

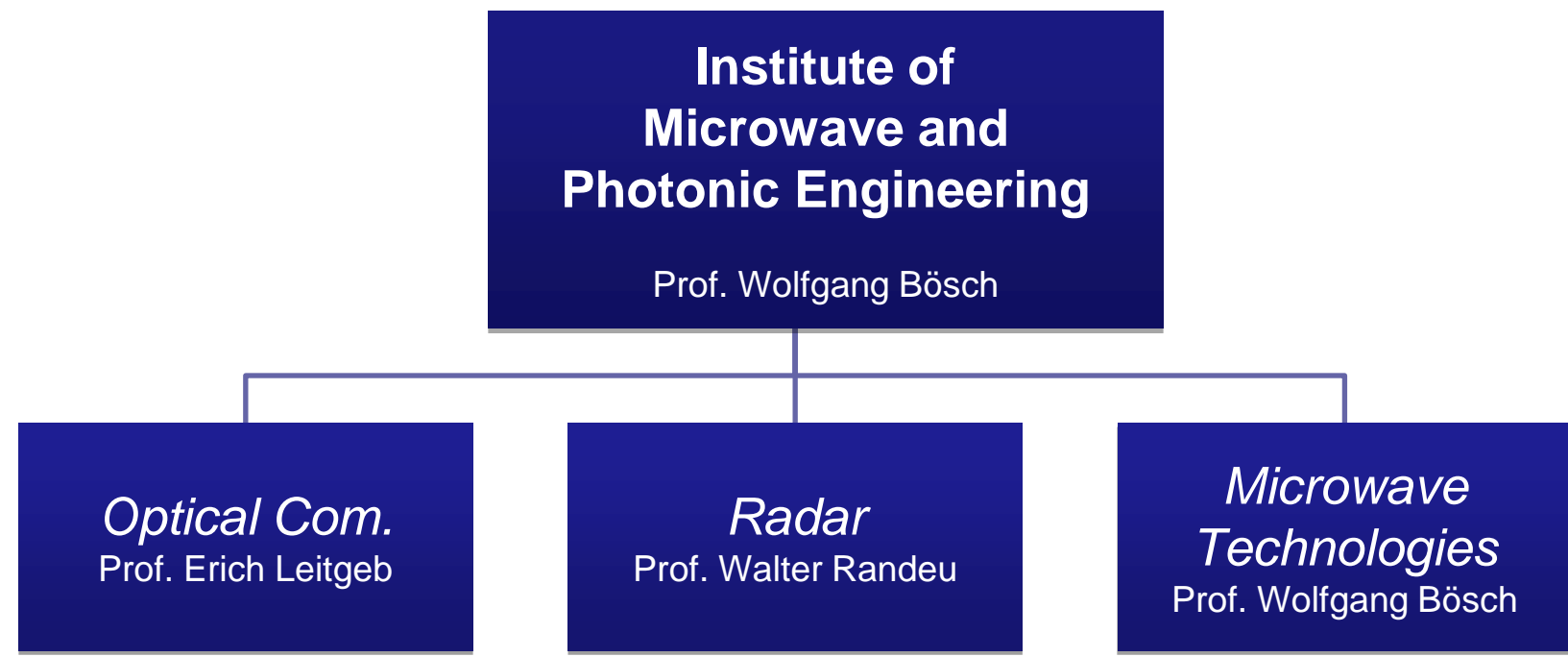
Institute for Microwave and Photonic Engineering



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Organisation of the new Institute



Professional experience

- Graduated in Vienna with Dipl.-Ing. in 1985 and obtained my PhD in Graz in 1989. In 2004 received my MBA from Bradford Business School (UK). Overall more than 20 years of industrial experience.
- 4 years with the European Space Agency, coordinating all European research projects on Monolithic Microwave Integrated Circuits (MMICs).
- 4 years in Canada and the US working on a range of novel amplifier designs for telecom and space applications.
- 4 years with EADS in Germany focusing on future electronically scanned radar concepts and novel TRM technologies.
- For 9 years at Filtronic as Technical Director and CTO of 3 business units (semiconductors, point to point and defense). Introducing many new technologies and innovative designs. Leading a number of R&D projects for the EMRS – DTC (Electro Magnetic Remote Sensing Consortium)
- Non-exec director of three R&D start-up companies in the UK.
- Technical Director of ADI, a non profitable organization to promote and coordinate R&D projects in Yorkshire
- Since 1st March Head of the new Microwave and Photonic Engineering Institute in Graz University of Technology.

