

# 6G-RIC Workshop

## 6G Technology Advancements: Highlights & Future Directions

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October 11, 2024 @ Fraunhofer HHI, Berlin  
Science and Event Space, Lanolinfabrik, Salzufer 15-16



# 6G-RIC Workshop

October 11, 2024, Fraunhofer HHI, Salzufer 15-16, Berlin



## AGENDA

08h00-08h30

Registration & Welcome

(6G-RIC Showroom, E-02)

### BLOCK 1

08h30-10h30

Plenary Session "6G-RIC Technology Advancements"

(Plenary Room, E-07)

10h30-13h00

6G-RIC Demo & Research Highlights + xG-Incubator + Lunch

(6G-RIC Showroom, E-02)

### BLOCK 2

13h00-14h30

Parallel Session I "Microelectronics & PHY-Layer Technologies"

(Plenary Room, E-07)

13h00-14h30

Parallel Session II "Network as a Sensor & Digital Twins"

(5<sup>th</sup> Floor, Room 5-28/29)

13h00-14h30

Parallel Session III "AI for Communication & Edge Intelligence"

(6G-RIC Showroom, E-02)

14h30-15h15

Coffee Break + 6G-RIC Demo & Research Highlights + xG-Incubator

(6G-RIC Showroom, E-02)

### BLOCK 3

15h15-16h30

Plenary Session  
"6G Technologies: Architectural & System Aspects, Future Topics"

(Plenary Room, E-07)

16h30-

Get-together

(6G-RIC Showroom, E-02)



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## BLOCK 1

08h30-10h30

### PLENARY SESSION I “6G-RIC TECHNOLOGY ADVANCEMENTS” (Plenary Room, E07)

#### Session Chair

Slawomir Stanczak (Fraunhofer HHI)

08h30-09h45

#### TALKS

Lorenzo Miretti (Fraunhofer HHI)

“Cell-Free MIMO: The most underrated 6G Technology?”

Corrado Carta

“Advances in microelectronics for very high frequency communications”

Gianluigi Liva (DLR)

“Massive Grant Free Access for 6G”

Andre Drummond (TU Braunschweig)

“OPEN RAN Evolution for 6G Campus Networks: Architecture & Security Challenges“

Robert Schober (FAU)

“The Role of IRS in 6G – The 6G-RIC View“

09h45-10h30

#### PANEL DISCUSSION

#### Moderator

Slawomir Stanczak (Fraunhofer HHI)

#### Panelists

Andreas Müller (Bosch)

Michael Meyer (Ericsson Research)

Ulrich Barth (Nokia Bell Labs)

Mariam Kaynia (Telefonica)



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## BLOCK 2

13h00-14h30

### PARALLEL SESSION I "MICROELECTRONICS & PHY-LAYER TECHNOLOGIES" (Plenary Room, E-07)

#### Session Chair

Wolfgang Heinrich (FBH-Berlin)

13h00-14h00

#### TALKS

Taro Eichler (Rohde & Schwarz)  
„Sub-THz Communication and Sensing:  
Leveraging Electronics and Photonics“

Christos Oikonomopoulos-Zachos (IMST)  
“D Band Active Antenna Array with Lens Enabling  
Quasi optical and Analogue Beam Reconfiguration  
for 6G Applications”

Friedel Gerfers (TU Berlin)  
“Advanced Circuit Design Techniques for  
6G mmWave Front-Ends”

Vadim Isakov (TU Braunschweig)  
„mmWave Signal Generation and Conversion for Integrated  
6G Transceivers in CMOS and BiCMOS“

14h00-14h30

#### PANEL DISCUSSION

#### Moderator

Wolfgang Heinrich (FBH Berlin)

#### Panelists

Taro Eichler (Rohde & Schwarz)  
Christos Oikonomopoulos-Zachos (IMST)  
Friedel Gerfers (TU Berlin)  
Vadim Isakov (TU Braunschweig)



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## BLOCK 2

13h00-14h30

### PARALLEL SESSION II “NETWORK AS A SENSOR AND DIGITAL TWINS” (5th Floor, 5-28/29)

#### Session Chair

Ehsan Tohidi (Fraunhofer HHI)

13h00-14h00

#### TALKS

Silvio Mandelli (NOKIA)

“Integrated Sensing and Communications:  
Practical challenges for providing 6G with radar capabilities”

Kenan Turbic (Fraunhofer HHI)

“Network as a Sensor: 6G-RIC Perspective on ISAC”

Andreas Eisenblätter (atesio)

“Communicating Digital Twins“

George Yammine/Patrick Agostini (IIS, HHI)

“Channel Charting: Exploring Velocity and Spatial Mapping”

14h00-14h30

#### PANEL DISCUSSION

#### Moderator

Ehsan Tohidi (Fraunhofer HHI)

#### Panelists

Silvio Mandelli (NOKIA)

Kenan Turbic (Fraunhofer HHI)

George Yammine/Patrick Agostini (HHI, IIS)

Bernhard Kloiber (Siemens)

Andreas Eisenblätter (Attesio)



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## BLOCK 2

13h00-14h30

### PARALLEL SESSION III "AI for COMM. & EDGE INTELLIGENCE" (6G-RIC SHOWROOM, E02)

#### Session Chair

Jochen Fink / Zoran Utkovski (Fraunhofer HHI)

13h00-14h00

#### TALKS

Miguel Lopez (Ericsson Research)  
"PHY design from 2G to 6G: The past, present and future of physical layer technologies, or how did we get here and where are we going?"

