Welcome to the 10th CWTe Research Retreat
Some highlights wireless technology now

- 5G is being rolled out - most countries will have access to 5G in 2020
- 6G initiatives have started
- WiFi
  - IEEE802.11ax
  - IEEE802.11ay
- Optical wireless communication
  - VLC: Li-Fi/802.11bb
  - Beam steered IR
- Large IoT networks
- Artificial Intelligence

Many challenges and new opportunities
New interdisciplinary research topics
Centre for Wireless Technology Eindhoven
CWTe Structure

Program Board Chairs

Bus. Dev.

Director

SPS

ECO

Electromagnetics

Integrated Circuits

Signal Processing Systems

Electro-Optical Communication

Electronic Systems

EM

IC

ES

TU/e
CWTe Research Programs

- **Ultra-high data rates**
  
  **Coordinator:** Dr. Ulf Johannsen
  - High Frequencies (>= 30GHz) and very high data rates (>Tbps)
  - Beamforming with many elements @ low cost
  - Next generation RAN (RoF, M-MIMO, Dyn. Reconf.)

- **Ultra-low power and IoT**
  
  **Coordinator:** Dr. George Exarchakos
  - Small (<< 1mm3), low-cost
  - Battery-less sensors/controls
  - Self-configuring networks, autonomous devices and AI

- **THz Systems**
  
  **Coordinator:** Prof. Marion Matters
  - 3D spectroscopic imaging
  - Small, low-cost short range
  - Radar

- **Radio Astronomy**
  
  **Coordinator:** Prof. Mark Bentum
  - Next generation radio telescopes
  - Large antenna arrays
  - Low frequency (<30 MHz)
CWTe Labs
Highlights 2019

• Opening of the Advanced Photonics Lab for Ultrafast Spectroscopy, Nano-photonics and THz imaging
• Opening Center for Astronomical Instrumentation (CAI)
Opening Center for Astronomical Instrumentation

- Collaboration Radboud University and TU/e
  - Dr. Marc Klein Wolt, Director Radboud Radio Lab, Radboud University
  - Prof. Mark Bentum, Professor in Radio Science, TU/e
- Agreement signed on 20 September
Highlights 2019

• Opening of the Advanced Photonics Lab for Ultrafast Spectroscopy, Nano-photonics and THz imaging
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• European Innovative Training Network ‘MyWave’ on Millimetre-Wave Communications for beyond-5G wireless communications
EU ITN MyWave

• 15 Ph.D. students; 3 countries
• Partners: TU/e (coordinator), Chalmers, KIT, Fraunhofer, Ericsson, NXP, Keysight, UMS, Gapwaves, TAC
• Millimetre-wave communications for beyond-5G mobile users
  • Reduce power consumption of mm-wave antenna front-ends
  • Real-time system adaptability for robust mm-wave communication with mobile users
  • Reliable connections of mobile users by Distributed Massive-MIMO with synchronous cooperation of several base-stations

Distributed Massive MIMO
Highlights 2019

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• TU/e-KPN Flagship: SmartTWO
• Mini-master and MOOC Wireless Communication starting September 2020
• Spin-offs:
  - TeraNova
  - MaxWaves
  - AntenneX
Invitation
CWT e 2019 Research Retreat

Wednesday, 9th of October 2019
De Zwarte Doos, 1st floor, TU Eindhoven

Hosted by: Center for Wireless Technology Eindhoven

9.00 - Welcome with coffee

Morning program
9.30 Opening and introduction
10.15 THz Resonances with Infinity Lifetime
10.50 - Break (incl. posters)
11.20 5G developments & outlook
11.55 Exploring the Unknown
Lunch
12.30 - Lunch (incl. posters)

Afternoon program
13.30 Start-up pitches
14.05 Connectivity needs in Ports 2030
14.40 - Break (incl. posters)
15.10 Integrated Microwave Photonics chip platform by hybrid integration
15.45 Towards cooperative driving - Vehicular networking for ITS
Closing
16.20 Closing session
16.30 - Drinks and networking

Sonia Heemstra de Groot (TU/e)
Ajay Kottapalli (RUG)
Jaime Gómez Rivas (TU/e)
Adrian Pais (TNO)
Peter Baltus (TU/e)

various speakers
Henk Zwetsloot (Groningen Seaports)
Robert Grootjans (LioniX)
Geert Heijenk (UTwente)
Sonia Heemstra de Groot (TU/e)