

SPACE 2025

(SPace, Aerospace and defenCE Conference)

July 21-23, 2025

Sheraton Grand Bengaluru Whitefield Hotel & Convention Center

AESS Bangalore Chapter

IEEE SPACE 2025 — SPace, Aerospace & defenCE Conference

IEEE AP-S Antennas and Propagation Society Bangalore Chapter

MTT-S IEEE MICROWAVE THEORY & TECHNOLOGY SOCIETY

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SPACE CONFERENCE SCHEDULE

July 21, 2025

TIME	VENUE : CONVENTION CENTRE
8.00-9.00	Registration/Networking
9.00-10.30	Inauguration (Prof. Kathleen Kramer, 2025 IEEE President, Mr. Tom Coughlin, 2024 IEEE President, Ms. Mary Ellen Randall, 2026 IEEE President, Dr. V Narayanan, Secretary, DoS, Dr. Samir V Kamat Secretary, DDR&D and Chairman DRDO, Shri. M Sankaran, Director, URSC, Prof. Sabrina Greco, 2025-2026 IEEE AESS President, Dr. K Rajlakshmi Menon, DG(Aero), DRDO, Shri. Rajeev Jyoti, Director-TD, IN-SPACe, Dr. Seema Chopra, ED, Boeing, Shri. Puneet Kumar Mishra, GC, SPACE 2025)
10.30-11.30	Exhibit Inauguration and Tea/Coffee
11.30-13.30	Space Plenary-:Dr. Pawan Goenka, Chairman, IN-SPACe, Shri M Sankaran, DS & Director, URSC, Shri Nilesh M. Desai, DS & Direrctor, SAC, Shri. D K Singh, DS & Director, HSFC
13.30-14.30	Lunch & Exhibit Visit
14.30-15.00	Defence Plenary: Dr. B K Das, DS & DG(ECS)
15.00-16.00	Panel Discussion on SPACE Technologies for AtmaNirbhar andd Viksit Bharat, Dr. K Rajlakshmi Menon, DS & DG(Aero), DRDO (Moderator), Mr. Hari Kumar, Director (R&D), BEL, Sri Y Dileep, DS & Director, ADE, Dr. R V Nadagouda, DS & AD(P), URSC, Mr. Venkat Katkuri, Head of Airbus DS, India & SA
16.00-16.30	Tea/Coffee & Exhibit Visit
16.30-18.30	Technical Presentations by Authors in 14 parallel sessions
18.30-18.50	MTT-S Technologies and Our place in Univverse, Dr. Goutaam Chattopadhyay, 2025 IEEE MTT-S President & Sr Scientist, JPL/NASA
18.50-19.10	Contribution of Inda in RF, Microwave and Astronomy, Prof. Debatosh Guha, 2024-2025 IEEE AP-S MGA Chair & Dean, CU
19.10-20.00	Interactive Session on: One IEEE and SPACE, Prof. Kathleen Kramer, 2025 IEEE President, Mr. Tom Coughlin, 2024 IEEE President, Mr. Puneet Kumar Mishra, GC, IEEE SPACE
20.00-21.30	Welcome Dinner

SPACE CONFERENCE SCHEDULE

July 22, 2025

TIME	VENUE : CONVENTION CENTRE
8.30-10.30	Special Sessions (5 Parallel)
10.30-11.00	Tea/Coffee & Exhibit Visit
11.00-13.00	Plenary: SPACE Technology and Ecosystem Development,Dr. D K Sunil, CMD HAL, Prof. Sabrina Greco, AESS President, Brig. Gen (Retd), Steve J Bleymaier, CTO, Ansys, Prof. Manoj Choudhary, Vice-Chancellor Gati Shakti Vishwavidyalaya, AVM Pavan Kumar, DG, DSA
13.00-14.00	Lunch & Exhibit Visit
14.00-15.00	Plenary: Policy Initiatives for SPACE by Different States: Sandeep Nanduri, MD, TIDCO, Govt of Tamilnadu, Ekroop Caur, Secretary of E/IT/BT, Govt of Karnataka, Neha Kumari, MD, GSEM, Govt of Gujrat, Shri. Rajeev Jyoti, Director-Technical, IN-SPACe
15.00-16.00	Panel Discussion on Opportunities for Industries and Startups in SPACE: Dr. Subba Rao Paluvuri, CMD, ATL (Moderator), Baskar Ceri, MD, NI India, Ronak Samantray, TakeMe2Space, Suyash Sigh, GalaxEye, Neha Satak, Astrom, Dr Tapan Misra, SISIR Radar, Shri. Sunil, Former ADG, Prasar Bharati
16.00-16.30	Tea/Coffee
16.30-18.30	Technical Presentations by Authors in 14 parallel sessions
18.30-18.40	Phased Array Measurements: Rahul Unni, Keysight
18.40-18.50	Navigating Aerospace & Defence Test requirements-R&S Automated Test Solutions: Marwin Countinho, SM, R&S
18.50-20.00	Interaction with Astronauts Designates: Angad Pratap, India, and Givovanna Estefania Ramirez Ruiz, Coulambia
20.00-21.30	Cultural Program & Conference Dinner



SPACE CONFERENCE SCHEDULE

July 23, 2025

TIME	VENUE : CONVENTION CENTRE
8.30-9.00	Advance Propulsion Technologies: Dr. S V Ramanamurthy, Director. GTRE
9.00-9.30	50 Years of Aryabhatta Spacecraft: Dr. P S Goel, Former Secretary, Earth Sciences Department, Member, Aryabhata Spacecraft Realization Team
9.30-10.30	Panel Discussion on Vehicle Health Monitoring (Dr Vinay Jammu (GE), Dr. V.Sudhakar (ADA), Dr. Seema Chopra, ED Boeing, Mr. Adishesha CS, Collins Aerospace, Mr. Satish Thokala, Mathworks) Sri Padma Kumar E.S., Director, IISU.
10.30-11.00	Tea/Coffee & Exhibit Visit
11.00-11.30	Plenary: Role of Ground Stations in Space Missions: Shri. Pankaj Killedar, Director, MCF
11.30-12.00	Plenary: New Advances in the search for Life beyond the solar system, Prof. Nikku Madhusudhan, Univ of Cambriddge
12.00-13.00	Panel Discussion on Strategic Role of Technology in Security and Growth of a Nation: Lt. Gen (Retd.) Ramesh Halagalli, Deputy Chief Indiann Army, Prof. P M Soundar Rajan, NIAS, Mr. Anupam Sharma, Director, DSP, DRDO,Brig. Manoj, DSA, Maj. Gen (Retd) Pawan Anand, UTS, (Moderator)
13.00-14.00	Lunch & Exhibit Visit
14.00-14.25	SemiCon Plenary: Srikanth Settikere, VP & MD, Microchip India
14.25-15.10	Panel Discsuuion on India Semicon Mission: Dr Satya Gupta, Chair, VSI, (Moderator), Mr. Jayraj Nair, CTO, Ansys, Sidhartha Mohanty, Altera, Dr. S D Sudarsan, ED, C-DAC
15.10-15.35	Plenary Talk: Dr. Abhay A Pashilkar, Director, NAL
15.35-16.35	Panel Discussion on "Software Defined Systems for SPACE": Panelists: Dr. S Somanath, 2022-2025 Secretray, DoS, Dr. Jitendra Jadhav, DG, ADA, Dr. Aniruddha Mukhopadhyaya, CTO Ansys, Moderator: Dr. G Satheesh Reddy, 2018-2022 Secretary, DDR&D,
16.35-17.30	Awards Ceremony and Valedictory (Chief Guests: Dr. G Satheesh Reddy, 2018-2022 Secretary, DDR&D, and Dr. S Somanath, 2022-2025 Secretray, DoS)
17.30-18.30	Tea/Coffee

Message from General Chair & Co-Chairs

It is a great pleasure to welcome you to the second edition of IEEE SPace, Aerospace and defenCE (SPACE) conference being held at Sheraton Grand Bengaluru Whitefield Hotel and Convention Centre, Bengaluru, India. The objective of SPACE is to create a premier interdisciplinary forum for Space, Aerospace and Defence experts, engineers, and researchers to come together to discuss the latest developments in designated technologies. The conference provides a platform for sharing cutting-edge research, exploring innovative approaches, and addressing the technical challenges faced by the Space, Aerospace and Defence organizations. Conference covers all aspects of Space, Aerospace and Defence technologies (within IEEE's field of interest). The conference program includes Plenary and Invited talks, Technical sessions, workshops, and panel discussions, all aimed at fostering collaboration and driving innovation in Space, Aerospace and Defence.

The conference received 600+ submissions and the TPC has selected a good collection of 325+ papers with acceptance rate of 54% that will be presented during the conference in 43 oral presentation sessions in 14 parallel sessions. The conference has also invited eminent experts and speakers for Plenary and invited Talks, and panel discussions, who will share the excitement of their new findings. Dedicated sessions and workshops are arranged on the same. An industry exhibit is also organized, in which, 40+ industries are participating to showcase their product, services and recent developments in Space, Aerospace and Defence related technologies. Special sessions on (1) Launch Vehical Technologies, (2) Artificial Intelligence/Machine Learning (AI/ML) Technologies, (3) Software Defined Radio (SDR) Technologies, (4) Quantum Technologies, (5) Women-lead Technology Developments, (6) Space Application Technologies, (7) Advance Airborne Technologies, (8) Semiconductor Technologies, (9) AI/ML in defence radars, are organized with an aim to provide the latest information on future technologies and encourage participants to develop technologies for the benefit of Humanity. We are pleased that 850+ delegates will be able to congregate and share their knowledge and expertise at a single platform.

SPACE 2025 has initiated 9 pathbreaking initiatives for the benefits of Students/YPs/WIE/Members/Startups/Members viz. (1) 3 Minute Thesis Program, (2) Student Authors Travel Grant, (3) AESS Volunteer Fellowship, (4) Women in SPACE, (5) upto 52% subsidized registration fees for Students/AESS/AP-S/MTT-S/IEEE Members, (7) upto 20% Early Submission advantage discount to authors who have submitted their manuscript well ahead of paper submission deadline to helped TPC to perform quality review and (8) Free Workshop Registration for DSTEI to AESS/AP-S/MTT-S Student Members and (9) Young Faculty Laureate Program



The conference has been made possible due to the generous support of our sponsors, ANSYS, Collins Aerospace, Anritsu, Emerson NI, Keysight, R&S, ATL, Apollo Microsystems, Azista Aerospace, ADTL, MVG India, Airbus, BEL, Astrome, L&T, GalaxEye, RFMWI, AMD, TAKEME2SPACE, FASTECH, ITI, Intech AS, Ark Formlabs, ICON Electromatic, Tabor Electronics, LDRA, APC Technology, Jyoti Electronics, JV Micoronics, NMIT, Albatross Projects, TEKKNOW, FormionIC, COMSOL, TVS, Kaizenet, IEEE AESS, IEEE MTT-S, and IEEE AP-S. We sincerely thank all of them for their invaluable support.

It would not be possible to organize a conference of such a magnitude without the help of some committed individuals. SPACE 2025 is particularly indebted to the Chief Patrons, Patrons, General Co-Chairs, TPC Chairs, Reviewers, Finance, Publicity, Publications, Sponsorship, Web and several other committees. We convey our gratitude to the eminent Plenary, Invited, workshop and panel speakers. Last, but not the least, our sincere thanks to IEEE AESS, IEEE Bangalore Section, IEEE AESS Bangalore Chapter, IEEE AP-S/MTT-S Bangalore Join Chapter and all the Knowledge partners for extending their wholehearted support.

We sincerely hope that all the delegates will have a wonderful time in the conference where each one will be able to make new friends, re-new old acquaintances and get technically enriched in this wonderful garden city of Bengaluru. Please make time to visit several historical sites with your friends and family that are around Bengaluru. The organizing committee will make sure that your stay during the conference is pleasant and comfortable and see you all soon!



Mr. Puneet Kumar Mishra



Dr. K Rajalakshmi Menon



Mr. Rajeev Jyoti



Dr. Seema Chopra

General Chair and Co-Chairs, IEEE SPACE 2025

July 21, 2025: 9.00-11.00 Hrs: Convention Hall

Inaugural Session:



Chief Guest: **Dr. V Narayanan,** Secretary, DoS & Chairman, ISRO

Dr. V. Narayanan, Distinguished Scientist (Apex Grade), assumed the charge of Secretary, Department of Space, Chairman, Space Commission and Chairman, ISRO on 13th January, 2025. Prior to this, he served as Director, Liquid Propulsion Systems Centre (LPSC), one of the major Centres of the Indian Space Research Organisation (ISRO). As Director, he provided techno-managerial leadership to LPSC, which is engaged in the development of Liquid, Semi-Cryogenic and Cryogenic Propulsion Stages for Launch Vehicles, Chemical and Electric Propulsion Systems for Satellites, Control Systems for Launch Vehicles and Transducer development for propulsion system health monitoring.

Dr. V. Narayanan, who is a Rocket & Spacecraft Propulsion Expert, joined ISRO in 1984 and functioned in various capacities. During the initial phase, for 4½ years, he worked in the Solid Propulsion area of Sounding Rockets and Augmented Satellite Launch Vehicle (ASLV) and Polar Satellite Launch Vehicle (PSLV) in Vikram Sarabhai Space Centre (VSSC). He contributed to process planning, process control and realization of Ablative nozzle systems, Composite motor cases and Composite Igniter cases.

As one of the few Cryogenic members working in this area in the beginning, he carried out fundamental research, theoretical & experimental studies and contributed to the successful development and testing of Cryogenic subsystems. Dr. V. Narayanan played a crucial role in the successful development of the Cryogenic Upper Stage (CUS) and contributed to making it operational for the GSLV Mk-II vehicle.

As the Project Director of the C25 Cryogenic Project, he provided techno-managerial leadership, conceived, designed and developed the 25-tonne Cryogenic Propulsion System of the GSLV Mk-III Launch Vehicle powered by an engine developing a thrust of 200kN. He contributed to establishing the necessary infrastructure and facilities for design, analysis, realization, testing and launching. Due to his innovative approach, the C25 Cryo Stage was developed under his guidance in the shortest time frame with all successful tests and was

inducted into the GSLV Mk-III vehicle. Subsequently, he also made the stage operational. His contribution made India one among six countries in the world to have complex and high-performance cryogenic propulsion systems, achieving self-reliance in this area.

The work carried out as part of his M.Tech thesis titled "Cavitating Venturies for Flow Control in Cryogenic Rocket Engines" and Ph.D. thesis titled "Thrust and Mixture Ratio Regulation Systems for Cryogenic Rocket Engines" were directly employed in the development of Indian Cryogenic Propulsion Systems.

For the GSLV Mk-III M1/Chandrayaan-2 Mission, the L110 Liquid Core Stage and C25 Cryogenic Stage were delivered for the vehicle. Propulsion systems for the Orbiter and Vikram lander, which include the throttleable thrusters for soft landing, were also developed and delivered for the Chandrayaan-2 Mission under his guidance. As the Chairman of the National Expert Committee constituted to study the reasons for the hard landing of the Chandrayaan-2 lander, he contributed to pinpointing the reasons and corrective actions required to overcome the observations. He realised and delivered all the Propulsion Systems for Chandrayaan-3.

For the Indian Human Space Flight (Gaganyaan) programme, he worked on the Human Rating of C25 and L110 liquid stages of the LVM3 vehicle and successfully delivered the stages for maiden Gaganyaan mission. To enhance the GTO payload capability of the LVM3 vehicle and meet future Indian Heavy Lift Rockets' requirements, he guided the team and designed a LOX-Kerosene Semi-Cryogenic Propulsion System and provided techno-managerial leadership for its development. He has also made significant contributions in the Spacecraft Propulsion area. He also finalized the Propulsion Road Map of ISRO for the next 20 years (2017–2037). As Director of LPSC, he has delivered 226 liquid propulsion systems for launch vehicle and spacecraft missions.

Dr. Narayanan is an Alumni of Indian Institute of Technology Kharagpur and has taken his M.Tech. with First Rank in Cryogenic Engineering in the year 1989 and Ph.D in Aerospace Engineering in the year 2001. He is a recipient of Silver Medal from IIT Kharagpur, Gold Medal from ASI, ASI Award for Rocket and Related Technologies, Team Award from High Energy Materials Society of India, Outstanding achievement & Performance Excellence Awards and Team Excellence Awards of ISRO. He has been awarded with the Distinguished Alumnus Award-2018 by IIT, Kharagpur, National Design Award-2019 from NDRF of Institution of Engineers (India) and National Aeronautical Prize-2019 from AeSI. Dr. Narayanan is a Member of IAA, Fellow of INAE, Member of Space Propulsion Committee of IAF, National President of ISSE, Fellow of IEI (India), Fellow of Indian Cryogenic Council, Fellow of ASI, Served as member of INAE Governing Council and Member in various National and International Professional Bodies.



Chief Guest : **Dr. Samir V Kamat,** Secretary DDR&D and Chairman DRDO

Dr. Samir V Kamat has taken over as Secretary DDR&D and Chairman Defence Research and Development Organisation (DRDO) on 26th Aug 2022. Dr. Kamat completed his B. Tech (Hons) in Metallurgical Engineering from IIT Kharagpur in 1985 and PhD in Materials Science and Engineering from The Ohio State University, USA in 1988 and joined DRDO in 1989. Dr. Kamat has provided leadership and direction to several critical materials programmes in DRDO such as development of high strength steels for naval ship hulls, development of high temperature titanium alloys and nickel base superalloy based components for aeroengines,development of tungsten heavy alloys for kinetic energy penetrators, development of fused silica radomes for missile seekers, development of armour solutions for personnel as well as combat vehicles and stealth materials for airborne and naval applications. These have found use in various systems being developed by DRDO laboratories. In addition, he has spearheaded the development of naval systems such as advanced light weight torpedo, anti-torpedo decoy systems, autonomous underwater vehicles, advanced hull mounted and towed array sonars for ships and fuel cells based air independent propulsion systems for submarines. Dr. Kamat is a Fellow of the Indian National Academy of Engineering (INAE) and Institution of Engineers India (IEI). He is a recipient of Distinguished Alumni Award from IIT Kharagpur, Metallurgist of the Year Award from Ministry of Steel and Scientist of the Year Award from DRDO. He has published more than 180 papers in International peer-reviewed journals.



Chief Guest: **Dr. Pawan Goenka,** Chairman, IN-SPACe

Dr. Pawan Goenka earned his B. Tech. in Mechanical Engineering from IIT, Kanpur and Ph.D. from Cornell University, U.S.A. He is also a Graduate of Advanced Management Program from Harvard Business School. He worked at General Motors R&D Centre in Detroit, U.S.A. from 1979 to 1993. Dr. Goenka joined Mahindra & Mahindra Ltd. in 1993 as General Manager (R&D) and led the development of the Scorpio SUV. Dr. Goenka is credited with building a strong R&D infrastructure, a robust product portfolio for Mahindra and is widely recognised as a statesman of the Indian Auto Industry. Dr. Goenka served on the boards of several Mahindra Group Companies, both domestic and international. He retired from Mahindra as Managing Director and CEO on 1st April 2021.

Under Dr. Pawan Goenka's leadership, IN-SPACe has been at the forefront of implementing space reforms in India, facilitating private sector participation to boost the space economy and create a self-reliant, sustainable ecosystem. He was instrumental in shaping the Indian Space Policy 2023 and overseeing the release of Norms, Guidelines, and Procedures for its implementation. Dr. Goenka also played a key role in liberalizing the FDI policy for the space sector. Under his guidance, IN-SPACe launched the Decadal Vision and Strategy for the Indian space economy, along with an implementation roadmap aimed at increasing India's share in the global space economy. The Strategy roadmap is being implemented through various initiatives by IN-SPACe, including fostering partnerships between Indian private space players and international agencies & foreign private players. Under Dr. Goenka's leadership IN-SPACe is actively championing collaboration between ISRO and private players, facilitating technology transfers and handholding industry. His efforts continue to position the Indian private space sector as an emerging leader in the global space industry, attracting international interest and investment.

Dr. Pawan Goenka has received several awards such as the Burt L. Newkirk Award, Charles L. McCuen Achievement Award, the FISITA Medal of Honour, Automotive Man of the Year Award, CV Man of the Year Award, Lifetime Achievement Award & Param Shreshth Award. Dr. Goenka was also honoured with the Lifetime achievement Award for his unparalleled contribution to the automotive industry by The Automotive Component Manufacturers Association (ACMA) in March 2022. Dr. Goenka received the Distinguished Alumni Award from IIT Kanpur in 2004 and was also conferred with the Doctor of Science (honoris causa) in 2015. He is a Fellow of SAE International and of The Indian National Academy of Engineers and a member of National Academy of Engineers, USA.Dr. Goenka is past President of SIAM, of the Society of Automotive Engineers India, the ARAI Governing Council, and served as a Board Member of National Skills Development Corporation (NSDC) and a member of Confederation of Indian Industries (CII) National Council. He is currently serving as the Chairman of the Board of Governors of IIT Madras. Dr. Goenka is the Chairperson of the Steering Committee for Advancing Local value-add and Exports (SCALE), an initiative under the Ministry of Commerce & Industry. Dr. Goenka also serves as an Independent Director on the Board of Sun Pharmaceutical Industries Ltd. and Bosch Limited.



Chief Guest : **Shri M Sankaran,** DS & Director, URSC, ISRO

Shri M Sankaran is a Distinguished Scientist of Indian Space Research Organisation(ISRO). He took over as Director of U R Rao Satellite Centre (URSC), the lead Centre in the country for design, development and realisation of all satellites of ISRO, on June 01,2021. He is currently leading satellite fraternity to realise various types of satellites to meet the national requirements in the areas like communication, navigation, remote sensing, meteorology and inter-planetary exploration. Before taking over as Director, URSC he was functioning as Deputy Director for Communication and Power Systems Area in URSC and spearheading the developments. During his 35 years of experience in URSC / ISRO, he has contributed primarily in the areas of Solar arrays, Power systems, Satellite Positioning System and RF communication systems for Low Earth Orbit(LEO) Satellites, Geostationary Satellites, Navigation Satellites and Outer Space Missions like Chandrayaan, Mars Orbiter Mission (MOM) and others. He was instrumental in successful realisation of the 70V bus for the ISRO satellites, unique design for power generation and distribution systems for the interplanetary mission like Chandrayaan-1 & 2, Mars Orbiter Mission, Astrosat, etc. He has fostered the industries in the country for fabrication and testing of solar panels, battery systems, etc. Among his works in the recent years, he is leading the efforts towards to miniaturisation of avionics systems, indigenisation of electronics & power system components, micro/mini satellite bus development, etc. He is also spearheading the avionics system design, realisation and qualification for the Gaganyaan Programme. He joined the ISRO Satellite Centre (ISAC), currently known as URSC after obtaining his Master's degree in Physics from Bharathidasan University, Tiruchirappalli in 1986. He has been awarded ISRO's Performance Excellence Award for the Year 2017 and ISRO Team Excellence awards in 2017 and 2018. He has about 50 publications to his credit in Peer Reviewed Journals and International conferences.



Guest of Honor : **Thomas Coughlin,** 2024 IEEE President

Tom Coughlin, President, Coughlin Associates, is a digital storage analyst and business and technology consultant. He has more than 40 years in the data storage industry with engineering and senior management positions at several companies. An IEEE Life Fellow, Dr. Coughlin has many publications and six patents. He is also the author of "Digital Storage in Consumer Electronics: The Essential Guide," which is now in its second edition with Springer. Tom is a regular storage and memory contributor for forbes.com and media and entertainment organizations. Coughlin Associates consults and publishes books and market and technology reports, including The Media and Entertainment Storage Report and an Emerging Memory Report, and puts on digital storage-oriented events. Tom has served in numerous IEEE volunteer leadership roles, including President of IEEE-USA, Director of IEEE Region 6, Vice President and Board member of the IEEE Consumer Technology Society, Chair of the Santa Clara Valley IEEE Section, and Chair of the Consultants Network of Silicon Valley. He is also active with the Storage Networking Industry Association (SNIA) and the Society of Motion Pictures and Television Engineers (SMPTE).



Guest of Honor : **Prof. Kathleen A Kramer,** 2025 IEEE President

Kathleen A. Kramer is a Professor of Electrical Engineering at the University of San Diego in California, USA. She worked to develop new engineering programs as a founding member of the faculty and eventually became the chair of electrical engineering, then serving as Director of Engineering (2004-2013), providing academic leadership for all of the university's engineering programs. Her teaching interests are in the areas of signal processing, mechatronics and robotics, and communication systems. She has also been a member of technical staff at several companies, including ViaSat, Hewlett Packard, and Bell Communications Research. She is a Distinguished Lecturer for the IEEE Aerospace and Electronic Systems Society (AESS) and is a past vice president of the Society. She is a Fellow of ABET and a leader in the development of criteria for cyber security, mechatronics, and robotics. Kathleen served on the IEEE Board of Directors as IEEE Secretary and chair of Governance and IEEE Region 6 (Western USA) Director. She was also chair of the 2023 IEEE Ad Hoc Committee on Innovating Funding Models. She received the B.S. degree in electrical engineering magna cum laude with a second major in physics from Loyola Marymount University, and the M.S. and Ph.D. degrees in electrical engineering from the California Institute of Technology.



Guest of Honor : **Ms. Mary Ellen Randall,** 2026 IEEE President

Mary Ellen Randall is an IEEE Fellow and member of the IEEE-Eta Kappa Nu honor society. She held technical and management positions in IBM, including an international assignment, hardware and software development, digital video chips, client/server services, network management, operating systems, and test design automation. She routinely managed projects on an international scale.

She served on the IEEE Board of Directors as IEEE Treasurer, IEEE Vice President of MGA, and Region 3 Director, and served as IEEE WIE Committee Chair among other leadership positions. She created and developed the IEEE MOVE International Community Outreach Program for Disaster Relief and STEM education. She received awards for this work, including the IEEE Haraden Pratt Award.

Ms. Randall is founder/CEO of Ascot Technologies, Inc., an award-winning software company which develops enterprise applications utilizing mobile delivery technologies. As a result, she was named a top “Woman In Business” in the Research Triangle North Carolina area and made Business Leader Magazine's “Impact 100” List. She holds a M.S. Computer Science and a B.A. Mathematics from Binghamton University.



Guest of Honor : **Prof. Maria Sabrina Greco,** 2025-2026 IEEE AESS President

Maria Sabrina Greco is with the Dept. of Information Engineering of the University of Pisa, where she is Full Professor since 2017. She's IEEE fellow since Jan. 2011. She was co-recipient of the 2001, 2012 and 2021 IEEE Aerospace and Electronic Systems Society's Barry Carlton Awards for Best Paper published on the T-AES, co-recipient of 2019 EURASIP JASP Best Paper Award, co-recipient of the 2019 H Mimno Award for the best paper published on the AE Systems Magazine, recipient of the 2008 Fred Nathanson Young Engineer of the Year award for contributions to signal processing, estimation, and detection theory and of IEEE AESS Board of Governors Exceptional Service Award for “Exemplary Service and Dedication and Professionalism, as EiC of the IEEE AES Magazine”.

She's Editor in Chief of the EURASIP Journal of Advances in Signal Processing. She has been member of the IEEE SPS BoG (2015-17), Chair of the IEEE AESS Radar Panel (2015-16), SPS Distinguished Lecturer for the years 2014-2015, AESS Distinguished Lecturer, AESS VP Publications (2018-2020), EiC of the IEEE AESS Magazine and IEEE SPS Director-at-Large for Region 8 (2021-22). She's now President of AESS (2024-25). Her general interests are in the areas of statistical signal processing, estimation and detection theory. In particular, her research interests include clutter models, coherent and incoherent detection in non- Gaussian clutter, CFAR techniques, radar waveform diversity, bistatic/mustistatic active and passive radars, cognitive radars and integration of sensing and communications. She co-authored many book chapters and more than 300 journal and conference papers.

July 21, 2025: 11.30-13.30 Hrs: Convention Hall

Plenary Session -1: Chair: Dr S Pal, DS & Former VC DIAT & AD URSC



1. Next Generation Satellite Technologies: Shri M Sankaran, DS & Director, URSC

Shri M Sankaran is a Distinguished Scientist of Indian Space Research Organisation(ISRO). He took over as Director of U R Rao Satellite Centre (URSC), the lead Centre in the country for design, development and realisation of all satellites of ISRO, on June 01,2021. He is currently leading satellite fraternity to realise various types of satellites to meet the national requirements in the areas like communication, navigation, remote sensing, meteorology and inter-planetary exploration. Before taking over as Director, URSC he was functioning as Deputy Director for Communication and Power Systems Area in URSC and spearheading the developments. During his 35 years of experience in URSC / ISRO, he has contributed primarily in the areas of Solar arrays, Power systems, Satellite Positioning System and RF communication systems for Low Earth Orbit(LEO) Satellites, Geostationary Satellites, Navigation Satellites and Outer Space Missions like Chandrayaan, Mars Orbiter Mission (MOM) and others. He was instrumental in successful realisation of the 70V bus for the ISRO satellites, unique design for power generation and distribution systems for the interplanetary mission like Chandrayaan-1 & 2, Mars Orbiter Mission, Astrosat, etc. He has fostered the industries in the country for fabrication and testing of solar panels, battery systems, etc. Among his works in the recent years, he is leading the efforts towards to miniaturisation of avionics systems, indigenisation of electronics & power system components, micro/mini satellite bus development, etc. He is also spearheading the avionics system design, realisation and qualification for the Gaganyaan Programme. He joined the ISRO Satellite Centre (ISAC), currently known as URSC after obtaining his Master's degree in Physics from Bharathidasan University, Tiruchirappalli in 1986. He has been awarded ISRO's Performance Excellence Award for the Year 2017 and ISRO Team Excellence awards in 2017 and 2018. He has about 50 publications to his credit in Peer Reviewed Journals and International conferences.



