



FUTURE INDUSTRIAL COMMUNICATION

Conference website: www.applied-5g.de



PROGRAM

- 11.9. 5G NATIONALES SYMPOSIUM 
- 12.9. 5G RESEARCH PERSPECTIVES 
- 13.9. 5G PROJEKTE IM DIALOG 

BMBF-FORSCHUNGSINITIATIVEN 5G
INDUSTRIELLE KOMMUNIKATION DER ZUKUNFT
11.–13. SEPTEMBER 2018 | BERLIN

GEFÖRDERT VOM





PROGRAM

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Bundesministerium
für Bildung
und Forschung



Industrielles
Internet



Taktiler
Internet

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WELCOME TO FUTURE INDUSTRIAL COMMUNICATION

It is our pleasure to welcome you to “Future Industrial Communication”, the annual cutting-edge forum for discussions on 5G technologies, including their application in industry.

The first day is dedicated to the annual meeting of the 5G research initiatives from the “ICT 2020” program of the German Federal Ministry for Education and Research BMBF. In the morning service and system providers as well as users from industry will showcase the relevance of 5G for industrial communication in their respective markets. The afternoon provides application examples from the research initiatives. Don't miss out on the accompanying 5G exhibition, where the a testbed wall and first demonstrators will be presented.

On the second day our “5G Research Perspectives Day” will bring together researchers, practitioners and key stakeholders from around the world who will present the state-of-art and different application scenarios from their fields of work. Day 3 is reserved for interactive networking and exchange of ideas between the two research initiatives: “5G: Industrial Internet” and “5G: Tactile Internet”.

The networking dinner on Tuesday night will be held at the iconic Wasserwerk, the perfect opportunity to make new contacts and catch up with established colleagues.

Warm thanks go to all our speakers for their time and effort, as well as to the project managers at VDIVDE-IT for their continuous support, it is much appreciated.

We look forward to welcoming you to an inspiring event.

Gunnar Schomaker & Lutz Stobbe
(Accompanying research IP45G)

GENERAL INFORMATION

CONFERENCE VENUE

Sofitel Kurfürstendamm
Augsburger Straße 41
D-10789 Berlin

CONFERENCE REGISTRATION

The conference registration fee includes admission to all conference sessions and the exhibition, as well as lunch and refreshments during breaks. All participants have free admission to the networking dinner.

THE REGISTRATION DESK IS OPEN

Tuesday, September 11, 2018 // 08.30 am – 06.30 pm
Wednesday, September 12, 2018 // 08.00 am – 05.00 pm
Thursday, September 13, 2018 // 08.00 am – 02.00 pm

LUNCH AND COFFEE BREAKS, DIETARY REQUIREMENTS

Coffee breaks and lunch will be taking place in the foyers outside the conference room and in the exhibition. The rich buffet lunch is designed to cater for all dietary requirements and all tastes. When in doubt, please consult one of the chefs serving the food, they will be able to give you detailed information.

INTERNET ACCESS

Sofitel Berlin Kurfürstendamm kindly provides free Internet access for all conference participants. No special password is needed.

CONFERENCE LANGUAGE

The official language of all presentations on the first day is German, on the second day English.

CONTACT INFORMATION AND ASSISTANCE DURING THE CONFERENCE

Please do not hesitate to contact us if you have any questions or requests. Our counter and registration desk is located next to the entrance of the main conference room.

We are happy to assist you with any technical questions regarding your presentation, last-minute printing and generally any problems that might come up.



