

### Seminar On

## E-Band Multibeam Transmitarrays for Unmanned Aerial Vehicle Aided Communications

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**Date** : 12 April 2023 (Wednesday)  
**Time** : 11:00 am – 12:00 noon  
**Venue** : Room 15-202, 15/F, State Key Laboratory of Terahertz and Millimeter Waves,  
Lau Ming Wai Academic Building, City University of Hong Kong

### Abstract

Unmanned aerial vehicles (UAVs) aided wireless communications promise to provide high-speed cost-effective wireless connectivity without needing fixed infrastructure coverage. They are a key technology enabler for sixth generation (6G) wireless networks, where a three-dimensional coverage including space, aero and terrestrial networks are to be deployed to guarantee seamless service continuity and reliability. UAV aided wireless communications also serve as important tools to assist the natural disaster monitoring and relief operations.

Owing to the aerodynamic requirements, it is highly desirable to employ conformal antennas that can follow the shapes of UAVs to reduce the extra drag and fuel consumption. To enable hundred gigabits-per-second (Gbps) data rates and massive connectivity for 6G networks, E-band antennas have drawn an increasing amount of attention due to the vast available spectrum and low atmospheric attenuation. To this context, E-band conformal antenna arrays featured with high gains and multiple beams are highly demanded. However, new challenges exist in designing and implementing high-gain multi-beam conformal arrays for UAV platforms.

This talk will present the latest advances on E-band conformal transmitarrays developed by Dr Qin's group. In particular, a new method to achieve multi-beam radiations with a wide angular coverage will be discussed. Antenna prototypes with simulated and measured results will be demonstrated to verify the developed method.

### Biography



**Pei-Yuan Qin** received a Bachelor Degree in Electronic Engineering from Xidian University, Xi'an, China, in 2006, and a joint Ph.D. Degree from Xidian University and Macquarie University, Australia, in electromagnetic fields and microwave technology in 2012.

From 2012 to 2015, he was a Postdoctoral Research Fellow in Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia. From 2015 to 2016, he was a Chancellor's Postdoctoral Research Fellow/Lecturer with University of Technology Sydney (UTS), Australia. Since 2022, he is an Associate Professor with UTS. He is a visiting scholar with Harvard University in 2018. His research interests are in the areas of reconfigurable antennas, conformal antennas and arrays.

Dr Qin was awarded an Australian Research Council (ARC) Discovery Early Career Researcher Award in 2017. He has secured over \$1.2 million highly competitive funding from ARC and he is currently leading one ARC Discovery Project (\$400K). He was awarded the Vice-Chancellor's Commendation for academic excellence by Macquarie University in 2012. His team's research have won many awards, including 2016 Computer Simulation Technology (CST) University Publication Award and Best Paper Award in 2019 ISAP. He has served as General Co-Chairs/organising committee members for many flagship conferences in Antennas and Propagation Society. He is currently severing the Associate Editors of IEEE Transactions on Antennas and Propagation and IEEE Antennas and Wireless Propagation Letters. He is the founder and Chair of Australian Node - Antenna Measurement Techniques Association (AMTA).

\*\*\* ALL ARE WELCOME \*\*\*

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