

Wireless Infrastructure Technology at Chalmers – WiTECH

Tommy Svensson

Prof., Leader Wireless Systems, Chalmers

CC Director: Marianna Ivashina (E2)

CC Vice-Director: Christian Fager (MC2)

Steering Board Chair: Maria Wargelius (Ericsson)

V O L V O

ERICSSON

ICOMERA
AN EQUANS COMPANY



SAAB

SATCUBE
Satellite broadband

OMNISYS
INSTRUMENTS



KONGSBERG

gotmic
Göteborg Microwave Integrated Circuits

ZNf

UTQ
UniqueSec

MITSUBISHI
ELECTRIC

APWAVES

qamcom

RISE

VINNOVA

Sweden's Innovation Agency



CHALMERS

CHALMERS

SNS CO-OP project and 6G-IA Webinar: The Swedish National Initiative on 6G:
Perspectives from the Advanced Digitalisation program Oct. 28, 2025



- 10-year program (2024-2028/2033)
- 18 partners:

V O L V O



WiTECH vision

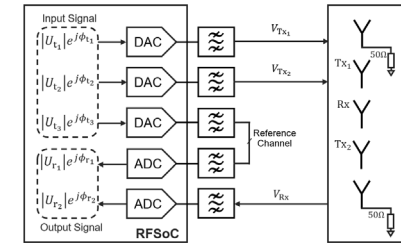
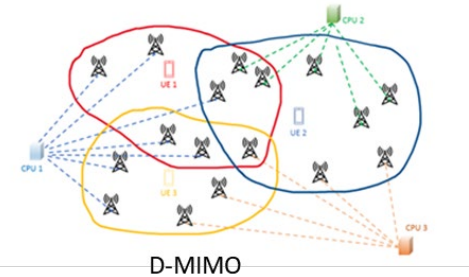
Create a sustainable future by developing:

- Next-generation of robust and trustworthy wireless communication and sensor systems (e.g. 6G)
- Sustainable, energy-efficient semiconductor components and processes

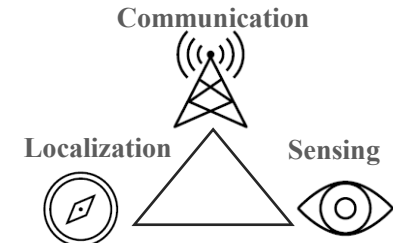


RESEARCH LINES

- **RL1: Digital signal processing techniques** for future envisioned convergence of wireless infrastructure services and global service coverage. 3 Projects.

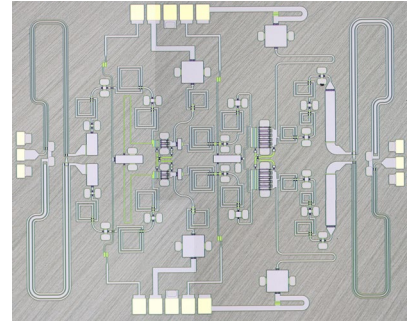


Hardware modeling

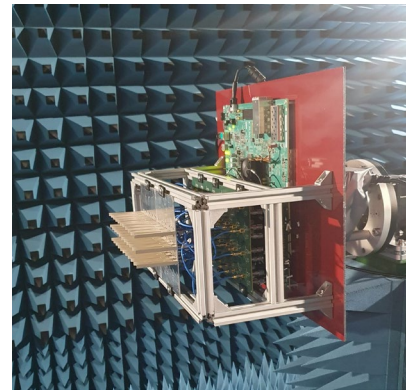


RESEARCH LINES

- **RL1: Digital signal processing techniques** for future envisioned convergence of wireless infrastructure services and global service coverage. 3 Projects.
- **RL2: Agile, sustainable, and energy-efficient wireless hardware solutions**, enabling efficient resource sharing, utilization of new data, and reducing environmental impact. 4 Projects.



