EUCAP2024 Scientific Workshop

Defence Radar, Antennas and Electromagnetics: past present and future

Scotland has a long and proud history in the development of radar in the UK so it is particularly apposite that we are holding a scientific workshop in this area at EUCAP 2024 in Glasgow. Centred on the development of phased array and related technologies, leading research institutes and industries are contributing to what promises to be an exciting and thought-provoking session.

This workshop is jointly chaired with the IEEE Phased Array Systems and Technology conference (PAST), the first time EUCAP and PAST have cooperated in this way.

Our aim is to inspire future engineers and technology developments through knowledge of the current state of the art, but informed by the long and successful history of radar. We draw together leading international industry experts to both celebrate radar antenna history and to present their views on future challenges and technologies. A directed panel discussion will allow these areas to be further expanded and explored.

Although this workshop is centred on the defence industry, it will have a relevance to those working in other application areas including communications, imaging and remote sensing. It is designed to interest both experienced engineers and those starting in this technology, and from both industrial and academic backgrounds. We are strongly encouraging researchers at all career stages to join us and engage with the expert panel.

The workshop will be jointly chaired by David Conway (MIT Lincoln Laboratory) on behalf of IEEE PAST and Tony Brown (Queen Mary, University of London and Easat Radar Systems Ltd) representing EUCAP2024.

Programme

Date: Monday 18th March				
Start Time	**Duration**	**Title**	**Presenter(s)**	**Institute**
13:30	00:05	Introductory remarks	Tony Brown, David Conway	Queen Mary, University of London, UK; MIT Lincoln Labs, USA
13:35				
	00:30	Historical Perspective of World War II Radar Development	David Conway	MIT Lincoln Labs
14:05	00:30	History and Future Directions of Airborne Radars	Claudio Biancotto	Leonardo
14:35	00:30	Development of Phased array and multi-phase centre systems	Stephen Harman	THALES UK
15:05	00:30	**BREAK**		
15:35	00:30	Recent Past, Current, and Future AESA Radar Development at Lincoln Lab	David Conway	MIT Lincoln Labs
16:05	00:30	Phased array Antennas for radar: research directions at TNO	Stefania Monni	TNO
16:35	00:30	Phased Array Technology at FHR – From Early beginnings to High-End Solutions	Dirk Heberling	FHR Fraunhofer
17:10	00:40	Panel discussion		
17:50		**END OF WORKSHOP**		

David Conway (MIT Lincoln Lab) David Conway is a senior member of the technical staff at MIT Lincoln Laboratory in the RF Technology Group, where he leads concept, design, and development activities in phased arrays with a focus on materials, topologies, and techniques that reduce array cost. His broader interests include MMIC and beamformer design, thermal management, polarimetric radar, and antenna and radar test and evaluation. Current efforts are focused on applying low-cost topologies, methods, and materials to advanced capability AESA systems. Prior to joining Lincoln Laboratory in 2010, Mr. Conway worked in industry for more than 26 years. His former employers include Hughes Aircraft, ITT, M/A-COM, and Cobham. His efforts during that period included microwave radiator, filter, and beamformer design; communication and radar transmit/receive module design and automated test development; high-power amplifier and multifunction MMIC design; and the design, development, and marketing of a commercial MMIC product line. Mr. Conway has published sixteen papers, co-wrote a book chapter, and holds one patent. He received an MSEE degree from the University of Southern California and a BEE degree from the Georgia Institute of Technology

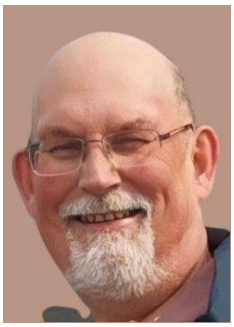
Claudio Biancotto received a Laurea degree (BSc) in Telecommunications Engineering from Politecnico di Milano in 2004, an MSc in Mobile Communications from Heriot-Watt University in 2016, a Laurea Specialistica degree (MSc) in Telecommunications Engineering from Politecnico di Milano in 2007 and a PhD in Electrical Engineering from Heriot-Watt University in 2012. In 2017 he Joined Leonardo in Edinburgh (UK) where he is currently the Chief Antenna Engineer in the Antenna Group, overseeing the various activities of the group from R&D to production support of the AESAs manufactured in Edinburgh.Prior to Leonardo, Dr Biancotto worked at CommScope as Senior RF Engineer where he was responsible for the design of novel microwave antennas and their qualification to support the introduction into production.
Dr. Biancotto has been involved in the various aspects of Antenna Engineering for the past 20 years, with various interests encompassing phased arrays, RCS, Electromagnetic BandGap structures, Design For Manufacture, antenna modelling, antenna measurements using Near-Field ranges, outdoor ranges and compact ranges.

Stefania Monni (1974) obtained her MSc. in Electronic Engineering in 1999 from the University of Cagliari, Italy. Between 1999 and 2000 she was with the European Space Agency as Trainee on interferometry and polarimetry techniques for Synthetic Aperture Radar. She obtained her Ph.D. in Electrical Engineering in 2005 from the Technical University of Eindhoven, The Netherlands, jointly with TNO, on integral equation based analysis techniques for period structures. Since 2014 she is leading the Antenna Team at TNO Radar Technology department, and she is responsible for the definition and technical coordination of the research activities and the long-term strategy. Since 2019 Stefania is also with the Chip Integration Technology Centre (CITC), in Nijmegen, The Netherlands, as senior scientist of the RF Chip Packaging Program.

Stephen Harman is a radar product technical lead within the Information Surveillance and Recognisance (ISR) domain of Thales UK with responsibility for assurance of ISR's radar products. Previously he was the Chief Technology Officer of Aveillant, with responsibility for the technical direction of the company and acted as design authority for Aveillant's Radars. He is a Fellow of the IET With over 30 years' experience in radar science, system design and engineering.

Dirk Heberling (born 15.08.1961) studied electrical engineering and graduated with a Dipl. Ing. degree from RWTH Aachen University, Aachen, Germany in 1987. There he also received the Dr. Ing. degree in 1993 for his thesis on conformal microstrip antennas.

In 1993 he joined IMST GmbH, Kamp-Lintfort, Germany to establish a new Antenna Section and from 1995 to 2003 he was head of the Antennas Department, and from 2003 to 2008 he was head the Department of Information and Communication Systems of IMST GmbH. In 2008 he moved to RWTH Aachen University where he is Head of the Institute and holder of the chair for High Frequency Technology. In addition 2016 he became director of the Fraunhofer Institute for High Frequency Physics and Radar Techniques, FHR.



Tony Brown started work in 1974 at the Marconi Research Laboratories at Great Baddow, Essex, UK. His first experience of phased array radar development was in 1976, an X-band portable system. Tony moved to STL in Harlow, Essex where he worked on early digital beamformer arrays. Moving to the University of Surrey (1980) he gained hi PhD in 1983. He then joined Racal Antennas Ltd as Chief Engineer. Leaving Racal in 1987 he co-founded Easat Antennas Ltd, later becoming Easat Radar Systems, and now a leading supplier of ATC and coastal radar. Tony accepted a Chair position at the University of Manchester (UMIST) in 2003. He retired in 2018 becoming Professor Emeritus. He later joined Queen Mary, University of London on a part time basis in 2019. He maintains a long-term research collaboration with the University of Cambridge on wide band phased arrays and is part time CTO in Easat Radar Systems Ltd