2. ISRO's Quantum Technology Developments: Shri. Nilesh M Desai, DS & Director, SAC

Shri Nilesh M. Desai, Distinguished Scientist, has assumed charge with effect from 1st January, 2021, as the Director of Space Applications Centre (SAC), Ahmedabad, a lead centre of Indian Space Research Organisation (ISRO), for design and development of space-borne instruments and associated applications. Born on 1st April, 1964 at Navsari, Gujarat, Shri Nilesh Desai, is a top ranker and gold-medalist of 1985/86 BE (Electronics & Communication) batch of L. D. College of Engineering, Gujarat University, Ahmedabad, India. Immediately thereafter, in 1986, he started his professional career at SAC/ISRO, Ahmedabad in ISRO's Microwave Remote Sensing Programme (MRSP). In his thirty-five years of dedicated and illustrious engineering and research career, he has been involved in design and development of ISRO's Microwave Radar Systems, and realization of entire gamut of advanced and synergetic applications involving earth observation, navigation and communication technologies for societal benefits, governance and strategic uses. Shri Nilesh Desai is a highly accomplished Engineer, who has successfully led the design and development of ISRO's airborne & Spaceborne Microwave Remote Sensing Payloads like RISAT-1 C-Band Synthetic Aperture Radar (SAR), Oceansat-2 and Scatsat-1 Scatterometers, Chandrayaan-2 Orbiter SAR and Lander Altimeter and Hazard Detection & Avoidance Processing System, Airborne SAR for Disaster Management, MiniSAR etc. and associated Signal & Data Processing and Remote Sensing Applications. He was also responsible for the design & development of different types of real time data processing techniques, User Receivers for indigenous NavIC (Navigation with Indian Constellation) satellites and SatCom Hub Earth Stations and user terminals for Mobile, Broadband & High Throughput communication satellites. He has also served as Deputy Director of Microwave Remote Sensors Area (MRSA) and SatCom and SatNav Advanced Applications Area (SNAA/SSAA). He was elevated as Associate Director, SAC with effect from 17 Dec., 2018, wherein he led the centre with a persuasive leadership style. All these years, he has also provided leadership and direction in developing and strengthening space infrastructure and its applications. Many State-of-the-Art technologies utilized in pilot projects for governance, development and strategic use involving synergetic satellite Communication & Navigation (called ComNav) based applications were developed under his leadership. He has made considerable efforts in popularizing and proliferating usage and applications of indigenous navigation technologies like NavIC and Gagan for commercial, governmental and strategic users. He has also mentored the design of world class courses on Satellite Communication (SatCom) and Global Navigation Satellite Systems (GNSS),

under the aegis of United Nations Centre for Space Science and Technology Education for Asia and the Pacific (UN-CSSTEAP). He has been the main author or co-author of about 175 technical papers presented at various national and international conferences within and outside India. He has also contributed significantly in more than 225 technical reports of SAC/ISRO. He has represented ISRO/India at various International forums at Austria, China, France, Germany, Israel, Russia, Singapore, South Africa and United Kingdom, including delegations at International Committee on Global Navigation Satellite System (ICG) meetings & conferences. Most recently, he organized and presided over the ICG-14 held in India during Dec.-2019. He is the recipient of ISRO Performance Excellence Award-2018, ISRO Individual Merit Award-2010 and ISRO Team Award for RISAT-1 Payload Design, Realization and Data products for the year-2012. He is an advocate of outreach activities related to Indian Space Programme, in general and SatNav, SatCom and Remote Sensing & Earth Observation Programmes, in particular. He is energetic & enthusiastic and spends considerable time and energy in giving direction towards various professional and outreach activities like Vikram Sarabhai Space Exhibition, Smart India Hackathon (SIH), Popular lectures in Engineering & Science on National Science & Technology days etc. As Chief Nodal Officer of ISRO/DOS for SIH and as a mentor, he has been spearheading the organization of various outreach activities for school and college students, at SAC/ISRO. His fields of interest and research include Data Acquisition and Digital Signal Processing for Radar, Navigation & SatCom signals, DSP and Microprocessor architectures, FPGA/ASIC hardware and VLSI designs, embedded systems and software quality assurance. He is an active and contributing life member of many professional societies like Indian Society of Remote Sensing (ISRS), Indian Society of Geomatics (ISG), Astronautical Society of India (ASI) and Indian Society of Systems for Science and Engineering (ISSE). Presently, he is serving as the National President of ISRS Executive Council, and the Vice President of ISSE-Ahm. Chapter.



3. India's Human Space Program: Shri. D K Singh, DS & Director, HSFC

Shri D K Singh, Distinguished Scientist, holds Master of Technology in Electronics Engineering from IIT-BHU Varanasi with Specialisation in Microwave Engineering and Bachelor of Technology in Electronics Engineering from HBTI, Kanpur. He received his pre-degree education from Queens College Varanasi. Prior to his current role at Human Space Flight Centre, he held the various important responsibilities over his 35 year long association with ISRO. This includes Group Director, Radio Frequency Systems Group, Deputy Director, Human Space Flight & Advanced Technology Area and Associate Director at Space Applications Centre, Ahmedabad.

His expertise is in the domain of Circuits & Systems Design and Development for Satellite Communications & Navigation. He made notable contributions in broad spectrum of technical and managerial roles ranging from Sub-system Designer to System designer, Project Manager to Associate Project Director for ISRO's Communications and Navigation Satellites starting from INSAT-2 Series in 1989 to advanced communication satellites of today as well as NavIC series of satellites. Some of his important contributions are towards Design and development of High Throughput Communication Satellite Payloads, Crew Communication Systems for Gaganyaan, Space Based Quantum Communication System, Space based Laser Communication System, Atomic Frequency Standard for Navigation Satellites, High Power Microwave Amplifiers etc.

Owing to his expertise in Payload Systems design, he was deputed to Boeing Satellite Systems, USA as Payload Expert for a communication satellite development project. He participated in various international forums as part of ISRO delegation.

He received ISRO merit award for year 2013 and ASI award in 2018 for his contributions towards Spacecraft Technologies. He was awarded prestigious membership of International Academy of Astronautics in year 2022.He has several national and international publications and one Patent on his credit.

July 21, 2025: 14.30-15.00 Hrs: Convention Hall

Plenary Session-2: Chair: Dr. Tapan Misra, Chief Scientist, SISIR Radar



1. Aerospace Program: Our Signature in the sky and beyond: Dr. B K Das, DS & DG (ECS)

Dr B K Das, Distinguished Scientist has been appointed as Director General (Electronics & Communication System) on 29th April 2022. Prior to this, he was Director, ITR followed by Director, IRDE and Director, DEAL. He was an integral part of Indian Missile Program for 33 years and worked relentlessly towards Test and Evaluation of various state of the art Missiles and other air borne Weapon Systems. He was instrumental in flight evaluation of all missiles under IGMDP, Agni and its variants, BMD, BrahMos, LRSAM, MRSAM, air to air missiles and all other class of weapon systems. He has led the team towards planning and establishment of new test ranges beyond ITR. He has spearheaded the Test Range, which is the Best and Busiest Range in the world today. He has transformed the Test Range Technology for the country to have entire capability of indigenous Test Systems with international capabilities. Indigenous development of Electro Optical Tracking System, Tracking Radar System, Long Range Telemetry System, Phased Array & drone-based Telemetry system, Dual Band Telemetry to beat the plasma, Telecommand System and number of multitarget tracking Systems along with various processes and system software creating automated system for mission management has been achieved under his dynamic leadership. In IRDE, under his dynamic leadership a number of state-of-the-art products could be realized like Electro-optic Mast, Light weight Electro Optic Payload for helicopters, Compact Optronic Payload for UAVs and Aircrafts, Advanced Gunner Main Sight and Indigenous Commander Panoramic Sight, Time Gated Raman Spectroscopy, LIDARs, Hyperspectral Systems and many more critical EO systems. During this period, he has created various infrastructure and state of the art Test Facilities for Electro Optical Systems which will reduce the development cycle of such systems. He has led various projects of national importance in both the Labs and defined the vision for both of these laboratories for next 20 years. He has also spearheaded critical communication programmes like Software Defined Radio, CTCS, Datalink etc. As Director General of Electronics and Communication System, he has led significant programmes of national importance like Active Electronically Scanned Array Radar (Uttam) and its

variants for fighter aircrafts enabling its production and next gen technologies in fighter radars, land based and air borne Electronic Warfare Systems, Long Range Radars, first antidrone system leading to production in a record time of 24 months, Dornier Midlife upgrade system etc. He has taken some game changing initiatives to have a faster realisation of systems and building the defence ecosystem with Industries, Academia, Startups, MSME and Incubation Centres. He has brought defence challenges across these entities towards realising a techno rich organisation. He received numerous awards including Lakshmipat Singhania-IIM, NRDC, Young Engineer National Award and Medallion by Indian National Academy of Engineering (INAE), Biju Ratna Award, Agni Award of Excellence in Self Reliance from DRDO, Scientist of The Year Award for the year 2003, Award for DRDO path breaking research for Air Defence Systems for the year 2006-07, Award for DRDO Path breaking research for the year 2007-08, etc.

July 21, 2025: 18.30-19.10 Hrs: Convention Hall

Plenary Session-3: Chair: Shri M Sheik Altaf, Director, LRDE



1. MTT-S Technologies and Our Place in the Universe:

Dr. Goutam Chattopadhyay, JPL/NASA, 2025 IEEE MTT-S President

Goutam Chattopadhyay is the 2025 President of the IEEE Microwave Theory and Technology Society (MTT-S). He is a Senior Scientist at NASA's Jet Propulsion Laboratory (JPL) at the California Institute of Technology (Caltech) and a Visiting Professor at Caltech in Pasadena, USA. Dr. Chattopadhyay earned his Ph.D. in Electrical Engineering from Caltech in 2000. He is a Fellow of both IEEE (USA) and IETE (India), serves as 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 the development of space instruments for the search for life beyond Earth. Dr. Chattopadhyay has published over 400 papers in international journals and conferences and holds more than 20 patents. He has received over 35 NASA Technical Achievement and New Technology Invention Awards. In 2024, he was honored with the Armstrong Medal from the Radio Club of America (RCA) for his outstanding contributions for radio science. He also received the NASA-JPL People Leadership Award in 2023. He was named IEEE Region-6 Engineer of the Year in 2018 and received the Distinguished Alumni Award from the Indian Institute of Engineering Science and Technology (IIEST), India, in 2017. Additionally, he has won the Best Journal Paper Award from IEEE Transactions on Terahertz Science and Technology in both 2020 and 2013, the Best Paper Award for Antenna Design and Applications at the European Antennas and Propagation Conference (EuCAP) in 2017, the IETE Prof. S. N. Mitra Memorial Award in 2014, and the IETE Biman Bihari Sen Memorial Award in 2022.

Abstract: Space exploration captivates us because it speaks to one of humanity's deepest instincts—the desire to understand our origins and our place in the cosmos. By venturing beyond Earth, we uncover the mysteries of distant planets, stars, and galaxies, gaining profound insights into our own world. Whether searching for signs of life, studying the birth of stars, or tracing the evolution of galaxies, each discovery reshapes our understanding of the universe—and ourselves. Space exploration inspires innovation, demands global

collaboration, and pushes us to dream beyond the limits of the possible. Ultimately, it reminds us that while we occupy a tiny corner of the cosmos, we are a curious and resilient species capable of reaching for the stars. The rapid advancement of technologies championed by the MHz-to-THz community of the IEEE MTT-S has revolutionized space exploration, opening new frontiers for scientific discovery. These technologies enable more efficient communication systems, high-resolution imaging, and enhanced remote sensing—tools that are critical for probing distant worlds and cosmic phenomena. As space agencies and private ventures continue to harness these capabilities, they deepen our understanding of planetary environments, astrophysical processes, and the very fabric of space-time. In doing so, MTT-S technologies not only transform how we explore the cosmos but also challenge our perspective on humanity's

place within it, inviting us to revisit fundamental questions about our existence, the possibility of life beyond Earth, and our role in the universe.





2. Contribution of India in RF, Microwave & Astronomy:

Prof. Debatosh Guha, IEEE Fellow, MGA Chair IEEE AP-S

Debatosh Guha is a Professor in the Institute of Radio Physics and Electronics, University of Calcutta, India. He is also associated with the department of Electronics and Electrical Communication Engineering of the Indian Institute of Technology Kharagpur, and served the same as HAL Chair Professor. He received the B.Tech. and M.Tech. degrees from the University of Calcutta in 1987 and 1989, respectively and started his career as Project Engineer in Webel Telecommunication Industries Limited. After graduating with a PhD in microwave engineering from Calcutta University, he joined the same University as an Assistant Professor in 1994. He spent about two years with the Royal Military College of Canada, Kingston, Ontario as a Visiting Research Professor working largely on the developments of various low profile microwave and wireless antennas. He has researched in developing microstrips and dielectric resonator antenna technologies. Defected Ground Structure (DGS) -inspired antenna is one of his major areas of contribution. He has published 70+ papers in top Journals, 150+ conference articles, and a Book entitled 'Microstrip and Printed Antennas: New Trends, Techniques, and Applications' from Wiley, UK. He developed commercial indoor/outdoor wireless antennas for a North American industry operating since 2007. Professor Guha is a Fellow of 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 a Senior Member of IEEE and recipient of some notable awards which include IETE Ram Lal Wadhwa Award 2016 (New Delhi), IEEE AP-S 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 a Section Editor of INAE Letters. He served IEEE Kolkata Section as the Chair (2013-2014); IEEE AP-MTT Kolkata Chapter as the Founding Chair (2004) and Chair (2010-2011). He conceptualized and initiated two flagship IEEE sponsored conferences in India in 2007 and 2010 in the fields of Electromagnetics and Antenna Engineering.His current research interests include DGS-integration technique for advanced antenna design, unconventional modes and their applications in Dielectric Resonator Antennas, wideband and ultrawideband antennas, Specific antennas for space and wireless industries.

July 22, 2025: 11.00-13.00 Hrs: Convention Hall

Plenary Session -4 : Chair: Shri Rajeev Jyoti, Director-Technical, IN-SPACe



1. Smart use of waveforms for integrated sensing and communication:

Prof. Maria Sabrina Greco, 2025-2026 IEEE AESS President

Maria Sabrina Greco is with the Dept. of Information Engineering of the University of Pisa, where she is Full Professor since 2017. She's IEEE fellow since Jan. 2011. She was co-recipient of the 2001, 2012 and 2021 IEEE Aerospace and Electronic Systems Society's Barry Carlton Awards for Best Paper published on the T-AES, co-recipient of 2019 EURASIP JASP Best Paper Award, co-recipient of the 2019 H Mimno Award for the best paper published on the AE Systems Magazine, recipient of the 2008 Fred Nathanson Young Engineer of the Year award for contributions to signal processing, estimation, and detection theory and of IEEE AESS Board of Governors Exceptional Service Award for “Exemplary Service and Dedication and Professionalism, as EiC of the IEEE AES Magazine”.

She's Editor in Chief of the EURASIP Journal of Advances in Signal Processing. She has been member of the IEEE SPS BoG (2015-17), Chair of the IEEE AESS Radar Panel (2015-16), SPS Distinguished Lecturer for the years 2014-2015, AESS Distinguished Lecturer, AESS VP Publications (2018-2020), EiC of the IEEE AESS Magazine and IEEE SPS Director-at-Large for Region 8 (2021-22). She's now President of AESS (2024-25). Her general interests are in the areas of statistical signal processing, estimation and detection theory. In particular, her research interests include clutter models, coherent and incoherent detection in non- Gaussian clutter, CFAR techniques, radar waveform diversity, bistatic/mustistatic active and passive radars, cognitive radars and integration of sensing and communications. She co-authored many book chapters and more than 300 journal and conference papers.

Abstract: The Integrated Sensing and Communication (ISAC) paradigm is an emerging framework that combines radar-based sensing and wireless communication into a unified system. Traditionally managed by separate systems, ISAC integrates these functions, enabling novel applications, improving resource efficiency, and reducing hardware costs and power consumption. This talk will offer a short overview of the ISAC paradigm and will show some examples on how the same waveforms can be used in a smart way for both sensing and communication purposes. Some insights into future directions of research will be provided as concluding remarks.



2. Next-Gen Systems in the Digital Age: Engineering for Agility and Scale:

Brig. Gen (Retd) Steve Bleymaier, CTO, Ansys

Brigadier General, Retired, Steve Bleymaier is the Chief Technology Officer for Aerospace & Defense at Ansys. Before joining Ansys, Steve served 28 years in the U.S. Air Force and commanded at all levels, including a 9,500-person, $3 billion Air Logistics Complex. Thereafter, he consulted for several Aerospace & Defense companies and then joined Ansys 5 years ago; first as Vice President, Global Strategy & Government Programs in Federal Aerospace & Defense sales, and currently as Chief Technology Officer for Aerospace & Defense.

Abstract: The imperative to field increasingly complex systems faster continues to drive the A&D industry's quest to achieve digital engineering and digital transformation's vision of perpetual agility, but new forces have entered the fray: from government mandates on Digital Engineering (DE) and Digital Mission Engineering (DME) implementation and cybersecurity attestation, to developments in AI and autonomous technology. The character of war is changing, with battlefields becoming transparent and drones and AI driving a focus on persistent mass and the industrial capacity of nations to innovate faster, to competitors taking increasingly hostile and aggressive actions with new technology (hypersonic missiles, electronic warfare, intermediate-range ballistic missiles, etc.), further exacerbating the need to field more advanced weapon systems faster than ever. The reality is that DE and physics-based engineering simulation are the answer and commercial technology exists today that's open, mission centric and can connect digital thread.



3. Space Logistics: Prof. Manoj Choudhary, VC, Gati Shakti Vishwavidyalaya

Professor Manoj Choudhary holds a Ph.D in Communication Systems from from IIT Kanpur and a Bachelor's degree in Electronics & Communication Engineering from MBM Engineering College, Jodhpur. Prof. Choudhary is currently on lien from IIT Jodhpur, where he is a Professor in the Department of Electrical Engineering. He has also held the position of Dean (International Relations, Alumni Relations and Corporate Relations). Before joining academia, Prof. Manoj has a very vast experience in the industry as a top technologist and business leader having worked with top electronics and semiconductor companies such as Samsung Electronics and Texas Instruments. He was the Senior Director and Head of System LSI R&D (Semiconductor chip business) at Samsung Electronics India R&D Center, Bangalore. In this role for 5 years, he led the business unit and grew the team 5 times to approximately 1,200 R&D Engineers working in the SOC (System on Chip) design & development along with software for various market segments including Wireless Modem (5G/4G), Connectivity, Automotive, Camera image sensors and Power management ICs. He was member of the team to develop world's 1st 5G chip and world's first 108 Megapixel camera for mobile phone. During 2014 ~ 2016, within Samsung Electronics, he was the Director of Digital Media & Communication (DMC R&D) leading 5G Communication and IoT (Internet of Things) R&D along with new standards development. During 2010 ~ 2014, he led SAIT (Samsung Advanced Institute of Technology) India, which is Samsung's corporate technology research lab. Between 2002 ~ 2006, he set up the next generation wireless research group and Intellectual Property Group at Samsung. His research led to standardization of emerging wireless technologies such as Ultrawide Band and 3G-WLAN interworking in IEEE and 3GPP. He has been one of the authors of Ultrawide Band MAC specification at the WiMedia Alliance and also served as world-wide co-chair of its Technical Steering Committee. During 2006 ~ 2010, he worked with Texas Instruments (India) as Development Unit Manager of wireless modem software development for mobile handsets. Very well recognized internationally and at national level, Prof. Manoj is credited with building a strong research team for wireless standards and intellectual property mission at Samsung Electronics way back in 2002. He has been co-author of 6 IEEE/ECMA standards. He has won many awards such as “University Gold Medal”, “Young Achiever Award”, “Patent of the Year Award” to name a few. Prof. Manoj has delivered numerous papers, talks and tutorials in national/international conferences and industry forums (FICCI, IESA, NASSCOM etc). He has 30+ granted patents in US, Korea, European Union and India. Dr. Manoj is co-author of the book “Ultra Wideband Demystified: Technologies, Applications, and System Design Considerations” published by River Publishers, Denmark. Currently, he is a invited member of 6G Task Force, (Department of Telecom, Govt of India) and also a member of the Management Council of the Semiconductor Laboratory SCL (Ministry of Electronics & IT). He is also an Independent Director on the Jodhpur Discom Board.



4. Space Exploitation in defence domain: AVM Pawan Kumar, DG DSA

Air Vice Marshal Pawan Kumar VM currently serves as Director General of the Defence Space Agency. In his current assignment, he is handling all aspects related to space exploitation in the military domain by the Indian Defence Forces. AVM Pawan Kumar VM graduated from National Defence Academy in 1988 and was commissioned as a Fighter Pilot in Indian Air Force in Jun 1989. The Air Officer has more than 3000 hours of accident free flying and has flown Hunters, Jaguars and MIG-27s. He is a Pilot Attack Instructor and a Fighter Strike Leader. The Air Officer has undergone staff course at Defence Services Staff College Wellington, Higher Command Course at College of Air Warfare and the prestigious NOC course. He was Defence Attache to Czech Republic with concurrent accreditation to Hungary, Poland, Slovakia, Serbia, Bulgaria and Greece. He also played a major role in various bilateral/ Multilateral Air exercises with US and Singapore. He has been awarded with the Chief of the Air Staff commendation in 1996 and Air Officer Commanding in Chief commendation in 2004. In recognition of his distinguished service, the Air Officer was awarded with the Vayu Sena Medal in 2009.

July 23, 2025: 11.00-13.00 Hrs: Convention Hall

Plenary Session -5 : Chair: Shri R V Nadagouda, AD (Projects), URSC



1. Role of Ground Stations in Space Missions : Shri. Pankaj D. Killedar, Director, MCF

Shri Pankaj D. Killedar took over as Director of Master Control Centre, the lead Centre in the country for Control and Operations of Geo-stationary/Geo-synchronous satellites, on August 01, 2023. Shri. Pankaj D. Killedar graduated from Walchand College of Engineering, Sangli in 1990 with B.E degree in Electronics and Telecommunication and received M.Tech in Electronics and Communication from IIT Powai, Mumbai in 1992. He joined ISAC, ISRO in November 1993 in GEOSAT Program where he played multiple roles as a Systems Engineer, Project Manager, Deputy Project Director, Division Head & Project Director (PD). As a Project Director he successfully realized, GSAT-7A an exclusive Ku band satellite for strategic applications, GSAT-29 a payload for GSLV Mk-III D2 also an experimental technology demonstrator and GSAT-24 an enhanced I-3K bus satellite based on new demand driven model. Prior to transfer to MCF he was working as Project Director, GSAT-20 an indigenous KaxKa High Throughput Satellite (HTS) for broadband connectivity, Project Director, GSAT-22/23, high power Ku-band DTH satellites and PD GSAT-32 S-band multi-beam satellite. He joined MCF as Associate Director with effect from 1st January, 2023. He has received Team Excellence Award for realization of GSAT-29 Technology Demonstration Project.



2. New Advances in the search for Life beyond the solar system:

Prof. Nikku Madhusudhan, Univ of Cambriddge

Nikku Madhusudhan is a Professor of Astrophysics and Exoplanetary Science at the Institute of Astronomy at the University of Cambridge, UK. His research interests include understanding the atmospheres, interiors, formation conditions and habitability of exoplanets. He is widely known for pioneering atmospheric retrieval methods for exoplanets along with various theoretical and observational developments in the field. Most recently, his work led to the theory of hycean worlds, a new class of habitable exoplanets, and to the first chemical inferences in the atmospheres of candidate hycean worlds and temperate sub-Neptune exoplanets using the James Webb Space Telescope.

Abstract: The search for life beyond the solar system is one of the major frontiers of modern science. Numerous efforts are underway to detect habitable exoplanets around nearby stars and to characterise their atmospheres with large telescopes, including the James Webb Space Telescope (JWST). A new class of habitable sub-Neptune exoplanets, called hycean worlds, have been proposed, which are expected to be temperate ocean-covered worlds with hydrogen-rich atmospheres. The possibility of such planets significantly expand and accelerate the search for life elsewhere. The first atmospheric spectrum of a candidate hycean world, K2-18 b, was observed recently with JWST which led to inferences of multiple carbon-bearing molecules in its atmosphere with hints of a potential biomarker. In this talk we will discuss these latest observational and theoretical developments towards the characterisation of habitable exoplanets and the search for life beyond the solar system.

July 23, 2024: 14.00-14.25 Hrs: Convention Hall

Space Plenary-6: Session Chair: Dr. Satya Gupta, President, VLSI Society of India

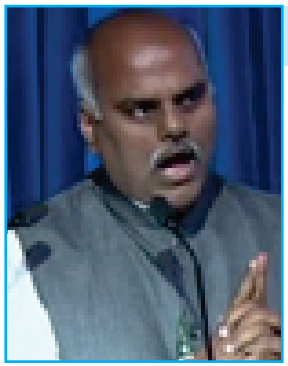


1. Plenary Talk: Mr. Srikanth Settikere, VP & MD Microchip Technology India

Over 30 years of working experience in the Semiconductor Industry. Instrumental in driving Microchip India's growth in product development, capacity expansion, and operational excellence. Contributed to the success of Microchip India for more than two decades since inception. Fostered a culture of innovation, leading to over 50 patents filed under his leadership, Providing strategic leadership, ensuring regulatory compliance, developing and maintaining relationships with global stakeholders and oversee the overall management and direction of the design center, Established strategic partnerships with key industry players, enhancing the company's competitive edge, Developed innovative solutions for complex semiconductor challenges, earning recognition and several industry awards. Education: B.E. (ECE) from Bangalore University AND M.B.A (Finance) from Mysore University, Previously worked Companies: Siemens Semiconductor India Pvt Ltd. Synopsys India (Apara Designs Pvt Ltd). Professional Affiliations: Member, India Electronics & Semiconductor Association (IESA), Awards and Recognitions: Semiconductor Industry Leadership Award by the electronics systems designs forum

July 23, 2024: 15.10-16.00 Hrs: Convention Hall

Space Plenary-7: Session Chair:



1. Advance Propulsion Technology: Dr. S V Ramanamurthy, Director. GTRE

Dr. S.V. Ramana Murty is an Outstanding Scientist and the Director of the Gas Turbine Research Establishment (GTRE). He assumed this role on February 1, 2023. Dr. Murty's career includes significant contributions to the field of gas turbine research and development, culminating in his appointment as Director of GTRE, a key establishment involved in designing, developing, and integrating advanced technologies for aero gas turbine engines for defence forces.



2. Plenary Talk: Dr. Abhay A. Pashilkar, Director, NAL

Dr Abhay Anant Pashilkar joined National Aerospace Laboratories after his M.E. from the Indian Institute of Science (IISc), Bangalore, in 1993 and B.Tech (Hons) from IIT Kharagpur both in Aerospace Engineering. He worked as a Guest Scientist for 9 months in 1998 in the Institute of Flight Mechanics, DLR, Braunschweig, Germany. He has a Ph.D from the IISc in 2002. Pashilkar was with the NTU, Singapore for his post-doctoral fellowship from 2003 till 2005. Dr. Pashilkar was part of the National Control Law Team (NCT) for the Light Combat Aircraft project at the Flight Mechanics & Control Division (FMCD). In this period, his responsibilities included upgrading and maintaining the Engineer-in-the-loop-Simulator (ELS) for the LCA Airforce and Navy versions. He was the Deputy Project Director for the SARAS Autopilot programme from 2005 to 2011. From 2007 to 2014, he was Group Head, Flight Simulation at FMCD, NAL. The group under his charge undertook development of the SARAS Flight Training Device (FTD) and the Regional Transport Aircraft (RTA) simulator. The Advanced Medium Combat Aircraft (AMCA) control laws and a flight simulator, as well as the Handling Qualities Simulator for ASTE, IAF, were realised. In 2015, he provided the flight dynamic model of the Mig21 aircraft simulator at Bhuj Air Force Base. He has coordinated the multi-divisional Mirage project for aero-mechanical clearance of new stores from 2015 till 2018 under a project sanctioned by HAL. This is a multi-disciplinary activity involving various divisions of NAL (flight mechanics & control, structures, wind tunnel tests, computation fluid dynamics, and flight tests). In 2018, he took over as the founding head of the Systems Engineering Division (SysED). The division is implementing Product Life Cycle Management (PLM), Multi-disciplinary Design Aircraft Optimization (MDAO), Reliability Analysis, and Model-based Systems Engineering (MBSE) solutions for aircraft programmes like SARAS Mk II and Hansa of NAL. SysED supports feasibility studies of Hansa Next Generation (NG) aircraft and the Regional Transport Aircraft (RTA). Subsequently, it has given key inputs for the configuration selection of the SARAS Mk II. The division has prepared the aircraft level reliability analysis for Hansa and SARAS Mk II systems and conducted anthropomorphic studies of the SARAS Mk II cockpit. SysED has also determined the mass and energy balance required for the design of the feasible High Altitude Pseudo-Satellite (HAPS) of the Zephyr class. From 2019 to 2022, he was the Program Director (Civil Aircraft Projects) at NAL. Dr. Pashilkar has guided six PhD's and one MS Engineering candidate in the areas of flight dynamics and control, parameter estimation, computer science, and human factors. There are over 70 publications in national as well as international journals and conferences with him as an author. He has received the CSIR Young Scientist Award in Engineering Sciences for the year 2001 in the area of "Significant Contributions to Control System Design, especially towards Providing Control Law for Handling of Aircraft under High Angle of Attack Unsteady Aerodynamics". He was also awarded the Indian National Academy of Engineering (INAE) Young Engineer Award for the Year 2003 for "Modeling, Analysis, and Simulation of Aerospace Systems". NAL received the CSIR Technology Award 2019 for "Carriage, Handling, and Store Release for a Fighter Aircraft" for its work on the Mirage FoC Upgrade project.