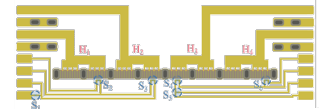
Energy efficient hardware



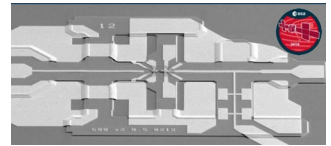
Reconfigurable antenna systems

RESEARCH LINES

- **RL1: Digital signal processing techniques** for future envisioned convergence of wireless infrastructure services and global service coverage. 3 Projects.
- **RL2: Agile, sustainable, and energy-efficient wireless hardware solutions**, enabling efficient resource sharing, utilization of new data, and reducing environmental impact. 4 Projects.
- **RL3: Reliable semiconductor component design processes and autonomous test methods** for trustworthy system designs and increased production efficiency. 4 Projects.



Packaging and integration



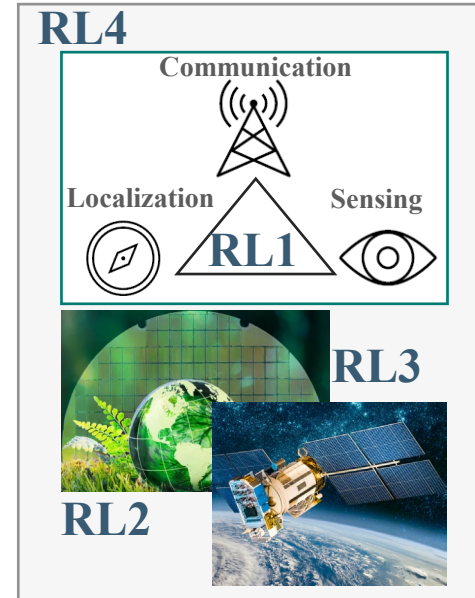
In-house process development



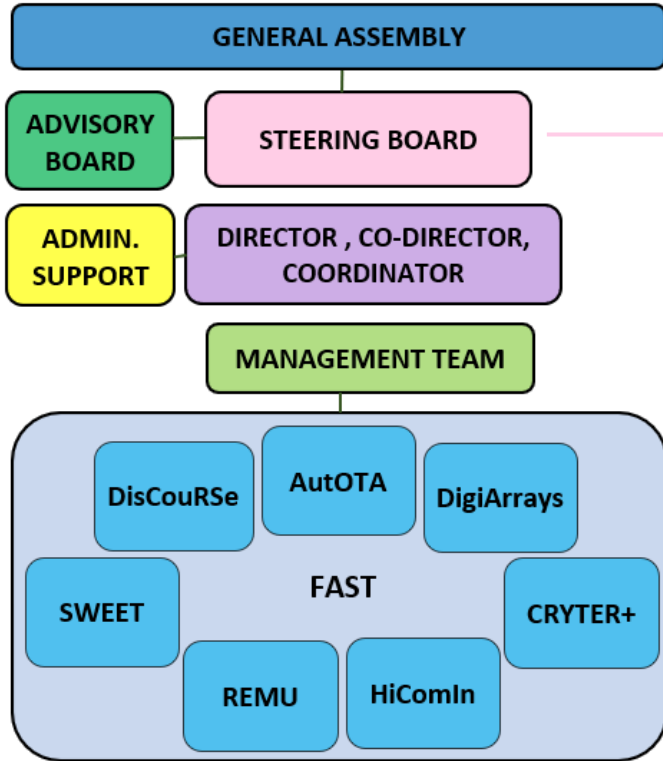
Over-the-air testing

RESEARCH LINES

- **RL1: Digital signal processing techniques** for future envisioned convergence of wireless infrastructure services and global service coverage. 3 Projects.
- **RL2: Agile, sustainable, and energy-efficient wireless hardware solutions**, enabling efficient resource sharing, utilization of new data, and reducing environmental impact. 4 Projects.
- **RL3: Reliable semiconductor component design processes and autonomous test methods** for trustworthy system designs and increased production efficiency. 4 Projects.
- **RL4: Unified eco-system:** Alignment of priorities, coordination of centre-wide collaborations, training and beyond. ('FAST' project)



