Technische Universität Dresden

FAKULTÄT ELEKTROTECHNIK UND INFORMATIONSTECHNIK

Prof. Thomas Mikolajick
Chair of Nanoelectronics, Dean of Studies

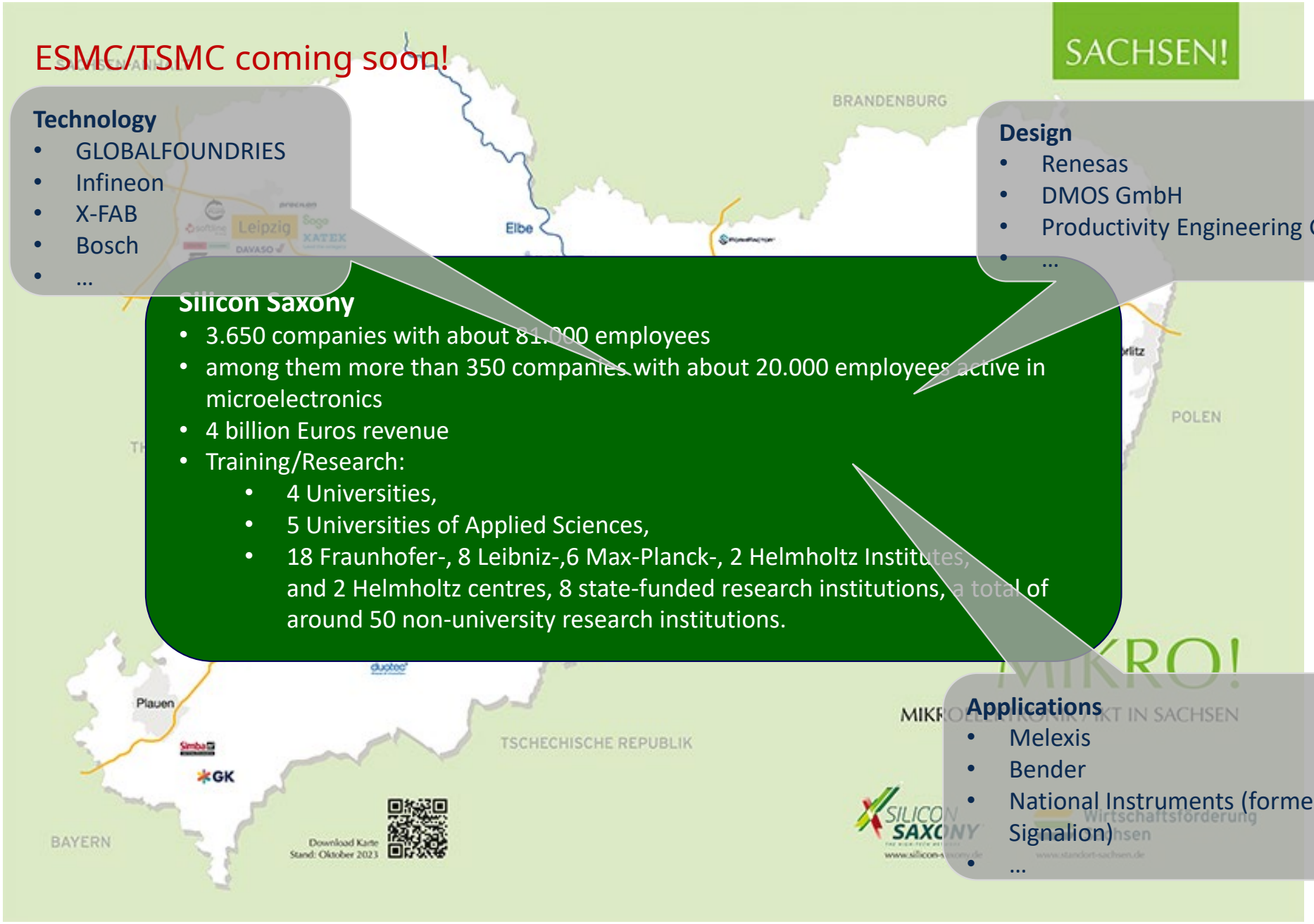
Dipl.-Phys. Manuela Tetzlaff
Study Advisor

Welcome! Herzlich Willkommen!

Nanoelectronic Systems (M.Sc.)

- Microelectronic in Saxony
- TU Dresden
- Micro-/Nanoelectronics at TU Dresden
- Faculty of Electrical and Computer Engineering
- Master‘s programme Nanoelectronic Systems (NES)
- General Information

ESMC/TSMC coming soon!



Technology
- GLOBALFOUNDRIES
- Infineon
- X-FAB
- Bosch
- …

Design
- Renesas
- DMOS GmbH
- Productivity Engineering GmbH
- …

Silicon Saxony
- 3.650 companies with about 81.000 employees
- among them more than 350 companies with about 20.000 employees active in microelectronics
- 4 billion Euros revenue
- Training/Research:
  - 4 Universities,
  - 5 Universities of Applied Sciences,
  - 18 Fraunhofer-, 8 Leibniz-,6 Max-Planck-, 2 Helmholtz Institutes, and 2 Helmholtz centres, 8 state-funded research institutions, a total of around 50 non-university research institutions.

