

EXPERT GROUP HIGH-FREQUENCY ENGINEERING AND RADIO COMMUNICATIONS

Contacts



Senior Consultant Research Transfer

Prof. Dr. Detlef Schlager
FTZ Leipzig e.V.

- EMC
- Electrical Engineering
- Electromagnetic Fields



ARTME - Applied Radio Technology and Microwave Engineering

Prof. Dr. René Sallier and M. Sc. Jens Voigt
HTWK Leipzig, F ING, rene.sallier@htwk-Leipzig.de, jens.Voigt@htwk-Leipzig.de

- High-frequency Circuit and Electronics Design
- Material Properties in High-frequency Applications
- Frequency-selective Structures, Antennas and Surfaces



COM-Lab

Prof. Dr. habil Marco Krondorf
HTWK Leipzig, F ING, marco.krondorf@htwk-Leipzig.de

- Modulation and Coding
- FPGA Implementations
- Satellite Communications
- Baseband Signal Processing
- Spread Spectrum Systems, OFDM
- Monte-Carlo System Simulations



Secure Systems Lab

Prof. Dr. Jörn Hoffmann
HTWK Leipzig, F ING, joern.hoffmann@htwk-Leipzig.de

- Secure Chip Design
- Security for Embedded Systems
- Secure Communication Architectures
- Security of Real-time Operating Systems



NEMS & AeroXess

Prof. Dr. habil. Robert Geise
HTWK Leipzig, F DIT, robert.geise@htwk-Leipzig.de

- Antenna Design
- RF-Measurements
- Radar Applications
- Navigation Systems
- UAV-based Measurements
- Electromagnetic Simulations



RadioLab

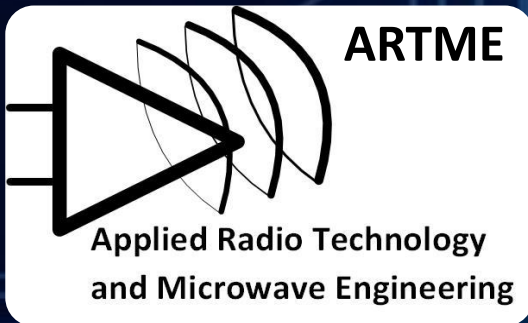
Prof. Dr. Michael Einhaus
HTWK Leipzig, F DIT, michael.einhaus@htwk-Leipzig.de

- Simulation for Mobile Radio Networks
- Planning and Optimization for MRN
- Propagation and QoS Measurements
- Modeling and Digital Twins for MRN
- Industry and Campus Networks



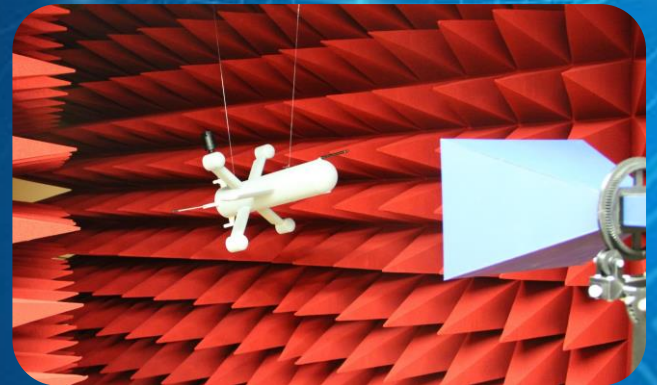
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Our Labs



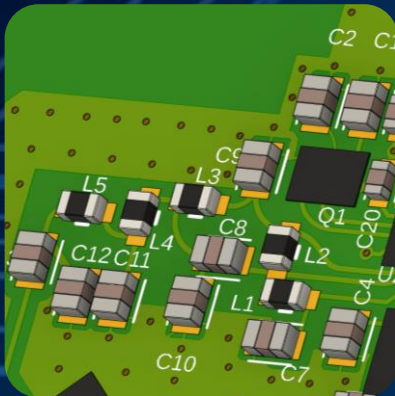
Semi-Anechoic Chamber - 300 MHz to 40 GHz

- TX / RX of system components within objects
- Material properties under EM waves
- Measurement of RF-resonant and selective structures