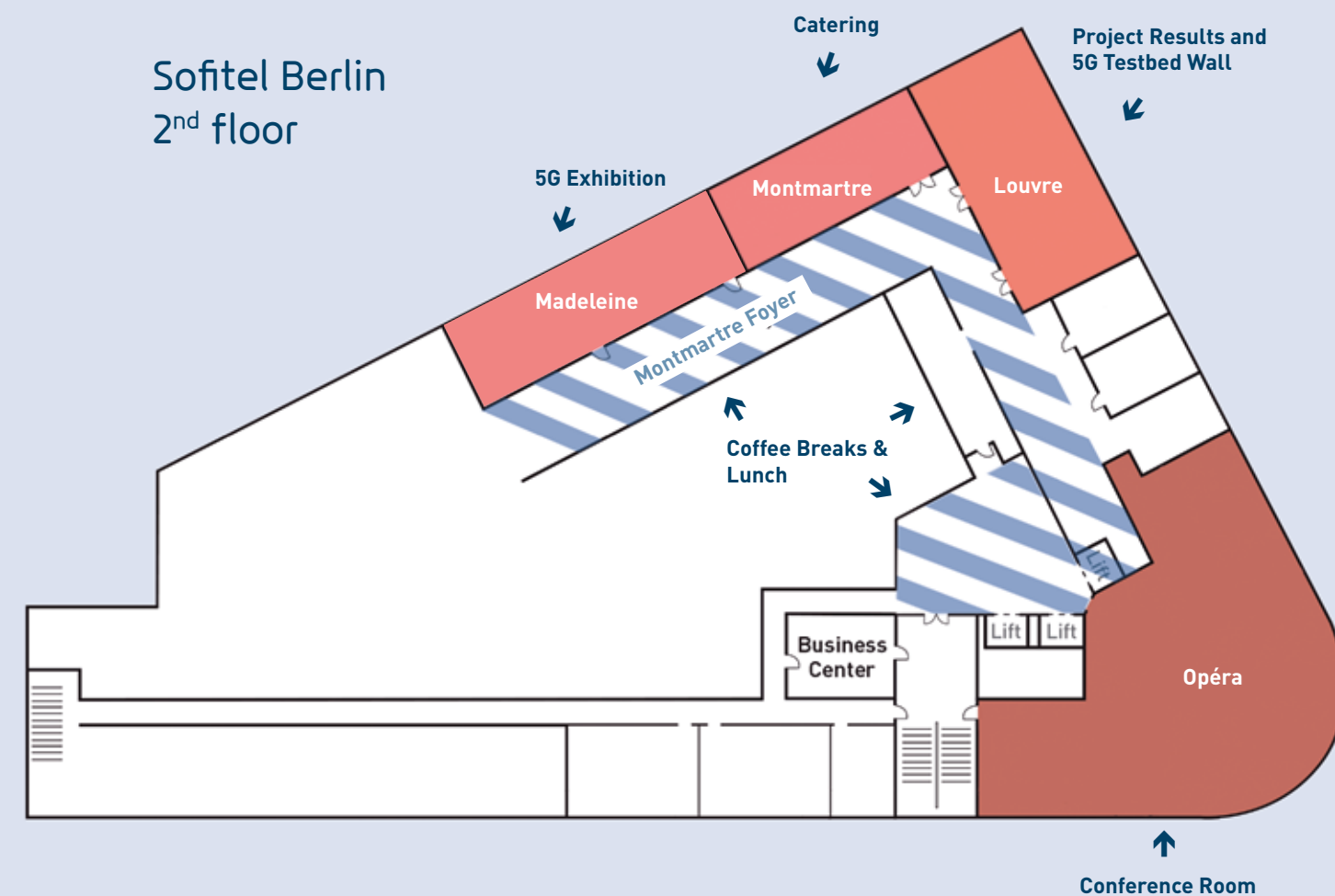
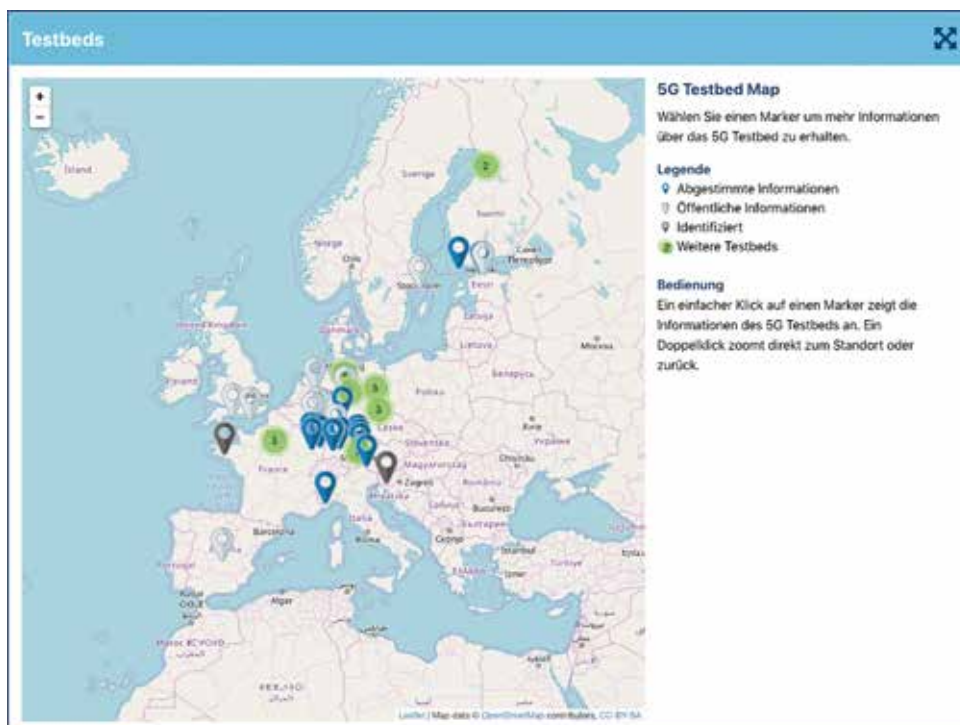
5G EXHIBITION