Special Session on Advances in Airborne Surveillance Technology

Venue: Petunia, Time: Tuesday, July 22, 2025 8:30 – 10:30 Hrs



1. Key Note Talk: India's Capability in Airborne Surveillance Systems Technology: Past, Present and Future : Santhya P, Sc 'G' & Director, CABS

Smt Santhya P joined DRDO in 1992 and is presently holding the appointment of Director CABS from 18 Nov 2024. Previous to being appointed as Director CABS she was Project Director for ISR for developing technologies and systems for the Indian ISTAR programme. She was also heading the Technology Group for Design and Development of Data Handling and Display Systems (DHDS) and the Mission System Integration and Flight Testing Group. She has been instrumental in setting up of the Independent Verification and Validation Team in CABS for the Airborne Early Warning and Control System (AEW&C). She has established custom made IV&V and SCM processes best suited for complex system of Systems like AEW&C. With her meticulous planning and execution, the AEW&C software was successfully certified as per DO 178B Guidelines, a first in DRDO. Conceptualization and setup of Mission Software Support Facility for AEW&C to facilitate the maintenance of AEW&C Software is another noteworthy achievement which has been operationalized in SDI (IAF). Some of the noteworthy awards received by Smt Santhya P, are Laboratory Scientist of the Year Award 2013, Technology Group Award 2015, Certificate of Appreciation from Secretary DD R&D and Chairman DRDO during AEW&C Induction Ceremony in 2017 and Technology Group Award for the year 2018

Abstract: The Airborne Surveillance Systems as a force multiplier is introduced. India has made significant progress in the area of Airborne Surveillance Systems and the constituent technologies, spanning four decades from 1985. The Indian Airborne Early Warning and Control system, christened “Netra” has been operationalized by the Indian Air Force (IAF) and is being exploited in various operations. CABS has diversified the Airborne Surveillance Technology from Air to Air to Air to Sea, Air to Ground, and Passive Airborne Surveillance Systems. Various programmes are highlighted that cater to the comprehensive surveillance needs of the country, along with the technologies that support these initiatives.

2. Advance Sensor technology for Airborne Surveillance System:

Dr R Rajesh, Sc-G, Dr R Ramkumar, Sc-E, Sri Reep Khanikar, Sc-F, CABS

Abstract: Airborne surveillance systems require multiple sensors and communication systems that perform in a cohesive way to achieve a mission. The niche and specialized features of airborne sensors and along with their use cases, are elucidated. These sensors span the whole spectrum in the EM band. The core features of cohesive sensor operations, tight control of the sensors in space, time, and frequency for interoperability, and challenging aspects of sensor integration are also brought out. The operations of the system in a network-centric environment are also elucidated. Airborne Surveillance Systems, being a technologically complex system with a multitude of advanced sensors working in cohesion to deliver a comprehensive Situation Picture of Air, Sea, and Ground, it is imperative to understand the contributions of each sensor. The talk brings out the advances in sensor technologies, which are used to bring out systematic improvements in the Airborne Surveillance Systems. The application of these sensors for enhancing situational awareness is discussed. The array of sensor technologies, such as Airborne Radars, EOIRs, Airborne Sonics, Co-operative Sensors, etc., and the constituent technological improvements such as Distributed Aperture Technologies, Tile Based Technologies, Software Defined Technologies, MIMO technologies, Shared Aperture Systems, is detailed. The future advancements envisaged for Airborne Surveillance Technologies is also brought out. Further, Cooperative sensor technology enables multiple sensors to actively share information for improved detection, tracking, and identification in complex environments. Unlike passive systems, these sensors use transponder-based communication to exchange real-time data such as identity, position, and velocity. Technologies like Identification Friend or Foe (IFF), Automatic Identification System (AIS), and Automatic Dependent Surveillance–Broadcast (ADS-B) exemplify this approach, enhancing situational awareness and safety across air, land, and sea domains. IFF supports military target recognition, AIS aids maritime navigation, and ADS-B improves air traffic surveillance. Emerging systems like Vehicular Ad Hoc Networks (VANETs) and swarm robotics further expand capabilities. Together, these technologies create interoperable sensor networks that enhance decision-making, efficiency, and operational effectiveness in both civilian and defense applications. The effectiveness of the Cooperative sensors in Airborne surveillance is also brought out.

3. MSDF and AI/ML Technology for Airborne Surveillance System:

Dhipu TM, Sc-F, Muthu kumar A, Sc-F, CABS

Abstract: Modern battlefields involve rapidly changing threats and massive data from multiple sensors, overwhelming operators and complicating decision-making. Multi Sensor Data Fusion (MSDF) addresses this by integrating real-time data from diverse sources to create a unified operational picture, enhancing situational awareness. MSDF, rooted in signal processing, estimation theory, and AI, is vital for Network Centric Warfare, supporting threat assessment and intercept control through improved data authenticity, reliability, and reduced ambiguity. Artificial Intelligence and Machine Learning (AI/ML) further enhance surveillance by enabling automated target tracking, classification, and alert prioritization across sensors like radar, EO/IR, SIGINT, and COMINT. AI/ML reduces operator load, accelerates decision-making, and evolves with experience, making future warfare increasingly autonomous, intelligent, and efficient through advanced ISR and predictive analytics.

4. Advanced Mission Computing Technology for ISR Application: Vinod Kumar, Sc-F

Abstract: A novel Mission Suite (MS) architecture using virtualization technologies has been developed and demonstrated under Project ISR (Intelligence, Surveillance & Reconnaissance). This approach enables multiple operating systems and applications to run on a single server with high availability and fault tolerance through multi-server clustering. By reducing hardware footprint, more applications can be hosted on existing platforms, lowering costs. The virtualization layer interfaces directly with bare-metal hardware, enhancing security and reliability without relying on general-purpose operating systems. Dynamic resource allocation and controlled virtual machine (VM) movement optimize performance. This first-of-its-kind airborne implementation has shown improved application efficiency and reduced hardware requirements. Ongoing studies are assessing certification for deployment in safety- and mission-critical systems.

5. Model Based System Engineering in Design and Development of Airborne Surveillance System:

Dr R Rajesh, Sc-G, Y Maheshwaran, Sc-F

Abstract: Airborne system of systems are characterized by inherent complexity, long lifecycle, and a distributed development environment. Model-based SE framework allows breaking down the complexity into manageable parts that can be cohesively integrated to form the overall system. The advantage of MBSE, along with real-world applications of MBSE, is brought out. The constituent tool environment and adaptations of the same for airborne surveillance programmes is brought out.



Dr. R Rajesh, Sc-G: Dr R Rajesh, received B-Tech in ECE from NIT Calicut in the year 2002 and PhD from ECE Dept IISC Bengaluru in 2009. Since 2002 he is working as scientist at CABS, DRDO Bengaluru, where he is heading a division for system engineering, sensor development, multi-sensor data fusion and AI. His area of interest also includes radar systems, information theory and wireless communication. He is fellow of IETE and senior of member of IEEE. He has won various awards like DRDO young scientist award, Lab scientist of the year award and technology group award. He has over 70 publications in reputed international journals and conferences. He has won best paper award for six (6) of his publications and best demo award for the product on automatic speech recognition.



Sri Y. Maheshwaran, Sc-G: Y. Maheshwaran is scientist at Centre for Airborne System, Bengaluru with more than 25 years of research expertise and currently heading the Mission System Software Development Division for Intelligent Surveillance and Reconnaissance project. His aera of research includes Mission Critical System development for Airborne surveillance for Image Intelligence Interpretation. He has implemented the model-based system engineering approach and frame work for efficient System Design and development. He is a member of IEEE, Advanced Computing Society.



Sri Reep Khanikar, Sc-F: Sri Reep Khanikar joined CABS DRDO in 2005 as Scientist-B. He has been involved in design and development of Secondary Surveillance Radar (SSR) for AEW&C system. Currently he is heading SSR team in CABS and He is DPD for SSR system for AEW&C Mk-II. He was awarded laboratory scientist of the year 2012 for his contribution towards development of Mode-S and AGNI award 2014 for indigenous development of SSR for AEW&C system.



Vinod Kumar, Sc-F: Shri Vinod Kumar has joined Centre for Airborne System, Bengaluru (CABS) DRDO after completing his M.Tech from IIIT Allahabad. He has a total of 17 years of research experience in Application Software Development. Presently, he is the Team Lead for deployment of Intelligence Exploitation System (IES) and Design of Mission Suite (MS) architecture for project Intelligent Surveillance and Reconnaissance (ISR). He also has a rich knowledge and Experience in Mission Software Airworthiness Certification as per DO-178B/C. He is a Certified Software Quality Engineer from American Society of Quality (ASQ).



A Muthukumar, Scientist 'F': Sri A Muthukumar, completed his B.E. in Computer Science from Madras University in the year 2002 and M.E. in Avionics from Madras Institute of Technology in the year 2006. He is working as a scientist-F, at Centre for Airborne Systems (CABS), DRDO from the year 2006, where he is involved in the development and realization of Multi Sensor Data Fusion (MSDF) functionalities for the Airborne Early Warning and Control (AEW&C) system. Currently he is heading a team for the development of MSDF algorithms for the AEW&C Mk-II, MRMR/MMMA programmes and other projects. He was awarded DRDO technology group award, Lab award and published 08 papers in international journals and conferences.



Dhipu TM, Sc-F, Dhipu TM is presently working as Scientist- 'F' at Centre for Airborne Systems, DRDO. He has over 16 years of working experience in the field of airborne surveillance technologies with the DRDO. He holds a Master's Degree from Indian Institute of Science (IISc), Bengaluru. Several technologies developed by him, particularly in the field of scientific visualization and artificial intelligence related to object detection and tracking, are being continuously used in the act of safeguarding our borders. He is a recipient of the prestigious DRDO Performance Excellence Award, as force multipliers for the armed forces of our nation. He has over 15 publications in leading international journals and conferences. Presently, he is heading the team that is involved in developing artificial intelligence solutions for maritime surveillance systems.wards development of Mode-S and AGNI award 2014 for indigenous development of SSR for AEW&C system.



Ramkumar Raghu, Sc-F: Ramkumar Raghu received his B.Tech degree in Electronics Engineering from the Indian Institute of Technology (ISM), Dhanbad in 2009. He completed his M.S (Research) and PhD degree in Electrical Communication Engineering from the Indian Institute of Science (IISc), Bengaluru, in 2023. Ha has been working as a Scientist at the Centre for Airborne Systems, DRDO, since 2009. He has developed Communications Systems for IAF's Netra and has also developed an AESA-based Maritime Patrol Radar for Naval applications. He is currently involved in the design and development of Maritime Surveillance Platforms. He has won several awards including DRDO's Agni Award and Technology Group Award. He has several papers in reputed IEEE Conferences and Journals. His research interests include Wireless-Communication, Content-Centric Networks, Machine Learning, MIMO systems, AESA Digital Radars and Adaptive Digital Beamforming.

Special Session on Launch Vehicle Technology

Venue: Poinsettia 2, Time: Tuesday, July 22, 2025 8:30 – 10:30 Hrs

1. Guidance & Control of Launch Vehicles and STS: Dr. Gopal Jee, GD, CGDG, VSSC

Abstract: Reusable launch vehicle (RLV) is being developed by ISRO, where it is envisaged to recover both booster and upper stage of a space transportation system (STS). Booster is recovered using propulsion system whereas upper stage recovery is assisted by aerodynamics along with propulsion system. Guidance and control are the two essential components of onboard software which provides complete autonomy to the reusable launch vehicle. Guidance is the path planner algorithm, ensuring RLV's safe ascent to the orbit, de-boost, re-entry and landing on a runway. Control works as an autopilot, ensuring the safety of the vehicle while steering it towards the targeted location decided by the guidance algorithm. To get complete reusability, various experimental flights are being carried out by us. We have achieved the mastery in launching the RLV to high altitude (HEX mission – Hypersonic re-entry experiment) using booster, landing it on a runway (LEX experiment – Landing experiment). Capability of taking the RLV to the orbit and re-entering into the Earth's atmosphere (OREX – orbital re-entry experiment), without violating structural and thermal loads is being developed. Pinpoint landing of the booster is planned in near future. Brief description of plant modelling of rotational and translational dynamics, autopilot and guidance design will be covered in this talk. Glimpse of experiences gained during the journey of development of RLV will be given during the presentation.



Dr. Gopal Jee joined as scientist/engineer 'SC' at Vikram Sarabhai Space Centre, ISRO in June 1999. Currently he is holding the post of Group Director of Control and Guidance Design Group (CGDG) of CGSE entity. He graduated from National Institute of Technology (MNREC), Allahabad, India in 1997. Then he did Post-Graduation from Indian Institute of Technology, Delhi, India in Control Engineering and Instrumentation. He completed PhD in Department of Aerospace Engineering, Indian Institute of Technology, Bombay in 2010. His main area of work is Flight control law design for various launch vehicles including Reusable Launch Vehicle (RLV). He mainly contributed for the autopilot design of reusable launch vehicle, crew module control and test vehicle control for testing crew escape system. He won ISRO's young scientists merit award for the year 2007 in appreciation of his contribution to the Indian space program in launch vehicle avionics area. He also won a few best paper awards in various international conferences. He has two journal publications and about 43 conference papers to his credit and is a reviewer of many international journals. He is a life member of Systems Society of India, Aeronautical Society of India and Indian Society of Systems for Science and Engineering. His current research interests are in Control law design for air-breathing propulsion system and Integrated guidance and control law design for reusable launch vehicles.

2. Actuators Sensors and Robotics for Space Applications: Dr. Biju Prasad B, GD, CASG, VSSC

Abstract: Actuators are used for the control and guidance in satellite launch vehicles. This can be achieved through thrust vector control by deflecting the liquid engine and solid motor nozzles, injecting high density fluid into the supersonic exhaust jet or deflecting the external fins during the aerodynamic phase of the mission. Actuators are also used to control the mixture ratio of fuel and oxidiser to maintain optimum propellant outage or alter the engine thrust. Since these are mission critical operations, a very high level of reliability and fault tolerance is required. This is achieved by introducing redundancy in its critical elements and maintaining a rugged fault detection isolation and reconfiguration system. Space robotics is a niche area which finds lot of application in interplanetary exploration, unmanned missions of orbital vehicles and in space stations for repair, maintenance and conducting experiments. These robotic systems should not only be designed to survive launch loads and harsh environments expected in space and interplanetary missions but also possess artificial intelligence to respond to unseen situations. In space stations, humanoids can conduct series of experiments and assist in cargo transfer and maintenance operations. With the tremendous advancements happening in AI ML area, space robotics has the potential to accelerate space exploration without risking the human life.



BIJU PRASAD B obtained his PhD in Mechanical Engineering from CUSAT, M.E. in Aerospace Engineering from Indian Institute of Science, Bangalore and B-Tech in Mechanical Engineering from College of Engg. Trivandrum, University of Kerala. Presently he is Scientist/Engineer 'G', and Group Director, Control Actuation Systems Group, ESAE, VSSC ISRO. He joined VSSC in 1995 and worked in the design and development of Fault tolerant Actuators and sensors for the thrust vector control system and mixture ratio control system of satellite launch vehicles such as LVM3, HRLV, PSLV, SSLV, RLV and Gaganyaan (manned mission), Landing Gear systems for Reusable Launch Vehicles, Robotic systems for space application. He is also, Associate Project Director, RLV ORV (Landing gear systems) and Deputy Project Director, LVM3 (Control systems). He holds one patent on linear electromechanical actuator. He is a recipient of team excellence award for the development of LVM3. His Areas of interest include Fault Tolerant Actuators, Mechanisms and Robotics

3. RF Systems for Launch Vehicles: Shri. Lal M J, Group Director, RFSG/AVN, VSSC

Abstract: RF Systems in Launch Vehicles can be grouped into Telemetry, Tracking and Tele-command systems. Functional requirement of telemetry systems is to acquire telemetry data pertaining to the vehicle performance and satellite injection parameters. All launch vehicles are inherently explosion prone whenever they contain fuel or oxidizer, or explosive devices are installed, or toxic chemicals or high-pressure gasses are on board. There is requirement to track all rocket systems during their ascent from the ground to low earth orbit, and terminating any flight before it poses a hazard to lives or property. Tracking and Tele-Command System forms an important part of System for terminating the flight for Range Safety. Vehicle instantaneous position should be known with high accuracy in real - time. Based on tracking data, coded sequence should be sent to launch vehicle, decoded onboard for command execution as per the issued command from the ground. The position of launch vehicle can be computed using either Radar Tracking, Inertial Navigation System or GPS/NaViC Based systems. Radar tracking is an independent system. Data from Inertial Navigation System or NaVIC system is collected though launch vehicle Telemetry.



Lal M J, Scientist/Engineer G is Presently holding the post of Group Director, RF Systems Group, Avionics Entity, VSSC. He Has 33 years of experience in Instrumentation, Development of Data Acquisition Systems, Development RF Systems and Project Management. He Graduated in Electronics and Communication from University of Kerala in 1991. He Joined Vikram Sarabhai Space Centre in 1992 as Test Engineer in Integrated Structural Dynamic Test Facility, Structures Entity. He completed his Post graduation in Telecommunication from Indian Institute of Science in 2001. He Worked in RF Systems area 2001-2017 and Moved over to core PSLV Project as Deputy Project Director, Electrical Integration and Checkout Systems in 2017. He was Associate Project Director of PSLV 2019-2023 and Vehicle Director, PSLV-C57/Aditya-L1 Mission.

4. Avionics Fabrication Techniques: Smt. Sheena Abraham, Group Director, EPG, VSSC

Abstract: Avionics package Life Cycle starts with Launch Vehicle Project Requirements. Based on mutual discussion and compromise between Design team and Project team, Conceptual design will be made. Specifications will be generated and preliminary design will be arrived at block diagram level. The preliminary design has to undergo all reviews and once the circuit is finalized, Printed Circuit Board (PCB) layout design is made. After getting clearance for all design as well as Quality Control aspects, the PCB will be fabricated. The inputs for the fabrication of Avionics packages are Components, PCBs and Mechanical chassis. The PCB will be wired with components or electronic parts by means of Reflow soldering operation and Manual soldering. After wiring the card is ready for testing. It will undergo all testing to check whether the original specifications whatever aimed is met and whether all project requirements are met. The different tests are Initial Standard Room Conditions Test (ISRC), Thermal tests (Hot and Cold soak), Vibration, Shock EMI, Vacuum test, Final Standard Room Conditions Test (FSRC. There are two tpes of tests like Qualification tests to establish design margin and Flight acceptance tests to bring out workmanship defects. After obtaining all clearances, a Configuration Controlled Document (CCD) will be released. There is an approved CCD for each package. Once the package fabrication and testing is streamlined, the production can be outsourced to external industries after accreditation and proper enabling. Electronic devices are shrinking in size and increasing in complexity due to improvements in VLSI technology. Miniaturized Avionics packages are the need of the hour for space applications. For that miniaturization technologies like Hybrid Microcircuit technology, Surface Mount Technology and 3D packaging technologies are used. All these will be addressed briefly in the presentation along with some case studies.



Sheena Abraham, Scientist/Engineer 'G' from Vikram Sarabhai Space Centre is the Group Director of Electronics Production Group of Electronics Systems and Actuators entity. She took her BTech in Electronics and Communication from College of Engineering, Trivandrum in 1994 and MTech in Electronics Design and Technology from Indian Institute of Science, Bangalore. She joined VSSC in 1995 and has 30 years of experience in different fields like design and miniaturization of sensors, design and development of Data Acquisition systems, development of miniaturization technologies, production of Avionics Packages. She has developed advanced and miniaturized sensors like MEMS Acoustic sensor, MEMS based Smart Pressure Sensor, Piezoelectric Vibration Sensor and MEMS Rate Sensors. The sensors developed by her have flown in different Launch Vehicles. The MEMS acoustic sensor developed by her is the first indigenously developed MEMS sensor to be flight tested in an Indian Launch Vehicle. A patent has been granted for her invention “MEMS based sensor for measuring acoustic pressure”. She has also contributed a lot in the area of Electronic Packaging technologies like Hybrid Micro circuits and Surface Mount Technology. She has set up and qualified a SMT Machine soldering line in VSSC for the reflow soldering of all Avionics Surface Mount assemblies. She is at present responsible for the realization of Avionics packages for all operational Launch Vehicles like PSLV, GSLV, LVM3 and development vehicles including Gaganayaan through external industries as well as through in-house facilities. She has taken a lead role in enabling many external industries for the production of Avionics Packages to meet ISRO launch manifesto. She has been awarded ISRO Team award in the year 2017 for “PSLV C37 with 104 Satellites-Multi satellite integration mission operation”. She has won the Institution of Electronics and Telecommunication Engineers (IETE) B V Baliga Memorial Award 2020 for her outstanding contribution in the field of Electronics & Telecommunication with emphasis on R&D and industrial development during the past 10 years. She is a Fellow of IETE.

Special Session on: Semiconductor Technologies : Defence and Space Applications

Venue: Amarylis, Time: Tuesday, July 22, 2025 8:30 – 10:30 Hrs

Abstract: Future defence systems and space technologies focus on the application of information technology and computer networking to get the advantage by using of EO systems in areas like sophisticated 3D visualisation, laser radars, and infrared sensors. This provides the defence forces with a better situational awareness and Improvement of surveillance and military ISR capabilities. Developing these systems require material and device technologies for Tuneable detectors and tuneable sources like QCL, VCSEL, DFB, T2SLbased detectors and APD. Similarly, RF sensors which remains largely concealed and shrouded in secrecy are required to work in higher frequencies with technologies like GaN Ka band and InP based THz sources and detectors. These technologies owing to its broadband operation and enhanced reliability find application in futuristic defense systems. These technologies have begun making inroads into the SatCom market, leveraging high efficiency compared to other materials to enable smaller device sizes, thereby saving valuable space at the system level. Transitioning from L/C/X-bands to Ku/Ka-bands enables higher data rates in mobile satellite communication. SiC power devices and high efficiency solar cells are technologies for green energy required both for defence and space applications. This special session will give insight into all the above mentioned technologies along with the indigenous status. 1. Present Status of Indigenous Technologies, 2. Laser Technology, 3. InP HEMT and THz: launch pad for networking in space, 4. Infrared Focal Plane Array Technologies-HgCdTe & State of the Art, 5. High Efficiency III-V Triple junction Solar cell for space application, 6. Silicon Carbide Devices: Enabling Efficient Power Electronics for a Sustainable Future, 7. GaN technology for Ka-band: Key challenges and prospects



Dr. D. S. Rawal is an Associate Director and Outstanding Scientist (Scientist-H) at Solid State Physics Laboratory (SSPL), DRDO, Delhi, heading the advanced semiconductor technology development activities in the critical areas of RF, Photonics, MEMs, Nano, THz/Quantum devices and has a vast experience of more than 30 years in Semiconductor Process Technology . He joined SSPL, Delhi in 1992 and has mainly worked for the development and Transfer of Technology of GaAs and GaN based MMIC technology that is under production at GAETEC, Hyderabad. He received his M.Sc. Degree in Physics and M.Tech. Degree in Electronics and Communication Engineering from University of Roorkee, Roorkee, India (Now IIT Roorkee), in 1988 and 1990, respectively. He did his PhD in Experimental Plasma Physics from IIT Delhi. He has published more than 100 research papers in various international journals/conferences and delivered more than 50 invited talks in various National/International forums. He has supervised 03 PhD students for their doctorate from IIT Delhi and Delhi University on GaN HEMT device technologies. And presently supervising 03 more students for doctorate from Delhi University. He is also an active reviewer for various reputed international journals like IEEE Electron Device Letters, Journal of Applied Physics (AIP), Applied Surface Science (Elsevier), JVST A/B (AIP), IEEE trans. on Electron Devices, IEEE Sensors, Surface Coating and Technology (Elsevier), Vacuum (Elsevier), Journal of Alloy and Compounds (Elsevier), Nanotechnology (IOP science), Journal of Physics D (IOP), Physica Status Solidi (Wiley) and Semiconductor Science and Technology (IOP). He is also a Member PI of Technology Group-I under National Quantum Mission working towards development of “On demand SPE, SPAD, High Frequency Devices and InP based Epitaxial Semiconductors”. He has many awards to his credit and is a recipient of DRDO Path Breaking Research Award (Twice), Scientist of the Year Award and Elsevier Outstanding Reviewer Award-2017, IOP Outstanding Reviewer Award-2024 etc.

2. Laser Technology: Dr. Soma S Mahajan

Abstract: SSPL Delhi is involved in the development of high power laser diodes. Over the years, various laser diode technologies have emerged including single emitter laser diodes, arrays, stacks and fiber coupled laser diodes (FCLD) in different operational modes and varied output powers employed for defence applications ranging from range finders, dazzelers, proximity fuses, fencing, explosive initiation for detonation etc. Recently, fabrication of indigenous laser diode technology has successfully been established at GAETEC, Hyderabad, a pilot production plant which is now capable of production of single emitter laser diode technology upto 10W (CW) for 976 nm emission. The 10W single emitters serve as the basic building blocks for high power Fiber coupled laser diodes (FCLDs) modules employed for Directed Energy Weapons (DEW) applications and initiation of explosive detonation. These modules with output power upto 100W(CW) emitting at 976 nm have also been developed in collaboration with industry. Communication between various underwater entities like submarine to unmanned underwater vehicle (UUV) is a key area for strategic defence applications in blue-green laser region of spectrum. To cater the strategic demand, SSPL is also working on blue-green laser technology employing InGaN/GaN based multiple quantum well laser structures. Laser diodes emitting at 415 nm with the pulsed power upto 4W have been developed. Apart from this, SSPL is also venturing into single mode technology; development of Vertical Cavity Surface Emitting Laser (VCSEL) and Distributed Feedback (DFB) laser diodes to produce a narrow linewidth and stable output power. These special diodes exhibit wide range of applications including optical communication systems, spectroscopy, sensing and also serve as light sources in quantum sensors and quantum communication for quantum technologies. Recently, the first set of VCSEL devices delivering power of 5mW at 850 nm have been realized. The complete development cycle starting from the procurement of raw epitaxial material to device packaging and testing was successfully carried out at SSPL.



Dr Somna S Mahajan is working as a scientist `G' at Solid State Physics Laboratory (SSPL), Delhi, DRDO. She was awarded Ph.D degree in the area of `Diamond like carbon thin films` from IIT Delhi in the year 1998. She has rich experience in vacuum technology, metal-semiconductor contacts, fabrication technology of Monolithic Microwave Integrated Circuits (MMIC) and Laser Diodes. Currently she is leading a team of scientists working in the area of High power Laser diode technology development. She has published more than 25 research papers in various international journals and conferences. She is a recipient of `Technology group award' for the development 10 W high power laser diodes and DRDO `Path breaking research award' for the development of MMIC technology.

3. InP HEMT and THz: Launch pad for networking in space: Dr. Mahadev Bhat K

Abstract: With the concept of miniature satellites called CubeSats and networking them in space has the potential to revolutionize the twenty first century with extremely high speed of communication in connecting the world as one, through the space and Internet of space things (IoST). Negligible absorption of THz frequency in space compared to the high molecular absorption in earths atmosphere makes the THz frequency operation very suitable for communication in space compared to ground-based applications. Very high bandwidths available in these frequency range also makes high speed data transfer possible. High Electron Mobility Transistors (HEMTs) fabricated on InP Substrate with InxGa1-xAs (x varying from 0.53 to 1) as channel has made this as reality with cut of frequency reaching close to 1THz. Extremely high electron mobility and electron saturation velocity of these devices make them the best suitable candidate for low noise applications as well. with low DC power consumptions and high frequency response make them aptly suitable candidates for CubeSats. Having said that, achieving the THz performance from these devices is extremely challenging with gate lengths very low gate lengths. Exploring various aspects of device technology like material layer engineering, device topological engineering and device fabrication engineering simultaneously is essential to extract the best performance from these devices. Some of the technological challenges involved will be covered in this technical presentation.



Dr. Mahadeva Bhat K is working as scientist at Solid State Physics Lab Delhi for last 28 years and currently heads the III-V device technology division at SSPL and has experience in device layer design & Growth, device topological engineering, device process development and integration specific to GaAs and GaN based High electron Mobility Transistors. He has obtained his MSc in Materials Science from Mangalore University, Karnataka and PhD from IIT Madras. He has worked as Post-doctoral fellow at Arizona State University, AZ, USA and University of California, Davis, CA, USA exploring the development of current aperture vertical electron transistors (CAVETs) and GaN on GaN IMPATT diodes. He also worked at GAETEC Hyderabad as Scientist from SSPL for 22 years on MMIC Fabrication and manufacturing.

4. Infrared Focal Plane Array Technologies-HgCdTe & State of the Art

Abstract: Infrared sensor arrays are of high importance for a variety of defence, scientific, and commercial applications. An important requirement for defence surveillance systems is a sensor that can provide all condition vision. IR sensors fulfil this criterion of vision through fog, haze, dust, smoke and night, since they sense the thermal energy emitted by objects as a function of their temperature and emissivity. Other requirements are high sensitivity, fast response to scene changes, thermal stability and ability to tune to various IR windows. Mercury Cadmium telluride (HgCdTe) based semiconductor photon detectors offer all the listed advantages for IR detection. Competing technologies in mid wave infrared (MWIR) and long wave infrared (LWIR) are InSb, antimonide based type II super lattices and quantum well infrared photodetectors (QWIPS). Shortwave infrared (SWIR) sensors are made from HgCdTe and InGaAs materials. Dual band, multi-color and hyperspectral imaging are the recent applications of III generation sensors where HgCdTe and T2SL material systems are commercially viable. Present work reports the development of HgCdTe MWIR photodiode arrays with 15µm pitch in 384×288 and 640×512 format. The FPA package consists of a two-dimensional photovoltaic infrared detector array hybridized with a Si-CMOS based Readout Integrated Circuit (ROIC) using indium bumps. The detector array performs the function of IR signal detection and ROIC consists of signal processing circuitry which collects the signal from individual detector elements and integrates the output signal to form an image. The two-dimensional detector array is fabricated using Hg1-xCdxTe semiconductor material. MCT (Hg1-xCdxTe) epilayers with a composition of x= (0.285-0.295)±0.0005 corresponding to a cut-off wavelength of ~4.8-5.4µm at 89 K are used. The epilayers are grown in-house by LPE technique on CZT substrate. The fabrication steps for photodiode array includes common contact formation, boron implantation for junction formation, p/n-contact etching of diodes, passivation of diodes and finally the indium bump growth to provide metal contact on individual diode pixels and ROIC. The ROIC and detector array are flip-chip bonded using FCB machine. This is followed by backside thinning, antireflection (ARC) coating, wire bonding on Dewar, cooler integration and testing. The technology for IR Focal Plane Array (IRFPA) fabrication and integration is fully developed at SSPL and thermal images of room temperature scenes have been demonstrated.