Microwave Technology Group - Focus

- ❖ **Design of MW components and systems with low power consumption**
 - **Highly integrated** transmit/receive modules and **front-ends**.
 - **High linearity** and **high efficiency** systems
 - **Innovative designs** enabled by emerging technologies for communication, radar and measurement applications

- ❖ **mmW technologies**
 - Components and design techniques for mmW **integrated front-ends**
 - mmW component **characterization** and **nonlinear modeling**

- ❖ **Antennas and transitions**
 - Characterization and measurement of **multiple antenna OTA systems** (MIMO, diversity, new standards – LTE etc.)
 - **Adaptive and integrated antennas** and transitions

MW and mmW Research and Teaching Laboratory

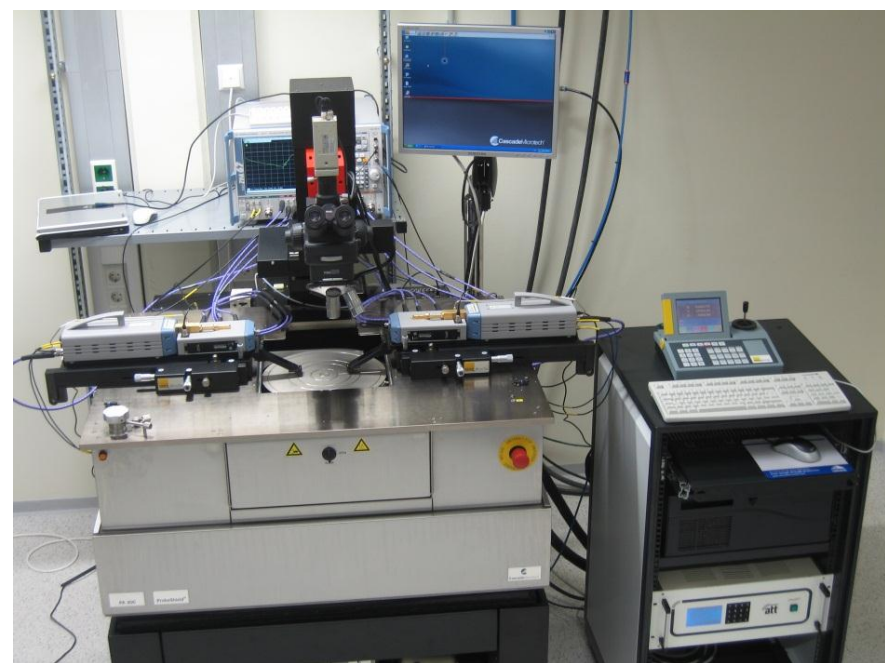
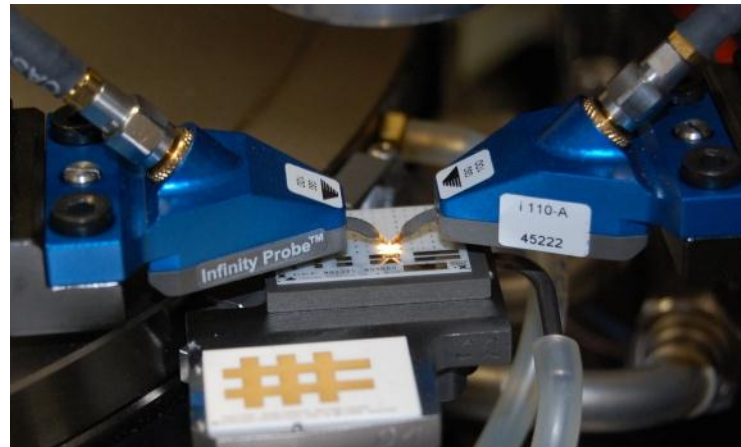
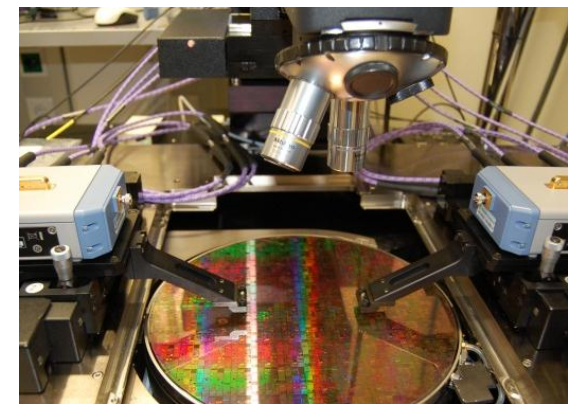