The accompanying exhibition of the event features:

- Information on the different research projects
- Results from the IP45G research on current 5G trials
- Demonstrators from research and industrial applications

5G TESTBED WALL

Check out our 5G testbed wall and get an overview of testbeds all over Europe, encompassing areas as diverse as smart cities, transportation, autonomous vehicles, health and social care, manufacturing, robotics, equipment trials.







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INDUSTRIE & KOMMUNIKATION – WAS WIR GESTALTEN

- 10:30 Uhr** **5G for the Factories of the Future**
Dr. Andreas Müller | Bosch
- 11:00 Uhr** **Gamechanger 5G – Wie die aufkommende Mobilfunktechnologie Industriezweige verändert**
Dr. Michael Meyer | Ericsson
- 11:30 Uhr** **Cyber Security und IoT als Enabler für 5G**
Peter Rost | Rohde & Schwarz Cybersecurity
- 12:00 Uhr** **Wo 5G konkreten Nutzen stiftet – Anwendungsszenarien und Anforderungen aus Sicht von Automation und Produktion**
Daniel Behnke | Weidmüller
- 12:30 Uhr - 13:45 Uhr** **MITTAGSPAUSE | AUSSTELLUNG**

5G FORSCHUNGSINITIATIVEN – HIN ZUR ANWENDUNG

- 13:45 Uhr** **Von ZDKI zu 5G: Vernetzung als Schlüsseltechnologie der Digitalisierung in der Industrie**
Prof. Dieter Schotten | DFKI
- 14:15 Uhr** **Alte und neue Welt in Safety-kritischen Szenarien: IP vs. ICN**
Prof. Matthias Wählisch | FU Berlin
- 14:45 Uhr** **Auf der digitalen Überholspur mit 5G – die nächste industrielle Revolution für Deutschland**
Dr. Volker Ziegler | Nokia Mobile Networks
- 15:15 Uhr** **Querschnittsthemen: 5G im Kontext industrieller und taktiler Kommunikation**
Dr. Simon Oberthür | Begleitforschung IP45G

5G AUSSTELLUNG UND THEMENTISCHE

**15:45 Uhr -
16:30 Uhr** **Kaffeepause | Ausstellung | Thementische**

An Thementischen zu aktuellen Sonderthemen wie digitaler Sicherheit, gleichem Internet für alle und technologischer Verfügbarkeit stehen Ihnen die Referenten Rede und Antwort.



5G DISKUSSION

Diskutieren Sie mit!

THEMENTISCHE

Prof. Hans Schotten:
» Vernetzte Fabriken:
Alles nur 5G?«

Dr. Volker Ziegler:
» Auf in die nächste indus-
trielle Revolution mit 5G.«

Prof. Matthias Wählisch:
» IP war gestern?! Und nun?«

Dr. Simon Oberthür:
» Nutzen von 5G abschätzen:
Wie müssen Testbeds gestaltet
werden?«

5G KOMMUNIKATION

– ZWISCHEN GLOBALEN TECHNOLOGIETRENDS UND DEN ANFORDERUNGEN DEUTSCHER INDUSTRIE

16.30 Uhr -

Diskussion

17.30 Uhr

Nach kurzen Impulsstatements werden die Teilnehmer den Stand der industriellen und taktilen Kommunikation in Deutschland diskutieren.