Dr. Vanya Srivastav is a senior Scientist at SSPL Delhi. She is heading the IR Technology team. The group is actively involved in research, development and fabrication of Infrared sensors. Dr. Vanya Srivastav has more than 23 years of experience in Research & Development related to Semiconductor Devices. She received her M.Tech degree in Solid State Materials from IIT Delhi. She received her Ph.D. degree from IISc Bangalore. Her professional experiences include Modelling, Design and Simulation of semiconductor devices, Microlithography; Dry processing of Semiconductor wafers; Vacuum Systems; Design of low temperature testing & measurement systems; Optoelectronic characterization of devices. She has published more than 30 papers in various international journals and conference proceedings. She has also been a reviewer for several reputed international journals.

5. High Efficiency III-V Triple junction Solar cell for SPACE Application: Dr. Akhilesh Pandey

Abstract: III-V Triple junction solar cell-based devices are showing great attention world-wide due to its wide applications in spacecraft and satellite. In the space sunlight is the only high-volume energy source available and are being used to convert light energy into the electrical power. The electrical power generated by solar panel provide the power to the space craft in all phase of life. The smallest unit of the panel is the solar cell which are connected either in series or parallel or both to increase the power which are being utilized in the space craft. Usually normal solar cell (Si, CdTe based) cannot used in the space due to moderate efficiency, limited spectral coverage and availability of high radiation. The III-V arsenide and phosphide based solar cells exhibit several advantages as compared to other solar cells in terms of cost, weight, efficiency and radiation resistance. III-V based solar cell are the best suited in space satellites/space craft. III-V triple junction solar cell (TJSC) structure (InGaP/InGaAs/Ge) consist of three sub cell of band gap 1.88 eV (top cell), 1.4 eV - InGaAs (middle cell), 0.67eV-Ge (bottom cell). To enhance the efficiency three single sub solar cells are added in tandem manner with the help of tunnel junction. III-V multi-junction solar cells technology offers high efficiencies as compared with traditional solar cells and have been used effectively in space applications, concentrated photovoltaics, unmanned aerial vehicle, solar powered drones etc. In this presentation lattice matched III-V triple junction solar cell (LM-TJSC) structure consist of three sub cells {InGaP (1.88eV)/InGaAs (1.4eV)/Ge (.67eV)} integrated with the highly doped tunnel junction grown by MOCVD technique have been analysed structurally and electrically. Structurers are characterized using High resolution x- ray diffraction (HRXRD), planer/cross-sectional FE-SEM and Secondary Ion mass spectroscopy (SIMS) techniques. In the (TJSC) structure layer sequence, layer thickness and doping were determined by SIMS as well as FESEM techniques. Layers composition, strain and substrate offset angle was determined by HRXRD. The TJSC structure (determined by the above characterization) have been used to fabricate as a solar cell with the the photo conversion efficiency ~ 27-28% under AM1.5 condition. The extracted parameters of the solar cell structure have also been used in the simulation study of the TJSC. The structural, electrical characterization and simulation study of the TJSC structure has been presented and it will be very useful to fabricate the high efficiency space solar cell devices.



Dr Akhilesh Pandey is working as a Senior Scientist at SSPL. He is head of the Material Characterization div at SSPL. Dr. Pandey has more than 21 years of experience in Research & Development related to semiconductor materials and device structure characterization. He completed M.Sc degree in Physics (Electronics) from Lucknow University, Lucknow. He received his Ph.D. degree from IIT Roorkee in "III-Nitride semiconductor". His area of research: Structural and Optical characterization of thin films, III-Nitride epitaxial device heterostructures, bulk single crystals, Growth and characterization of metal oxide nanostructured thin films and 2D layers (TMDCs), AlN thin layers growth and characterization as well as AlN based piezoelectric sensors. Currently, he is working in III-Nitride multilayer heterostructure characterization for high power and high frequency electronics devices applications and III-V Triple junction solar cells for space applications. Pandey has published more than 120 research papers and review articles in international peer-reviewed Journals. He has delivered more than 50 Invited/ Oral talks in national/international forums, and conferences at various institutes (IISc, IITs, Universities and DRDO Labs). He reviewed various research papers as referees in different journals Elsevier, IOP, AIP, and Springer publishers.

6. Silicon Carbide Devices: Enabling Efficient Power Electronics for a Sustainable Future: Dr. Rupesh Kumar Chaubey

Abstract: Silicon carbide (SiC) electronics is transforming various industries with its versatility. Its temperature resilience and power efficiency make it ideal for aerospace applications, particularly in avionics and propulsion systems, where it enables aircraft to perform better while reducing weight. The defense sector also benefits from SiC's capabilities, which support mobile artillery and armored transport. Additionally, SiC-based electronics are enhancing electric vehicles by providing efficient and reliable power management, a crucial aspect in this rapidly evolving transportation sector. Furthermore, SiC electronics are being utilized in renewable energy systems, such as solar and wind power, for remote installations, and are also improving the performance of heavy machinery in demanding environments. Overall, SiC technology is contributing to increased operational readiness, better energy efficiency, and lower maintenance costs across these diverse fields.



Dr. Rupesh Kumar Chaubey obtained his M.Sc. and Ph.D. degree from Banaras Hindu University. He joined Solid State Physics Laboratory in 2004. He has more than 20 years of research experience in the area of Semiconductor device fabrication. His areas of interest are III-V based devices for RF and optoelectronics applications and WBG based devices for power electronics applications.He has many awards to his credit as:In 2016- DRDO Pathbreaking award for GaN HEMT material & Device Technology, In 2016- Technology group award for C-band GaN HEMT device technology development, In 2019- Technology group award for X-band device technology development, In 2022- DRDO Technology Day oration award, In 2023- Technology group award for X-band GaN Monolithic Microwave Integrated Circuits

7.GaN technology for Ka-band: Key challenges and prospects: Robert Laishram

Abstract: The increasing demand for high frequency, high linearity, and cost-effective high-power amplifier (HPA) solutions at Ka-band frequencies is a key driving force behind the rapid progress in the development of GaN Ka-band HEMT RF devices. The ability of GaN technology to meet the size, weight, and power (SWaP) constraints is one of its most transformative strengths in meeting the demands of strategic systems, military radars, 5G/6G systems. However, before the full potential of the GaN can be exploited, several critical issues related to the device design, epi-structure and fabrication challenges need to be addresses. The need to aggressive scale the gate length mitigating the adverse issues related to short-channel effects, gate leakage and parasitic capacitances remains a major challenge. The talk will focus on the future prospects of this critical technology, key challenges and briefly touch upon the journey at SSPL to indigenously develop this technology.



Robert Laishram did his Master in Physics from University of Madras, Chennai. He is currently working as Scientist at Solid state Physics Laboratory, Delhi. His current interest is in the development of high frequency devices and circuits. He has a rich expertise in the fabrication of GaAs and GaN high frequency devices. He has played a major role in the development of X-band GaN technology at SSPL. Currently, he is heading the research and development activity of Ka-band GaN technology at SSPL, Delhi.

Special Session on Space Technology Applications

Venue: Helconia 1, Time: Tuesday, July 22, 2025 8:30 – 10:30 Hrs

Agriculture Applications: Dr. Chowdary VM Group Director, Agricultura Sciences & Applications Group, NRSC



Dr V M Chowdary is Group Director & Scientist/Engineer 'G', Agricultural Sciences & Applications Group at NRSC, ISRO, Hyderabad since 1998. He is Former Director of MNCFC, Min of Agriculture, Govt of India and Former DGM of Regional Remote Sensing Centre-North, Delhi (ISRO). He was Post Doctoral Fellow atJapan Society for Promotion of of Scinece (JSPS), Kyoto university, Japan. He did his PhD in Soil and Water Conservation engineering from Indian Agricultural Research Institute, New Delhi and M.Tech (Irrigation and Drainage Engineering) from G.B.Pant University of Agriculture and Technology, Pantnagar. He is Elected Fellow of NAAS (National Academy of Agricultural Sciences), Fellow of National Academy Agricultural Sciences, A.P. Akademi of Sciences, Indian Water Resources Society (IWRS), and Indian Association of Hydrologists (IAH). He received JSPS - Japan Society for Promotion of Science Fellowship, 2005-2007, NESA-Eminent Scientist Award, 2014, ISRO Team Excellence Awards, 2015 & 2016, IWRS- Eminent Water Resource Scientist Award-2018, APAS-Prof. N.G.Ranga Memorial Award, 2018. His Areas of Research include Digital agriculture initiatives, Agricultural water management, Groundwater recharge, Soil erosion modeling, Non-point source pollution, watershed management, Drought monitoring, Decision Support Systems and application of geospatial technologies for natural resources management. He has 6907 Google citations and h index of 61. He has authored 90 peer reviewed publications with total impact factor of nearly 250.

Climate Studies: Dr. Ramana MV, Group Director, Atmospheric Sciences & Land Surface process Group, NRSC



Dr M. Venkata Ramana received Ph.D. degree in Physics from M.G. University, Kerala, India. Since 2016, he has been with Earth and Climate Sciences Area (ECSA) of National Remote Sensing Centre (NRSC), ISRO, Hyderabad. His prior experiences include Assistant Project Scientist at Scripps Institution of Oceanography, University of California at San Diego (UCSD), US (2001-2010) and Associate Professor at Indian Institute of Space Science and Technology (IIST), Trivandrum India (2010-2016). He is currently, Group Director: "Atmospheric Sciences & Land-surface processes Group", at NRSC. He is currently representing ISRO at CEOS's Atmospheric Composition Virtual Constellation (AC-VC). He has published around 80 papers in international journals, including in Nature, Proceeding of the National Academy of Sciences, etc. His research interests include Climate and Climate Change, Aerosol-Cloud-Radiation-Climate; Land Surface Process, Atmospheric Composition, Retrieval and validation of geophysical products from satellite data, Extreme weather events; Climate mitigation and adaptation.

Invited Talk: Reliability Analysis of Communication Systems: S Dharmaraja, Professor and Former Head Department of Mathematics Indian Institute of Technology Delhi

Abstract: Reliability is defined to be the ability of a system or component to perform its required functions under stated conditions for a specified period of time. In the world of broadband network, different types of communication networks are facing a large demand due to its high- speed wireless data transmission, extensive coverage from base stations, and a luxury of upgrading protocol software. In this talk, an analytical model is discussed to determine reliability attributes of third generation and beyond Universal Mobile Telecommunication Systems (UMTS), Voice over Internet Protocol (VoIP), Long-Term Evolution Advanced (LTE-A), Vehicular Ad hoc Network (VANET), High-Altitude Platform (HAP) networks. These networks are modelled using stochastic models such as Markov chains, semi-Markov process, reliability block diagrams and Markov reward models to obtain these attributes. Numerical results illustrate the applicability of the proposed analytical model. Recent advancements in the reliability analysis of anti-drone and unmanned aerial vehicle (UAV) systems have provided valuable insights into their performance, resilience, and operational effectiveness. In this talk, the architectural frameworks, stochastic modelling techniques, and significant results emerging from contemporary research in anti-drone and UAV systems is presented. Google citations and h index of 61. He has authored 90 peer reviewed publications with total impact factor of nearly 250.



S. Dharmaraja earned his B.Sc. degree in Mathematics from Presidency College, Chennai, in 1992, M.Sc. degree in Applied Mathematics from Anna University, College of Engineering, Guindy, Chennai, in 1994 and Ph.D. degree in Mathematics from the Indian Institute of Technology Madras, Chennai, in 1999. From 1999 to 2002, he was a post-doctoral fellow at the Department of Electrical and Computer Engineering, Duke University, USA. From 2002 to 2003, he was a research associate at the TRLabs, Winnipeg, Canada. He has been with the Department of Mathematics, IIT Delhi, since 2003, where he is currently a Professor, Department of Mathematics and joint faculty of Bharti School of Telecommunication Technology and Management from June 2013. He is a 'Professor (HAG)' from Oct. 2020 and he appointed as 'Institute Chair Professor' from July 2019 to June 2024. During Sept. 2020 and Aug. 2022, July 2014 and August 2017, he served as Head, Department of Mathematics. He appointed as 'Jaswinder & Tarvinder Chadha Chair Professor' for teaching and research in the area of Operations Research from May 2010 to July 2015. He has held visiting positions at the New York University, USA, Duke University, USA, Emory University, USA, University of Calgary, Canada, University of Los Andes, Bogota, Colombia, National University of Colombia, Bogota, Colombia, University of Verona, Verona, Italy, Sungkyunkwan University, Suwon, Korea, Universita degli Studi di Salerno, Fisciano, Italy and University of New South Wales, Sydney, Australia. His research interests include applied probability, queueing theory, stochastic modeling, performance analysis of computer and communication systems and financial mathematics. He has published over 100 papers in refereed international journals and over 40 papers in refereed international conferences in these areas. He is an Associate Editor of International Journal of Communication Systems (published by Wiley) and an Associate Editor of Opsearch (published by Springer). He is co-author of a text book entitled "Introduction to Probability and Stochastic Processes with Applications" in John Wiley (US Edition, New Jersey, June 2012) and (Asian Edition, New Delhi, Jan. 2016), co-author of a text book entitled "Financial Mathematics: An Introduction" in Narosa, Nov. 2012 and co-author of a text book entitled "Introduction to Statistical Methods, Design of Experiments and Statistical Quality Control" in Springer (Asian Edition, Sept. 2018). Recently, he is co-author of a monograph book entitled "Reliability Assessment of Tethered High-altitude Unmanned Telecommunication Platforms: k-out-of-n Reliability Models and Applications" in Springer Verlag (Singapore, 1st edition, March 2024) and co-author of a text book entitled "Introduction to Probability, Statistical Methods, Design of Experiments and Statistical Quality Control" in Springer (Second Edition, April 2024).

Dr. D. K. Sunil, Chairman & Managing Director



Prior to taking over as Chairman & Managing Director, Dr. D.K. Sunil was holding the post of Director (Engineering and R&D) of the Company from 29th September, 2022.

Dr. D. K. Sunil did his graduation in Electronics & Communication Engineering from Osmania University, Hyderabad and M. Tech in Aircraft Production Engg from IIT, Madras. He also completed Ph.D in Electronics Science from University of Hyderabad in the year 2019.

Dr. Sunil joined Hindustan Aeronautics Limited (HAL) in 1987 as a Management Trainee, and has about 37 years of experience in varied roles in the company contributing significantly to Design, production, quality enhancement, and customer support issues.

Under his leadership, new technologies were developed like High Power Radar Power Supply, Voice Activated Control System, Combined Interrogator Transponder which has become new growth areas for the Company. A trailblazer in collaborations, Dr. Sunil pioneered partnerships with institutions like IIT Kanpur for datalinks and IIIT Hyderabad for voice recognition technologies. His visionary approach strengthened HAL's position in cutting-edge technologies.

During his tenure in Mission Combat Systems R&D Centre in Bengaluru, he led teams focused on ground breaking projects such as Active ESA Radar, Automatic Flight Control System for Light Combat Helicopter (LCH), and Mission Computers for helicopter and fighter platforms.

His extensive design expertise spans from the equipment level to system-level projects for both aircraft and helicopters, covering the entire spectrum of design activities at HAL's design centers.

Dr Sunil has shared his knowledge with the wider community through the publication of seven papers in peer-reviewed journals, and his innovations in wireless communication are protected by nine copyrights. Dr Sunil has a patent to his credit for Robust Variance Based Squelch for Airborne V/UHF radio in RF interference Dominated Environment, which was received in Mar 2024.

Acknowledged for his expertise, he was nominated to be a member of the DGCA External Expert Committee for the certification of the Hindustan-Dornier 228 Aircraft.

Under the dynamic leadership of Dr. D. K. Sunil, as Director (Engineering and R&D), the Company witnessed a series of remarkable achievements and advancements. Notably, under his strategic guidance, HAL successfully obtained release of military certification to the HTT 40 aircraft program, secured pivotal projects such as the Indigenous Multi-Role Helicopter (IMRH) for the Indian Air Force (IAF) and Army, as well as the Utility Helicopter Maritime (UHM) for the Indian Navy.

Dr. Sunil was entrusted with additional charge of Chairman and Managing Director (CMD) of the Company from 1st September, 2024. In accordance with the Letter No. F.No 49013/03/2021-D(HAL-III) dated 9th September, 2024, he has assumed the charge of Chairman & Managing Director w.e.f. 9th September, 2024.

Dr. Sunil was holding additional charge of Director (Operations) from 1st September, 2024 to 26th November, 2024, additional charge of Director (HR) from 1st March, 2025 to 6th May, 2025 and additional charge of Director (Engg and R&D) from 9th September, 2024 to 15th July, 2025.

He is Nominee Director in Multi-Role Transport Aircraft Ltd., Aerospace and Aviation Sector Skill Council (Section 8 Company) and Defence Innovation Organization (Section 8 Company).

He is not related to any other director of the Company and does not hold shares in the Company.

"Systems and Technologies for SATCOM Phased Arrays - Challenges and Opportunities"

Abstract:

Phased arrays are redefining satellite communications, enabling compact, agile, and electronically steerable antennas for both user terminals and gateways. This invited talk will present a comprehensive overview of SATCOM phased array architectures, from analog and digital beamforming to hybrid implementations tailored for space, airborne, maritime, and ground terminals.

We will explore the enabling technologies behind these systems, including advancements in RFICs, GaN and CMOS front-end modules, beamforming ICs, and thermal management solutions. Key system-level design tradeoffs—such as power consumption, beam agility, form factor, and cost—will be discussed.

Speaker Bio:



Dr. Venkata Vanukuru (Venkat) received MTech and PhD both from IIT Madras. He had spent 17 years at GlobalFoundries, where he last served as a Technical Director, making significant contributions to the Technology/PDK/Design/IP development. He was a "Master Inventor" and "Patent Advocate" at GlobalFoundries with over 50 US patents and has an extensive publication record, including 15 IEEE Transactions papers and 45 IEEE conference papers. He was twice the recipient of prestigious CEO Recognition Award at GlobalFoundries (2018, 2020). He is a passionate teacher, actively collaborating with faculty and students across multiple IITs on course work, teaching and research. Also, he is a Visiting Faculty at IISc Bangalore. Dr. Venkat has delivered invited talks, tutorials, and workshops at top IEEE conferences, such as IMS, RWW, APMC, IMaRC, EDTM, and ICEE. His research focuses on the design and technology optimization of RF and power circuits

Spacecraft Testing at a New Level

Speaker: **Josef Migl,** Airbus Defence and Space GmbH, Munich, Germany

Abstract

State-of-the-art satellites require test capabilities from the UHF-band up to mm-wave frequencies (Q-, V-, W-Band) up to 110 GHz as well as a large test area up to 10 m or even larger in order to deploy the entire antenna farm for end-to-end payload testing combined with extremely high-performance demands.

Airbus developed for that reason the next step in size and performance of the well-known Compensated Compact Range Facility, i.e., an indoor Antenna and Payload Test Range which allows rapid payload testing utilizing far-field test principles which are applied under Near-Field Conditions and therefore under controlled environmental conditions. The recent design is called CCR 150/120 indicating the size of the main reflector by 15 x 12 m. The Compensated Compact Range concept (CCR) of Airbus is featuring two major advantages for such measurements.

First of all, the compensating reflector design of the CCR delivers lowest cross-polarization (< -40 dB) over the entire test zone area for frequencies ≥ 3 GHz and its short effective focal length provides advantageous scanning capability of the test zone. The very low cross-polar contribution of the measurement range is a mandatory aspect for testing antennas utilized for telecommunications satellites due to their stringent crosspolar specifications. The scanning capability is of interest for deployed antennas of spacecrafts and allows measurements without relocation of the complete spacecraft for moving the Antenna under Test (AUT) into the centered test zone even for antenna farm spanning over 17m in diameter. This feature is already highly interesting for antenna testing, but much more for end-to-end testing campaigns where it provides a fully radiated test scenario for up- and downlink without touching the spacecraft at all. In order to achieve large test zones Airbus developed the above mentioned CCR 150/120 with a centered test zone size of 10 m and scanned test zone diameters of at least 7 m for off-axis locations which provides finally an entire elliptical test zone area of approximately 20 x 10 m. This design allows the testing of all state-of-the art spacecrafts within the centered test zone with the maximum available performance over the entire test zone area and provides sufficient margin for future spacecraft designs.

Within this presentation performance data of a recently installed, extremely large compensated compact-range test facility will be presented. The design criteria were mainly determined by the stringent requirements for antenna and payload testing of current and future communication satellites including broadband testing at low frequencies for navigation applications and extremely high frequencies for gateway antenna applications at the mm-wave bands.

Index Terms— Compensated Compact Range, Quiet Zone Scanning, Plane Wave Probing, Antenna Measurement, Payload Testing, Broadband Test Capabilities, mm-wave Antenna Testing

Josef Migl

Education: 1992 Dipl.-Ing. (FH) at University of Applied Science Munich

1997 Dipl.-Ing. at Technical University Berlin

Position: Head of Engineering, Antenna and Payload Measurement Technique, TSMOT2

Airbus Defence and Space GmbH, Munich, Germany

Experience:

1990 – 1991 Messerschmitt Bölkow-Blohm GmbH (MBB)

- Planar Near-Field Measurement Technique

1992 – 1997 INPRO, Berlin

- High Power Nd: YAG Laser Development
- R&D Work for High Power Laser Applications in the Field of a Car Production Line

1997 - 1999 Best Engineering GmbH, Munich (Prof. Dr. Fasold)

- Development of a new Concept to Investigate the Behaviour of Multi-Feed Array Antennas within the INTELSAT Study "INTEL-1482"
- RF Engineering for INTELSAT Study "INTEL-1482", Study for Measurement Accuracy Improvements

Since 1999 Airbus Defence and Space GmbH (and former companies)

- R&D Work in the Field of the Planar and Cylindrical Nearfield Measurement Technique
- Design of Compact Range Antenna Test Facilities for single and double reflector ranges
- RF Engineering and antenna testing of multiple commercial measurement champaigns in the Airbus' Nearfield and Compact Range Test Facilities for customers like Intelsat, Eutelsat, HispaSAT, ArabSAT
- RF System Engineering of Compact Range Facility Projects for Antenna and Payload Measurements

- RF Systems Engineering for the INTELSAT IX C-Band Antenna Subsystem
- Antenna and RF design for large tracking ground station antennas for projects in Australia, French Guiana, Spain
- Systems Engineering Management of multiple test range facility projects in India, China, Russia, Turkey, Kazakhstan
- Test Engineering and Test Manager for payload test campaign of national and international spacecraft projects
- Lecturer for Antenna Near-Field and Compact Range Measurement Technique for internal and external customers
- Author of multiple papers about antenna and payload measurements of spacecrafts

Date: July 23, 2025 Time: 8:30-10:30AM Venue: Poinsettia 2

1. Challenges and accomplishments of interplanetary missions : Moon to Mars & Role of Women Scientists :

Dr. Ritu Karidhal, PD, VOM, ISROAbstract: Working for Mars Orbiter Mission is the most prestigious and challenging one as it was totally a new kind of mission for ISRO from conceptualization till Mars Orbiter Insertion. Implementing full scale onboard autonomy for an interplanetary mission and making it capable of having self-diagnostics and self-recovery was one of the toughest tasks . Similarily ensuring the soft and safe landing on Moon surface is highly challenging and complex task , for ex study of huge amount of image data for landing site selection , performing various tests etc. Women Scientists of ISRO have contributed immensely towards achieving the success of these challenging missions. "



Ritu Karidhal is a Senior Scientist in Indian Space Research Organisation with a key role in realizing the Mars Orbiter Mission, which created history of being the first mission to reach Mars in itsfirst attempt. She is also the Mission Director of Chandrayaan-2 and integral part of Chandrayan-3 team.

She did M.Sc. in Physics from Lucknow University and then M.Tech from Indian Institute of Science in Bangalore . She joined ISRO in year 1997. She has worked for many prestigious missions of ISRO and also handled responsible position for many missions.

Being the Deputy Operations Director for MOM , she , with her team, was responsible to execute the critical operations of Leaving Earth and Capturing Mars , which could be realized flawlessly. Being the Mission Director of Chandrayaan-2, she was responsible to execute the mission operations from liftoff till reaching Moon. She has also been integral part of Chandrayaan-3 Mission contributing towards finalization of its Mission Configuration.

Mrs Ritu Karidhal has published more than 35 papers both in International and National Publications. She is the Corresponding Member of International Academy of Astronautics . She has been the recipient of many awards including " Young Scientist Award in 2007 by Shri Abdul Kalam , the then President of India , " , "Lakshmipati Singhania Young Leader Award" in Science and Technology by Honble' President of India Smt Drooped Murmu in 2023 , UP Gaurav Samman 2023 by Honble' UP Chief Minister Shri Yogi Adityanath , "ISRO Team Award for MOM

in 2015 " , "ASI Team Award ", "Women Achievers in Aerospace, 2017" by SIATI(Society of Indian Aerospace Technologies & Industries (SIATI), " The Baroda Sun Achievement Award " by Bank of Baroda. She was the member of Gender Equality Advisory Council of G7 under UK Presidency in year 2021. She has received Honorary doctorate Degree from U.P Governor Mrs Anandiben Patel at Lucknow University Lucknow and also IISC Alumnus Award 2019 at Bangalore.

2. Talk on "Formation flying and its advantages"

Abstract:

Satellite formation flying is the coordinated movement and positioning of multiple spacecraft, flying in close proximity to each other, to achieve a common mission objective. This technique allows for enhanced capabilities compared to using a single large satellite, offering benefits like increased redundancy, higher resolution data and the ability to observe targets from multiple angles. It can also be more cost-effective to launch and operate a constellation of smaller, simpler satellites than one large complex one. While offering several advantages, there are also a few disadvantages including increased complexity in orbital control and potential for collision due to space debris. This talk will touch upon the concept, advantages and disadvantages of formation flying satellites with a few examples.



ANURADHA S PRAKASHA Joined U R Rao Satellite Centre, ISRO, Bengaluru in 2001 and currently designated as Project Director for SAMOOHA Satellites, a Formation flying Constellation.

More than two decades of experience in space domain; contributed to more than 40 satellite missions in the following areas:

i) Satellite configuration

ii) Mission planning, analysis & operations

iii) Autonomy and automation of satellite operations

iv) Dynamic Satellite Software Simulator - design & development for national and international customers.

Designated Responsibilities

- Project Director, SAMOOHA Satellites Constellation, first of its kind at ISRO
- Associate Project Director for Communication and Navigation Satellites: CMS-01and NVS-01(next generation satellites series for NavIC)
- Co-Study Director for the cutting-edge technological Opto-Quantum Communication Program

- Operations Director for GSAT-12, GSAT-18 & South Asia Satellite (first ISRO satellite with Electric Propulsion system)
- Project Manager for the heaviest and highest power handling ISRO S/C - GSAT-11

Personal :

- Born in Udupi, Karnataka

Academics :

- Post Graduation (Physics, with specialization in Electronics), Cochin University of Science & Technology (CUSAT)
- CIPM (Certificate In Program Management)

Interests & Other achievements

- Tagged by media as "ISRO's Space Girls" as one of the trio of women scientists where women held all three key positions in the satellite mission (Project Director, Mission Director, Operations Director) for the first time in the world (in 2011 for GSAT-12)
- Responsible for the Live Broadcast of Mars Orbit Insertion event of Mars Orbiter Mission(Mangalyaan) in the presence of Hon'ble PM of India, Sri Narendra Modi
- Youngest Member of the ISRO team for first Multilateral Young Professional Exchange Program (MYPEP) to Japanese Aerospace Exploration Agency (JAXA)

  Imparted training to INMARSAT & Avanti space engineers at London, ISRO's international customers for Hylas Satellite
- Published & presented technical papers in national and international forums
- Delivered space-related lectures in various forums
- Invited speaker at many government and corporate organizations, including DRDO, MNCFC, MCF, RRSC, KRVP, GE, Honeywell, Ericcson, Citrix Systems, Visa Inc, Amazon Web Services, FICCI-YFLO, IEEE-WIE, Inner Wheel etc.
- Promotion of scientific temper through talks delivered in various educational institutions and by being an Organizing member and judge for numerous events, conferences and competitions
- Compered for numerous national & international conferences and events in presence of the President of India, the Prime Minister of India, Governors, Chief Ministers and heads of various organizations

- Have been School Head Girl, College Union Vice-Chairperson at St.Joseph's College, Kerala and first President of Women's Cell at Christ College, Kerala
- Interested in literary activities, reading, space-related activities
- Social responsibility and community connect:
  - Member of Inner Wheel Club (District 319), one of the largest women's organizations with consultative status at the United Nations
  - Member of Mission Chai, serving tea daily to cancer patients and attendants at Kidwai Memorial Institute of Oncology and providing food and essential items to needy and frontline workers during floods and pandemic (Mission Chai has served lakhs of teas and more than a lakh meals in 2021-2022)
- Member of professional bodies: Institute of Electrical and Electronics Engineers (IEEE), Astronautical Society of India (ASI), Indian Society of Systems for Science and Engineering (ISSE), Institute of Electronics and Telecommunication Engineers (IETE) and Indian Society of Remote Sensing (ISRS)
- Awards: ISRO Team Excellence Award for GSAT-12, Best Alumnae Award (St.Joseph's College), Distinguished Alumni award (Christ College), Kalathilakam award (Cochin University of Science And Technology, CUSAT)
- Nominated by ISRO-DOS for National Award for Women - Nari Shakti Puraskar 2022

Semiconductors: Fuelling next generation Systems

Advanced semiconductor technologies play pivotal role in development of robust and efficient SWAPc systems like next generation RADARS, electronic warfare systems, drones, sensors and satellites. Being strategic, these technologies are often restricted or denied. SSPL along with GAETEC and STARC as production partners has been spear heading the development of indigenous technologies and their limited production for strategic applications of DRDO and ISRO.

India has developed and demonstrated semiconductor material and device process technologies for high frequency, high power devices and GaN MMIC for microwave communications, semiconductor lasers, MEMS-based sensors, Acoustic sensors, SAW based sensors and IR imaging devices. A lot of work is happening in quantum technology for sensing , THz technology, High efficiency Solar cells and SiC power devices for green energy and space applications. Other areas of interest are 6G and IoT technologies using GaN device technology, InP HEMTs and photonic IC technology.