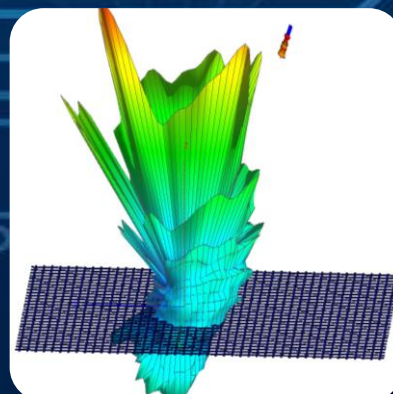
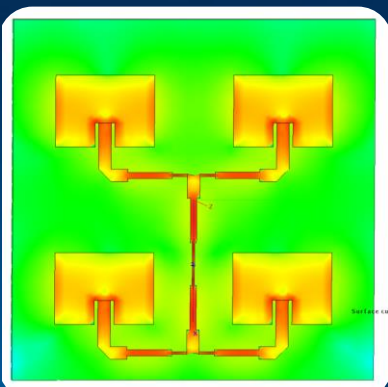
Equipment

- Signal and spectrum analyzers and vector signal generators from 100 kHz to 30 GHz
- network analyzers from 5 kHz to 6 GHz, high-power
- RF amplifiers from 13.5 MHz and, at lower power levels, up to 20 GHz
- measurement setups for determining dielectric properties
- measurement antennas from the shortwave range up to 20 GHz



Circuit and PCB Design

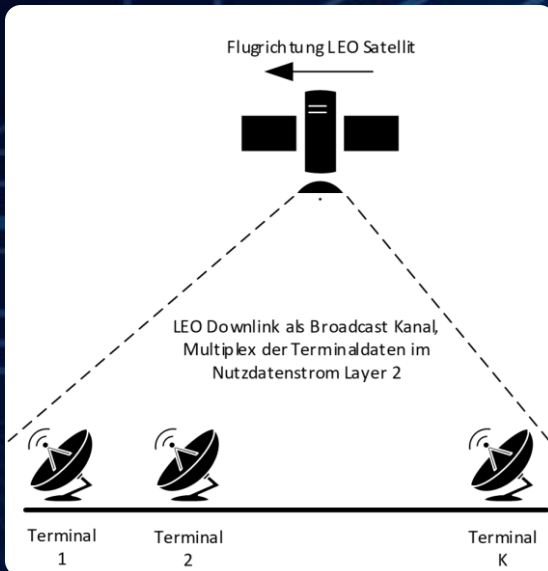
- High-frequency PCB design (up to the double-digit GHz range)
- High-speed digital design (Autodesk Fusion Electronics)
- RF simulation & development (Altair FEKO, MATLAB)



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Our Labs

ARTME

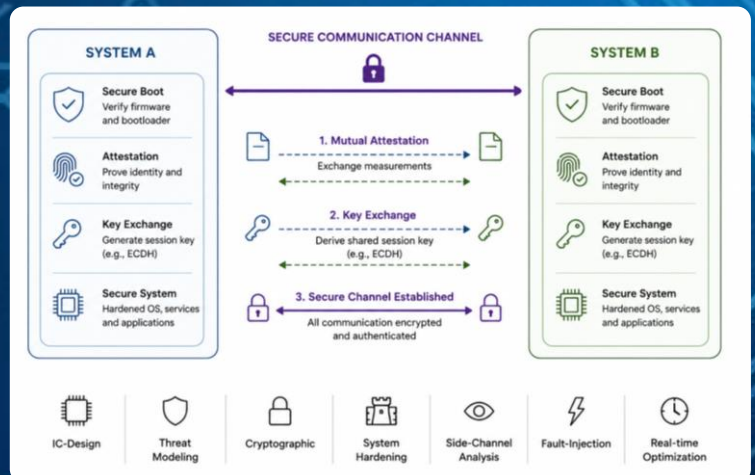


COM-Lab Satellite Communications

- Baseband signal processing and link budget calculations for LEO satellite communications
- Waveform-Design Layer 1 and Layer 2
- Software defined radio and real time signal processing using FPGA
- LEO overflight simulations
- GNSS-denied object tracking
- LDPC FEC and iterative turbo-receivers
- Phased array beam forming and DoA estimation
- Time and frequency synchronization
- MIMO-OFDM base band signal processing

