



TECHNISCHE
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DRESDEN

**Industry
Partner
Program
Event**

IPP is now

5G Lab Germany
INDUSTRY
DAY



SEPTEMBER 24
2015



www.5glab.de

5G Industry Day Registration

Company
Title
Name
First name
E-mail

- ☐ I will attend the 5G Lab Germany Industry Day Presentations, and will join the...
- ☐ Wireless Track
 - ☐ Network & Cloud Track
 - ☐ Hardware Track
 - ☐ Application Track
- ☐ I will take part in the evening get-together

→ submit

Register via email or fax

Sascha Berger
E event@5glab.de
F +49 351 463 41099



Register online at

5glab.de/events/summer-event-2015

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5G Industry Day Invitation

We are pleased to invite you to our 2nd 5G Lab Germany Industry Day, which will be held on September 24, 2015 at Technische Universität Dresden.

The 5G Lab Germany and its industry partners will be presenting their recent research activities to their respective affiliates.

After the welcome session, the event will be held in four parallel tracks, which cover the 5G Research Tracks of the 5G Lab Germany.

We are looking forward to welcome you to the 5G Lab Germany Industry Day 2015.

Yours faithfully,



Prof. Gerhard Fettweis

5G Lab Germany
Coordinator



Prof. Frank Fitzek

5G Lab Germany
Coordinator

5G Mission

Understand and Drive the Holistic Requirements and Solutions of 5G

Deliver Technology Breakthrough

Be Opinion Leader in Forming 5G

Deliver Lab Examples and Test Beds

Business Innovation Through Technology Transfer and Cooperation

Simple One-stop Shop for Complex 5G Research Topics



**5G Lab
GERMANY**

5G Industry Day Agenda

- 08:00 **Welcome Coffee**
- 08:45 **Welcome Speech**
Prof. Dr.-Ing. habil. Hans Müller-Steinhagen
Rector// TU Dresden
- 08:55 **The 5G Lab Germany - Update & Vision**
Prof. Dr.-Ing. Dr. h.c. Frank Fitzek
Prof. Dr.-Ing. Dr. h.c. Gerhard Fettweis
Coordinators// 5G Lab Germany
- 09:30 **External Plenary Keynote: 5G as a Catalyst**
Luke Ibbetson
Head of Research and Development// Vodafone
- 09:50 **External Plenary Keynote:**
5G – Getting Closer to the Answers?
Dr. Chih-Lin I
Chief Scientist of Wireless Technologies//
China Mobile Research Institute
- 10:10 **Coffee Break** & Walk to Parallel Tracks
- 10:45 **Parallel Tracks**//Morning Session
- 13:00 **Lunch Break**
- 14:00 **Parallel Tracks**//Afternoon Session
Walk to the Various Chairs of 5G Lab Germany
- 16:10 **Demonstrators**//**Posters**//**Coffee**
- 17:00 **Open End**
- 19:00 **Informal Get-together in the Restaurant**
‘Italienisches Dörfchen’

5G Industry Day Tracks

- **Wireless Track**
led by Prof. Fettweis
- **Network & Cloud Track**
led by Prof. Fitzek & Prof. Fetzner
- **Hardware Track**
led by Prof. Plettemeier & Prof. Ellinger
- **Application Track**
led by Prof. Urbas & Dr. Altinsoy

5G Industry Day Localities

- ▴ **Joint Welcome Session** **GÖR 226**
Görges-Building
- ▴ **Wireless Track** **GÖR 226**
Görges-Building
- ▴ **Network & Cloud Track** **BAR 218**
Barkhausen-Building
- ▴ **Hardware Track** **GÖR 127**
Görges-Building
- ▴ **Application Track** **BAR II63a**
Barkhausen-Building

Görges-Building//Helmholtzstr. 9//01069 Dresden
Barkhausen-Building//Helmholtzstr. 18//01069 Dresden

Please see p.21 for a campus map.
In the map the rooms are marked with a triangle.