As the global industry advances toward becoming a trillion-dollar market by 2030, Semiconductors plays a pivotal role in making India technologically self-reliant (Atmanirbhar). The talk will also touch upon emerging global technology trends, their implications for defense and commercial markets. These innovations not only strengthen national defense but also contribute to the country's economic and technological growth making the Viksit Bharat 2047 dream alive.



Dr. Meena Mishra, Outstanding Scientist and Director of the Solid State Physics Laboratory (SSPL), DRDO, will be the Guest of Honor at this year's Department Convocation.

Dr. Meena Mishra assumed the charge as Director of SSPL with effect from 1st October 2023. She earned her Ph.D. from Jamia Millia Islamia in 2005 and her M.Sc. in Electronics from Delhi University South Campus in 1988. She began her career at SSPL in 1989 as Scientist 'B' and rose through the ranks to become an Outstanding Scientist / Scientist 'H' in 2022.

Over the course of more than 34 years, she has made significant contributions to semiconductor research and has been instrumental in the indigenous development of GaAs and GaN-based MMIC technologies for strategic applications. Her research expertise spans GaAs MESFET-based MMICs, GaAs-based digital integrated circuits, and the modeling, characterization, and design of high-frequency devices using GaAs and GaN technologies.

As the Technology Director for GaN MMICs, SAW sensors, and acoustic sensors, she has guided multiple teams in the successful development of cutting-edge technologies for defense applications. She led the project team that achieved the indigenous development of GaN MMIC technology up to X-band applications. In parallel, she also directed the successful development of wideband C–Ku band TR front-end chips and core chips for electronic warfare systems, as well as Ku-band TR front-end chips for RF seeker applications.

In her current role as Director of SSPL, Dr. Mishra leads seven technology verticals that include single crystal bulk growth, epilayer growth, single-emitter laser diodes, infrared imaging sensors, MEMS and sensor technologies, terahertz systems, and quantum technologies. Under her leadership, the laboratory has earned wide recognition for delivering indigenous technologies to user laboratories, facilitating technology transfers to production agencies, and fostering active collaborations with industry and academia. She continues to lead efforts to indigenize several state-of-the-art technologies that are critical for strategic national applications.

Dr. Mishra has authored over 120 publications in national and international journals, conferences, and workshops. Her contributions have been recognized with several prestigious awards, including the DRDO Outstanding Teamwork Award in 1999 for the development of GaAs MMIC technology, and the DRDO Pathbreaking Research / Outstanding Technology Development Award in 2016 for the development of AlGaN/GaN HEMT technology.

We are honored to welcome Dr. Meena Mishra as the Guest of Honor and look forward to her presence and inspiring address at the convocation ceremony.

Time (Kolkata)	Convention Centre	Zinnia	Amarylis	Petunia	Poinsettia 1	Poinsettia 2	Heliconia 1
Monday, July 21							
09:00-11:00	IS: *Inaugural Session & Exhibit Inauguration*						
11:00-11:30	TCN3: *Tea/Coffee/Networking*						
11:30-13:30	PS1: *Space Plenary*						
13:30-14:30	LB2: *Lunch Break/Networking*						
14:30-15:00	PS2: *Defence Plenary*						
15:00-16:00	PD1: *Panel Discussion on SPACE Technologies for AtmaNirbhar andd Viksit Bharat*						
16:00-16:30	TCN4: *Tea/Coffee/Networking*						
16:30-18:30			OS1: *Power/Energy/Power Electronics*	OS2: *Women-Led Technology Developments-I*	OS3: *Remote Sensing Applications*	OS4: *CubeSats-I*	OS5: *SDR*
18:30-19:10	PS3: *Plenary: TED Talks*						
19:10-20:00	PS4: *Panle Discussion: One IEEE and SPACE*						
20:00-21:30	D1: *Welcome Dinner*						

Heliconia 2	Hibiscus 1	Hibiscus 2	Tulip	Aryabhata	Pritvi	HT-2	Vikram Sarabhai	DS Kothari
OS6: *Trajectory Design*	OS7: *Signal/Data Processing*	OS8: *Target Detection and Direction Finding*	OS9: *Microwave Devices*	OS10: *Control & Guidance-I*	OS11: *Communication-I*	OS12: *UAV Technologies-I*	OS13: *AIT/C-I*	OS14: *Antenna Arrays*

Time (Kolkata)	Convention Centre	Zinnia	Amarylis	Petunia	Poinsettia 1	Poinsettia 2	Heliconia 1
Tuesday, July 22							
08:30-10:30			SS4: *Semiconductor Technologies : Defence and Space Applications*	SS3: *Airborne Surveillance Systems Technology*	SS1: *ISRO's Microwave Remote Sensing Payloads*	SS2: *Launch Vehicle Technologies*	SS5: *Space Weather/EMI/EMC*
10:30-11:00	TCN5: *Tea/Coffee/Networking*						
11:00-13:00	PS5: *Plenary: SPACE Technology and Ecosystem Development*						
13:00-14:00	LB3: *Lunch Break/Networking*						
14:00-15:00	*Plenary: SPACE Policy Initiatives for by Different States*						
15:00-16:00	PS6: *Panel Discussion on Opportunities for Industries and Startups in SPACE*						
16:00-16:30	TCN6: *Tea/Coffee/Networking*						
16:30-18:30			OS15: *GNSS Technologies*	OS16: *Women-Led Technolofy Developments-II*	OS17: *AI/ML in defence Radars*	OS18: *AIT/C-II*	OS19: *Docking & Rover Technologies*
18:30-19:00	PS7: *Industry Plenary*						
19:00-20:00	PS8: *Interaction With Astronauts*						
20:00-21:30	D2: *Cultural Program and Conference Dinner*						

Heliconia 2	Hibiscus 1	Hibiscus 2	Tulip	Aryabhata	Pritvi	HT-2	Vikram Sarabhai	DS Kothari
3MT: *Three Minute Thesis Competition*		OLS1: *OLS1*						
OS20: *Reliability & Quality Assurance*	OS21: *Photonics/Electro-optics/THz*	OS22: *Sensors*	OS23: *Antennas*	OS24: *AI/ML Technologies for SPACE*	OS25: *Wireless Sensor Networks & mm-wave Tech*	OS26: *Aircraft/HAP Technologies*	OS27: *Space Exploration*	OS28: *Embedded System/VLSI*

Time (Kolkata)	Convention Centre	Zinnia	Amarylis	Petunia	Poinsettia 1	Poinsettia 2	Heliconia 1
Wednesday, July 23							
08:30-09:00	*Plenary Talk: Advance Propulsion Technologies: Dr. S V Ramanamurthy, Director. GTRE*						
09:00-09:30	PS: *Celebrating 50 Years of Aryabhatta Spacecraft*				SS6: *Women in SPACE-I*		YFLP-I: *Young Faculty Lau*
09:30-10:30	PS9: *Panel Discussion on Integrated Vehicle Health Monitoring*						
10:30-11:00	TCN7: *Tea/Coffee/Networking*						
11:00-12:00	PS11: *Astronomy and Application Plenary*				SS7: *Space Technology Applications*		YFLP-II: *Young faculty La*
12:00-13:00	PS12: *Panel Discussion on Strategic Role of Technology in Security and Growth of a Nation*						
13:00-14:00	LB4: *Lunch Break/Networking*						
14:00-15:10	SSX: *Special Session on SemiCon India Mission*						
15:10-15:35	SS: *Plenary Talk: Dr. Abhay A Pashilkar, Director, NAL*		OS29: *Airborne Surveillance Systems*	OS30: *Women-Led Technology Developments-III*	OS31: *Beamformering Technologies*	OS32: *Ground Support & UAV Technologies*	OS33: *SAR Technologies*
15:35-16:00	PD: *Panel Discussion on Software Defined Systems*						
16:00-16:35							
16:35-17:30	PS13: *Awards and Valedictory*						
17:50-18:30	TCN8: *Tea/Coffee/Networking*						

Heliconia 2	Hibiscus 1	Hibiscus 2	Tulip	Aryabhata	Pritvi	HT-2	Vikram Sarabhai	DS Kothari
	Plenary Talk: Advance Propulsion Technologies: Dr. S V Ramanamurthy, Director. GTRE							
ureate Program			PS: *Celebrating 50 Years of Aryabhatta Spacecraft*					
	PS9: *Panel Discussion on Integrated Vehicle Health Monitoring*							
	PS11: *Astronomy and Application Plenary*							
ureate Program	PS12: *Panel Discussion on Strategic Role of Technology in Security and Growth of a Nation*							
OS34: *UAV Technologies-II*	OS35: *Communication-II*	OS36: *AI/ML Technologies for SPACE-II*	OS37: *Metamaterials/Metasurfaces/FSS*	OS38: *CubeSats-II*	OS39: *Quantum & Secured Communication Technologies*	OS40: *Control & Guidance-II*	OS41: *AIT/C-III*	OS42: *Ground Station Technologies*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PANEL DISCUSSION ON
SOFTWARE DEFINED SYSTEMS
PANELIST
Dr. S Somanath
2022-2025 Secretary, DoS & Chairman, ISRO
PANELIST
Dr. Aniruddha Mukhopadhyay
Lead Chief Technologist, Ansys
PANELIST
Dr. Jitendra J Jadhav
DS & DG ADA
MODERATOR
Dr. G Satheesh Reddy
2018-2022 Secretary, DDR&D & Chairman, DRDO
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PANEL DISCUSSION ON
OPPORTUNITIES FOR INDUSTRIES AND STARTUPS IN SPACE
Panelist
Baskar Ceri
MD, NI India
Panelist
Ronak Samantray
TakeMe2Space
Panelist
Suyash Singh
GalaxEye
Moderator
Dr. Subba Rao Paluvuri
CMD, ATL
Panelist
Neha Satak
Astrom
Panelist
Dr. Tapan Misra
SISIR Radar
Panelist
Sri Sunil
President, IETE
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PANEL DISCUSSION ON
INTEGRATED VEHICLE HEALTH MONITORING
Panelist
Dr Vinay Jammu
VP, GE Digital, USA
Panelist
Shri Padma Kumar ES
Director, IISU
Panelist
Mr. Satish Thokala
Mathworks
Panelist
Mr. Adishesha CS
Collins Aerospace
Moderator
Dr. Seema Chopra
ED Boeing
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STRATEGIC ROLE OF TECHNOLOGY IN SECURITY AND GROWTH OF A NATION
Panelist
Lt. General (Retd) Ramesh Halagalli
Deputy Chief Indian Army
Panelist
Prof. P M Soundar Rajan
NIAS
Panelist
Rear Adm(Retd.) Mohit Gupta
India Army
Panelist
Mr. Anupam Sharma
Director, DSP, DRDO, Maj. Gen (Retd)
Panelist
Brig. Manoj
DSA
Moderator
Maj. Gen (Retd.) Pawaan Anand
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INDIA SEMICON MISSION
PANELIST
Mr. Jayraj Nair
CTO, Ansys
PANELIST
Dr S D Sudarsan
ED, C-DAC
PANELIST
Sidhartha Mohanty
Senior Director, Intel
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PANEL DISCUSSION ON
SPACE TECHNOLOGIES FOR ATMANIRBHAR ANDD VIKSIT BHARAT
Panelist
Mr Hari Kumar R
Director (R&D)
Panelist
Sri Y Dileep
DS & ADE Director
Panelist
Dr. R V Nadagouda
DS & AD(P), URSC,
Panelist
Mr. Venkat Katkuri
Head, Airbus DS, India & SA
Panelist
Dr. K Rajalakshmi Menon
DG(Aero), DRDO
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Monday, July 21 16:00 - 16:30 (Asia/Kolkata)

TCN4: Tea/Coffee/Networking

Monday, July 21 16:30 - 18:30 (Asia/Kolkata)

OS1 : Power/Energy/Power Electronics

Room : Amarylis

Chairs : Ritam Chakraborty (Fluence Energy, India), S n Singh (IIT Kanpur, India)

16:30 **Motor Types and Their Suitability Analysis in Aerospace Applications**

Abhishek PC and Prajnashree Hebbar (Manipal Institute of Technology, India); Bindu S (Manipal University & Manipal Institute of Technology, Manipal, India); Athulya Jyothi V and Lakshman Rao S Paragond (Manipal Institute of Technology, India)

16:45 **Optimal WBG Device Selection for Enhanced Inverter Performance in Tactical Energy Systems**

Debarghya Dutta and Pabitra Biswas (National Institute of Technology Mizoram, India)

17:00 **Mathematical Modeling and Transient Analysis of Switched Mode SONAR Power Converter Topologies**

ANU TK (A. P. J. Abdul Kalam Technological University, India); Panchalai VN (NPOL, India & NITT, India); Yedukrishnan C Gopal (NPOL, India)

17:15 **Designing of a Multi-Voltage Bandgap Reference for Biomedical Applications**

Praveen Hunasigidad and Nagaveni S (IIT Dharwad, India)

17:30 **Dynamic Arc Simulations of Contactor Using MHD Analysis**

Pooja G (Company, India); Sandeep Santhanagopal and Shashikumara M (TE Connectivity, India)

17:45 **AC Electronic Load for Testing of a SONAR Power Amplifier**

Sateesh Kumar Kuncham (NIT, Tiruchirappalli, India); Ronit Mishra (M.Tech, India); Panchalai VN (NPOL, India & NITT, India); Kumaresan Natarajan (National Institute of Technology, Tiruchirappalli, India)

18:00 **Design, Simulation and Realization of Planar Transformers for Electronic Power Conditioners**

Amrit Shandilya (Space Applications Centre & ISRO, India); Deepak Kumar Agarwal (Space Applications Center Isro, India)

18:15 **Grey Wolf Optimization Based SMC for Traction Control of an Electric Vehicle**

Dimna Denny C (A P J Abdul Kalam Technological University Kerala, India); Ramesh Kumar P (Government Engineering College Thrissur, India & Kerala Government, unknown); Sivadasan K V (Government Engineering College, Wayanad, India)

Monday, July 21 16:30 - 18:30 (Asia/Kolkata)

OS2 : Women-Led Technology Developments-I

Room : Petunia

Chairs : **Madhumita Chakravarti (Defence Research and Development Organisation (DRDO), India), Nandini Harinath (ISTRAC, India)**

16:30 **Design and Fabrication of Ultra-Wideband Power Divider for Spacecraft Checkout Applications**

Abhilasha Agarwal (Indian Space Research Organization, India); Viswanadha Srivani, Raja Sharma and MD. Tosicul Wara (UR Rao Satellite Center, Indian Space Research Organisation, India)

16:45 **GIS-Based Unified Mission Management System with Enhanced AI Capabilities for Monitoring and Controlling Multiple Drones**

Sonia Mitruka and Rajwala Pinkesh P (Bharat Electronics Limited, India)

17:00 **Rugged and Cost-Effective Data Storage Solution for Human Flight Missions**

Namrata Kar (ISRO, India); Konganapalle Gowthami and Puja Singh (URSC, ISRO, India); Jafi E J (Indian Space Research Organisation (ISRO), India); Srividhya R (URSC, ISRO, India); Srividhya S (ISRO, India)

17:15 **Integrated Approach to IEL and HIRF Analysis Towards Certification of Aircraft**

Veena Haridas (CSIR-National Aerospace Laboratories, India); Vaitheeswaran M (National Aerospace Laboratories, India)

17:30 **Flexible Communication Payload for Switchable Broadcast & Broadband Services in India**

Neha Mehra (Space Applications Centre, ISRO, India); Abhishek Kakkar and Subhash Bera (Space Applications Centre & ISRO, India)

17:45 **A Tri-Band Stacked Microstrip Patch Antenna for NavIC Ground Segment Applications**

Shikha Maharana and T Subramanya Ganesh (ISTRAC, India); Debdeep Sarkar (Indian Institute of Science, India); Dileep Dharmappa (ISTRAC, India)

18:00 **Deep Learning Based Mars Terrain Classification with Edge Detection for Planetary Rovers**

Sri Hema N and Jegathesan V (Karunya Institute of Technology and Sciences, India); Jamuna Sri N (JCT College of Engineering and Technology, India); Sai Teja Varma Chekuri (Karunya Institute of Technology and Sciences, India)

Monday, July 21 16:30 - 18:30 (Asia/Kolkata)

OS3 : Remote Sensing Applications

Room : Poinsettia 1

Chairs : Imteyaz Ahmad (Indian Space Research Organisation, India), V S Hegde (ISRO, India)

16:30 **Estimation of Evapotranspiration Using GIS and Remote Sensing with Landsat Images**

Aadithya Thirumalai Ananthanpillai (NITInnov Technologies Pvt ltd & ACW (Aries Connects world), India); Subashini Kumaraswamy, Sr (NIT INNOV TECH, India & NIT INNOVTECH, India); Karthikeyan Dhesingu (NITinnov Technologies Pvt Ltd & Aries Connects World, India); Devesh Arvind Patel (Aries Connects World Inc., USA); Suresh M (NITInnov Technologies Private Limited, India & Aries Connects World Inc, USA)

16:45 **Design and Implementation of Low-Cost LiDAR System**

Charulatha Siva and Pakanati Guna Sri (Hindustan Institute of Technology and Science, India); Havilah Y.J (Hindustan, India)

17:00 **Explainable AI (XAI) Assisted Prediction Model for Soil Fertility**

Remya Praveen, Vaishnav Kale and Prateek Saurabh Srivastav (D Y Patil International University, India)

17:15 **Sustaining Bengaluru: Predictive Modeling of NDVI, Rainfall, AQI, and Temperature Trends**

H S Prasantha (Atria University, India & N/a, India); Deepesh Yadav and Dhanikonda Venkat Venu (Atria University, India)

17:30 **Jitter Correction Network - a Deep Multi-Scale Optical Flow Framework for Robust Satellite Image Restoration**

Abdullah Taher (King Abdulaziz City for Science and Technology (KACST), Saudi Arabia)

17:45 **Vertical Growth of City from Time Series High Resolution Stereo Imagery**

Nalini J (National Remote Sensing Centre, India); Saravanan S (National Institute of Technology, Tiruchirapalli, India)

18:00 **Machine Learning-Based Ionospheric Anomaly Detection for Earthquake Prediction in NorthEast Region, India**

Sankar P (Hindustan Institute of Technology & Science, India); Charulatha Siva (Hindustan Institute of Technology and Science, India); Cindrelaa J (SRM Institute of Science and Technology, India)

Monday, July 21 16:30 - 18:30 (Asia/Kolkata)

OS4 : CubeSats-I

Room : Poinsettia 2

Chairs : Ravi Chandra Babu G (UR Rao SAttellite Centre, India), Sreedharan Pillai Sreelal (Indian Space Research Organization, India)

17:00 **Communication Link Design and Budget Analysis for JSS Nanosatellite Project**

Thyagarajamurthy A (JSS Science and Technology University, Mysuru, India); Aprameya C V (JSS Science and Technology University, India); Sudarshan Patil Kulkarni (JSS Science and Technology University, Mysuru, India); Jayakumar Venkatesan (Valles Marineris International Pvt Ltd, India); Shankaraiah N (JSS Science and Technology University, Mysuru, India); Shashidhar R (JSS Science and Technology University, India)

17:15 **High-Gain Sequentially Rotated LHCP Metasurface Antenna Array for Uplink Ka-Band CubeSat Applications**

B Satyanarayana (Bangalore University, India); Shashi Kumar D (Christ University, India); Venkatesha Muniswamy (Sai Vidya Institute of Technology, India); Vasudeva R Reddy (Votary Softech Solutions Pvt Ltd Hyderabad, India)

17:30 **Design and Analysis of PCB-Integrated 1U CUBESAT Structure for Enhanced Payload Capacity**

Charan Raj (Dayananda Sagar University, India & Dayananda Sagar Institution, India); Sripad Kulkarni, Prashantha Kumar and KH Navalguand (Dayananda Sagar University, India)

17:45 **Low Earth Orbit Earth Observation Small Satellites Constellation - Applications and Market Potential**

Hariharan VK (Dayananda Sagar University, India)

18:00 **Facilities Establishment for Small Satellite Manufacturing and Operations**

Hariharan VK (Dayananda Sagar University, India)

18:15 **Space Science and Technology Education in India**

Hariharan VK (Dayananda Sagar University, India)

Monday, July 21 16:30 - 18:30 (Asia/Kolkata)

OS5 : SDR

Room : Heliconia 1

Chairs : Mangal Lal Chand (DRDO, India), Sumitesh Sarkar (Indian Space Research Organization, India)

16:30 Eliminating Software-Defined Radio Dependency in Satellite Security Research: a Software-Based Attack Model

Kelli Yuvraj and Abhay Kumar Das (Silicon University, India)

16:45 Comparative Analysis of Fairness Models Using Multicast RSMA

Sony Sethukumar (Indian Institute of Space Science and Technology, India); Chris Prema (Associate Professor & Indian Institute of Space Science and Technology, Trivandrum, India)

17:00 Sensing Performance Analysis of OTFS Waveforms with Digital Modulation for ISAC

Anup George Koshy (VIT University, Vellore, India); Nanditha Unnikrishnan (CABS DRDO & Defence Research Development Organization, India); Ramkumar R (DRDO, India); R Rajesh (CABS, India)

17:15 Effect of Gain/Phase Imbalance in the Quadrature Modulator of the Communication Systems on Spectral Efficiency

Aditya Kumar (Indian Institute of Technology, Roorkee, India); Meenakshi Rawat (Indian Institute of Technology Roorkee, India)

17:30 Expanding Connectivity Beyond Terrestrial Limits

Chengappa Munjandira (Hewlett Packard Enterprise, India)

17:45 Low-Cost Ground Station Design for NOAA APT Signal Reception Using SDR

Maitreyee Choudhary and Riya Tambekar (MIT World Peace University, India)

Monday, July 21 16:30 - 18:30 (Asia/Kolkata)

OS6 : Trajectory Design

Room : Heliconia 2

Chairs : Roshan Thomas Eapen (Penn State University, USA), Vinod Kumar (IN-SPACE, India)

16:30 **A Smooth Interpolated Trajectory for Rapid Maneuver Between Current and Target Quaternions During Abort in Human Spaceflight Missions**

Sugandha Maniktala (ISRO, India & Department of Space, India); Rima Ghosh (URSC, India); Rijesh MP (UR Rao Satellite Centre, India & Indian Space Research Organization, India); Mohan Sundara Siva (Government & Indian Space Research Organisation, India)

16:45 **Transfer Between Orbits in the Cislunar Space Using a Virtual Target Following Strategy**

Priyanjali Shukla (Indian Institute of Science, Bangalore, India); Debasish Ghose (IISc Bangalore, India)

17:00 **Cubic Polynomial-Based Predictor-Corrector Guidance for Integrated Entry and Descent**

Partha Ajit Surve (Indian Institute of Science, India); Radhakant Padhi (Indian Institute of Science, Bangalore, India)

17:15 **Orbit Bundle Based Halo Orbit Allocation Policy in Cislunar Space**

Madhav Nakani (Indian Institute of Science, India); Ishfaq Zahoor Bhat (Indian Institute of Science, Bengaluru, India); Debasish Ghose (IISc Bangalore, India)

17:30 **Natural Trajectory Transfer Between Halo Orbits for Optimal Closest Approach to Desired Orbit**

Ishfaq Zahoor Bhat (Indian Institute of Science, Bengaluru, India); Debasish Ghose (IISc Bangalore, India)

17:45 **AI-Driven Space Debris Detection and Trajectory Prediction for Enhanced Safety at Bhartiya Antriksh Station**

Shubham Dahatonde (Manipal University Jaipur, India & UR Rao Satellite Centre & Indian Space Research Organisation, India); Gyanesh Kumar (UR Rao Satellite Centre & Indian Space Research Organisation, India); Varaa Sharma (Manipal University Jaipur, India)

18:00 **Optimizing Soft Landing Trajectory Design for Lunar Missions: Fuel Efficiency and Control Strategies**

Amrutha V P (APJ Abdul Kalam Technological University, India & College of Engineering, Trivandrum, India); Sreerenjana R (APJ Abdul Kalam Technical University, India); Sreeja S (College of Engineering Trivandrum Kerala, India)

18:15 **An Enhanced and Efficient Approach to Launch Vehicle Liftoff Clearance Using GJK-VHACD Algorithm**

Prashant G Iyer, Mansoor KS and Sheethal Antony (Vikram Sarabhai Space Center, India)



Monday, July 21 16:30 - 18:30 (Asia/Kolkata)

OS7 : Signal/Data Processing

Room : Hibiscus 1

Chairs : Maria Sabrina Greco (University of Pisa, Italy), P Radhakrishna (LRDE, India)

16:30 **Tracking Performance Bounds**

Stefano Coraluppi and Andrew Hunter (STR, USA)

16:45 **Conventional Vs Deep-Learning Methods for Visible and Infrared Image Fusion: a Human Perception Based Comparison**

Nithin Eswarappa and Jeevan K. M. (Gandhi Institute of Technology and Management (GITAM), India); Shefali Waldekar (Nirma University, India); Bikram Kumar Vivek (Gandhi Institute of Technology and Management (GITAM), India); Koshy George (GITAM University, India)

17:00 **Trimodal Image Fusion Framework for a Visible-Infrared-SAR Benchmark Dataset**

Nithin Eswarappa and Jeevan K. M. (Gandhi Institute of Technology and Management (GITAM), India); Shefali Waldekar (Nirma University, India); Bikram Kumar Vivek (Gandhi Institute of Technology and Management (GITAM), India); Koshy George (GITAM University, India)

17:15 **High Oblique Aerial Remote Sensing: Analysis of Geopointing Accuracy**

Sangeeta Shrivastava (CAIR, India); Dilip Kumar Dalei (DRDO, India); Rajesh Kumar (CAIR, India); Narayan Panigrahi (Defence Research and Development Organisation, India)

17:30 **geoAnalytics: an Open Source Python Library for Geospatial Data Analytics**

Kattumuri Vanitha (The University of Aizu, Japan); Uday Kiran Kiran Rage (The University of Aizu, Japan & NICT, Japan); Yohiko Ogawa and Makiko Ohtake (University of Aizu, Japan)

17:45 **Compound Barker Code Generation for High Range Resolution at Longer Range of Indian ST Radar**

Mohit Tanti (National Institute of Technology Rourkela, India); Arghadeep Saha (RCC Institute of Information Technology, India); Lakshi Prosad Roy (National Institute of Technology, Rourkela, India)

18:00 **Multisensor Association of Airborne Radar and IFF with Dynamic Gating Logic**

Renu Kumari Chauhan (Centre for Airborne Systems, India); B R Kapuriya, A Muthukumar and R Rajesh (CABS, India)

18:15 **Adaptive Spirometry: a Computational Approach to Correct Pulmonary Function Readings Across Different Environments**

Pankaj Jain (Nanasaheb Mahadik College of Engineering, India)

Monday, July 21 16:30 - 18:30 (Asia/Kolkata)

OS8 : Target Detection and Direction Finding

Room : Hibiscus 2

Chair : Anil Kumar Singh (LRDE, India)

16:30 **ML Based Intrusion Detection System Using NLP**

Harsika Diksha (Government, India); Tushar Gautam (India)

16:45 **Single-Receiver Target Detection and Localization of Space Objects**

Justin K. A. Henry (Pennsylvania State University, USA & The Pennsylvania State University, USA); Ram M Narayanan (Pennsylvania State University, USA)

17:00 **Source Localization Using Majorization-Minimization (MM) Method Based on Frequency Difference of Arrival (FDOA) and Time Difference of Arrival (TDOA)**

Dishita Singh (Defence Research and Development Organisation (DRDO) & LRDE, India)

17:15 **SWaP Optimized Multiband Exciter Receiver Architecture for C/X/Ku-Band Radars**

Rahul Agrawal, Amit Goel, Vishal Maheshwari, Sumanta Pal and Ashutosh Kumar (LRDE, India)

17:30 **Clutter Mitigation Using Time Reversal Processing for Multi-Dynamic Radar Scenario**

Jawed Qumar (Indian Institute of Technology Guwahati, India); Christopher S (IITM, India)

17:45 **3D Direction of Arrival Estimation in Ultra-Low SNR of Frequency Modulated Signal Using Space-Time Modulated Metasurface**

Atharva Joshi (Visvesvaraya National Institute of Technology Nagpur, India); Neeraj Rao (Visvesvaraya National Institute of Technology Nagpur, Maharashtra & Ministry of Human Resource and Development, India); Anjuli Mothe and Mukundan Vijay (Visvesvaraya National Institute of Technology, India)

Monday, July 21 16:30 - 18:30 (Asia/Kolkata)

OS9 : Microwave Devices

Room : Tulip

Chairs : Sanjeev Kulshrestha (Space Application Centre, ISRO, India), Mahadevan Vaidyanathan (ISRO & PES University, India)

16:30 **Design and Development of Miniaturized UHF Band Circulator for Space Applications**

Md Ehsanul Haque, Krunal V. Parikh and Ashish Jain (Space Applications Centre, ISRO, Ahmedabad, India); Tushar V. Gajjar (Space Applications Centre, Ahmedabad, India); Surya Prakash Sharma (Space Applications Centre, India); Keyur Trivedi (Sci/Eng, India)

16:45 **Design Considerations in TR Module for SSR Application**

Savita Gond (DRDO, India & CABS, India); Nitin Kumar (Defence Research Development Organization, India); Pushkar Lal Vijayvergiya (Centre for Airborne Systems, India); Manjunatha K (CABS, DRDO, India); Harish Naik and A K Singh (Centre for Airborne Systems, India)

17:00 **Design, Simulation & Development of Multiband RF Up-down Converter with IBW of 2GHz**

Chittaranjan Swain (CABS DRDO, India); Thara Mathew (CABS, India); Jayaprakash K P (CABS, DRDO, India); Santhya P (CABS, India)

17:15 **Design and Realization of Wide Bandwidth Contiguous Waveguide Output Multiplexer with Dual-Passband Filters**

Prajot Anil Ballamwar (Space Application Centre, ISRO, India); Hitesh Modi (Sac isro, India); Parthasarathi Samanta (Space Applications Centre, ISRO, Ahmedabad, India); Praveen Ambati (SAC-ISRO, India)

17:30 **High-Performance Wideband Helical Resonator Filter with Tunable Cross-Coupling**

Shivam Tiwari (Space Applications Centre, India); Kirti Srivastava (India); Praveen Ambati (SAC-ISRO, India)