Teilnehmer:

- Peter Rost, Rohde & Schwarz Cybersecurity GmbH
- Wolfgang Wanner, INSYS microelectronics GmbH
- Prof. Slawomir Stanczak, Fraunhofer HHI
- Thomas Schildknecht, Schilknecht AG
- Nick Kriegeskotte, Bitkom

17:30 Uhr

Tagesresümee der Begleitforschung IP45G

Dr. Gunnar Schomaker | SICP – Software Innovation Campus Paderborn
Dr. Lutz Stobbe | Fraunhofer IZM

18:15 Uhr

Aufbruch zum Networking Dinner

Wir treffen uns vor dem Hotel, um gemeinsam zum Networking Dinner im 10 Minuten entfernten Wasserwerk zu laufen. B

Location

Wasserwerk Berlin
Hohenzollerndamm 208
10713 Berlin





11.9. 5G NATIONALES SYMPOSIUM



12.9. 5G RESEARCH PERSPECTIVES



13.9. 5G PROJEKTE IM DIALOG



OPENING

5G RESEARCH PERSPECTIVES

08.00–09.00 Registration

09.00–09.10 Welcome

9:10 – 10:40

SESSION 1: STATE OF GROUND BREAKING TECHNOLOGIES

- 09:10

A 5G Review and Outlook of Open Challenges for 6G

Prof. Gerhard Fettweis | Technische Universität Dresden
- 09:40

5G NR and Future Fronthaul

Dr. Francisco J. Garcia | Keysight UK Limited, Edinburgh
- 10:10

Hardware Design Challenges and Novel Concepts for 5G mm Wave Systems

Dr. Ivan Ndip | Fraunhofer IZM, Berlin
- 10:40 - 11:30

COFFEE BREAK & EXHIBITION

11:30 – 13:00

SESSION 2: SEAMLESS COMMUNICATION SYSTEMS

- 11:30

Open Baton & Open5GCore Enabling Instant Customized Industry Network Provision

Prof. Thomas Magedanz | Fraunhofer FOKUS, Berlin
- 12:00

5G Tactile Internet in Automotive Environments

Prof. Falko Dressler | University of Paderborn
- 12:30

Enhancing 5G Radio Access Technologies with Machine Learning

Prof. Slawomir Stanczak | Fraunhofer HHI, Berlin

14:30 – 16:30

SESSION 3: INDUSTRIAL APPLICATIONS AND 5G

- 14:30** **Molecular Communications for Industrial Applications**
Prof. Robert Schober | Universität Erlangen/Nürnberg
- 15:00** **On the Way to Knowledge Defined Networks**
Dr. Heiko Lehmann | T-Labs, Berlin
- 15:30** **General Classification of 5G Use Cases for Production and Logistics**
Anne Bernardy | FIR e.V. an der RWTH Aachen
- 16:00** **“Concepts and Challenges for Resilient Systems in Industrial Automation”: How can a system autonomously and intelligently work and decide**
Prof. Rolf Kraemer | IHP GmbH





11.9. 5G NATIONALES SYMPOSIUM



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5G PROJEKTE IM DIALOG

Der dritte Tag dient dem internen Austausch der Projektpartner der BMBF-Forschungsinitiative »Industrielle Kommunikation der Zukunft« mit den zwei Forschungsschwerpunkten »5G: Industrielles Internet« und »5G: Taktiles Internet«.

09:00 – 15:15

IMPULSE AUS DEN FORSCHUNGSPROJEKTEN

- 09:00** **Begrüßung**
Dr. Simon Oberthür, Michael Kemkes | IP45G Begleitforschung
- 09:15** **Li-Fi und Wi-Fi in der Industrieproduktion – Erkenntnisse aus dem SESAM-Projekt**
Thomas Menzel | SESAM
- 09:30** **TSN über Mobilfunk, Edge Computing für den Shop Floor, spezielle Probleme und Herausforderungen bei der Architekturintegration**
Peter Rost | TacNet 4.0
- 10:00** **Sicherheitskonzepte: Authentifizierung und Überprüfung von Geräten**
Florian Patzer | FlexSi-Pro
- 10:15** **PAUSE**
- 10:45** **Communication Abstraction Supports Network Resource Virtualisation in Automation**
Santiago Soler Perez Olaya | FIND
- 11:00** **SDN und TSN als Enabler für das industrielle Internet der Zukunft**
Marco Ehrlich | FIND

Ergebnisse aus den Projekten des Forschungsschwerpunkts 5G Taktiler Internet

AMMCOA:

»Erster Prototyp des mmWave Front-End-Moduls aufgebaut und erste Beamsteering Kalibrierungsprozeduren wurden erstellt.«

Wi-Fi

TACNET 4.0:

»Spezifikation einer Gesamtarchitektur als einheitliche Lösung unterschiedlicher Anwendungen.«

5G-NetMobil:

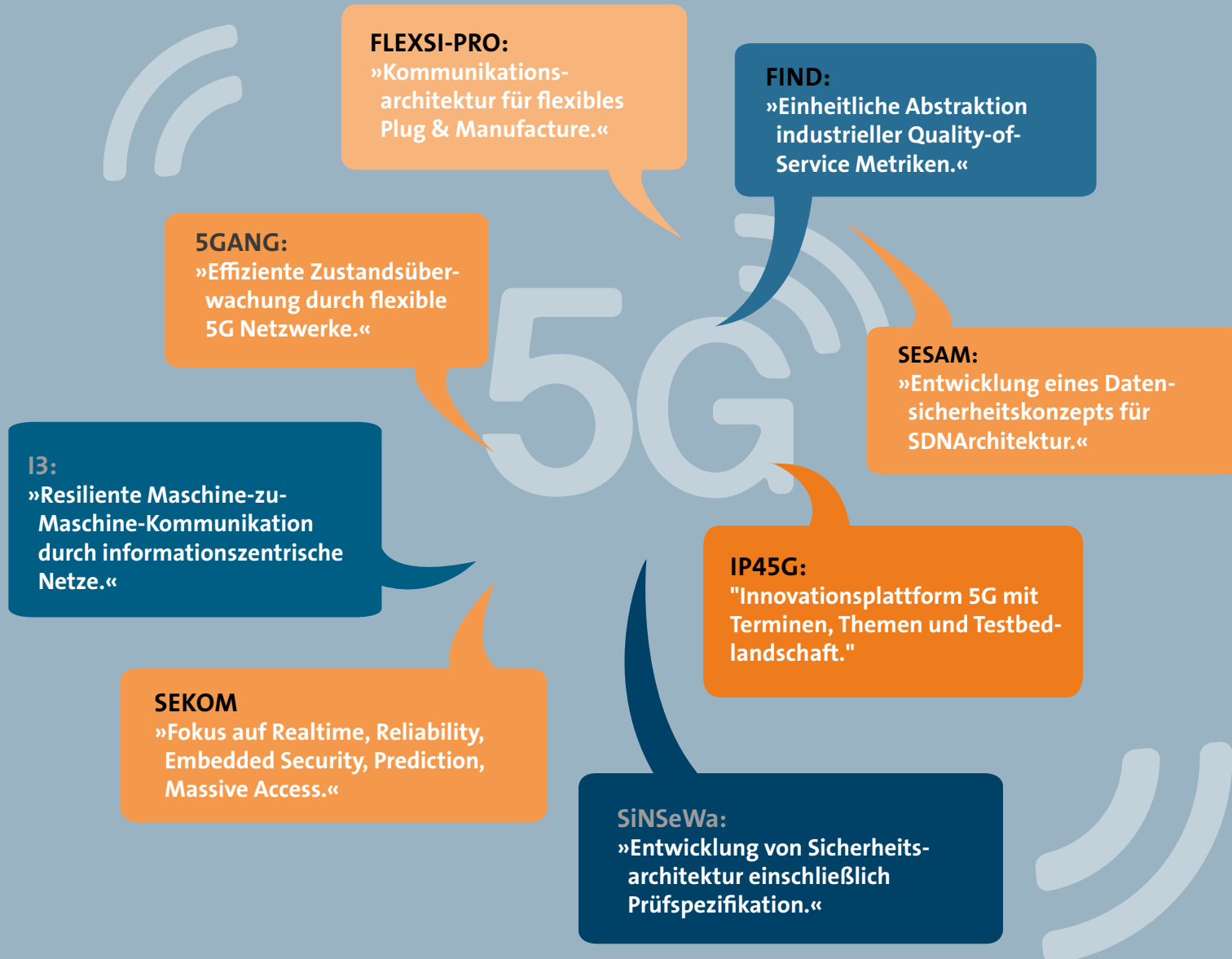
»Konzepte für Radio-Ressourcen-Management, Hybride V2X Kommunikation, Agile Mobile Edge Cloud, Network Slicing, Predictive Quality of Service entwickelt.«

