

IW6 - Design, Simulation and Realization of Phased Array Antennas

Abstract:

Phased arrays provide scanned beams or multiple beams that are commonly used for radar, communication systems and space applications. This course begins with an introduction to the fundamentals of phased antenna arrays, emphasising key concepts such as array factor, coupling, gain/directivity, and problems such as grating lobes, beam squint and scan blindness. The second part focuses on practical examples of real active array antenna systems and their efficient 3D EM design and integration.

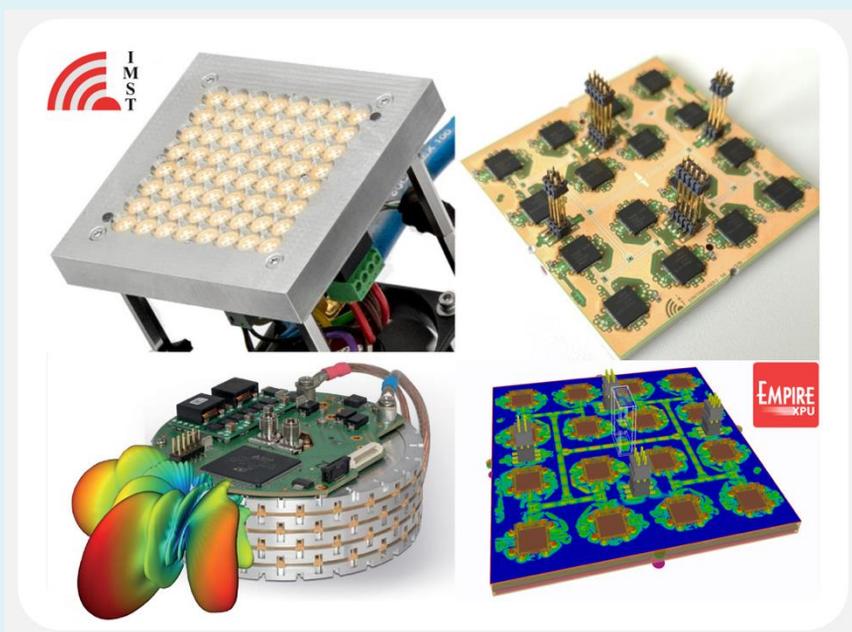
Workshop Outline:

1. Phased array design guidelines.

The first part will provide participants with basic guidelines for the analysis and design of phased array antennas. The basic design process will be explained with a focus on key parameters such as technology and array architecture choices, thermal management and array calibration.

2. Satcom and 5G array design, realisation and integration.

The second part of the workshop is filled with practical examples of real array antenna systems. Efficient simulation models for different design stages will be explained. Simulated performance will be compared to measurements. Vehicle and aeroplane integrated performance of a Ka-band phased array will be shown as the last step using an antenna digital twin. The hardware for some of the systems presented will also be shown in the course.



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Instructors:



Simona Bruni is Director of the Sub-THz Antenna Systems team at IMST GmbH. Her research interests include the design of integrated antennas, high-frequency antenna arrays, and front-end design for communications and automotive applications.



Marta Arias Campo is Director of the Sub-THz Antenna Systems team at IMST GmbH. Her research interests include the analysis and design of lens antennas and quasi-optical structures for high-speed wireless communications and radar applications.