has to her credit 3 patents and 1 copy right. She has received outstanding contribution award from Scientific Advisor to Defence Minister during 2003. She is a recipient of the National Research & Development Corporation (NRDC), India Award 2005 and National Science Day Award-DRDO-2009. She has received IETE Smt. Ranjana Pal Award in 2012 and IETE CDIL Award for the Best Paper in Industry in 2014. She is a Fellow of the IETE and Member of EMC Society, India and Antenna Test and Measurement Society(ATMS). She has published more than 50 research papers in National/International Journals and Conferences.



**Dr. Amalendu Patnaik** received his PhD in Electronics from Berhampur University, India, in 2003. Dr. Patnaik Currently teaches in IIT-Roorkee as an Associate Professor in the ECE department. He held the Chairman office for the Department of Research Committee (2017-2019). He has co-authored two books (Compact Antennas for High Data Rate Communication: Ultra-wideband (UWB) and Multiple-Input-Multiple-Output (MIMO) Technology, & Neural Networks for Antennas in Modern Antenna Handbook (Wiley)). Till 2018 he has 7 sponsored research projects whose main objective resides on a better understanding of working & design of Antennas for various applications. He has been a crucial part of India's NPTEL program and has taught a course on "Advanced Antenna Theory". He is an IEEE Senior member. He has authored and co-authored over 100 peer-reviewed papers in international journals and conferences. He holds a key interest in Soft computing techniques and microwave engineering. He serves as an Editorial Board Member of the International Journal of RF and Microwave Computer-Aided Engineering (Wiley).



**Dr. DEBARATI SEN** received her Ph.D. in Telecommunication Engineering from IIT-KGP, India, in 2010 as a National Doctoral Fellow. She currently serves as Associate Professor in G.S.S. School of Telecommunications, IIT Kharagpur, before joining KGP she served as Chief Engineer in Samsung research, Bangalore, India. Dr. Debarati focuses on Wireless and Optical Communication Systems, mostly on 5G & Beyond Communications, Millimeter Wave and Terahertz Communications, AI based Wireless, Large MIMO Systems, Short Range Communications, Cloud RAN, Visible Light Communications. Her research is supported by a variety of Govt. organizations including MHRD, BEL, HAL, MeitY, DST, DRDO, Indian Railways and external collaborators like AIRBUS, Qualcomm, Samsung, Ericsson etc. She is an editorial board member of an International Journal by Inderscience Publishers. Her professional involvement also includes – Chairing Technical Sessions and TPC membership of top tier IEEE Conferences, reviewer of IEEE Journals and Conference papers, delivering invited lectures in academia/industry. She is a recipient of Best Paper Award at Samsung Tech. Conference 2010, IE(I) Young Engineers Award 2010, Award of Excellence at Samsung Tech. Fair 2010, Samsung Spot Award for Excellence in Research etc. She is a member of IEEE, member of ComSoc, RCC, WIE, and an associate member of IE (I). She has published over 100 peer-reviewed papers in international journals and conference and 12 patent applications, few of them are US granted



**Dr Vamsi Krishna Velidi** received the M.Tech and Ph.D degrees in RF & Microwave Engineering (Department of Electronics and Electrical Communication Engg ) from the Indian Institute of Technology Kharagpur (IIT-KGP) in 2008 and 2012, respectively. He joined the Indian Space Research Organization (ISRO), U R Rao Satellite Centre - Bangalore (formerly ISRO Satellite Centre) in 2011 as Scientist/Engineer in Communication Systems Group, where he is actively involved in the design & development of miniaturized high-performance RF/Microwave passive systems for various Spacecraft and Ground applications. He has authored/co-authored 50+ research publications that include 27 in International Journals till date. He is recipient of the ISRO-ASI Young Scientist Award 2016, ISRO Team Excellence Award – 2017 and Awarded first position in URSI-RCRS 2017 Young Scientist Award competition. He is a Senior Member IEEE (from 2016) and served as Editorial Board Member (2015-2018) for Wiley International Journal of RF & Microwave Computer-Aided Engineering. His current research interests include design, analysis and characterization of high-performance compact passive RF/Microwave Integrated Circuit Components using Waveguide/Planar/Substrate Integrated Waveguide (SIW)/Semiconductor (CMOS) Technologies for Satellite/Wireless/Millimeter-Wave applications.



**Dr. Animesh Biswas** received his Ph.D.in RF , Microwave & Photonics from IIT-Delhi in 1989. He went to Oregon State University, USA for postdoctoral studies. He currently serves as Director of National Institute of Technology, Rourkela. He is a recipient of UKERI research award from British Council, UK in 2009 & 2014. He is a reviewer for various National and International journals such as, Microwave Theory and Technique, IEEE, Microwave and Electromagnetic IETE. His research interests include Electromagnetics, Micro & Millimeter wave circuits and techniques, Optical Guide structure, MMICs. Dr. Biswas has authored and co-authored 82 journals and 123 conference papers. He is an IEEE senior member, Fellow of IETE, India. Recently he has received IETE - Ram Lal Wadhwa Award.