11:15 – 15:15

IMPULSE AUS DEN FORSCHUNGSPROJEKTEN

- 11:15** **Sichere Netze für selbstorganisierende Wartungssysteme**
Ronald Steinke | SINSeWa
- 11:30** **Flexible Verfahren für Low Latency – Datenübertragung und Embedded Security in verschiedenen Szenarien aus Industrie und Handel**
Dr. Khoi Le | SEKOM
- 11:45** **Plug-and-Manufacture mit SDN, OPC UA und TSN**
Florian Patzer | FlexSi-Pro
- 12:00** **MITTAGSPAUSE**
- 13:00** **Projekte im Dialog**
Workshoparbeit im World-Cafè Stil zu den Themen „Industrielle Anwendung“, „Sicherheit“ und „Architektur“
- 14:30** **Zusammenführung der Ergebnisse**
Vorstellung der Arbeiten des World-Cafés
- 15:00** **Zusammenfassung und Ausblick**
- 15:15** **ENDE TAG 3**

Ergebnisse aus den Projekten des Forschungsschwerpunkts 5G Industrielles Internet



DIE FORSCHUNGSSCHWERPUNKTE

ZUVERLÄSSIGE DRAHTLOSE KOMMUNIKATION IN DER INDUSTRIE

Der Förderschwerpunkt adressiert zentrale Forderungen für kabellose Kommunikation: Zuverlässigkeit sowie geringe Latenzzeiten als Grundlage für die Anwendungsfelder zukünftiger Industrie 4.0 Lösungen.

5G: INDUSTRIELLES INTERNET

Der Förderschwerpunkt adressiert innovative Technologien und intelligente selbstorganisierende Netzmanagementlösungen für anwendungsfreundliche, handhabbare und flexible Kommunikationsnetze in Industrie 4.0 Szenarien.

5G: TAKTILES INTERNET

Der Förderschwerpunkt adressiert Anwendungen in 5G Gesamtkonzepten, insbesondere aus Industrie 4.0, vernetzten Baumaschinen, vernetztem, autonomen Fahren und Smart Farming. Anforderungen sind höchste Zuverlässigkeit und Verfügbarkeit in Kombination mit extrem kurzen Reaktionszeiten unter Einbezug der Weitverkehrsnetze.

THE RESEARCH INITIATIVES

RELIABLE WIRELESS COMMUNICATION IN INDUSTRY

The initiative responds to vocal demand in industry for reliable wireless communication: Reliability and low latency enabling new use cases in future Industry 4.0 solutions.