17:45 **Frequency Response Improvement in Semi Rigid Cables for High Frequency Application**

Nishant Shukla (SAC, ISRO, India); Akhilesh Mohan (Indian Institute of Technology Roorkee, India); Praveen Ambati (SAC-ISRO, India); Jayesh Thakkar (SAC, ISRO, India)

18:00 **Simulation Studies on Slow Wave Structure Characteristics in Magnetically Insulated Line Oscillator**

Shivabhagya M S, D Senthil Kumar and S K Datta (DRDO, India); Srinivas N (Scientist, India)

18:15 **2D Antenna Array Design Using 4 x 4 Butler Matrix for X-Band Applications**

Dhanesh Kumar Jallepalli (SRM University AP, India); Prasannakumar Seelam (SRM University, AP, India); Rupesh Kumar (SRM University AP, India)

Monday, July 21 16:30 - 18:30 (Asia/Kolkata)

OS10: Control & Guidance-I

Room: Aryabhata

Chairs: Sudhakar S (ISRO Satellite Centre (ISAC, Now URSC), India), Puneet Singla (Penn State University, India)

16:30 **Satellite Attitude Control via Convex Stability Without Using Eigenvalues with Significant Computational Savings**

Rama K Yedavalli (Robust Engineering Systems, LLC, USA & The Ohio State University, USA)

16:45 **Fast Attitude Settling and Pointing Control with Self-Adjusting Saturation for Agile High-Throughput Spacecraft**

Chiranjib Guha Majumder, Ashok Kumar Kakula and Jithesh PV (Indian Space Research Organization, India); Shubha Kapoor (ISRO, India); Mohan Sundara Siva (Government & Indian Space Research Organisation, India)

17:00 **Plant Control Calibration for Satellite Attitude Determination and Control System (ADCS)**

Hemesh Patil (Ansys Inc., India); Himangshu Bora (Ansys Inc, India); Nitin Gupta and Prem Andrade (Ansys Inc., India)

17:15 **Magnetometer and Sun Sensor Based Attitude Estimation**

Vikram Kumar Saini (Indian Institute of Technology, Kanpur, India & Bellatrix Aerospace, India); Shubhakriti Gupta (Manipal Institute of Technology, India); Dipak Kumar Giri (IIT KANPUR, India)

17:30 **Satellite Navigation and Control Using Discrete-APF and Fixed-Time Sliding Mode Controller**

Paridhi D Choudhary (Indian Institute of Technology, Kharagpur, India); Rakesh Kumar Sahoo (Indian Institute of Technology Kharagpur, India); Manoranjan Sinha (Indian Institute of Technology, Kharagpur, India)

17:45 **Design and Development of Table-Top Spacecraft Attitude Control Testbed Using Pyramidal Configuration Control Moment Gyroscopes**

Aditya Nath Roy, Mridul Sengupta and Aman B Bhavsar (Indian Institute of Technology Kanpur, India); Arya Das and Abhilash Karan (IIT Kanpur, India); Dipak Kumar Giri (IIT KANPUR, India)

18:00 **Impact Angle Constrained 3D Guidance Law for Stationary Target Interception**

Naman Kumar Sahu, Sayantan Pal and Sikha Hota (Indian Institute of Technology Kharagpur, India)

18:15 **Enhanced Lateral-Directional Control for Aircraft with Auto-Tuned ARI Gain**

Kapil Sachan and Guruganesh R (CSIR National Aerospace Laboratories, India); Jayalakshmi M (Aeronautical Development Agency, India)

Monday, July 21 16:30 - 18:30 (Asia/Kolkata)

OS11 : Communication-I

Room : Pritvi

Chairs : Neelavathy M (URSC, India), Anindya Saha (Tejas Networks, India)

16:30 **Managing Resources in Semantic Communications Enabled Wireless Systems**

Sridhar Iyer (KLE, India)

16:45 **BSC and BEC-Based Information-Theoretic Modeling and Analysis of SAGIN and SAGUIN Point-to-Point Links**

Samyak Sahu (Birla Institute of Technology and Science Pilani, India); Sainath Bitragunta (Birla Institute of Technology and Science Pilani, Rajasthan, India)

17:00 **Phase Gradient Surface for in-Satellite Communications**

Sylvie Rana and A. r. Harish (Indian Institute of Technology Kanpur, India)

17:15 **Intelligent Channel Coding Using Graph Neural Networks: a Machine Learning Perspective**

Koushik Kota, M Thilakeshwari and T Likith Vignesh (GITAM School of Technology, India); Nagarjuna Telagam (GITAM University, India); Ambar Bajpai (GITAM University, Bengaluru & IEEE Bangalore Section, India)

17:30 **Optimized RACH Procedure for Low Earth Orbit (LEO) Satellites in Non-Terrestrial Networks (NTN)**

Harshit Gupta (Bharat Electronics Limited, India); Nidhi Srivastava (Central D&E & Bharat Electronics, India)

17:45 **Communication Blackout Analysis of Hypersonic Re-Entry Vehicles**

Vaishnavi Bhope, Saurabh Patwardhan and Vishal Tripathi (ANSYS SOFTWARE PVT LTD, India); Nijas Cm (Ansys Software Pvt Ltd & Ansys, India)

18:00 **A Comparative Analysis of Advanced Modulation and Coding Schemes for LEO Based Satellite Network**

Deepika Revankar Manjunath (Bharat Electronics Limited, India)

18:15 **Phase Continuity Scheme for Digital FMCW Generation**

Shivani Bhargav and Saravana B Kumar (Indian Space Research Organisation, India); Prateek Kumar (Space Application Centre ISRO, India); Umang Bhatia (Indian Space Research Organisation, India); Ritesh Kumar Sharma (Space Applications Centre, India); Rinku Atulkumar Agrawal (Space Application Centre ISRO, India)

Monday, July 21 16:30 - 18:30 (Asia/Kolkata)

OS12 : UAV Technologies-I

Room : HT-2

Chairs : Kamesh Namuduri (University of North Texas, USA)

16:30 **Distributed EO/IR Drones for Area Suveillance**

Mark E Davis (Medavis Consulting, USA)

16:47 **Development of Transition Controller for a Tilt-Rotor VTOL UAV with Dynamic Control Allocation**

Yokesh K (Indian Institute of Science, India); Sai P S V S Kumar (Indian Institute of Science Bangalore, India); Radhakant Padhi (Indian Institute of Science, Bangalore, India)

17:04 **Autonomous UAV Path Planning for Window Detection and Traversal: Ensuring Smooth and Safe Navigation**

Rudrashis Majumder (Indian Institute of Science, India); M R Rakshith (IIT Kanpur, India); V Sundaram Suresh (Indian Institute of Science, India)

17:21 **A Hybrid Approach Towards Remaining Useful Life Prediction of Li-Ion Batteries of UAVs**

Dharmaraja Selvamuthu, Ritam Dasgupta and Ayush Sharma (IIT Delhi, India)

17:38 **Reliability and Maintainability in UAV Systems: an Analytical Approach**

Dharmaraja Selvamuthu, Ishav Singla and Devansh Agarwal (IIT Delhi, India)

17:55 **A CTMC-Based Approach for UAV Maintenance Optimization: Balancing Cost and Availability**

Dharmaraja Selvamuthu and Sanya Sachan (IIT Delhi, India); Raina Raj (Indian Institute of Technology Delhi, India)

18:12 **Modeling and Simulation of UAV Maintainability Using an Optimization Approach with Environmental Constraints**

Dharmaraja Selvamuthu (IIT Delhi, India); Ankit Kumar Kumar (Indian Institute of Technology, Delhi, India); Raina Raj (Indian Institute of Technology Delhi, India)

Monday, July 21 16:30 - 18:30 (Asia/Kolkata)

OS13 : AIT/C-I

Room : Vikram Sarabhai

Chairs : Raghavendra Mr (ISTRAC, ISRO, India), A K Singh (Centre for Airborne Systems, India)

16:30 **AUTOMATED INTERPRETATION of on-Board 1553B Transactions from BUS MONITOR for ADITYA L1**

Tharun SV (ISRO, India); Unnikrishnan P and Anjani Srilaxmi (URSC, India); Krishnan V (ISRO, India)

16:47 **Phase Harmonization in T/R Modules Through ATE Measurements**

Bhupendra Kumar and Karthik Bodaballa (Centre for Airborne Systems DRDO, India); Harish Naik (Centre for Airborne Systems, India); Manjunatha K (CABS, DRDO, India); A K Singh (Centre for Airborne Systems, India); Jawed Qumar (Indian Institute of Technology Guwahati, India); Manoj Kumar Meshram (Indian Institute of Technology (BHU) & Banaras Hindu University, India)

17:04 **Design and Development of Automated Test Equipment for Airborne Surveillance System**

Amit Kumar (Centre for Airborne Systems, DRDO, India); Bhupendra Kumar (Centre for Airborne Systems DRDO, India); Jawed Qumar (Indian Institute of Technology Guwahati, India)

17:21 **Large Scale Synthetic 3D Terrain Generation and EOIR Sensor Simulation for ISTAR Applications**

Arun Kumar and Pooja Goel (Centre for Airborne Systems, DRDO, India); Sony Soman Oommen (DRDO, India); Santhya P and Maheshwaran Y (CABS, India); Aruna Shanmugasundaram (CABS, DRDO, India); Avinash M (Government, India & DRDO, India)

17:38 **Experimental Performance Evaluation of RF over Fiber Optic Channel for QPSK Modulation**

Santosh Kumar (CABS, DRDO, India); Chittaranjan Swain (CABS DRDO, India); Jayaprakash K P (CABS, DRDO, India); Santhya P (CABS, India)

17:55 **Design and Development of s-Band WR-340 Waveguide Full Height to Quarter Height Transitions for Satellite Testing Applications**

Karri V R Dinesh Kumar Reddy (URSC & UR Rao Satellite Center, India); MD. Tosicul Wara (UR Rao Satellite Center, Indian Space Research Organisation, India); Suneeta V and Kraleti Chandrasekharam (URSC, India)

18:12 **Verification and Validation of MIL STD 1553B BUS Protocol Using OmniBus II PXIe Card**

Nidhi Mittal and Deepthi VD (CABS DRDO, India); Jayaprakash K P (CABS, DRDO, India); Santhya P (CABS, India)

Monday, July 21 16:30 - 18:30 (Asia/Kolkata)

OS14 : Antenna Arrays

Room : DS Kothari

Chairs : A. r. Harish (Indian Institute of Technology Kanpur, India), Machavaram V. Kartikeyan (Indian Institute of Technology, Roorkee, India)

16:30 **Active Return Loss (ARL) Optimization Using Unit Cell Analysis and Its Verification Using a Finite Size Array for Active Phased Array Radar**

Ravi Kumar Samminga, Scientist (DRDO, India & LRDE, India); Khushboo Daga (RF and Antenna Design, India); Amlesh Singh (LRDE, India & DRDO, India)

16:45 **Reducing Scanning Losses in Linear Arrays Using Dielectric Domes with Matching Layers**

Mahima Gowda RG, Ravi Kumar J K and A Mahesh (RV College of Engineering, India); Ashutosh Kedar (Scientist F, India)

17:00 **A 2×2 Series-Feed Single Port Antenna Array for Radar Applications**

Venkata Kishore Kothapudi (Vignan's Foundation for Science Technology and Research, India); Sarikonda Gopi Krishna Raju (Vignan's Foundation for Science, Technology, Research, India); Gudipudi Teja Kumar (Vignan's Foundation for Science, Technology & Research, India); Sana Sultana, Gobburi Nandini and Shaik Nashfatha (Vignan's Foundation for Science, Technology, and Research, India); Pappula Lakshman (IIT Bhubaneswar, India); Vijay Kumar (VIT University, India)

17:15 **Dual Directional Beam Generation and Scanning in Time-Modulated Antenna Arrays at Harmonic Frequencies**

Kannarao Shatarasi (NIT Warangal, India); Gopi Ram (National Institute of Technology, Warangal, India); Subbareddy Ankinapalli (NIT Warangal, India)

17:30 **An Easily Alterable 2-Bit Binary Coding Sequence Reconfigurable Array Antenna for Passive Pattern Diversity Applications at ISM Band**

Swarnadeep Koley (Institute of Engineering and Management, Kolkata, India & University of Engineering and Management, Kolkata, India); Soham Banerjee (IEMK, India); Mayukh Dutta (Insitute of Engineering and Management, Kolkata & MAKAUT, India); Soumajit Chatterjee (Institute of Engineering and Management, Kolkata, India); Malay Gangopadhyaya (Institute of Engineering and Management, Kolkata & University of Engineering and Management, Kolkata, India); Gobinda Sen (Institute of Engineering & Management, Kolkata, West Bengal & UEM, Kolkata, India)

17:45 **Design and Synthesis of a Dual Band Series Feed Microstrip Patch Antenna Arrays Using Machine Learning and Deep Learning Algorithms**

Shubham Acharya (Kolkata, India); Malay Gangopadhyaya (Institute of Engineering and Management, Kolkata & University of Engineering and Management, Kolkata, India); Gobinda Sen (Institute of Engineering & Management, Kolkata, West Bengal & UEM, Kolkata, India)

18:00 **Analysis of CP Antenna Array with Flat and Hemispherical Dielectric Lenses**

Mohith N Raate (R V College of Engineering, India); Shushrutha K S (RVCE Bangalore, India); A Mahesh (RV College of Engineering, India)

18:15 **Graded Dielectric Multilayer Flat Lens for High Efficiency CP Antenna Arrays**

Mohith N Raate (R V College of Engineering, India); Shushrutha K S (RVCE Bangalore, India)

Tuesday, July 22 16:30 - 18:30 (Asia/Kolkata)

OS15: GNSS Technologies

Room: Amarylis

Chair: Surendra Pal (Indian Space Research Organisation, India)

16:30 **Interference Scenarios in Indian Navigation Satellite Systems**

Subhash Bera and Saket Buch (Space Applications Centre & ISRO, India); Dhaval Upadhyay (Space Application Centre, India); Vijay Singh Bhadouria (Space Applications Centre, ISRO, India)

16:45 **RF Front-End Design and Realization for Onboard GNSS SSV Receiver**

Avinash R Pulsay and Amit Rawat (Space Applications Centre, ISRO, India); Rati Singh and Jayesh Thakkar (SAC, ISRO, India)

17:00 **A Study of Traditional Ranging of Geosynchronous Satellites Towards Optimising Terrestrial Dependency**

Ramarao G (Jain University, India & Personal, India); Raju G (Jain University, India); Hemanth Reddy N (Indian Space Research Organisation, India); Neelavathy M (URSC, India)

17:15 **Low Earth Orbit (LEO) as an Alternate Source for Position Navigation and Timing (PNT) in Airborne Aerospace Applications**

Sourav Chatterjee, Atanu Santra, Subramanian Ramasamy and Seetharam Pandith (Collins Aerospace, India)

17:30 **Cognitive Enhanced Dual-Stage Weak Signal Acquisition**

Nithin C Biju (BITS Pilani Goa Campus, India)

17:45 **Advanced NavIC Receiver Architecture with Multi-Application Support for Low Earth Orbit Missions**

Vinoj VS (Indian Space Research Organization, India & ISRO Inertial Systems Centre, India); Biju V S, Mohammed Basim, Anand Shankar, Rekha AR and Radhakrishna Pillai C (ISRO, India)

18:00 **Overview and First Results of Onboard DDM Processor of EOS-08/GNSS-R Payload**

Pratik Sharma (Space Applications Centre, ISRO, India); Saravana B Kumar (Indian Space Research Organisation, India); Pramod Mishra (Indian Space Reasearch Organization India, India); Avadhesh Kumar (SAC-ISRO, India); Shalini Gangele (Space Applications Centre, ISRO, India)

18:15 **Single Layered, Single Feed, Dual Band Circularly Polarized Patch Antenna for GNSS Applications**

Mekala Devi. V and Mithunesh K V (Amrita University, India); Mruthyunjai Sriram E (Amrita Vishwa Vidyapeetham, India); S Balasubramaniyam and Mohit S (Amrita University, India)

Tuesday, July 22 16:30 - 18:30 (Asia/Kolkata)

OS16: Women-Led Technolofy Developments-II

Room: Petunia

Chair: Hema Singh (CSIR-National Aerospace Laboratories, Bangalore, India)

16:30 **Broadband K/Ka Band Dual-Linear/Dual- Circular Polarized Feed Design for Satellite Payload Testing in Compact Antenna Test Ranges**

Haindavi Manigilla and Puneet K Mishra (URSC, India); Renuka R (URSC, Bangalore, India)

16:45 **Optimized Logarithmic Spiral Antenna for GPR System to Detect Landmines and Explosives**

Chetna Sharma, Priyanka Jangid and Gyan Singh Yadav (IIIT Kota, India); Dinesh Vishwakarma (PDPM-IIITDM Jabalpur, India)

17:00 **Prediction of 1D Array Antenna at V-Band Using ANN Approach**

Gayatri Routhu (SRM University AP, India); Manas Sarkar (ISTRAC, India); Rupesh Kumar (SRM University AP, India)

17:15 **Optimizing Disaster Response With tHAPs: Modeling and Coverage Analysis for Crisis Zones**

Neha Tiwari and Dharmaraja Selvamuthu (IIT Delhi, India); Swades De (Indian Institute of Technology Delhi, India)

17:30 **Design and Development of Pipeline Inspection Bot**

Nanda Radhakrishnan and Niran S Narayanan (College of Engineering Trivandrum, Kerala, India); Surya Narayan (APJ Abdul Kalam Technological University, India); Vaishnav A M (India); Sreeja S (College of Engineering Trivandrum Kerala, India)

17:45 **Fully Integrated Reconfigurable Constant Current LED Driver for Adaptive Input**

Aditi P Sardesai (Indian Institute of Technology, Dharwad, India & Na, India); Nagaveni S (IIT Dharwad, India); Manjunath Hegde (Indian Institute of Technology, Dharwad, India)

18:00 **Intelligent Multi-Sensor Data Fusion for Enhanced RADAR and Optical Imaging Applications Using Huffman Encoding**

Anjali Devarajan, Ashrith P Jain, Ashutosh Goswami and Ayush Vats (RV College of Engineering, India); Kiran V (VTU, India)

18:15 **Antenna for Telemedicine: Miniaturized Lotus Shaped Printed Monopole for Wearable Devices**

Anitha R Vaddinuri (BMS Institute of Technology & Management, Avalahalli, Doddaballapur Main Road, Yelahanka & Bengaluru, India)

Tuesday, July 22 16:30 - 18:30 (Asia/Kolkata)

OS17: AI/ML in defence Radars

Shri. G Vishwam, Former Director, LRDE
Dr. Justin Sagayaraj
Shri. S D Suresh
Dr. Ashutosh Kedar
Ms. Anandita De
Mr. Venkatesh K
Room: Poinsettia 1

Tuesday, July 22 16:30 - 18:30 (Asia/Kolkata)

OS18: AIT/C-II

Room: Poinsettia 2

Chairs: Vinod Chippalkatti (CentumElectronics Ltd, India), Nagesh S K (URSC, India)

16:30 **Challenges in Spacecraft Preservation and Revalidation Approach**

Farhana Tabassum (Indian Space Research Organisation, India & UR RAO SATELLITE CENTRE, India); Bezawada Ravi Kiran, Yogesh Kumar Bhawsar and Imteyaz Ahmad (Indian Space Research Organisation, India); Jasvinder Singh Khoral (URSC, India)

16:45 **Human Spaceflight Satellite Module Integration Aspects**

Kritika Gupta (ISRO, India)

17:00 **Assembly, Integration and Testing of Microsat-2C**

Shweta Shweta (ISRO, India); Binu D (Indian Space Research Organization, India); Priyanka Mishra (Indian Space Research Organisation, India); Renuka R (URSC, Bangalore, India); Pramod V. B. (UR Rao Satellite Centre, India); RV Nadagouda (Indian Space Research Organisation, India)

17:15 **Design, Simulation and Development of Multi-Channel X-Band SAR Test Interface Unit with Wide Dynamic Range**

Chittaranjan Swain (CABS DRDO, India); Thara Mathew (CABS, India); Jayaprakash K P (CABS, DRDO, India); Santhya P (CABS, India)

17:30 **Automated Verification and Cross Comparative Analysis of Spacecraft Databases Using a Hybrid Similarity Based Approach**

Sai Kiran Reddy Dwarampudi and Priyanka Mishra (Indian Space Research Organisation, India); Bhooma Gopalan (UR Rao Satellite Centre, India); Puneet K Mishra (URSC, India); Renuka R (URSC, Bangalore, India); Pramod V. B. (UR Rao Satellite Centre, India); RV Nadagouda (Indian Space Research Organisation, India)

17:45 **Harness Design of Electric Propulsion Systems**

Suravi Bose (ISRO, India)

Tuesday, July 22 16:30 - 18:30 (Asia/Kolkata)

OS19: Docking & Rover Technologies

Room: Heliconia 1

Chair: Jasvinder Singh Khoral (URSC, India)

16:30 **Visual Odometry Analysis on the ISRO's Chandrayaan-3 Pragyan Rover Images**

Mokkapati Shanmukha Sree (Indian Institute of Technology Kanpur, India); Rima Ghosh (URSC, India); Sugandha Maniktala (ISRO, India & Department of Space, India); Sumithra Kakanuru (URSC, ISRO, India); Dipak Kumar Giri (IIT KANPUR, India); Harish K Jolgekar (URSC, ISRO, India); Mohan Sundara Siva (Government & Indian Space Research Organisation, India)

16:45 **Slip Estimation in Planetary Rovers Using a Single-Wheel Testbed and Optical Flow Sensing**

Ayush Agrawal and Arya Das (IIT Kanpur, India); Rima Ghosh (URSC, India); Harish K Jolgekar (URSC, ISRO, India); Dipak Kumar Giri (IIT KANPUR, India)

17:00 **A Power-Efficient, Modular Rover Design for Multi-Purpose Exploration**

Deekshitha M, Pradeep Kumar K, Renuka Anil Sutar and R Sujay (Dayananda Sagar University, India)

17:15 **Reinforcement Q Learning for Terrain-Energy-Aware Lunar Rover Navigation**

A Anto Kelvin Prabhu (Christ University, India); V Vaidhehi (CHRIST & Deemed to be University, India)

17:30 **Autonomy Framework for Spacecraft Docking: Techniques and Fault-Tolerant Strategies from the SPADEX Mission**

Shashank Tomar, Kanu Priya Govila, Mandarapu Pranavika, Chinmay S Mhatre, Sumithra Kakanuru, Prakhar Gupta, Renuka Agarwal and Sangireddy Amarnath Reddy (URSC, ISRO, India)

17:45 **FPGA-Based Visual Navigation Sensor for Spacecraft Docking**

Rahul K Devaraj and Inbasaaharan Ganapathy (VSSC, India); Abhay Dileep (IISU, India); Vikash Manidhar (VSSC, India); Jyothish M (Indian Institute of Technology Madras, India)

18:00 **Analysis of Veyon Robotic Manipulator for in-Orbit Servicing**

Yuvaraj Singh. S, Swetha Mohanachandran and Mark Milton (SpaceTug Private Limited, India)

Tuesday, July 22 16:30 - 18:30 (Asia/Kolkata)

OS20: Reliability & Quality Assurance

Reliability Analysis of Communication Systems: Prof. S Dharmaraja, IIT Delhi

Room: Heliconia 2

Chair: Faizal Jeswant PV (UR RAO Satellite Centre, India)

17:00 **Risk Assessment of Post Touchdown Location Services of Indian Human Space Mission**

Amit Kumar Gupta (Space Applications Centre (ISRO), India); Prateek Bansal (Indian Space Research Organization, India); Manish Mehta and Shilpa Pandya (Space Applications Centre (ISRO), India)

17:15 **Physics-of-Failure Based Reliability Prediction of Rubidium Lamp Used in Indian Rubidium Atomic Frequency Standard for Navigation Payload**

Satya Priya Mittal (Space Applications Centre (ISRO), India); Akshaya Kumar Sahu (Space Applications Centre (ISRO), Ahmedabad, India); Manish Mehta and Shilpa Pandya (Space Applications Centre (ISRO), India)

17:30 **Design of a Highly Radiation-Tolerant Reconfigurable Data Transmitter for ISRO's Solar Observation Mission**

Deepali C V (URSC, India); Kumar Harshit and Bindu R (Indian Space Research Organization, India); Senthil Kumar (ISRO, Bangalore, India); Neelavathy M (URSC, India); Ramalakshmi N (ISRO, India); Suvarna Lankapalli (Indian Space Research Organization, India)

17:45 **Offline LLM-Based Expert Systems for Confidential Software Documentation: Integrating Ollama and JSON Templates for Regulatory Adherence**

Nidhi Mittal and Deepthi VD (CABS DRDO, India); Jayaprakash K P (CABS, DRDO, India); Santhya P (CABS, India)

18:00 **An Automated Tool for Dynamic Field Reliability Assessment Using Life Data Analysis**

Sridevi Ch, Mobina Shaik, Chalapathi Rao A, Brahma Sastry Vvs, Srinivas P and C S Padmavathy (National Remote Sensing Centre, ISRO, India)

18:15 **Mitigating Radiation Risks on the Space Station: a Comparison of Shielding Technologies**

Ishan Pandey (Indian Institute of Science & Indian Space Research Organisation, India); Vivek Kumar, Vinod Kumar, Sarat Kumar Dash and Sandhya V. Kamat (ISRO, India)

Tuesday, July 22 16:30 - 18:30 (Asia/Kolkata)

OS21: Photonics/Electro-optics/THz

Room: Hibiscus 1

Chair: M. Senthilkumar (ISRO, India)

16:30 **Transparent Self-Cleaning Coatings for Space Applications: Enhancing Optical Performance and Longetivity**

Meena Laad and Akhila Shalu (Symbiosis Institute of Technology, India)

16:45 **Experimental Validation of an Opto Electronic Oscillator Using High Q Factor RF Filter**

Meena Dasan (LRDE, DRDO, India); Vidyamol s and Preenu Acha Prasad (LRDE, India)

17:00 **A Homodyne Technique to Measure the Frequency Chirp of Raman Beams in Gravimetry**

Hriday Dath (ISRO Inertial Systems Unit, India & Vikram Sarabhai Space Center, India); Ahmed Rabeeh I C (ISRO Inertial Systems Unit, India); Radhika V n (ISRO INERTIAL SYSTEMS UNIT, India)

17:15 **Optimization of a Nanostructured Thin Film Based One Dimensional Photonic Crystal Bandpass Filter for NIR Satellite Imaging**

Divya Sampath and Venkateswaran N (Sri Sivasubramaniya Nadar College of Engineering, India)

17:30 **Design of an Optomechanical Pendulous Accelerometer for Precision Sensing Applications**

R Shivaranjeni (Hindustan Institute of Technology and Science, Chennai, India); Uthra T K (Defence Institute of Advanced Technology, India); Kaushal Chandak (Hindustan Institute of Technology and Science, India); Mebanshanlari K Kharshanlor (Hindustan Institute of Technology & Science, India); Dinesh Kumar (Hindustan Institute of Technology and Science (HITS), India); Sangeeta N Kale (Defence Institute of Advanced Technology, India); Sree Ramana M (Research Centre Imarat, India)

17:45 **Security Enhancement in Mission-Critical Free-Space Optical Communication Using AES-128 Encryption Algorithm**

Chinchu Joseph (RF Photonics Lab, India); Arockia Bazil Raj (Defence Institute of Advanced Technology Pune, India); Eguri Samson Vineeth Kumar (RF Photonics Lab, India)

18:00 **Mathematical Modeling and Simulation of Silicon Ring Modulator (SRM) Based Photonic Sampler**

Nagayya S Hiremath, Venkatesha Muniswamy and Advaith PR (Sai Vidya Institute of Technology, India)

18:15 **Study of 2D Terahertz SAR Imaging Based on FMCW Radar System**

Chandra Wadde (SRM University AP, India); Mark Clemente-Arenas (Universidad Nacional Tecnológica de Lima Sur, Peru); Sravani Nagireddy (SRM University- AP, India); Gayatri Routhu and Rupesh Kumar (SRM University AP, India)

Tuesday, July 22 16:30 - 18:30 (Asia/Kolkata)

OS22: Sensors

Room: Hibiscus 2

Chair: Ajay Andhiwal (UR Rao Satellite Centre, ISRO, India)

16:30 **Physical Modelling of Sensor FOV Blockages and Hybrid Mode Sensing Based Sun Acquisition**

Chiranjib Guha Majumder and Monica Saraswathi Dantuluri (Indian Space Research Organization, India); Harish K Jolgekar (URSC, ISRO, India); Mohan Sundara Siva (Government & Indian Space Research Organisation, India); Sudhakar S (ISRO Satellite Centre (ISAC, Now URSC), India)

16:45 **Performance Modelling and Statistical Analysis of Metal Oxide-Based Sensors for Space Applications**

Meena Laad (Symbiosis Institute of Technology, India)

17:00 **GUI-Based Electromechanical Modeling of Quartz Pendulous Acceleration Sensors for Performance Analysis**

Uthra T K and Sangeeta N Kale (Defence Institute of Advanced Technology, India); Sree Ramana M (Research Centre Imarat, India)

17:15 **Configurations of SSRR Based Microstrip Capacitor Sensor for Castrol Oil Level Measurement in Space Applications**

Jayant Gajanan Joshi (Government Polytechnic Nashik, India); Mandar Joshi (University of Pune, India); Raghavan S (NIT, India); Shyam Sundar Pattnaik (National Institute of Technical Teachers Training & Research, India)

17:30 **Air-Quality Assessment by Integrating Sensors and Drone for IoT Application**

Prasannakumar Seelam (SRM University, AP, India); Venkata Naga Sai Kiran Damarla (SRM University, India); Pondala Venkata Ramana Murthy (SRM University, AP, India); Navya Sree Gottumukkala (SRM University AP, India); Harish Puppala (SRM University AP, Amaravati, India); Rupesh Kumar (SRM University AP, India)

17:45 **Passive Ranging of Ballistic Missile with Infrared Sensors Using Angle-Only Tracks**

Sudesh Kashyap and Sanketh Ailneni (National Aerospace Laboratories, India); Vishnu Priya Vadlamudi and Ramya B (Project Associate, India)