Wireless Track Agenda

→ **Wireless Track**
led by Prof. Fettweis

- 10:45 **The 5G Lab Germany Wireless Track**
Prof. Dr.-Ing. Dr. h.c. Gerhard Fettweis
Coordinator//5G Lab Germany
- 11:15 **KEYNOTE//Nokia**
5G: Expand the Human Possibilities of the Connected World
Dr. Amitava Ghosh
Head//North America Radio Systems Research
Nokia Networks
- 11:30 **KEYNOTE//Alcatel-Lucent**
The role of Multiple RANs and the challenges for the future
Dr. Theodore Sizer
Vice President//Wireless Research Program
Bell Laboratories, Alcatel-Lucent
- 11:45 **Projects Presented by Track Members**
Link-Level Algorithms
Research Overview of the Link-Level Algorithms Group
Dr. Wolfgang Rave
Investigation on Channel Estimation for mmW Outdoor Environments
Hsiao-Lan Chiang
Adaptive Beamforming for mmW Environment
Tobias Kadur
mmWave Wireless Backhaul with MIMO
Xiaohang Song
Synchronization: Embryonic Development to Electronic Networks
Alexandros Pollakis
- 12:20 **Coding & Links**
Information Theory - The Guide to Optimal Information Transmission and Processing
Dr. Meik Dörpinghaus

Wireless Track Agenda

→ **Wireless Track**
led by Prof. Fettweis

- 12:30 Energy-Efficient Communication employing 1-bit Quantization and Oversampling at the Receiver
Lukas Landau
Code Design to Achieve Arbitrary Diversity Order Using Spatial Coupling
Najeeb ul Hassan
- 12:45 **KEYNOTE//Ericsson**
The Road to 5G
Dr. Magnus Frodigh
Director//Wireless Access Networks//Ericsson
- 13:00 **Lunch Break**
- 14:00 **KEYNOTE//National Instruments**
5G: From Theory to Practice
James Kimery
Director of Marketing//National Instruments
- 14:15 **Projects Presented by Track Members**
Multi-carrier Waveform GFDM
Research Overview of the GFDM Group
Dr. Dan Zhang
Waveform Advancements and Synchronization Techniques for GFDM
Ivan Gaspar
Spatial Multiplexing for GFDM
Maximilian Matthé
Fronthaul Requirements of Flexible Centralization in Cloud Radio Access Networks
Jens Bartelt
- 14:40 **KEYNOTE//Inradios**
M2M meets Satellite Communications
Dr. Marco Krondorf
Management//Inradios

Wireless Track Agenda

→ **Wireless Track**
led by Prof. Fettweis

14:55 **Projects Presented by Track Members**

Links & Protocols

Research Overview of the Links & Protocols Group

Dr. Andreas Festag

Exploiting Distributed Source Coding for Multi-hop

Routing in Wireless Ad Hoc Networks

Sebastian Kühlmorgen

Power Allocation in Ad-Hoc Networks

Albrecht Wolf

Linear Multi-Cell Precoding for Throughput

Optimization Considering Outage

Dr. Xin Zhang

15:20 **System Level Algorithms**

Research Overview of the System Level Group -

Models and Algorithms for the Design and Analysis of
Future Wireless Networks

Dr. Meryem Simsek

Achieving High Availability in Wireless Networks by
Inter-Frequency Multi-Connectivity

David Öhmann

Multi-Cell Beamforming Performance under Realistic
Spatial Traffic Conditions

Henrik Klessig

On the Impact of a High Dynamic Range on Cell-Edge
Uplink Performance in SC-FDMA

Sascha Berger

15:45 **KEYNOTE//KOMSA**

**25 Years of ICT-Experience in Distribution and
some Views on Future Developments**

Dr. Gunnar Grosse

Chief Executive Officer//KOMSA Kommunikation
Sachsen AG

Wireless Track Sponsors

→ **Sponsors of the former IPP**

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Network & Cloud Track Agenda

→ **Network & Cloud Track**
led by Prof. Fitzek & Prof. Fetzer

- 10:45 **The 5G Lab Germany Network & Cloud Track**
Prof. Dr.-Ing. Dr. h.c. Frank Fitzek
Coordinator//5G Lab Germany
- 11:20 **KEYNOTE//O&O Software**
Bringing Windows NT 4 to the Cloud
Olaf Kehrer
Managing Director//O&O Software
- 11:45 **Projects Presented by Track Members**
Network Coding
Distributed Storage Using Network Coding in Peer Devices at the Edge of the Network
Juan Cabrera//Group Fitzek
Deploying Network Coding with Software Defined Networks
Frank Wilhelm//Group Fitzek
Browser Based Peer-to-Peer Streaming
Patrik Braun//Group Fitzek
Multipath Routing in Network Coded Wireless Mesh
Sreekrishna Pandi//Group Fitzek
- 12:20 **KEYNOTE//Ericsson Eurolab**
5G: Media Everywhere
Dr. Thorsten Lohmar
Expert – Media Delivery//Ericsson Eurolab
- 12:45 **Open Discussion**
- 13:00 **Lunch Break**
- 14:00 **KEYNOTE//Cloud & Heat**
Decentralised Low Latency Micro Datacenters
Dr. Jens Struckmeier & Sebastian Varga
Chief Technical Officer//CLOUD & HEAT Technologies