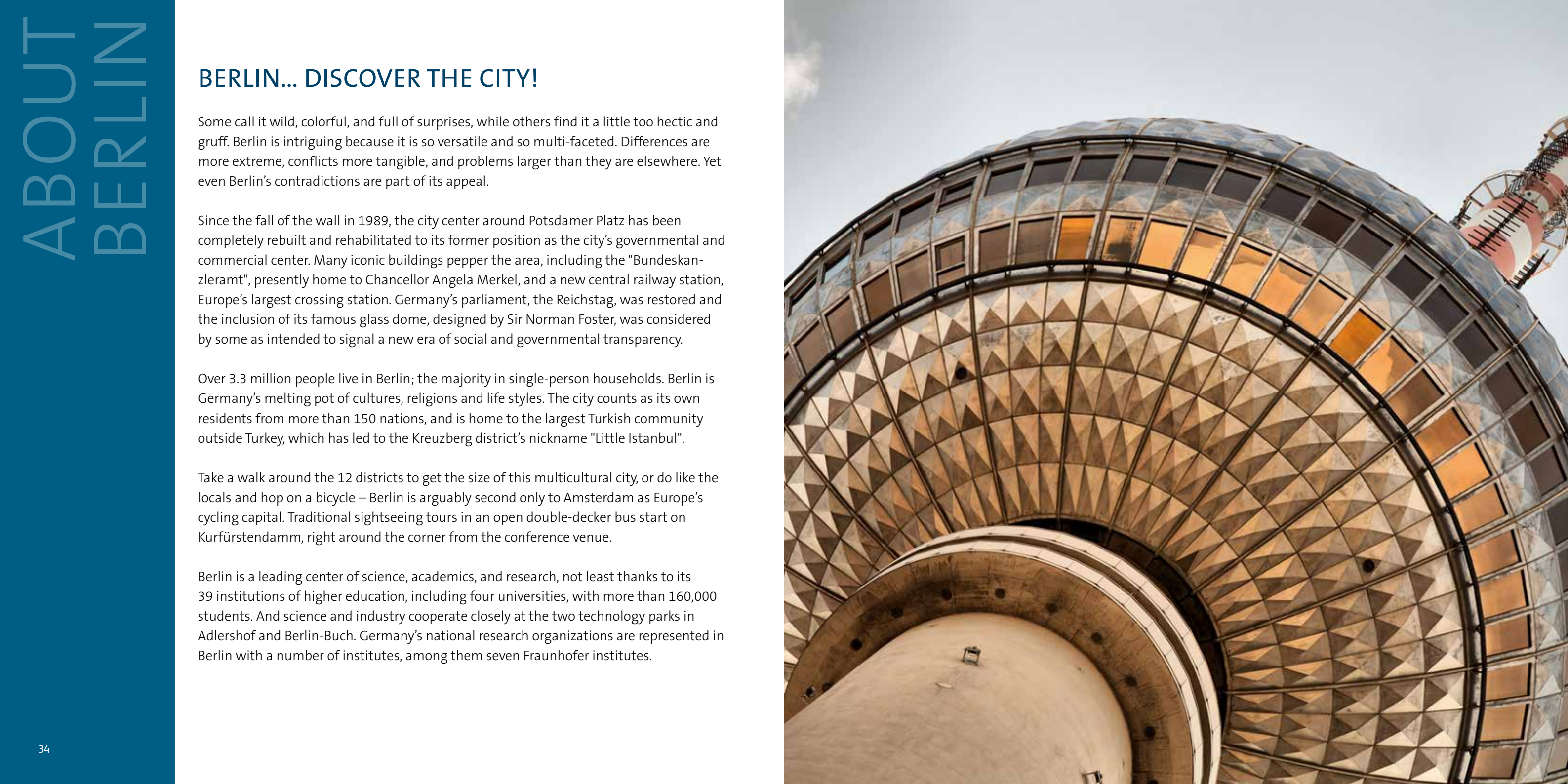
5G: INDUSTRIAL INTERNET

The initiative supports innovative technologies and intelligent self-organizing management solutions for user-friendly and flexible communication networks in Industry 4.0 environments.

5G: TACTILE INTERNET

The initiative is aimed at applications in complex 5G concepts, especially in Industry 4.0, connected construction machines, autonomous driverless vehicles, and smart farming. All use cases demand uncompromising reliability and availability with extremely low latency even in wide area networks.





BERLIN... DISCOVER THE CITY!

Some call it wild, colorful, and full of surprises, while others find it a little too hectic and gruff. Berlin is intriguing because it is so versatile and so multi-faceted. Differences are more extreme, conflicts more tangible, and problems larger than they are elsewhere. Yet even Berlin's contradictions are part of its appeal.

Since the fall of the wall in 1989, the city center around Potsdamer Platz has been completely rebuilt and rehabilitated to its former position as the city's governmental and commercial center. Many iconic buildings pepper the area, including the "Bundeskanzleramt", presently home to Chancellor Angela Merkel, and a new central railway station, Europe's largest crossing station. Germany's parliament, the Reichstag, was restored and the inclusion of its famous glass dome, designed by Sir Norman Foster, was considered by some as intended to signal a new era of social and governmental transparency.

Over 3.3 million people live in Berlin; the majority in single-person households. Berlin is Germany's melting pot of cultures, religions and life styles. The city counts as its own residents from more than 150 nations, and is home to the largest Turkish community outside Turkey, which has led to the Kreuzberg district's nickname "Little Istanbul".

Take a walk around the 12 districts to get the size of this multicultural city, or do like the locals and hop on a bicycle – Berlin is arguably second only to Amsterdam as Europe's cycling capital. Traditional sightseeing tours in an open double-decker bus start on Kurfürstendamm, right around the corner from the conference venue.

Berlin is a leading center of science, academics, and research, not least thanks to its 39 institutions of higher education, including four universities, with more than 160,000 students. And science and industry cooperate closely at the two technology parks in Adlershof and Berlin-Buch. Germany's national research organizations are represented in Berlin with a number of institutes, among them seven Fraunhofer institutes.

ANSPRECHPARTNER / CONTACT

CONFERENCE ORGANIZERS

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