Alex Keller (NVIDIA)  
"Real-Time Neural Receivers Drive AI-RAN Innovation"

Renato Cavalcante (Fraunhofer HHI)  
"Mathematical Foundations of Resource Allocation: Unlocking New Insights for Enhancing Neural Networks"

Henning Sanek (Apple)  
"Towards Native AI/ML in 6G: a UE perspective **(to be confirmed)**"

14h00-14h30

#### PANEL DISCUSSION

#### Moderator

Zoran Utkovski / Jochen Fink (Fraunhofer HHI)

#### Panelists

Miguel Lopez (6G-ANNA)  
Alex Keller (NVIDIA)  
Renato Cavalcante (HHI)



# 6G-RIC Demo Session

October 11, 2024, Fraunhofer HHI, Salzufer 15-16, Berlin



## BLOCK 3

15h15-16h30

### PLENARY SESSION II "6G TECHNOLOGIES: "FUTURE TOPICS" (Plenary Room, E07)"

#### Session Chair

Slawomir Stanczak (Fraunhofer HHI)

15h15-16h30

### TALKS (Q & A)

Andreas Benzin & Wilhelm Keusgen (TU Berlin)

"6G Wide Area Coverage in the 7-15 GHz Frequency Range using Giga-MIMO and Open RAN"

Andreas Müller (Bosch)

"Network of Networks and Digital Twins"

Zoran Utkovski (Fraunhofer HHI)

"Semantic Communication & Next Gen. AI"

Stefano Cioni (European Space Agency - ESA)

"Non-Terrestrial Networks (NTN) in 3GPP" (**virtual talk**)



# 6G-RIC Demo Session

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## OCTOBER 11

10h30-13h00

14h30-15h15

**DEMO AND STARTUP SESSION** (6G-RIC Showroom, E-02 + Integration Lab, E-01)

Session Coordinators: Leszek Raschkowski, Kenan Turbic, Ramez Askar, Zoran Utkovski

## and on OCTOBER 10

16h00-17h00

### xG-Incubator Startups (6G-RIC Showroom, E-02)

S01: Modular Open RAN Radio Unit Platform for 6G Research

S02: 6G Network Planning and Customized 5G/6G RAN: Adaptive Network Slicing

S03: MOCZ - an alternative Physical Layer to OFDM for short-packet communication

### 6G-RIC Demos (6G-RIC Showroom, E-02)

S04: 2\*2 D-band LOS-MIMO Demo

S05: Secrecy Maps Demo

S06: Channel Charting for Positioning

S07: Photonic Neuromorphic Computing for Nonlinear Optical Signal Equalization (NELI)

S08: Intent-based Optical Transport Control

S09: Autonomous Link-Capacity Adjustment in Optical Metro-Aggregation Networks

S10: Multi-RIS-based Signal Amplification using Channel Splicing for Calibration

S11: Application level energy monitoring for Green 6G

S12: AI native control interfaces

S13: Signal Equalization using Micro-Ring Resonator based Reservoir Computing

S14: Simulation Environment ISAC + Channel Charting

S15: Simulation-based demo RIS

Massive Beams  
airpuls  
MOXZ

IHP  
HHI-WN + TUB  
IIS-LV  
HHI-PN+TUB-PKS  
FOKUS, TUBS-KN, HHI-PN  
HHI-PN  
TUB-TKN  
HHI-WN  
HHI-WN  
CAU  
HHI-WN  
HHI-WN, TUB-TKN



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## and on OCTOBER 10

16h00-17h00

### 6G-RIC Demos (6G-RIC Showroom, E-02)

S16: Simulation-based demo RIS

S17: Networked Collaborative Robotics

S18: Neuromorphic Wireless Cognition

S19: 240GHz Single-Carrier Demo

S20: Energy-efficient Sub-THz Waveform Design

S21: Space division Multiplexing PON

S22: Automatic Deployment of Mobile Network Services

S23: Semantic-aware (Massive) Multiple Access

S24: D-Band Sub-THz Sensing and Communication

HHI-WN

HHI-WN + TUB-Control

HHI-WN

IHP

HHI-WN

HHI-PN

TUC

DLR

HHI-WN

### Demos (6G-RIC Integration Lab, E-01)

I01: Next-Gen RAN: User mobility and energy saving

I02: OAI MU-MIMO (First step of Cell free MIMO)

I03: mmWave Sidelink

I04: Interactive Channel Emulation for 5G Sidelink

HHI-WN

HHI-WN

HHI-WN

HHI-WN, airpuls



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## 6G-RIC

Research and  
Innovation Cluster