ORGANIZATIONAL STRUCTURE



7 technical projects

● ○ 18 partners

● ○ 8 delegates

○ Board Chair Maria Wargelius



○ Christoph F. Mecklenbräuker (TU Wien, Austria)

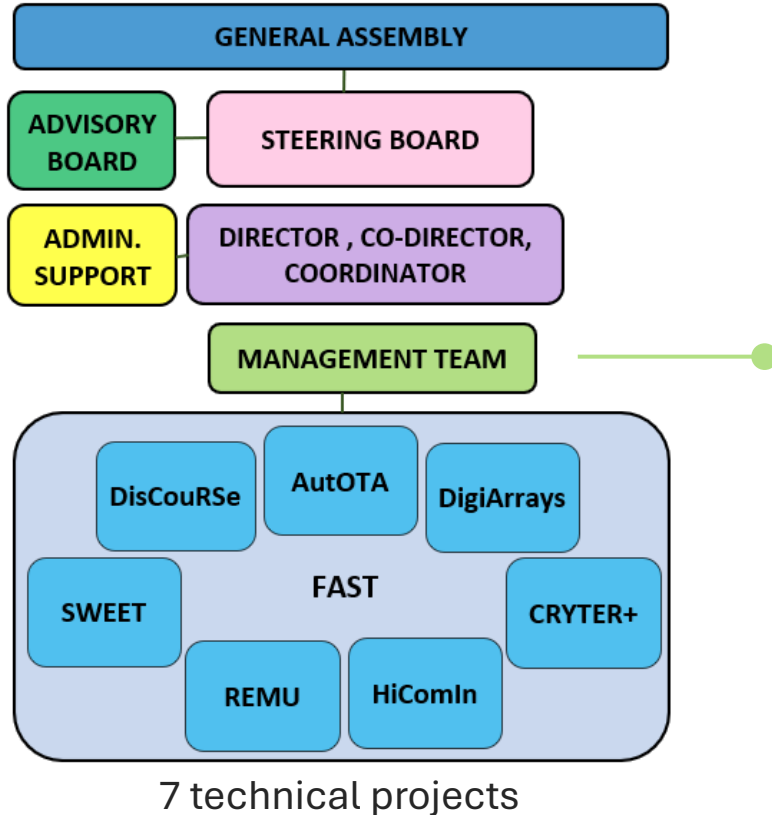
○ Wolfgang Heinrich (F. Braun Institut, Berlin, Germany)

○ Riana H. Geschke (Fraunhofer FHR, Germany)

○ Christophe Gaquière (Univ. de Lille, France)



