



Universität Karlsruhe (TH)
Research University • founded 1825



European School of Antennas



Ultra Wideband Antennas

2nd Edition 2008

Date:

April 2010.

Place:

To be defined.

Addressed audience:

PhD students and scientists (including participants from industry). The course is strictly limited to a number of 20 participants. For PhD students the possibility of obtaining 3 ECTS credits from an exam is given.

Course fees:

PhD students / university employees: 400 €
Industry employees: 1200€

Short description:

This tutorial will present an insight into design, evaluation and measurement procedures for ultra wideband (UWB) antennas as well as into the characteristics of the UWB radio channel. State of the art topics regarding UWB systems in the fields of communications, radar and sensor networks will be discussed. Lectures will be complemented with laboratory exercises including the measurement of transient antenna properties in the time domain, UWB wave propagation modelling, and the design and numerical optimization of UWB antennas.

Detailed topics are:

- Applications and regulations overview
- UWB antenna basics and principles of wideband radiators, transient antenna characterization, UWB antenna quality measures derived from the antenna impulse response
- UWB radio channel modelling and channel measurements with special respect to the antenna influence
- Properties and design considerations of the following UWB antennas: UWB ridged horn antennas, Vivaldi antennas, logarithmic periodic antennas, mono cone antennas, spiral antennas, aperture coupled bowtie antennas, multimode antennas, sinuous antennas, impulse radiating antennas
- UWB leaky lens antenna, Green's function of a slot printed between two infinite dielectrics, dual band leaky lens antenna Design, elliptical lens concept, design of the feeding network
- Impulse radio UWB principles, modulation schemes, pulse shapes, time-hopping codes, transmitter architectures, receiver architectures, rake structures, stochastic properties of impulse radio UWB, temporal/spectral properties, amplitude properties, multi-band OFDM
- Beam-forming techniques, lenses and networks: Luneburg lens, Rotman lens, Maxon-Blass Matrix, Butler Matrix, linear UWB antenna arrays, true time delay beam-forming, circular arrays
- UWB Radar and Imaging, time vs. frequency domain radar, high-resolution radar and imaging, applications
- UWB sensor networks, distributed computing, localization and imaging

Teachers:

Prof. Werner Wiesbeck (IHE, Universität Karlsruhe)
Prof. Friedrich Jondral (INT, Universität Karlsruhe)
Prof. Luis Jofre (Universitat Politècnica de Catalunya)
Prof. Jordi Romeu (Universitat Politècnica de Catalunya)
Dr. Andrea Neto (TNO)
Dipl.-Ing. Christian Sturm (IHE, Universität Karlsruhe)

Scholarships:

From the Marie Curie programme 5 scholarships for PhD students will be granted. The scholarships cover travel expenses up to 800 € and the course fees. The application procedure is described on the course website.

Contact:

Registration and accommodation: Simone Gorré, simone.gorre@ihe.uka.de
Course details: Christian Sturm, christian.sturm@ihe.uka.de

For further information and registration please visit the official course website:

http://www.antennasvce.org/Community/Education/Courses?id_folder=158