

SHORT COURSE PROPOSAL TO EuCAP 2014, The Hague, THE NETHERLANDS

Course title: **Multibeam Antennas and Beamforming Networks**

The objective of this course consists in presenting the state of the art and the on-going developments in Multi-Beam Antennas (MBAs) and Beam-Forming Networks (BFNs). MBAs find application in several fields including communications, remote sensing (e.g. radars, radiometers, etc.), electronic surveillance and defense systems, science (e.g. multibeam radio telescopes), RF navigation systems, etc. The BFN plays an essential role in any antenna system relaying on a set of radiating elements to generate a beam. The course will cover both theoretical and practical aspects for the following topics:

- Overview of system requirements
- Multibeam Antennas
 - Linear and Planar Direct Radiating Arrays (based on Periodic or Aperiodic lattices)
 - Reflector-based architectures (Single-Feed-per-Beam, Multiple-Feed-per-Beam)
 - Lens-based architectures (free space and constrained)
- Beamforming Networks
- Analogue BFNs (Corporate, Blass, Nolen, Butler matrices)
- Digital BFNs
- RF Technology for Active Components
- Low Noise Amplifiers (LNAs, High Power Amplifiers (HPAs), T/R Modules, etc.
- Overview of some Operational Multibeam Antennas/BFNs
- MBAs for spaceborne Narrowband and Broadband Satellite Communication Systems
- MBAs for Wireless Communications
- On-going European Developments
- Current Design and Technological Challenges

Requested pre-requisites (e.g. the participants should have followed a Masters level course on Electromagnetics, or they should be able to use a given software) :

Basics of Antenna Theory and Microwaves.

List of chapters (typically between 5 and 10 chapters):

See above.