18:00 **Enhanced Target Localization Using Time Difference of Arrival with Multiple Sensors**

Madhura Atul Barshikar, P. Sc. 'B' (DRDO, Hyderabad, India); Suman Agrawal (Defence Research and Development Office, India)

18:15 **Modelling of Coarse Analog Sun Sensor of Mars Orbiter Mission**

Bijoy Kumar Dai (ISTRAC, India & Jadavpur University, India)

Tuesday, July 22 16:30 - 18:30 (Asia/Kolkata)

OS23: Antennas

Room: Tulip

Chairs: Senthil Kumar (ISRO, Bangalore, India), Kumar Vaibhav Srivastava (Indian Institute of Technology Kanpur, India)

16:30 **Wide Beamwidth Printed Quadrifilar Helix Antenna in s-Band for Pseudolite Transmit Antennas**

Suvrajit Ghosh and Atrish Mukherjee (Indian Space Research Organisation (ISRO), India); Sravan Kumar Sagi (Space Applications Centre ISRO, India); Milind B Mahajan (Space Applications Centre, ISRO, India)

16:45 **Design and Development of Ultra-Wide-Band, Ultra-Compact, Dual Linear Upper-X & Ku-Band Combined Feed for CATF**

Abhinav Kumar Jha (Isro, India); Puneet K Mishra (URSC, India); Joy Anil Gomes (Isro, India); Vivek Rai Srivastava and Pramod V. B. (UR Rao Satellite Centre, India); RV Nadagouda (Indian Space Research Organisation, India)

17:00 **Symmetric DGS for Dual-Polarized Patch Featuring Enhanced Polarization Purity over the Full Azimuth**

Sk Rafidul (HCLTech, India); Sourabh Basu (ISRO, India); Debojyoti Choudhury (HCLTECH, India); Debatosh Guha (University of Calcutta, India)

17:15 **Design of an Ultra-Wideband Antipodal Vivaldi Antenna for Deep Ground Penetration and High-Resolution Through-Wall Imaging**

Kunal Gupta, Anjitha V, Athul O Asok and Sukomal Dey (Indian Institute of Technology Palakkad, India)

17:30 **Slot-Based Design for Ultra-Wideband Elliptical Dipole Antenna**

Dheeraj V (R V College of Engineering, India); Koyram Sathyanarayana Shushrutha (RVCE, India)

17:45 **A High Gain Triple-Band Compact Microstrip Patch Antenna for X-Band Applications**

Kamisetti Sasank (Vignan's IIT, India); Deepak Ram (IIT BHU VARANASI, India); Kalyani Kandiraju (SVIT, India); Somak Bhattacharyya (IIT (BHU), India)

18:00 **Analysis of Different Deformation Shapes of Flexible Patch Antenna**

Kishore Ajay Kumar Ayyala (Amity University Haryana, India); Owais Ahmad Shah (Dayananda Sagar University, India); Arun Balodi (Dayananda Sagar University, Bengaluru, India); B. Anil Kumar (Gati Sakthi Vishwavidyala Gujarat, India)

18:15 **A Compact Consistent Gain Leaky-Wave Antenna with Wide-Band and Suppressed Open Stop-Band**

Mohammad Hafiez (National Institute of Technology Patna, India & Electronics and Communication, India); Ratnesh Ranjan (S R University, Warangal, India); Jayanta Ghosh (National Institute of Technology Patna, India)

Tuesday, July 22 16:30 - 18:30 (Asia/Kolkata)

OS24: AI/ML Technologies for SPACE

Room: Aryabhata

Chairs: Jayraj Nair (CTO Ansys, India), Narayanan Subramaniam (Vanashri Technology Consulting, India)

16:30 **Human-AI Teaming in Military Space Operations Model**

Clara Maathuis (Open Universiteit, The Netherlands)

16:45 **Machine Learning for Object Detection and Classification in Deep-Space Astronomical Images**

Aishwarya S (Rajalakshmi Institute of Technology, India & Anna University, India); Antony Alwin Raj P and Pandiarajan Thandapani (Rajalakshmi Institute of Technology, India)

17:00 **Approximate Computing Technique Based Convolutional Neural Networks for Pattern Recognition**

Ramesh SR (Amrita School of Engineering, Coimbatore, India & Amrita Vishwa Vidyapeetham, India); Sujith S (Amrita Vishwa Vidyapeetham, India)

17:15 **Human-in-the-Loop Spacecraft Maneuvers: Investigating Human Factors Through VR and Machine Learning**

Ajit Krishnan (ISRO, India); Himanshu Vishwakarma (Indian Institute of Science, Bangalore, India); Deeksha Chutani (IISc, India); Aniruddha Kumar Atulkar (Indian Institute of Science, India); Dinesh Bhathad (IISc, India); Maharudra Kharsade and Pradipta Biswas (Indian Institute of Science, India)

17:30 **Machine Learning-Based Classification of Space Debris and Satellites Using Orbital Parameters**

Sushnato Majhi (National Institute of Technology Jamshedpur, India); K Rahvendra Naik (Assistant Professor, India); Kumari Namrata (National Institute of Technology, Jamshedpur, India); Veerpratap Meena (IEEE Systems Council, India & Amrita School of Engineering, Bengaluru, India); Devendra Gowda (Acharya Institutes, India)

17:45 **Integrative Framework of CNNs and Machine Learning for Enhanced SAR Image Classification**

Vipanchi Dixit (Birla Institute of Technology and Science, Pilani, Hyderabad Campus, India); Anju Sharma (CSIR-National Aerospace Laboratories, India); Sudesh Kashyap (National Aerospace Laboratories, India)

18:00 **CPU Implementation of SAM Based Maritime Object Segmentation and Detection**

Meenakshi K (Defence Institute of Advanced Technology, India); Shubhada Joshi (GGS Indraprastha University, India); TM Dhipu (Center of Airborne Systems, DRDO, India); R Rajesh (CABS, India)

18:15 **Automated Defect Detection in Unmasked Printed Circuit Boards Using YOLOv8**

Avnish Jain (Indian Space Research Organisation, India)

Tuesday, July 22 16:30 - 18:30 (Asia/Kolkata)

OS25: Wireless Sensor Networks & mm-wave Tech

Room: Pritvi

Chair: K Vinoy (IISc, India)

16:30 **Energy-Efficient Clustering With Hybrid Optimization (ECHO) Protocol in Wireless Sensor Network for Border Surveillance**

Bhudeb Chakravarti (Adamas University, India); Santanu Chatterjee (Research Center Imarat & Defence Research and Development Organization, Hyderabad, India); Moumita Mukherjee (Adamas University, India)

16:45 **Swarm Intelligence-Enhanced Clustering for Energy-Efficient Border Surveillance in Wireless Sensor Networks**

Bhudeb Chakravarti (Adamas University, India); Santanu Chatterjee (Research Center Imarat & Defence Research and Development Organization, Hyderabad, India); Moumita Mukherjee (Adamas University, India)

17:00 **AI-Based Olfactory Sensing for Space Application**

Aishik Pal (IITJ-Indian Institute of Technology Jodhpur, India)

17:15 **HKDN-FEED: Spatial and Temporal Feature Engineering to Detect Covert Channels in Satellite IoT Networks**

G Hemanth Kumar, Durbadal Chattaraj and Naveen Kulkarni (Dayananda Sagar University, India)

17:30 **A Novel Federated Learning Framework for IoMT Security Using Integrated Fingerprinting**

Jyoti Ranjan Satapathy (Indian Institute of Technology, Indore & Military College of Telecommunication Engineering, India); John A (National Chung Cheng University, Taiwan); Sivam Mohapatra (National Institute of Technology, Rourkela, India)

17:45 **Bespoke Lens Design for a Millimeter-Wave Leaky-Wave Antenna with Fixed Frequency Beam-Steering**

Aakash Bansal (Loughborough University, United Kingdom (Great Britain))

18:00 **Millimeter Wave Humidity Sounder: High Precision Data Acquisition System(HPDAS)**

Ritesh Kumar Sharma (Space Applications Centre, India); Keyuri Harsh Patel, Amita A Shah, Akshay Kumar K and Saravana B Kumar (Indian Space Research Organisation, India)

18:15 **Dual-Surfaced Split Ring Resonator Based Low Profile Antenna for Sub-THz Applications**

Vineetha Joy (CSIR-National Aerospace Laboratories, India); Tanmay Parag Deuskar (Birla Institute of Technology and Science, Pilani (BITS Pilani), India)

Tuesday, July 22 16:30 - 18:30 (Asia/Kolkata)

OS26: Aircraft/HAP Technologies

Room: HT-2

Chairs: **Adishesha CS (Collins Aerospace & N/a, India), Rajeev Ranjan (Boeing, India)**

16:30 Next-Gen Energy Sustained Electric Aircraft

Amogha Kanchagar (Collins Aerospace, India)

16:45 **Baseline Differential-PI Control for High Altitude Platform Aircraft**

Kapil Sachan (CSIR National Aerospace Laboratories, India); Pushpendra Lalak Singh (Defence Institute of Advanced Technology, India)

17:00 **Modelling & Handling Qualities of High-Altitude Platform**

Shikha Jain (National Aerospace Lab & CSIR- NAL, India); Avinash Nayak (NAL, India); Karthikeyan N (Senior Principal Scientist, India)

17:15 **Evaluation of Atmospheric Disturbances in SILS for High Altitude Platform**

Shikha Jain (National Aerospace Lab & CSIR- NAL, India); Kapil Sachan (CSIR National Aerospace Laboratories, India); Karthikeyan N (Senior Principal Scientist, India)

17:30 **Bistatic RCS Characteristics of High Ellipticity Metallic Cylinder**

Sudeb Bhattacharya, Aakash Aakash and Kumar Vaibhav Srivastava (Indian Institute of Technology Kanpur, India)

17:45 **Design and Flight Testing of Ski-Jump Take-off Controllers for LCA Navy**

Anup Goyal, Akhila M R, Jayalakshmi Myala, Gaurav Kumar and Amitabh Saraf (Aeronautical Development Agency, India)

18:00 **Air Data Sensor False Fault Diagnosis in the Presence of Clear Air Turbulence**

Khadeeja Nusrath TK (CSIR-National Aerospace Laboratories, India); Ambalal V. Patel and Prabhavathi Bhai J (Aeronautical Development Agency, India)

18:15 **AI-Based Versatile Troubleshooting Guide for System of Systems in Aircraft**

Jayaprakash K P (CABS, DRDO, India); Somasekhar K (DRDO, India); Santhya P and K Rajalakshmi Menon (CABS, India); Aniverthy Amrutesh (Dr Ambedkar Institute of Technology, India)

Tuesday, July 22 16:30 - 18:30 (Asia/Kolkata)

OS27: Space Exploration

Room: Vikram Sarabhai

Chair: Soumyabrata Chakrabarty (IIT Kanpur & Space Applications Centre, ISRO, Ahmedabad, India)

16:30 **Predicting Stellar Metallicity: a Comparative Analysis of Regression Models for Solar Twin Stars**

Sathwik Narkedimilli (Telecom Paris, France); Satvik Raghav (Amrita School of Engineering, India); Sujith Makam (Indian Institute of Information Technology Dharwad, India); Prasanth A (Amrita School of Engineering Amrita Vishwa Vidyapeetham Bengaluru, India); Aswath Babu H (IIIT Dharwad, India)

16:45 **SIMHA: Sustainable Integrated Microbial and Hydrogen Fuel Cell Architecture for BAS**

Shailaja Ananda Kumar (M S Ramaiah College of Arts Science and Commerce, India); Abhay Bhandarkar and Nagaraju Kottam (Ramaiah Institute of Technology, India)

17:00 **Optimizing Communication in ROS 2 with QoS Parameters for System Advantages**

Utpal Kumar, Deekshitha M and Pradeep Kumar K (Dayananda Sagar University, India)

17:15 **Celestial Image Classification Using Attention and Boosting Mechanism**

Jesvin K Justin (Christ University Bangalore, India); Nisha Varghese and Kezya Steffyn. S (Christ University, India)

17:30 **Health Monitoring in Space: Design of a Wireless MBAN Based System**

Khushboo Dadhich and Devika Kataria (JK Lakshmipat University Jaipur, India); Pranab Roy (JK Lakshmipat University, India)

17:45 **ResNet-Based Deep Learning for Non-Invasive Blood Pressure Classification Using Filtered PPG Signals in Continuous Crew Health Monitoring**

Narendra Kumar Reddy Gangireddy (National Institute of Technology Calicut, India & NIT Calicut, India); Anish Raj (National Institute of Technology Calicut, India)

Tuesday, July 22 16:30 - 18:30 (Asia/Kolkata)

OS28: Embedded System/VLSI

Room: DS Kothari

Chairs: Krishna Paul (India), Kamaljeet Singh (Semi-Conductor Laboratory, India)

16:30 **Thermally Stable 1-Transistor FDSOI Neuron for Reliable Neuromorphic Applications in Space**

Aparna Krishna Kumar (IIITDM Kancheepuram, India); V Rajakumari (Indian Institute of Information Technology Design and Manufacturing, Kancheepuram, India); Kumar Pradhan (Indian Institute of Information Technology Design and Manufacturing Kancheepuram, India)

16:45 **Impact of Ground Layer and Methods to Achieve Low Loss in 65nm CMOS Technology**

Arthi R (Indian Institute of Technology Madras, India); Christopher S (IITM, India); R David Koilpillai (Indian Institute of Technology Madras, India)

17:00 **FPGA Implementation of Area Efficient Digital Encoder for Flight Termination System**

Manish Kumar (ITR, India); Utpal Mandal and Angsuman Roy (Defence R and D Organization, India); Gautam Sadhukhan (Integrated Test Range Chandipur, India)

17:15 **FPGA Based Auto-Reconfigurable Digital Recorder System for ISRO's Optical Communication Payload**

Vikas Singh (Indian Space Research Organisation, India); Nirbhay Tyagi and Ramesh B Gameti (Indian Space Research Organization, India); Abhishek Kunal and Akshay Kumar K (Indian Space Research Organisation, India); Shitisha Bajpai (Indian Space Research Organization, India); Ritesh Kumar Sharma (Space Applications Centre, India); Saravana B Kumar (Indian Space Research Organisation, India)

17:30 **End-to-End Reconfigurability of Avionic Systems for Space Missions**

Sreedharan Pillai Sreelal (Indian Space Research Organization, India); Sajin S and Priya P (Vikram Sarabhai Space Centre, India); Bibin Varghese (Indian Space Research Organization, India); Sreekumar Sankaranthil (Vikram Sarabhai Space Center, India)

17:45 **0.5-15 GHz Wideband MMIC Amplifier for Space Application**

Nilesh Dineshbhai Makwana (Space Applications Centre, ISRO, India); Shruti Sinha (SAC, ISRO Ahmedabad, India); Cvn Rao (Space Applications Centre (ISRO), India); Mukesh Patel (SAC, ISRO, India)

18:00 **Innovative Thick-Film Technology for Miniaturized Millimeter-Wave Patch Antenna on Alumina**

Rashmi Behera (ISRO, India); SUMA S Lonkadi (URRAO Satellite Centre, India); Ajay Andhiwal (UR Rao Satellite Centre, ISRO, India); Jothy Soman and Ramalakshmi N (ISRO, India)

18:15 **Development of Indigenous Solid State Relay Hybrid for Aerospace Applications**

Nirupam Sharma (ISRO, India); Priya Sarkar, Anup Kumar Agarwal and Anju Singh (URSC, India); Ajay Andhiwal (UR Rao Satellite Centre, ISRO, India); Jothy Soman and Ramalakshmi N (ISRO, India)

Wednesday, July 23 14:00 - 16:00 (Asia/Kolkata)

OS29: Airborne Surveillance Systems

Room: Amarylis

Chairs: Ashutosh Kedar (Scientist F, India), Ram M Narayanan (Pennsylvania State University, USA)

14:00 **Online Calibration Philosophy for AESA Based Airborne Secondary Surveillance Radar**

Bhupendra Kumar (Centre for Airborne Systems DRDO, India); Savita Gond (DRDO, India & CABS, India); Rishi Mishra (CABS, DRDO, India); Karthik Bodaballa (Centre for Airborne Systems DRDO, India); Harish Naik and A K Singh (Centre for Airborne Systems, India)

14:15 **Miniaturized Cavity Backed Slot Antenna for SSR Application with Different Radome Materials**

Pushkar Lal Vijayvergiya (Centre for Airborne Systems, India); Rishi Mishra (CABS, DRDO, India); Uma S (Centre for Airborne Systems & Defence Research and Development Organisation, India); Harish Naik, C Suresh, Jitendra Kumar and A K Singh (Centre for Airborne Systems, India)

14:30 **Velocity Vector State Space Mapping of Clutter Doppler Profile for Target Aircraft Trajectory Profiling in Airborne Surveillance Radar Systems**

Sony Soman Oommen (DRDO, India); Arun Kumar (Centre for Airborne Systems, DRDO, India); Priyanka Khedar (CABS, DRDO, India); Maheshwaran Y, Santhya P and K Rajalakshmi Menon (CABS, India)

14:45 **A Hybrid Algorithm for Emitter Location Fixing in Airborne Surveillance System**

Bhavish Kumar (Defence R&D Organisation & Min of Defence, Government of India, India); R Rajesh (CABS, India); Ramkumar R (DRDO, India)

15:00 **ESM-RADAR and IFF Fusion for Enhanced Airborne Surveillance Systems**

Abhishek Kumar (DRDO, India); B R Kapuriya, A Muthukumar and R Rajesh (CABS, India)

15:15 **Multi-Sensor Integration of AIS, ADS-B, SAR-DF for Airborne Maritime Surveillance**

Rajesh Gandhi and R Rajesh (CABS, India)

15:30 **Event-Driven System Architecture for the Airborne ISR System**

Pradeep Kumar Mahato, Vinod Kumar Rajak, Maheshwaran Y, Santhya P, Deepa Vishwakarma and Ajay Kumar Singh (CABS, India)

15:45 **Implementation of Model Based System Engineering in Airborne Surveillance System**

Amandeep Singh (DRDO, India); R Suchita and R Rajesh (CABS, India)

Wednesday, July 23 14:00 - 16:00 (Asia/Kolkata)

OS30: Women-Led Technology Developments-III

Room: Petunia

Chairs: Meena Mishra (SSPL, Timarpur, India), Ramalakshmi N (ISRO, India)

14:00 **Altitude and Velocity Estimation in FMCW Radar Altimeter With Phase Noise**

Reshma S (Indian Institute of Space Science and Technology, IIST & Vikram Sarabhai Space Centre, VSSC/ISRO, India); Sreedharan Pillai Sreelal (Indian Space Research Organization, India); Vani Devi M (Indian Institute of Space Science and Technology, India)

14:15 **A Parabolic Reflector Antenna with Compact Dual Circular Polarized Multilayer Microstrip Patch Feed for MEO and Next Generation LEO Local User Terminals**

Vidya KA (ISRO, India)

14:30 **Speech Transcription System for VoIP Based Airborne COMINT Data**

Sapna Sapna (DRDO, India); TM Dhipu (Center of Airborne Systems, DRDO, India); Amresh Kumar (DRDO, India); R Rajesh (CABS, India)

14:45 **MPSoC Based Pipelined Architecture Signal Processing of SSR**

Ramyakusuma Sunkara and Shikha Pallavi (Defence Research and Development Organisation, India); Reep Khanikar (DRDO, India); A K Singh (Centre for Airborne Systems, India); Salman Baig (Industry, India)

15:00 **Development of a Configurable Environment Simulator Tool for Centralized Traffic Control (CTC)**

Jyoti Chandrawat (Central Research Laboratory, Bharat Electronics Limited, India); Akhilesh Singh Tomar (Bharat Electronics Limited, India); Vandana Vandana (Bharat Electronics Limited, India & BEL CRL, India)

15:15 **Analytical Reconstruction and Parameter Estimation of a Tactical-Grade Pendulous Accelerometer from Partial Design Specifications**

Uthra T K (Defence Institute of Advanced Technology, India); R Shivaranjeni (Hindustan Institute of Technology and Science, Chennai, India); Sangeeta N Kale (Defence Institute of Advanced Technology, India)

15:30 **Advancing Handwritten Digit Recognition in Defense Systems: Comparative Analysis of Autoencoder-Based Transfer Learning**

Shruti Jain and Shivani Kapur (Bharat Electronics Limited, India); Vandana Vandana (Bharat Electronics Limited, India & BEL CRL, India)

Wednesday, July 23 14:00 - 16:00 (Asia/Kolkata)

OS31: Beamformering Technologies

Room: Poinsettia 1

Chairs: Chandrakanta Kumar (ISRO, India), Anil Kumar Singh (LRDE, India)

14:00 **RMS Gain and Phase Error Compensation Technique for Beamformer SoC**

Jyotsna Ladkani and Bhumika Deo (ISRO, India); Shreeranga RB (Indian Institute of Space Science and Technology, India); Hari Shanker Gupta (Space Applications Centre ISRO, India); Shilpi Soni (Space Applications Centre & ISRO, India)

14:15 **Design and Simulation of Phased Array Antenna Beamforming Unit (ABFU) for 28GHz Radar Applications**

Sarikonda Gopi Krishna Raju (Vignan's Foundation for Science, Technology, Research, India); Karru Balakrishna (Vignan's Foundation for Science, Technology and Research, India); Sairam Cherukumalli (Vignan's Foundation for Science, Technology, Research, India); Shaik Amman (VFSTR, India); Mohammad Ali Shaik (Vignan's Foundation Science, Technology, India); Venkata Kishore Kothapudi (Vignan's Foundation for Science Technology and Research, India)

14:30 **Design and Analysis of Compact Antenna for Advanced 5G for V2X Wireless Telemetry Satellite Applications**

Arun Raj (NIT Durgapur, India); Durbadal Mandal (National Institute of Technology, Durgapur, India); Dinesh Kumar Srivastava (Biet, Jhansi, India)

14:45 **Design and Analytical Evaluation of Transmitter-Receiver (TR) Modules for Radar System Applications**

Gudipudi Teja Kumar (Vignan's Foundation for Science, Technology & Research, India); Atchukola Pavan Sai Kumar (Vignan's Foundation for Science, Technology and Reasearch, India); Parepalli Likith (Vignan's Foundation for Science, Technology, India); Janaki Ramaiah Gavini (Vignan's Foundation for Science, Technology & Research Deemed University, India); Dugga Lakshmikanth Reddy (Vignan's Foundation for Science, Technology, India); Venkata Kishore Kothapudi (Vignan's Foundation for Science Technology and Research, India)

15:00 **A Digitally Programmable 9.1-11.2 GHz CMOS LC-PLL with Integrated Power Management for X-Band FMCW Radar Systems**

Javed Syed Gaggatur (Intel Foundry & King Consultants Education, India)

15:15 **Weighted Target Direction Agnostic Maximum SNR Beamformer Under Imperfect Steering Information**

Nanditha Unnikrishnan (CABS DRDO & Defence Research Development Organization, India); Ramkumar Raghu (Indian Institute of Science, India); R Rajesh (CABS, India)

15:30 **Simulation of Different Tapering Techniques for SLL Performance Using Inter-Element Spacing 0.7λ X/Ku-Band Series Feed Centre Fed Open-Ended Shared Aperture Antenna Array Air-Borne SAR Applications**

Kati Praveena (Vignan's Foundation for Science, Technology and Research, India); Venkata Kishore Kothapudi (Vignan's Foundation for Science Technology and Research, India)y (National Institute of Technology Calicut, India & NIT Calicut, India); Anish Raj (National Institute of Technology Calicut, India)



Wednesday, July 23 14:00 - 16:00 (Asia/Kolkata)

OS32: Ground Support & UAV Technologies

Room: Poinsettia 2

Chair: Raghavan Muralidharan (Tata Advanced Systems, India)

14:00 **Dynamic Response and Vibration Isolation of Instrument Racks**

Sunil Kumar Yadav (Defence Research and Development Organisation (DRDO), India & Ministry of Defence, Government of India, India); Priyank Prasad (DRDO, India); Jadi Chandrakumar, MR Shankar, Satish Kumar and Ashish Raman (CABS, India)

14:15 **Advancing Wildlife Conservation: AI-Driven Weight Estimation Drones for Accurate and Efficient Wildlife Management**

Karthik B (Dayananda Sagar University, India & Mysuru Zoo, India); Mithun P, Nikhil N P and Aditya Kulkarni (Dayananda Sagar University, India); J L Srinivas (Mysuru Zoo, India); Sripad Kulkarni (Dayananda Sagar University, India)

14:30 **Revolutionizing Software Development with Machine Learning: a Comprehensive Review**

Charanpreet Kaur and Tanu Agrawal (BEL, India)

14:45 **Computational Analysis of the Effect of Absorber Shape and Size on Antenna Performance in an Anechoic Chamber**

Deepshikha Bhargava (LECTURER at Kasetsart University, Thailand); Praveen Kumar Sharma (Marwadi University, India); Aakash Bansal (Loughborough University, United Kingdom (Great Britain)); Phadongsak Rattanadecho (Thammasart University, Thailand)

15:00 **Heterogeneous Track to Track Fusion from Radar and IRST on an Aircraft**

Sanketh Ailneni and Sudesh Kashyap (National Aerospace Laboratories, India); Nandan Kumar Sinha (Indian Institute Technology Madras, India)

15:15 **Ultra Wideband Fractal Shape Monopole Antenna for Airborne Application**

Jitendra Kumar (Centre for Airborne Systems, India)

15:30 **Fault-Tolerant Design of Software for Safety and Mission Critical Applications**

Anuradha Namuduri, Kishore Mandalapu and Sambhu Prasad Sesham (Indian Space Research Organization, India)

Wednesday, July 23 14:00 - 16:00 (Asia/Kolkata)

OS33: SAR Technologies

Room: Heliconia 1

Chair: Rajesh R (DRDO, India)

14:00 **Automated Shape Classification Using SAR Imaging and Machine Learning**

Chandra Wadde (SRM University AP, India); Pondala Venkata Ramana Murthy (SRM University, AP, India); Gokul Chinnaraj (SRM University -AP, India); Mark Clemente-Arenas (Universidad Nacional Tecnológica de Lima Sur, Peru); Rupesh Kumar (SRM University AP, India)

14:15 **Human Activity Classification as an Integrative Approach of SAR Technique with Conditional Generative Adversarial Network**

Gokul Chinnaraj (SRM University -AP, India); Chandra Wadde (SRM University AP, India); Pondala Venkata Ramana Murthy and Chakka Sai Sree (SRM University, AP, India); Rupesh Kumar and Vinod Bochu (SRM University AP, India)

14:30 **River Bed Mapping with Deviation Sensitive Unsupervised Segmentation of Optical SAR Remote Sensing**

Raja Munusamy and Karnak D Oza (Alliance University, India); Subhrangshu Adhikary (National Institute of Technology Durgapur, India); Saikat Banerjee (Csid Technomatrics pvt ltd, India); Raman Kumar Singh (NITI Aayog, India)

14:45 **SweepSAR Specific Features of Digital Sub-Systems of s Band SAR Payload for NISAR**

Himanshu Patel (Indian Space Research Organisation (ISRO), India); Manish Kumar (Space Applications Centre, India); Shalini Gangele, Ajay Kumar Singh and Kiral Ghodadra (Space Applications Centre, ISRO, India); Saravana B Kumar (Indian Space Research Organisation, India); Suneela Mishra (Space Applications Centre ISRO, India)

15:00 **IQ Data Based SAR Image Generation Using Synthetic 3D Scenario**

Avinash M (Government, India & DRDO, India); Pooja Goel (Centre for Airborne Systems, DRDO, India); Sony Soman Oommen (DRDO, India); Arun Kumar (Centre for Airborne Systems, DRDO, India); Aruna Shanmugasundaram (CABS, DRDO, India); Maheshwaran Y and Santhya P (CABS, India)

15:15 **Physics Based ISAR Image Generation and Automatic Target Recognition**

Muskan Deori (BITS, India); TM Dhipu (Center of Airborne Systems, DRDO, India); R Rajesh (CABS, India)

15:30 **Residual U-Net for SAR Image Despeckling - a Lightweight and Effective Deep Learning Approach**

Abdullah Taher (King Abdulaziz City for Science and Technology (KACST), Saudi Arabia)

15:45 **A Comprehensive Simulation Framework for Data Generation in SAR-ATR**

Dhiraj Kumar Singh (Electronics and Radar Development Establishment, India); Dhanesh G. Kurup (Amrita University, Bengaluru Campus, India)

Wednesday, July 23 14:00 - 16:00 (Asia/Kolkata)

OS34: UAV Technologies-II

Room: Heliconia 2

Chair: PM PM Soundarrajan (NIAS, India)

14:00 **Energy-Efficient UAV Trajectory-Aware Superframe Method for Medium Access Control Protocols**

Rajeev Kumar (Indian Institute of Technology Kanpur, India & Rajkiya Engineering College Kannauj, India); Yatindra Nath Singh (Indian Institute of Technology Kanpur, India & YRRNA Systems Lab, India); Dushantha Nalin K. Jayakody (Universidade Lusófona, Portugal & Sri Lanka Institute of Information Technology, Portugal)

14:15 **Differentially Flatness-Exploiting Robust Control for Quadrotors: a Hybrid SMC-Backstepping Approach**

Nitin Pal and Naba Kumar Peyada (IIT Kharagpur, India)

14:30 **AI-Powered Anomaly Detection with Blockchain for Real-Time Security and Reliability in Autonomous Vehicles**

Rathin Chandra Shit (International Institute of Information Technology Bhubaneswar, India); Sharmila Subudhi (Maharaja Sriram Chandra Bhanja Deo University, India)

14:45 **Machine Learning Algorithms to Strengthen Cyber Defense Mechanisms in Unmanned Aerial Vehicles**

Santosh Kumar S, Sr (Sri Venkateshwara College of Engineering, India); Bharathi S H (Reva University, India)

15:00 **Classification of Drones Vs Non-Drone Targets Using Deep Learning on Radar Tracks**

Yedhu Shali, Sherin Babu, Fahad A. m and Vijendra Srihari Bagmare (Bharat Electronics Limited, India); Viji Paul P (Bharat Electronics, India)

15:15 **Guptacharri Drashta: Cost-Effective Spy Drone for Defense and Cyber Security Applications**