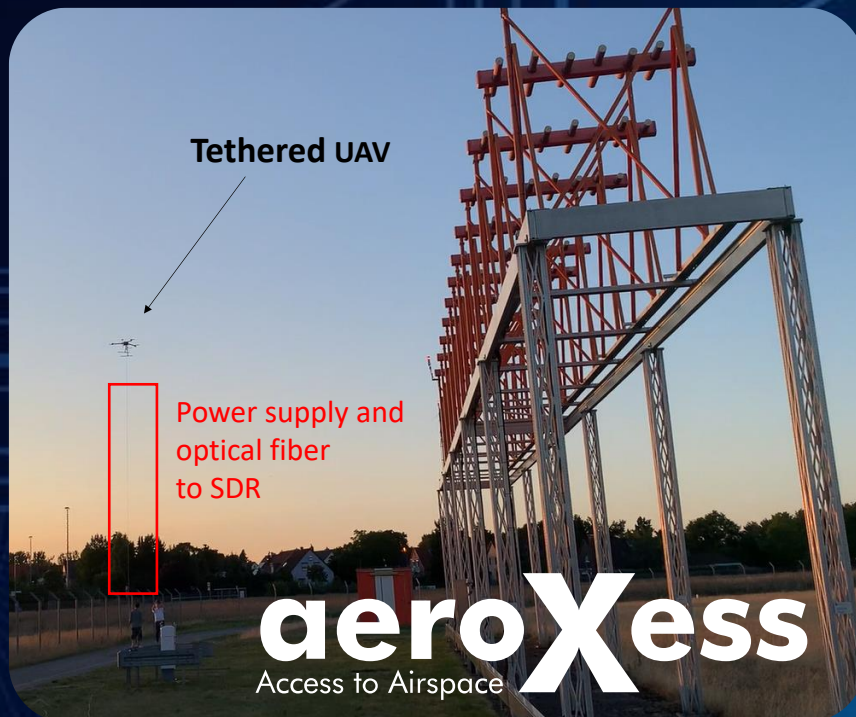
Secure-System-Lab

- Secure IC-Design
- Threat Modelling
- Cryptographic ICs
- System Hardening
- Real-Time Detection
- Side-Channel Protection
- Fault Injection Protection

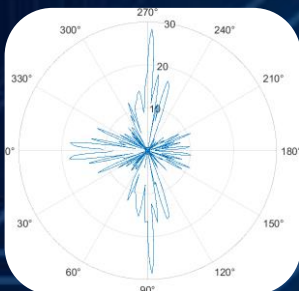


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Our Labs

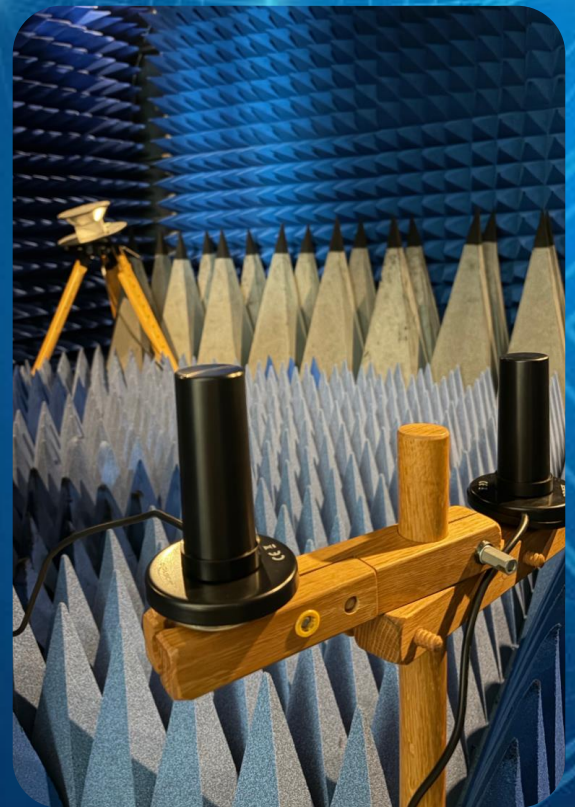


With our **AeroXess** laboratory we perform UAV based high frequency measurement applications. In particular, near field measurements of large antenna, e.g. navigation systems at airports can be performed in-situ. Low-frequency antennas, too large for nowadays anechoic chambers can also be characterized.



In our **NEMS** laboratory we realize antenna and propagation measurements as well as sophisticated EMC tests. Overall, we can analyze the integrity of communication and navigation systems. Lab infrastructure:

- Full anechoic chamber from 1 GHz
- High frequency measurements, spectrum analysis and vector analysis up to 20 GHz
- Outdoor and mobile equipment
- Oscilloscope up to 6 GHz
- Antennas from 30 MHz to 20 GHz
- Electromagnetic simulation software (Altair FEKO and CST Studio)
- Compute cluster for large electromagnetic simulations (> 1 TB RAM)



NEMS
LABORATORY

Navigation Electromagnetics Measurement Simulation

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Our Labs

RadioLab
HTWK Leipzig

RadioLab

- Simulation and QoS Prediction for Mobile Radio Networks
- Radio Access Network Planning and Optimization
- Propagation and QoS Measurements
- Modeling and Digital Twins for Mobile Radio Networks
- Industry and Campus Networks