Network & Cloud Track Agenda

→ **Network & Cloud Track**
led by Prof. Fitzek & Prof. Fetzer

- 14:15 **Projects Presented by Track Members**
Security & Cloud
Secure Edge Computing
Dr. Thomas Knauth//Group Fetzer
Secure Storage in Datacenters
Robert Krahn//Group Fetzer
Protocols for Ultra-low Latency, Ultralow Power Communication
Martina Brachmann//Group Santini
Applications of Advanced System Verification Techniques
Steffen Märcker & Marcus Daum//Group Baier
- 14:55 **KEYNOTE//Chocolate Cloud**
NC in the driver seat for distributed clouds
Prof. Daniel Lucani
Chief Executive Officer//Chocolate Cloud
- 15:20 **Projects Presented by Track Members**
Coding
Matrix-valued Compressed Sensing for Massive MIMO Channel Estimation
Dr. Christian Scheunert//Group Jorswieck
Multi-way Relaying
Bho Matthiesen//Group Jorswieck
Physical Layer Security on 5G
Dr. Pin Hsun-Lin//Group Jorswieck
Flexible Spectrum Management in 5G Systems
Dr. Siddharth Naik & Janis Noetzel//Group Jorswieck
- 15:50 **Open Discussion**

Hardware Track Agenda

→ Hardware Track

led by Prof. Plettemeier & Prof. Ellinger

- 11:00 **The 5G Lab Germany Hardware Track**
Prof. Dr. Dirk Plettemeier
Chair for RF and Photonics Engineering
- 11:10 **KEYNOTE//Rohde & Schwarz**
From mm-Wave to Gbps Experience – 5G
Outlook from a T&M Perspective
Meik Kottkamp
Technology Manager//Rohde & Schwarz
- 11:30 **Projects Presented by Track Members**
On-chip Antenna Measurements in the (Sub-) Millimeter-Wave Range
Bernhard Klein//Group Plettemeier
- 11:40 **Millimeter-Wave Wireless Data Transmission**
Gregor Tretter & David Fritsche//Group Ellinger
- 11:55 **KEYNOTE//NEC**
Technologies for Base Station with Massive Antenna towards 5G
Masao Ikekawa
Senior Principal Researcher//NEC
- 12:15 **KEYNOTE//Intel Mobile Communications**
Vision and Implication on Radio Access and Silicon Technologies
Prof. Dr. Josef Hausner
Division Vice President //Wireless Systems Engineering
Intel Mobile Communications
- 12:35 **Projects Presented by Track Members**
Broadband Dielectric Material Characterization in the Microwave Range
Patrick Seiler//Group Plettemeier

Hardware Track Agenda

→ Hardware Track

led by Prof. Plettemeier & Prof. Ellinger

- 12:50 Chair for Electron Devices and Integrated Circuits (CEDIC): Research and Project Overview
Dr. Wenfeng Liang//Group Schröter
- 13:00 **Lunch Break**
- 14:00 **KEYNOTE//Globalfoundries**
FD-SOI - Prospects and Requirements on the Design Ecosystem
Dr. Gerd Teepe
Director Design Engineering//GLOBALFOUNDRIES
- 14:20 **KEYNOTE//RacyICs**
Advanced Node SoC Design Services
Holger Eisenreich
Co-Founder and Managing Director//RacyICs
- 14:40 **Projects Presented by Track Members**
Chip Design for Energy Efficient MPSoCs in Nanometer CMOS
Dr. Sebastian Höppner//Group Mayr
Research Overview of the Vodafone Chair Hardware Group
Dr. Emil Matus//Group Fettweis
Guaranteed Service in TDM NoCS
Yong Chen//Group Fettweis
Accelerating Database Applications in MPSoCs
Sebastian Haas//Group Fettweis
Fault Resilient Network on Chip for Heterogenous MPSoCs
Sadia Moriam//Group Fettweis
Data Management on MPSoC
Benedikt Nöthen//Group Fettweis
Adaptive Memory Pooling in Heterogeneous MPSoCs
Friedrich Pauls//Group Fettweis

Hardware Track Agenda

→ **Hardware Track**

led by Prof. Plettemeier & Prof. Ellinger

15:25 Accelerating Frequency-Domain Equalization for Processors using Instruction Set Extension
Tobias Seifert//Group Fettweis