**Dr. Eva Rajo-Iglesias** received her Ph.D. degree in telecommunication engineering from the University Carlos III of Madrid, Madrid, Spain, in 2002. She was a Teaching Assistant with the University Carlos III of Madrid, from 1997 to 2001. She joined the Polytechnic University of Cartagena, Cartagena, Spain, as a Teaching Assistant, in 2001. She has been a Full Professor, since 2018. She visited the Chalmers University of Technology, Gothenburg, Sweden, as a Guest Researcher, from 2004 to 2008, where she has been an Affiliated Professor with the Antenna Group, Signals and Systems Department, from 2009 to 2016. Her current research interests include microstrip patch antennas and arrays, metamaterials, artificial surfaces and periodic structures, gap waveguide technology, MIMO systems, and optimization methods applied to electromagnetism. She was a recipient of the Loughborough Antennas and Propagation Conference Best Paper Award, in 2007, the Best Poster Award in the field of metamaterial applications in antennas at the Metamaterials Conference, in 2009, the Excellence Award to Young Research Staff at the University Carlos III of Madrid, in 2014, and the Third Place Winner of the Bell Labs Prize, in 2014. She is an Associate Editor of the IEEE Antennas and Propagation Magazine, and the IEEE Antennas and Wireless Propagation Letters. She has co-authored over 70 papers in JCR international journals, and more than 120 papers in international conferences.



**Dr. Venkata Vanukuru** received his M.Tech and PhD degrees, both from IIT Madras. He is with IBM/ GLOBALFOUNDRIES for the last 12.5 years, where he is currently a principal member of technical staff (PMTS). He is currently a visiting faculty at IIT Palakkad. He is the recipient of the prestigious CEO Recognition Award at GLOBALFOUNDRIES and Outstanding Technical Achievement Award (OTAA) at IBM. His research interests include design, optimization and implementation of RF and mm-wave integrated circuits. Modern cell phones are loaded with multiple RF front-end modules (FEM) consisting of T/R switches, low noise -amplifiers and power amplifiers. Passive devices account for more than 60% of the area and cost of modern high performance RFICs. For example, out of 0.8 dB total NF of state-of-the art cellular LNAs (sub 6 GHz applications) 0.5 dB is contributed by passive matching networks. There is a significant interest in both industry and academia to address the challenges imposed by silicon integration of such passive devices. This workshop aims at reviewing the recent advances made in the domain of silicon passives and their usage in building high performance RF circuit blocks. He has 25 US patents, 12 IEEE transaction papers and more than 25 IEEE conference papers. He is an IEEE senior member and a patent advocate at GLOBALFOUNDRIES.



**Mr. B Pavan Kumar** received his M.Tech. in Electronic System and Communication from National Institute of Technology-Rourkela, India, in the year 2007. Presently he is pursuing Ph.D. from Institute of Radio Physics and Electronics, University of Calcutta, India. After a brief tenure of about one year in IBM India Pvt. Ltd, he joined Indian Space Research Organization (ISRO) in 2008. Since then, he has been working in Communication Systems Group of U. R. Rao Satellite Centre, Bangalore. He has been actively involved in the design, development and testing of several microwave antennas and passive components for satellites and ground stations of ISRO. He worked as Project Manager – Antenna Systems of ISRO's prestigious missions. He is presently Deputy Project Director for another mission. His areas of interest include phased array antennas, reflector antennas, light weight antennas, compact RF rotary joints. He is the recipient of ISRO Young Scientist Merit Award for the year 2018 and ISRO Team excellence award for the design of S/X-band feed for ground station antenna. Mr. Pavan is a Senior Member of IEEE, Life Member of Astronautical Society of India, Life member of Society for Small Satellite Systems. He is an active reviewer in IEEE and IET journals.



**Dr. Gaurangi Gupta** received the B.E. degree in Electronics and Telecommunication engineering from Birla Institute of Technology Mesra, India in 2012, and the M.Tech and Ph.D. degrees in Electrical Engineering from Indian Institute of Technology (IIT) Kanpur, India, in 2014 and 2020, respectively. Currently she is working as a Senior Research Associate at the Department of Electrical Engineering, IIT Kanpur. She was a Visiting Student Researcher at the Remote Sensing Centre, University of Alabama, USA from Aug. 2018 to Feb. 2019 under the Indo-U.S. Fellowship. She is a recipient of best paper awards and travel grants in several conferences of international repute. Her research interests include antenna design and analysis, meta-surfaces, and RFID.



**Dr. Debalina Ghosh** received her Ph.D. in Electrical Engineering from Syracuse University, Syracuse, NY, USA in 2007. She currently serves as an Assistant Professor in IIT Bhubaneswar. Before joining IIT-Bhubaneswar she worked as a design engineer in RF systems at Intellex. Her research interests are Remote sensing, Electromagnetic Engineering, Computational techniques, Signal processing and Radio frequency identification. She has 7 recent journal publications and 20 conference papers and 1 patent under her name. She is a senior member of Institute of Electrical and Electronics Engineers (IEEE).