

Industrial Workshop

First 45 mins from CELESTIA TTI

Title: Planar Antennas and Electronic Steerable Antennas Applications (CELESTIA TTI)

Abstract: CELESTIA TTI has a long-standing history in the design of antennas for communication systems across multiple applications. With a team of highly skilled antenna and radiofrequency designers, the company has consistently achieved remarkable success in projects that marry exceptional performance and efficiency with a commitment to the reduction of size and weight (SWaP concept). One notable example is the development of flat antennas tailored for portable terminals in geostationary satellite communication scenarios.

In response to the escalating demand for electronic scanning antenna solutions, CELESTIA TTI is at the forefront, delivering phased-array solutions across various applications. These include pivotal projects such as space debris surveillance radar, the Galileo gateways, and in-flight satcom terminals.

This workshop offers a comprehensive overview of these groundbreaking projects, with a special emphasis on the promising future of electronic scanning antennas, highlighting their key role in shaping the landscape of advanced communication systems.

During the initial 45-minute slot of the workshop, CELESTIA TTI will present the topic "Planar Antennas and Applications of Electronic Steerable Antennas" in a dynamic presentation format. Keynote speakers Manuel J. González and Alberto Pellón will share insights and expertise on the subject. The presentation will feature live demonstrations of relevant hardware, providing attendees with a first-hand look at the technology. Additionally, the showcased hardware will be available for further exploration at our booth following the presentation.

Second 45 mins from CELESTIA UK

Title: Multi-Beam Phased Array Systems for SatCom Gateway Applications (CELESTIA UK)

Abstract: With the recent proliferation of LEO constellations, the ability of legacy ground segment equipment to keep pace has been limited. A new model for ground equipment is required. CELESTIA UK has developed a multi-faceted distributed aperture system that has the ability to track a significant number of satellites at once, with real-time, agile beams and no moving mechanical parts.

This workshop offers an insight into the design drivers and trade-offs for such a complex system of systems and the speakers will give their first-hand experience of the challenges involved as well as the performance achieved from their ground-breaking system.

In the second 45 minute slot of the workshop, CELESTIA UK will present our recent design and development work which has resulted in a distributed aperture system that is being used to communicate with a next generation LEO satellite. We will highlight its capabilities and performance characteristics. The Keynote speakers Ed Totten, Daniel White and Colum Tucker will share their experience and design know-how for such a complex system of systems. The team of speakers will touch on some of the challenges involved in the integration and testing of the system. Hardware will be showcased at the Celestia booth and a representation of the full system can also be seen.

Speakers:



Manuel J. González obtained his Telecommunications Engineering degree in Radiocommunications from the University of Cantabria, Spain, in 2002. In 2007, he became part of the CELESTIA TTI Antennas Department, taking on the role of RF and Active Antennas Architect. During his period of leadership, Manuel has played a key role in research and development projects for both industry and public organizations, including contributions to programs with the European Space Agency and Clean Aviation. His focus has primarily been on advancing satellite communication technologies tailored for portable, ground mobile and in-flight applications. Manuel's main research interests revolve around SATCOM solutions, particularly those leveraging electronically steerable antennas, and the exploration of radar systems.



Alberto Pellón received his Telecommunications Engineering degree in Radiocommunications from the University of Cantabria, Spain, in 2001. In 2002, he became part of the CELESTIA TTI Antennas Department and currently serves as the Technical Manager. Over the years, he has spearheaded cutting-edge research and development projects in collaboration with industry and the European Space Agency. These projects have encompassed a diverse range of applications, including the development of space debris surveillance radar and Ka-band gateways for Low Earth Orbit (LEO) megaconstellations. Alberto's primary research interests lie in

radar systems and the exploration of electronically steerable antenna solutions for ground, airborne, and spaceborne applications.



Ed Totten has a PhD in Astrophysics from the Queens University Belfast and the Royal Greenwich Observatory in Cambridge, UK. Ed has >20 years of experience in managing small to medium sized R&D Teams within large international defence companies. Until 2020, Ed was the Head of Airborne AESA Engineering at a large radar manufacturer where he was responsible for the design, build and test of next generation fire-control and surveillance radar systems. He joined Celestia in June 2020 and has been overseeing the development of phased array gateways and Satcom terminals.



Daniel White has a PhD in Electrical and Electronic Engineering from the University of Manchester, England in the design of Ultra Low Noise Amplifiers for Radio Astronomy. Daniel has been a member of the Celestia team for 3 years and has been heavily involved in the RF design and RF layout of the phased array Gateway designs and the RF tile design for the Celestia terminal concepts.



Colum Tucker has a MEng in Electrical and Electronic Engineering from Heriot-Watt University in Edinburgh, Scotland. Colum has been a member of the Celestia team for 2 years having previously worked for a large radar design company, where he completed a graduate scheme and was an Antenna Engineer. Colum has extensive knowledge in the fields of antenna design and modelling as well as antenna measurements. Colum has an in-depth knowledge of the calibration processes and software required for the successful operation of large phased array antenna systems.