15:30 **KEYNOTE//Lumiloop**
Efficient, Miniaturized Optical Data and Power Transmission
Eike Suthau
Technical Director//Lumiloop

Application Track Agenda

→ **Application Track**

led by Prof. Urbas & Dr. Altinsoy

10:45 **The 5G Lab Germany Application Track**
Dr.-Ing. habil. Ercan Altinsoy
Chair of Communication Acoustics

11:05 **KEYNOTE//Claas**
Current agricultural process data handling and future Farming 4.0 communication requirements
Dr. Carsten Hoff
Managing Director//CLAAS E-Systems

11:25 **KEYNOTE//Dresden Elektronik**
Wireless into Industry 4.0
Mike Ludwig
Group Leader Research//Dresden Elektronik

11:45 **Projects Presented by Track Members**
Industry 4.0
Prediction of human mobility by analysing sensor data
Paul Baumann//Group Santini
A 5G Application Vision from Research: Adaptive Federative 3D Exploration with Multi Robot Systems (ADFEX)
Michael Klix//Group Janschek
Error Propagation Analysis in Space to Ground Robotic Haptic Feedback Systems
Dr. Andrey Morozov//Group Janschek
Communication Requirements for Mobile Migratory Visualization Systems
Lukas Baron//Group Janschek
Co-Working in Industry-4.0 – When Robots Meet People
Prof. Uwe Aßmann

13:00 **Lunch Break**

Application Track Agenda

→ Application Track

led by Prof. Urbas & Dr. Altinsoy

- 14:00 **KEYNOTE// ABB**
Wireless for Internet of Things, Services, and People
Dr. Dirk Schulz
Principal Scientist//ABB Corporate Research
- 14:20 **Projects Presented by Track Members**
Automation
5G as an Innovator for Mobile Information Systems in the Process Industries
Jens Ziegler//Group Urbas
5G as an Information Carrier for Vertical Data Integration in Automation Networks
Chris Iatrou//Group Urbas
- 14:40 **KEYNOTE// Samsung**
5G Mobile Communications: Vision and Key Technologies
Dr. Maziar Nakovee
Chief Engineer//Samsung Electronics R&D Institute UK
- 15:00 **KEYNOTE// HP**
HP's Vision
Dr. Dejan Milojicic
Senior Research Manager//HP Labs Palo Alto
- 15:20 **KEYNOTE// FireEye**
Microkernels and Formal Verification: Towards Software without Security Critical Bugs
Dr. Hendrik Tews
Head of FireEye Research & Development
Dresden//FireEye Deutschland

Application Track Agenda

→ Application Track

led by Prof. Urbas & Dr. Altinsoy

- 15:40 **Projects Presented by Track Members**
VR & OS
Operating Systems for the 5G Era
Adam Lackorzynski//Group Härtig
Tactile Extension of Kinaesthetic Feedback Systems for Virtual Reality
Petko Bakardiev//Group Altinsoy
- 15:55 **Closing Remarks**

5G Demonstrations & Tours

DEMONSTRATIONS

Vodafone Chair Mobile Communications Systems

- Communications with 1-Bit Quantization and Oversampling at the Receiver//A Proof of Concept
- Multigigabit/s Link at 60 GHz
- FPGA-Demo//Dataflow Oriented Baseband Processing
- GFDM Transceiver Prototype
- GFDM MIMO Transceiver Prototype
- Channel Emulator Based on EASY-C Measurements
- GFDM Cognitive Radio within LTE UL
- Chip Demo//A MPSoC for Accelerating Database Applications

Chair of Communication Networks

- Reliable Synchronous Multicast
- Software Defined Networking
- Tactile Internet
 - Haptic User Interface
 - Tactile Goggles
 - Nao Robot
- Distributed Storage
 - Browser Based Distributed Cloud Storage
 - Local Network Based Distributed Cloud Storage
- Low Latency Security Solution
- Coded WebRTC