- Dedicated Cleanroom (50sqm + 30sqm)
- Spectrum and Signal Analysis (FSQ26)
 - 20 Hz to 26,5GHz
 - Demodulation / Analysis bandwidth up to 120 MHz
 - Generic OFDM-VSA Analysis Software
 - Noise Figure measurements
 - Phase noise measurements
- Vector Signal Generator (SMU200A)
 - Dual vector signal generator in one box
 - 80MHz internal ARB bandwidth (200MHz IQ modulator bandwidth)
 - 2 x 2 MIMO with realtime fading capability



Automated Wafer Prober

- Fully automated measurements (S-Parameter, NF etc.) and wafer mapping
- single die to 300mm wafers (12")
- - 40C to +165C temperature chuck
- up to 110GHz (RF and DC probes)
- Integrated laser cutter (two wavelengths)
- Dedicated cleanroom (30sqm)



Anechoic Chamber

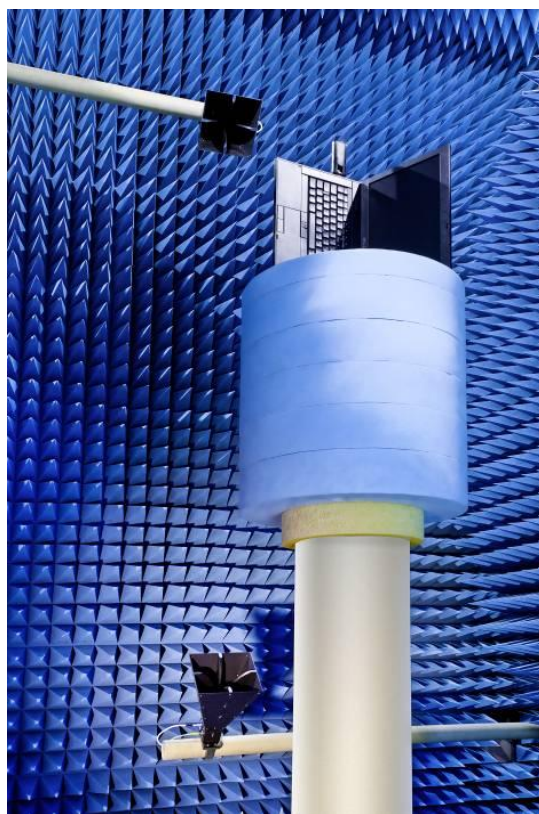
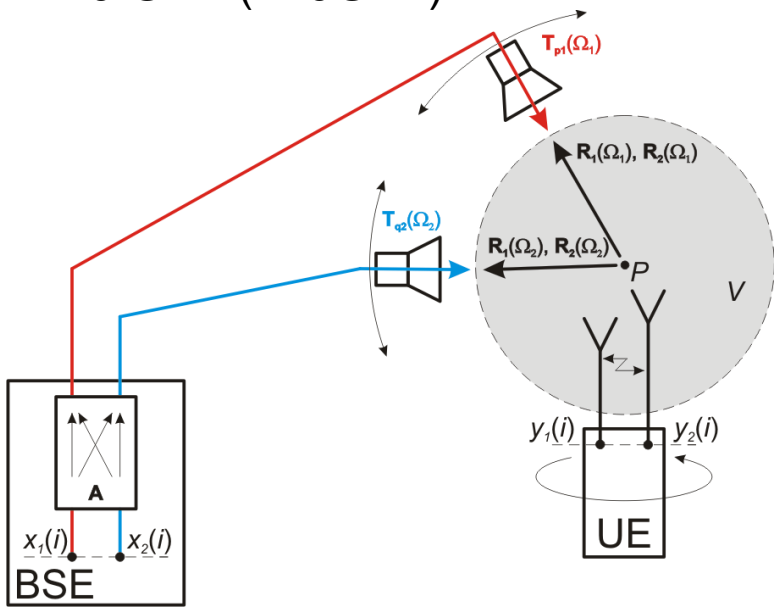
Dimension 5m x 5m x 4,5m

Two independent near field scanners

Position accuracy 0.01deg

Rotation in 2 axes

400MHz – 20 GHz (110GHz)



Expert staff and near term activities

Two new permanent academic staff positions

- Nonlinear behavioural modelling (MW and mmW)
- Complex RF, MW and mmW measurement
- Integrated front-end design
- Antennas, filters and transitions

Dedicated expert to run and maintain the MW laboratory

PhD activities

- MW power technologies and integrated design of key components (GaAs, GaN)
- High power switching amplifiers for linear applications – advanced Doherty
- Wireless sensor network antenna and repeater design
- OTA MIMO system characterisation
- ESD protection of RF antennas
- RFID antenna optimisation

Other potential activities and technology access

- Highly integrated mmW frontend in SiGe technology
- mmW MMIC design in GaN
- Reliability for GaAs MMICs in specific applications
- Active loadpull and nonlinear S-parameters