Details

Central Laboratory for Micro- and Nanotechnology (ZMNT)

The scientific and economic relevance of micro- and nanotechnology will continue to progress at an accelerated pace in the near and foreseeable future. In order to maintain competitiveness on a national and international scale several institutes of the Faculty of Mathematics, Computer Science and Natural Sciences and of the Faculty of Electrical Engineering and Information Technology at RWTH Aachen University established the "Central Laboratory for Micro- and Nanotechnology" (CMNT). The research infrastructure CMNT operates a central clean room facility with 500 m² of clean room space (ISO class 5), that will be extended (until spring of 2021) by additional 625 m² of clean room space. CMNT is organized as a shared user facility and is the central technology platform for the fabrciation of micro- and nanostructures at RWTH Aachen University. It makes a very broad set of different fabrication tools available for external and internal users. In order to guarantee a safe and efficient operation, CMNT provides a number of different online tools, such as an online reservation system as well as online safety training and video tutorials for the operation of the microfabrication tools. CMNT does only allow a significantly more efficient use of resources, but it also plays a central role in fostering the collaboration between physicists and engineers and in seeding multi-disciplinary research. Internal and external users including industrial partners have access to a first-class research infrastructure as well as to a broad scientific and technological knowledge base.

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To website

Host Institution

RWTH Aachen
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http://www.rwth-aachen.de

Scientific Domain

Primary Subjects:
- Physics
- Materials Science and Engineering
- Computer Science, Electrical and System Engineering

Secondary Subjects:
- Medicine
- Chemistry
- Mechanical and Industrial Engineering

Category

Micro- and Nanotechnology facilities

Scientific Services

CMNT will offer the following services: - Access to a first-class micro- and nanotechnology platform, - Design and fabrication of semiconductor devices, - Design and fabrication of nanostructures (minimum feature size approx. 10 nm), - Design and fabrication of photonic components and circuits, - Electrical and optical characterization of semiconductor devices, - Training of new users.

Scientific Equipment

- Micro- und nanolithography (photolithography, laser lithography, electron-beam lithography)

- Dry-chemical etching (reactive-ion etching, plasma etching)
- Chemical vapor deposition (PECVD, LPCVD)
- Atomic-layer deposition (ALD) and atomic-layer etching (ALE)
- Physical vapor deposition (electron-beam and thermal evaporation, sputtering)
- (Rapid) thermal processing (oxidation, nitridation, hydrogen, nitrogen)
- Wet-chemical processing
- Electroplating
- Chemical-mechanical polishing
- Circuit packaging (wire, chip and wafer bonding)
- Wafer dicing
- Wafer dicing (SEM, SFM, STM, optical and 3D laser microscopy, profilometry)
- Electrical transport measurements (DC, HF, I-V, (elektrochemische) C-V, Hall, room temperature, low temperature)
- (Electro-)optical characterization (Raman spectroscopy, FTIR spectroscopy, quantum efficiency, transmission, reflection, spectroscopic ellipsometry)

Keywords

- Micro-/Nanotechnology
- Semiconductor devices
- Quantum technology
- Solid-state qubits
- Silicon technology
- Integrated silicon photonics
- Photovoltaics
- Micro- and nano-electromechanical systems (MEMS and NEMS)
- Micro systems technology
- Circuit packaging
- Group III-nitrides
- Graphene devices
- 2D Materials

Networks

Aachen Graphene and 2D Materials Center
http://www.graphene.ac/

Users per annum

Internal Users: zurzeit ca. 100 Nutzer
External Users in total: 6
External Users: 5
External Users in the EU: 1
External Users outside of EU: 0