Chair of Communication Acoustics

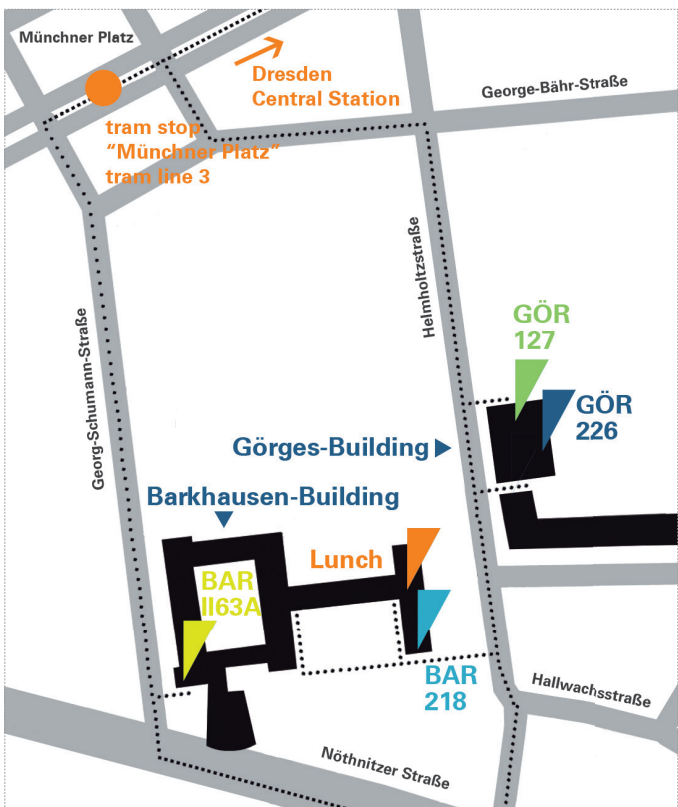
- Virtual Reality in the Multimodal Lab

GUIDED LAB TOURS

Chair for RF and Photonics Engineering

- Microwavephotonic Laboratory
- On-Chip Antenna Measurement Setup
- Antenna Laboratory

How to get there?



Joint Welcome Session	GÖR 226	1 st Floor
Wireless Track	GÖR 226	1 st Floor
Network & Cloud Track	BAR 218	1 st Floor
Hardware Track	GÖR 127	Groundfloor
Application Track	BAR II63a	2 nd Floor
Lunch	BAR Foyer	Groundfloor

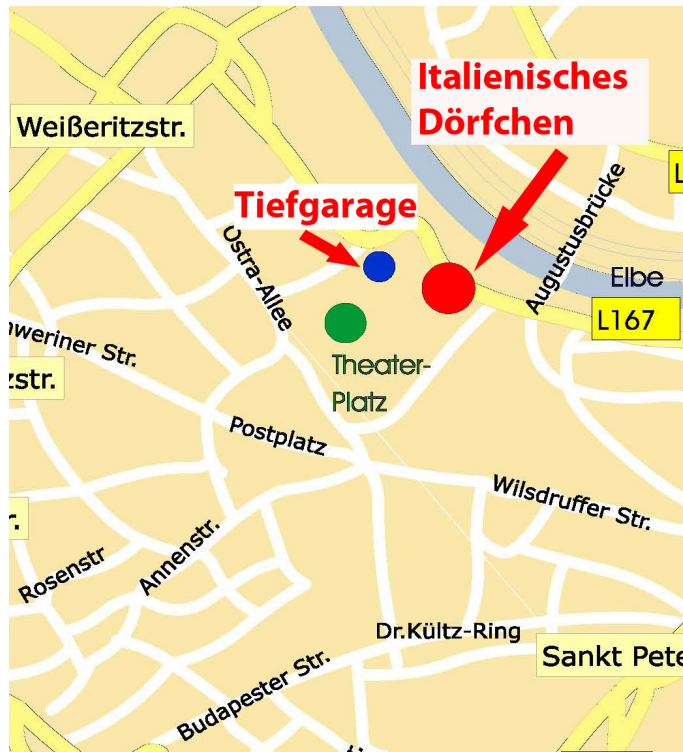
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Barkhausen-Building//Helmholtzstr. 18//01069 Dresden

Restaurant

“Italienisches Dörfchen”

Theaterplatz 3
01067 Dresden

Our Industry Partner Symposium ends with an informal get-together in the restaurant “Italienisches Dörfchen” in downtown Dresden (tram line 8 toward direction Dresden Hellerau: entrance Nürnberger Platz - stop Theaterplatz).



Hotels

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5G Partners

Industry Partners are welcome to join our initiative. 5G Lab Germany is offering a platform for companies to explore the impact of 5G on their business and gain experience of 5G technologies through our unique interdisciplinary approach, access to the latest research results and close contacts to world-class experts.

The 5G Lab Germany is already supported by highly innovative companies:



Alcatel-Lucent



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ROHDE&SCHWARZ



vodafone

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