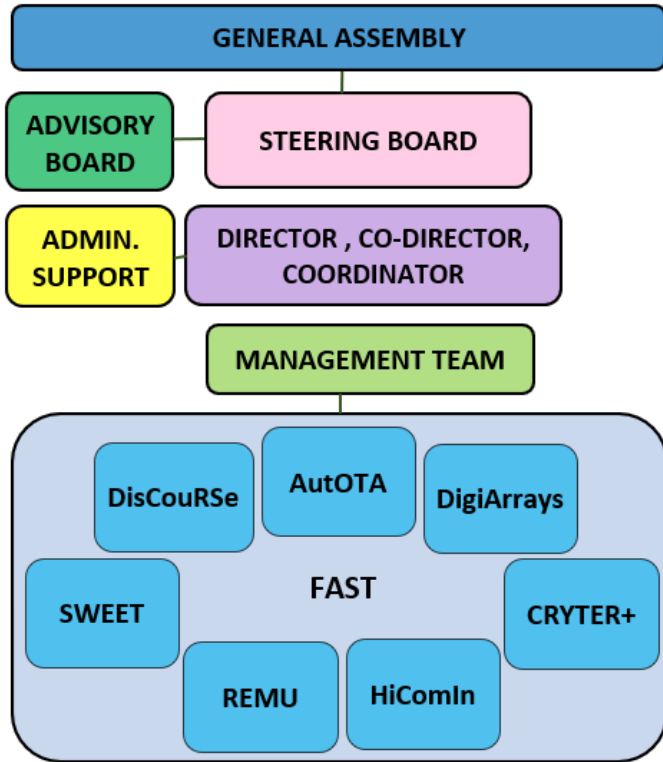
ORGANIZATIONAL STRUCTURE



- **Co-Directors:**
Marianna Ivashina, Christian Fager
- **Coordinators:**
Cristina Andersson, Daryna Pesina



ORGANIZATIONAL STRUCTURE



7 technical projects

Management team

- Fredrik Brännström
- Tommy Svensson
- Henk Wymeersch
- Giuseppe Durisi
- Oleg Iupikov
- Pavlo Krasov
- Rob Maaskant
- Helena Rodilla
- Vessen Vassilev
- Dan Kuylenstierna
- Gregor Lasser



Centre-wide collaborations and training

- **Mobility** across industry and academia, **joint supervision** of PhD/MSc/BSc students
- **Mentorship and gender-balance program**



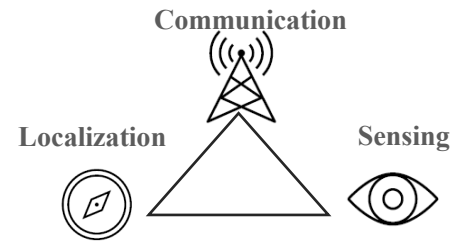
WiTECH consortium: Experimental infrastructure

- Widely-gathered multi-disciplinary competences
- World-class scientific infrastructures (RISE, Chalmers)



Centre-wide demos

- **Short-/mid- term impact goals:** Demonstrators for multi-disciplinary research, training, and continuous feedback between WiTECH projects.
 - ✓ Showcase at Europe's flagship conference and exhibition (European Microwave Week) with ~5000 participants, Gothenburg, 2028, organized by WiTECH consortium partners
- **Long-term impact goals:** Demonstrators in a real-life environment.
 - ✓ Installing a 5G+/6G infrastructure at RISE
 - ✓ Integrating objects from partners (e.g., mobile base stations, users, cars, UAVs), and including satellite networks
- **Cross-centre demonstrators, e.g., Space/Quantum**



WiTECH - The wider perspective



- **Complementing and leveraging national programs**
 - ✓ SSF semiconductor system design center ClassIC, edge computing, e.g. TeCoSa
 - ✓ Vinnova- and Chips Act Competence-, Wallenberg centers. Public sector Västra Götaland Region
- **Expansion through international collaborations**
 - ✓ Recognized international leader and benchmark in wireless academic-industrial collaboration
 - ✓ Agreements with strategic suppliers (e.g. Win Semi, Henkel, LPKF)
 - ✓ New partnerships through engagements in major EU and international research and training programs



BROADER PERSPECTIVE

With WITECH, we have run our Chalmers-industry collaboration for **more than 3 decades!** – Unique for any research environment in Sweden

- ✓ Prof. Erik Kollberg applied successfully for Sweden's first competence centre in microwave technology, Chalmers Center for High-Speed Technology (CHACH) started 1995.
- ✓ Previous GigaHertz-ChaseOn Centres 2007-2021.
Prof. Erik Ström (E2) and Jan Grahn (MC2). Bridge Center 2022-2023



1937 - 2023

- Efficient 5G transmitters for mm-wave
- Linear RF multi-antenna receivers
- Electro-thermal effects in communication and sensors
- THz and ultra-low noise receivers



- Integrated antenna arrays
- Vehicle communication
- Multi-antenna wireless architectures for 5G
- Sensor systems
- Microwave hyperthermia



GHZ

ChaseOn





WITECH



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