Durbadal Chattaraj, Srihari K B, Narendra Kumar H, Sudhir S and Nechgar Mohammed Afshan (Dayananda Sagar University, India)

15:30 **Smooth Trajectory Generation for Gap Traversal by UAVs**

Sandip Singha, Sayantan Pal and Sikha Hota (Indian Institute of Technology Kharagpur, India)

15:45 **Design and Application of a Quadcopter-Based Autonomous Cleaning Drone for High-Rise Glass Structures**

K Raghav, Mr (Dayanand Sagar University, India); Yashas V, Sripad Kulkarni and G N V Prasad (Dayananda Sagar University, India)

Wednesday, July 23 14:00 - 16:00 (Asia/Kolkata)

OS35: Communication-II

Room: Hibiscus 1

Chairs: Aloknath De (Samsung, India), Navin Kumar (Amrita University & School of Engineering, India)

14:00 **Comparative Analysis of Jakes and Smith Models for Rayleigh Fading in OFDM Based Wireless Communication Systems Using Different Modulation Schemes**

Radhika P (Indian Institute of Space Science and Technology, India)

14:15 **Low Complexity Channel Estimation in OTFS Enabled MIMO Systems**

Aman and Olivia Zacharia (Indian Institute of Space Science and Technology, India); Vani Devi M (IIST, India)

14:30 **Design, Simulation and Performance Evaluation of Airborne Data Link Using LabVIEW**

Chittaranjan Swain and Deepthi VD (CABS DRDO, India); Jayaprakash K P (CABS, DRDO, India); Santhya P (CABS, India)

14:45 **Multicast Based Voice Communication System for Satellite Mission Operations**

Aashish Aggarwal, Anusha K S, Anshul Khandelwal, Ashwin Khan and Gireesh M. (MCF, ISRO, India)

15:00 **Frequency Programmable Dual Modulation C-Band Transmitter for ISRO Satellites**

Kosuru Sai Malleswar and Himani Bahuguna Sarkar (ISRO, India); Khan Afzaal (URSC, Bangalore, India); Sirshendu Das and Karam Ilahi Khan (ISRO, India); Senthil Kumar (ISRO, Bangalore, India); Neelavathy M (URSC, India)

15:15 **CSMC: Coordinated Sensing, Motion and Communications in Space Vehicle Systems**

Dilip Krishnaswamy and Anand M (Centre for Development of Telematics, India)

15:30 **ML-HEO: a Hierarchically Resilient Network of Satellites in Multi-Level Highly Elliptical Orbits**

Anand Mohandas (C-DOT, India); Dilip Krishnaswamy (Centre for Development of Telematics, India)

15:45 **Q-GEO: Satellites in a Quasi-Geostationary Orbit for Ubiquitous Coverage**

Anand Mohandas (C-DOT, India); Dilip Krishnaswamy (Centre for Development of Telematics, India)

Wednesday, July 23 14:00 - 16:00 (Asia/Kolkata)

OS36: AI/ML Technologies for SPACE-II

Room: Hibiscus 2

Chairs: Seema Chopra (Boeing, India), P Deepa Shenoy (University Visvesvaraya College of Engineering, India)

14:00 **Smart Fault Detection in Satellites: Review of Lightweight ML Models for Real-Time Anomaly Detection**

Satthiganahally Vasudev Shrigandha (BE, India & Ambedkar Institute of Technology, India); Gourav Mohanan (Dayananda Sagar University, India)

14:15 **Analyzing the Evolution of Machine Learning Methodologies for Antenna Design Through Structural Topic Modeling**

Arun Balodi (Dayananda Sagar University, Bengaluru, India); Manoj Tolani (Manipal Institute of Technology, Manipal, India & Manipal Academy of Higher Education, India); Ambar Bajpai (GITAM University, Bengaluru & IEEE Bangalore Section, India); Owais Ahmad Shah (Dayananda Sagar University, India)

14:30 **High-Resolution Soil Moisture Prediction from SMOS Using Machine Learning Models**

Sudhakara B (National Institute of Technology, India); Shrutilipi Bhattacharjee (National Institute of Technology Karnataka, India); Manu Periasamy M and Annant Maheshwari (NITK, India)

14:45 **Predicting High-Resolution Soil Moisture Using MODIS Bands: a Fusion-Regression Approach**

Sudhakara B (National Institute of Technology, India); Spurthy Maria Pais (CMR Institute of Technology Bengaluru, India); Shrutilipi Bhattacharjee (National Institute of Technology Karnataka, India)

15:00 **Revolutionizing Warfare: AI-Driven Swarm Quadcopters with Modular and Self Repair Technology**

Raja Munusamy, K Thyagaraja, Keerthana K and Shreya R.S Gowda (Alliance University, India)

15:15 **Artificial Intelligence Based Radar Technology: Current Advancements, Future Directions and Challenges**

Tapas Kumar Pal (Research Centre Imarat, India & DRDO, India)

15:30 **Classification of Bird and Drone Targets Based on Radar Data Augmented with Feature Engineering Using Trajectory Kinematics Analysis and Using Random Forest Algorithm**

Rohit Ganeshan (Electronics and Radar Development Establishment, DRDO, India); Azeez P (Scientist, India); Vinod Alphonse (Electronics and Radar Development Establishment, DRDO, India); Senthil Rengarajan (Scientist, India)

15:45 **Aircraft Classification Through Deep Learning Based Diarization of Pilot Vocal Signature**

Harshil Gupta (DRDO, India); Hitesh NP (JSS Academy of Technical Education, Bengaluru, India); Amresh Kumar and Ramachandran Rajesh (DRDO, India)

Wednesday, July 23 14:00 - 16:00 (Asia/Kolkata)

OS37: Metamaterials/Metasurfaces/FSS

Room: Tulip

Chairs: Milind B Mahajan (Space Applications Centre, ISRO, India), Chinmoy Saha (Indian Institute of Space Science and Technology, India & Royal Military College of Canada, Canada)

14:00 **A Reconfigurable Intelligent Metasurface Antenna for Beam Steering Applications**

Raju Malleboina and Debdeep Sarkar (Indian Institute of Science, India)

14:15 **Characterization of Microwave Absorber and Frequency Selective Surface (FSS) in Time Domain: a New Approach**

Sasikanta Kumar and Satish Bandlamudi (URSC Bangalore, India); Puneet K Mishra (URSC, India); Renuka R (URSC, Bangalore, India); RV Nadagouda (Indian Space Research Organisation, India)

14:30 **SIW-Based Composite Right/Left-Handed Metamaterial for Ku-K Band Frequency Scanning Antennas**

Priya Rahul (KIIT Deemed to Be University, India); Sudhakar Sahu (KIIT University, Bhubaneswar, India); Wriddhi Bhowmik (Kalinga Institute of Industrial Technology, India)

14:45 **Design and Analysis of a Frequency-Selective Surface Based Ka-Band Linear-to-Circular Polarization Converter**

Prithvisha Gupta (Heritage Institute of Technology, India); Shubhanshi Jain (Indian Institute of Space Science and Technology, Thiruvananthpuram & Banasthali Vidyapith, India); Manas Sarkar (ISTRAC, India); Chinmoy Saha (Indian Institute of Space Science and Technology, India & Royal Military College of Canada, Canada)

15:00 **Compact Single-Layer Metasurface Absorber with Polarization Insensitivity and Wideband Characteristics**

Chatla Monica and Praveen Kitti B (SRM University - Andhra Pradesh, India); Gayatri Routhu (SRM University- AP, India); Rupesh Kumar (SRM University AP, India); Sravani Nagireddy (SRM University- AP, India)

15:15 **FSS Based Polarization Independent Microwave Absorber with Multiple Absorption Peaks in s, X, Ku and K Bands**

Chandravijay Bharati (VNIT, India); Ashwin Kothari (VNIT NAgpur, India); Abhay Gandhi (Viswesarayya National Institute of Technology, India); Yogesh Solunke (VNIT NAGPUR, India)

15:30 **A Meta Surface Based Low Profile Patch Antenna for Wireless Space Craft 5G Communications**

Vanitha Rani Rentapalli (VIT- AP University, India)

15:45 **EM Design of Multifunctional Metasurface for Multiband Polarizer**

Shiv Narayan (CSIR-National Aerospace Laboratories, India); Arya K. M. (CSIR-National Aerospace Laboratories, India & Academy of Scientific Innovation and Research (AcSIR), India); Raveendranath Nair (CSIR-National Aerospace Laboratories, India)

Wednesday, July 23 14:00 - 16:00 (Asia/Kolkata)

OS38: CubeSats-II

Room: Aryabhata

Chairs: Srinivasan M S (URSC, India), N Vishwanath (URSC, India)

14:00 **Design and Analysis of Harika Mark-1 CubeSat**

Amzaar Faisal (Northeastern University, USA); Abdul Rahman Khan (Aligarh Muslim University, India); Syed Saad Naqvi (EFS Facilities Management Services Group, India)

14:15 **Band Switchable Low Noise Amplifier Design in 65nm CMOS for Nano Satellite Applications**

Sai Kumar Bolem and Immanuel Raja (Indian Institute of Space Science and Technology, India)

14:30 **Modelling of Applied-Field Magneto Plasma Dynamic Thruster with Argon Propellant for CubeSat**

Akash C and Charulatha Siva (Hindustan Institute of Technology and Science, India)

14:45 **Physics Informed Neural Network for Optimal Rendezvous Guidance of Low-Thrust Cubesats**

Arya Das (IIT Kanpur, India); Dipak Kumar Giri (IIT KANPUR, India)

15:00 **Mission Design Using COTS Only Components for Short-Span LEO Missions**

Shreerang Saranjame (TakeMe2Space, India)

15:15 **Design and Development of a Miniature SMA-Based Hold-down and Release Mechanism for CubeSats**

Rahul Yadgirkar and Sharat Reddy (TakeMe2Space, India)

15:30 **Analysis and Optimization of Reaction Wheel Configurations for Satellite Attitude Control**

Nethra Naveen (TakeMe2Space, India); Pitchaimani M (ISRO, India)

Wednesday, July 23 14:00 - 16:00 (Asia/Kolkata)

OS39: Quantum & Secured Communication Technologies

Room: Pritvi

Chair: Anil Prabhakar (IIT Madras, India)

14:00 **White Rabbit-Based Control Electronics Synchronization in Superconducting Qubit Based Quantum Computers**

Mahesh Kondeti (Centre for Development of Advanced Computing, India); Vidyuth S D (Centre for Development of Advanced Computing India, India); Mohd Razin Ashfaque, Vaibhav Pratap Singh and Haribabu Pasupuleti (Centre for Development of Advanced Computing, India); Sudarsan S D (Centre for Development of Advanced Computing (CDAC), India)

14:15 **Quantum-Resistant Cryptography for Military Communications**

Sachin U (REVA University, India); Raveendra Gudodagi (Reva University, India); Madan HT (NMAM Institute of Technology, India)

14:30 **Implementation of Somewhat Homomorphic Encryption (SHE) Using RLWE Based Post Quantum Cryptography (PQC)**

Romio Rosan Sahani (IIT Guwahati, India); Srinivasan Krishanaswamy (Indian Institute of Technology, Guwahati, India); Gaurav Trivedi (Indian Institute of Technology Guwahati, India)

14:45 **Advancements in Fourier Analysis: the Quantum Perspective**

Satish Kumar T (DRDO, India); Aniverthy Amrutesh (Dr Ambedkar Institute of Technology, India)

15:00 **Implementation of Hybrid RS and Viterbi Coding Schemes and Its SNR Improvement Analysis for Tactical Wireless Systems**

Pavan Kumar Yerrolla (Bharat Electronics Limited, India); Hari Krishna Boyapati (Bharat Electronics Limited & Central Research Labortory-BEL, India); Sashikanth Yeswanth Chowdary (MSRS, India)

15:15 **Implementation of Phase Compensation and Low Complexity Random Access Channel in 7.2x Split Based ORU of 5G gNodeB**

Hari Krishna Boyapati (Bharat Electronics Limited & Central Research Labortory-BEL, India); Sashikanth Yeswanth Chowdary (MSRS, India)

15:30 **PAPR Reduction with Constellation Rotation & DFT-s-OFDM for Longrange Wireless Links**

Hari Krishna Boyapati (Bharat Electronics Limited & Central Research Labortory-BEL, India)

15:45 **Mitigating Quantum Threats in Space Domain: Challenges and the Role of Post-Quantum Cryptography**

Anupam Tiwari (Institution of Electronics and Telecommunication Engineers, India); Alok Kumar Gupta (ISTRAC, India)

Wednesday, July 23 14:00 - 16:00 (Asia/Kolkata)

OS40: Control & Guidance-II

Room: HT-2

Chairs: Radhakant Padhi (Indian Institute of Science, Bangalore, India), N K Philip (URSC, India)

14:00 **Detailed Terminal Error Analysis for N-Thrust Guidance and Novel Error Mitigation Techniques**

Sumithra Kakanuru and Kanu Priya Govila (URSC, ISRO, India); Ravikumar Lagisetty (Indian Space Research Organization, India)

14:15 **A Novel Approach for Autonomous Spacecraft Recovery to Sun Pointing Orientation**

Sugandha Maniktala (ISRO, India & Department of Space, India)

14:30 **A Semi-Automatic Human Supervisory Control Scheme for Manned Earth Orbiting Spacecraft**

Amit Singh (Indian Space Research Organisation, India); Rijesh MP (UR Rao Satellite Centre, India & Indian Space Research Organization, India); Bharat Kumar G V P (URSC, India); Mohan Sundara Siva (Government & Indian Space Research Organisation, India); Ravikumar Lagisetty (Indian Space Research Organization, India); Sudhakar S (ISRO Satellite Centre (ISAC, Now URSC), India)

14:45 **Current Literature PID Controller Philosophy Not Sufficient for Helicopter Dynamics and Control: Our Proposed Convex Stability Controller is Necessary**

Rama K Yedavalli (Robust Engineering Systems, LLC, USA & The Ohio State University, USA)

15:00 **High Precision Doppler Computation for Deep-Space Missions**

Manikantan Ramadas and Nandini Harinath (ISTRAC, India)

15:15 **Onboard Real Time Thrust Estimation for Chandrayaan-3: a Novel Approach Using Accelerometer Data Amidst RCS Corruption**

Aditya Rallapalli (Government, India & UR Rao Satellite Centre, India); Suraj Kumar and Chiranjib Guha Majumder (Indian Space Research Organization, India); Rijesh MP (UR Rao Satellite Centre, India & Indian Space Research Organization, India); Bharat Kumar G V P (URSC, India); Vidya V (UR Rao Satellite centre, ISRO, India); Sudhakar S (ISRO Satellite Centre (ISAC, Now URSC), India)

15:30 **Long-Range Rendezvous and Docking Maneuver Control of Satellite Using Cross-Feedback Sliding Mode Controller**

Vedant Vivek Kini, Dantu Phani Surya and Rakesh Kumar Sahoo (Indian Institute of Technology Kharagpur, India); Manoranjan Sinha (Indian Institute of Technology, Kharagpur, India)

15:45 **Engine-Based Attitude Control for Powered Descent of Lunar Landing Mission**

Chiranjib Guha Majumder (Indian Space Research Organization, India); Rijesh MP (UR Rao Satellite Centre, India & Indian Space Research Organization, India); Mohan Sundara Siva (Government & Indian Space Research Organisation, India); Aditya Rallapalli (Government, India & UR Rao Satellite Centre, India); Bharat Kumar G V P (URSC, India); Vidya V (UR Rao Satellite centre, ISRO, India)

Wednesday, July 23 14:00 - 16:00 (Asia/Kolkata)

OS41: AIT/C-III

Room: Vikram Sarabhai

Chairs: OVR Raghavareddy (Azista Aerospace, India), Hariharan VK (Dayananda Sagar University, India)

14:00 **Performance Results of Large Vacuum Test Facility for Electric Thrusters Testing**

Vara Prasad Kella (Indian Space Research Organization, India)

14:15 **In-House Design and Fabrication of s-Band Frequency Synthesizer for IRS Spacecraft Checkout System**

Subhakaran Singh Thivari (Government of india, India & I.S.R.O, India); Dhavala Ravi Teja (Government of india & I.S.R.O, India); MD. Tosicul Wara (UR Rao Satellite Center, Indian Space Research Organisation, India); Vishnu Kishore Pai (Government of india & I.S.R.O, India); HemaKumar.V.S (VelTech Rangarajan Dr Sagunthala R&D Institute of Science and Technology, India); Pooja Gupta (Government of india & I.S.R.O, India)

14:30 **NISAR s-SAR Payload: Overview of Final Stages of Ground Testing**

Anish Kumar Mishra (Space Applications Centre ISRO, India); Diksha Sharma (Space Application Centre, India); Rakesh Kumar, ChetanKumar Babubhai Lad and Suneela Mishra (Space Applications Centre ISRO, India); Himanshu Patel (Indian Space Research Organisation (ISRO), India); Prantik Chakraborty (SAC ISRO, India); Pankaj K Nath (Space Application Centre, India); Cvn Rao (Space Applications Centre (ISRO), India)

14:45 **Realization of Advanced Test Facility for Test & Evaluation of Air Borne Surveillance System**

Saravanan D (Government, India); Annapurna Sogunuru (CABS, India); Anand CS and Selvakumer S (Government, India)

15:00 **Design and Development of Mission Avionics Racks for Airborne Surveillance Platforms**

Priyank Prasad (DRDO, India); RV Ramkumar, Jadi Chandrakumar and Satish Kumar (CABS, India); Sunil Kumar Yadav (Defence Research and Development Organisation (DRDO), India & Ministry of Defence, Government of India, India); MR Shankar (CABS, India)

15:15 **Implementation and Validation of ARINC 429 Using LabVIEW for Testing of Airborne Systems**

Nidhi Mittal (CABS DRDO, India); Jayaprakash K P (CABS, DRDO, India); Deepthi VD (CABS DRDO, India); Santhya P (CABS, India)

Wednesday, July 23 14:00 - 16:00 (Asia/Kolkata)

OS42: Ground Station Technologies

Room: DS Kothari

Chair: V V Srinivasan (ISRO HQ, India)

14:00 **Study and Analysis of Satellite RF Downlink Spectrum in Real-Time Using s-Band Ground Station**

Soumyadipto De (PES University, India); Manikandan J (PES University (PESU), India)

14:15 **An Automated Interference Detection System for FDMA Based Satellite Communication Networks Using Multi-Scale Wavelet Technique**

Abhinav Vemuri Sai (Ramaiah Institute of Technology, India); Sahal Mohammed M. N. (ISRO Telemtery Tracking and Command Network, India); Rath D N and Shivani K L (ISTRAC, India)

14:30 **Remote Operation and Calibration Challenges in Ground-Based NEO Tracking: a Case Study of the Mount Abu 43cm Telescope**

Bikram Pradhan, Bulbul Mukherjee and Anilkumar A K (Indian Space Research Organisation, India)

14:45 **Design and Implementation of a Student-Built Ground Station Antenna in CanSat**

Maitreyee Choudhary and Riya Tambekar (MIT World Peace University, India)

15:00 **Innovative Antenna Calibration Technique for Chandryaan-3 Mission**

Bijoy Kumar Dai (ISTRAC, India & Jadavpur University, India); Kumar Harshit (Indian Space Research Organization, India); Senthil Kumar (ISRO, Bangalore, India); Leo Jackson and Nandini Harinath (ISTRAC, India); Anilkumar A K (Indian Space Research Organisation, India)

15:15 **Automation of Synchronous-Operations of Beacons for Onboard Tracking System of High Throughput Satellites**

Manish Kumar (MCF, ISRO, India)

15:30 **High Isolation Based 2-Port MIMO Antenna for X, K, Ku and Ka Band for 5G and mm-Wave Application**

Dipanjan Dutta and Thangavelu Shanmuganantham (Pondicherry University, India)

15:45 **Radio Frequency Interference from 4G Networks on Deep Space Missions-Implication and Mitigation**

Dharvendra P Yadav (ISRO, India & ISRO ISTRAC, India); Mridula Dwivedi (ISTRAC, ISRO, India); Sai Charan A and Anshuman Sharma (ISRO, India); Raghavendra Mr (ISTRAC, ISRO, India); Maheswari S (ISRO, India)

Tuesday, July 22 8:30 - 10:30 (Asia/Kolkata)

SS1: ISRO's Microwave Remote Sensing Payloads

Pre-launch Characterization & In-orbit Performance Analysis

Room: Poinsettia 1

Chairs: Prantik Chakraborty (SAC ISRO, India), Tapan Misra (Space Applications Centre (ISRO), India)

8:30 **Pre-Launch Characterization & in-Orbit Performance Analysis of MHS Onboard EOS-07/SSLV-D2 Mission**

Mahendra Pratap Singh Bhadoria (Indian Space Research Organization, India); Prantik Chakraborty (SAC ISRO, India); Ameya Kesarkar (Space Application Centre, India); Anamiya Bhattacharya (Indian Space Research Organization, India); Cvn Rao (Space Applications Centre (ISRO), India); Nilesh M. Desai (Space Applications Centre, ISRO, India)

8:45 **Near-Field Characterization of RISAT-1B Active Phased Array Antenna**

Akshay Pandit Vetal (Space Application Centre & ISRO, India); Yogendra Sahu (Space Application Centre, India); Partha Nandy (Space Application Centre ISRO, India); Ameya Kesarkar (Space Application Centre, India); Himanshu Sharma (Space Applications Centre, India); Ashok Rohada (Space Application Centre, India); Alok Pal (Space Applications Centre, India); Prantik Chakraborty (SAC ISRO, India); Pankaj K Nath (Space Application Centre, India); Cvn Rao (Space Applications Centre (ISRO), India); Nilesh M. Desai (Space Applications Centre, ISRO, India)

9:00 **Pre-Launch Characterization and in-Orbit Performance Analysis of Oceansat-3 Scatterometer**

Priyanka Gupta and Prantik Chakraborty (SAC ISRO, India); ChetanKumar Babubhai Lad (Space Applications Centre ISRO, India); Pankaj K Nath (Space Application Centre, India); Cvn Rao (Space Applications Centre (ISRO), India); Nilesh M. Desai (Space Applications Centre, ISRO, India)

9:15 **Pre-Launch Characterization & Preliminary in-Orbit Performance Analysis of GNSS-Reflectometry Payload in EOS-08 Mission**

Ananya Ray (Space Applications Centre & Indian Space Research Orgnaization, India); Sunita Khokhar (Indian Space Research Organisation, India); Himanshu Sharma (Space Applications Centre, India); Mahendra P Bhadoria (Space Applications Centre, ISRO, India); Diksha Gupta and Alok Pal (Space Applications Centre, India); Prantik Chakraborty (SAC ISRO, India); Pankaj K Nath (Space Application Centre, India); Cvn Rao (Space Applications Centre (ISRO), India)

9:30 **NISAR s-Band SAR Ground Checkout Systems**

Diksha Sharma (Space Application Centre, India); Anish Kumar Mishra, Rakesh Kumar, ChetanKumar Babubhai Lad and Suneela Mishra (Space Applications Centre ISRO, India); Pankaj K Nath (Space Application Centre, India); Cvn Rao (Space Applications Centre (ISRO), India)

9:45 **Methodology for Characterization of Navigation Radar Altimeter in Lab**

Sunita Khokhar (Indian Space Research Organisation, India); Priyanka Mehrotra (Space Applications Centre (ISRO), India); Ayush Jha (Indian Space Research Organisation, India); J. Rao, Pankaj K Nath and Ameya Kesarkar (Space Application Centre, India); Ananya Ray (Space Applications Centre & Indian Space Research Orgnaization, India); Akshay Pandit Vetal (Space Application Centre & ISRO, India)

Tuesday, July 22 8:30 - 10:30 (Asia/Kolkata)

SS2: Launch Vehicle Technologies

1. Guidance & Control of Launch Vehicles and STS: Dr. Gopal Jee, GD, CGDG, VSSC
2. Actuators Sensors and Robotics for Space Applications: Dr. Biju Prasad B, GD, CASG, VSSC
3. RF Systems for Launch Vehicles: Shri. Lal M J, Group Director, RFSG/AVN, VSSC
4. Avionics Fabrication Techniques: Smt. Sheena Abraham, Group Director, EPG, VSSC

Room: Poinsettia 2

Tuesday, July 22 8:30 - 10:30 (Asia/Kolkata)

SS3: Airborne Surveillance Systems Technology

1. Key Note Talk: India's Capability in Airborne Surveillance Systems Technology: Past, Present and Future, Director CABS
2. Advance Sensor Technology for Airborne Surveillance System
3. MSDF and AI/ML Technology for Airborne Surveillance System
4. Advanced Mission Computing Technology for ISR Applications
5. Model Based System Engineering in Design and Development of Airborne Surveillance System

Room: Petunia

Tuesday, July 22 8:30 - 10:30 (Asia/Kolkata)

SS4: Semiconductor Technologies : Defence and Space Applications

Session Moderator: Ms. Suma Varughese, Director General MED & CoS (Micro Electronic Devices and Computational Systems & Cyber Systems), DRDO

1. Present Status of Indigenous Technologies
2. Laser Technology
3. InP HEMT and THz: launch pad for networking in space
4. Infrared Focal Plane Array Technologies-HgCdTe & State of the Art
5. High Efficiency III-V Triple junction Solar cell for space application
6. Silicon Carbide Devices: Enabling Efficient Power Electronics for a Sustainable Future
7. GaN technology for Ka-band: Key challenges and prospects

Room: Amarylis

Tuesday, July 22 8:30 - 10:30 (Asia/Kolkata)

SS5: Space Weather/EMI/EMC

Invited Talk:

Room: Heliconia 1

Chair: DC Pande (Electronics and Radar Development Establishmnet, India)

9:00 **Effect of Thermal Blanket on the Charging of Spacecraft Bodies**

Soumyabrata Chakrabarty (IIT Kanpur & Space Applications Centre, ISRO, Ahmedabad, India); Anunnya Gudhenia (IIT Kanpur, India)

9:15 **Uncertainty Bounds for Anomalous Geomagnetic Storm Forecasting - a Deep Learning Approach**

Soumyabrata Chakrabarty (IIT Kanpur & Space Applications Centre, ISRO, Ahmedabad, India); Mihir Agarwal (Indian Institute of Technology Gandhinagar, India); Progyan Das (IIT Gandhinagar, India); Shruhrid Banthia (Indian Institute of Technology Gandhinagar, India); Dibyendu Chakrabarty (Physical Research Laboratory, India)

9:30 **Cold Atmospheric Plasma Jets in Space Research**

James Raja S (National Institute of Technology Calicut, India); Lintu Rajan (NITC, India); Venu Anand (National Institute of Technology Calicut, India)

9:45 **Geomagnetic Storm Effects on Indian Regional Navigation Satellite System (NavIC) Performance**

Raj Hakani (IITRAM, India); Abhishek Rawat (Institute of Infrastructure Technology Research and Management (IITRAM), India)

10:00 **Optimisation of Lightning Arresters for Airborne Radomes, Ensuring Better Protection and Antenna Performance**

Mrudula G (CSIR - National Aerospace Laboratories, India); Sharon Varghese (Ansys Inc, India)

10:15 **Study on Indirect Effects of Lightning on Aircraft Using Simulation**

Shazna Sadique (CSIR National Aerospace Laboratories, India); Mrudula G (CSIR - National Aerospace Laboratories, India); Sharon Varghese (Ansys Inc, India); Ajit Kumar Singh (3D Engineering Automation LLP Bangalore, India)

10:30 **The Weaknesses of the High-Power Microwave Weapon**

Mohamed zied Chaari (Qatar University, Qatar)

Tuesday, July 22 8:30 - 10:30 (Asia/Kolkata)

OLS1: OLS1

Room: Hibiscus 2

Chairs: Ravi Hosamani (KLE Institute Of Technology, Hubli & VTU, Belgaum, India), A Mahesh (RV College of Engineering, India)

8:30 **IoT Communication Framework with Ground Station Integration Using MQTT over TCP**

Priyanka Ahlawat and Mayank Dave (National Institute of Technology (Institute of National Importance), India); Supriya Mishra (National Institute of Technology, Kurukshetra, India); Mohanchur Sarkar (Space Application Centre (ISRO) Ahmedabad, India); Pravin Patidar (Space Application Centre & Indian Space Research Organisation, India)

8:45 **Quadra Wideband Cylindrical Dielectric Resonator Antenna for 5G,6G, and mmWave Application**

Dipanjan Dutta and Thangavelu Shanmuganantham (Pondicherry University, India)

9:00 **Dual-Mode Green Monopropellant Thrusters for Sustainable Space Exploration: Experimental Research at Khalifa University**

Djamal Darfilal (Khalifa University Space Technology, United Arab Emirates); Fatima Alhammadi (Khalifa University of Science & Technology, United Arab Emirates); Abderrahim Nabi (Khalifa, United Arab Emirates); Elena Fantino (Khalifa University of Science and Technology, United Arab Emirates); Jeongmoo Huh (United Arab Emirates University, United Arab Emirates); Sean Swei (Khalifa University, United Arab Emirates)

9:15 **Design, Development, and Testing of a Cost-Effective 2U Multidirectional Propulsion Platform for CubeSat Applications**

Djamal Darfilal (Khalifa University Space Technology, United Arab Emirates); Fatima Alhammadi (Khalifa University of Science & Technology, United Arab Emirates); Abderrahim Nabi (Khalifa, United Arab Emirates); Elena Fantino (Khalifa University of Science and Technology, United Arab Emirates); Sean Swei (Khalifa University, United Arab Emirates)

9:30 **Modular Automated Test System for Advanced Propulsion and Satellite Subsystems Using NI PXI Data Acquisition Technology**

Djamal Darfilal (Khalifa University Space Technology, United Arab Emirates); Abderrahim Nabi (Khalifa, United Arab Emirates); Fatima Alhammadi (Khalifa University of Science & Technology, United Arab Emirates); Sean Swei (Khalifa University, United Arab Emirates)

9:45 **High-Resolution Mangrove Land Cover Mapping in the Sundarbans Using U-Net and Multi-Source Satellite Data**

Rakesh Kumar Gupta and Soumen Moulik (National Institute of Technology, Meghalaya, India); Sheli Sinha Chaudhuri (Jadavpur University, India)

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