Applications
- Melexis
- Bender
- National Instruments (former Signalion)
- …

Master‘s Programme Nanoelectronic Systems (NES)

- Start 2011; initiated by Cool Silicon Cluster

Cool Silicon (2009 – 2014): Leading-Edge Cluster with the goal of energy efficiency in the information and communications technology (ICT) sector

COOL SiLiCON

COOL Computing

COOL Reader

COOL Sensornet

TU Dresden (founded in 1828)

29,000 students (20 % international students from 128 countries)

9,000 Employees

600 Professors

5 Schools

17 Faculties

121 Study Courses

School of Science

School of Humanities and Social Sciences

School of Engineering Sciences

School of Civil and Environmental Engineering

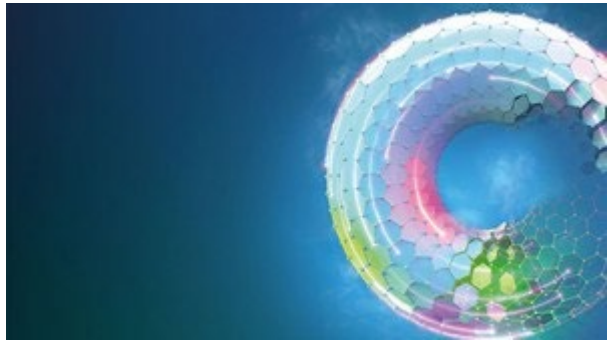
School of Medicine

Faculty of Electrical and Computer Engineering

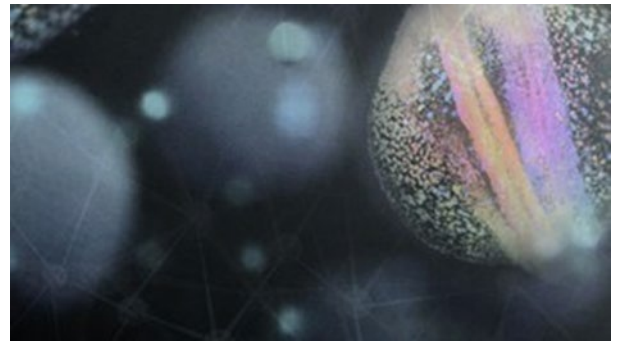
- **TU9** - the Alliance of leading Universities of Technology in Germany
- THE overall ranking 2025 - TUD ranks 160th, placing it among the top 10% of all universities listed
- High level of third-party funding: total budget of EUR 852 million (in 2024), of which EUR 369 million via third-party funding
- **University of Excellence** since 2012 – 5 Clusters of Excellence

Clusters of Excellence

CeTI
Centre for Tactile Internet with Human-in-the-Loop

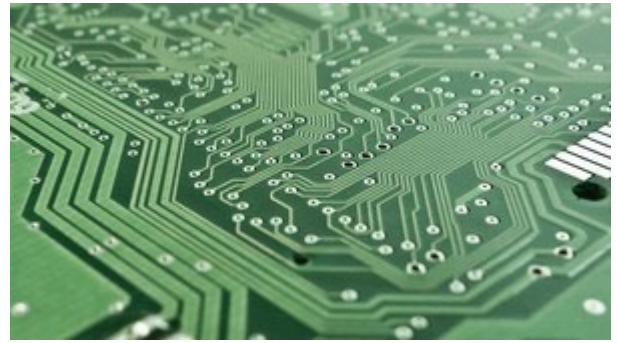


ct.qmat
Complexity and Topology in Quantum Matter



PoL
Physics of Life
TU Dresden

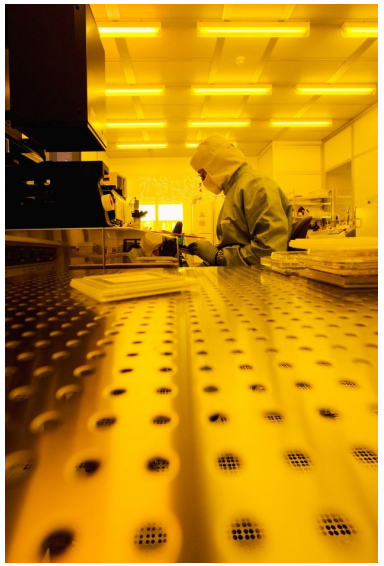
CARE - Climate-Neutral and Resource-Efficient Construction



REC²: Responsible Electronics in the Climate Change Era

Nanoelectronics at TU Dresden

- **Micro-, Opto- and Nanoelectronics** is one research focus of TU Dresden
- **Faculty of Electrical and Computer Engineering**
- **Master's programme Nanoelectronic Systems (NES)**
- **Institute of Semiconductors and Microsystems** (IHM)
  - 411 m^2 Clean Room Laboratory (built 2006, extended 2013)
  - Chair of Nanoelectronics
- **NaMLab gGmbH (2009)**
- **Institute for Applied Physics** (Photo Physics, Semiconductor Physics)
- **Institute for Material Science**



Faculty of Electrical and Computer Engineering

- 31 professors
- 4 junior professors
- 350 PhD Students
- 460 scientific employees
- 1.800 Students (343 NES Students)
- approx. 39 million Euro third party funding every year
- one of the oldest faculties for electrical engineering in Europe
- one of the largest faculties for electrical engineering in Germany
- Heinrich Barkhausen was the founder of the first Low Power Technology Institute

Faculty of Electrical and Computer Engineering

Scientific and research oriented education

High School Abitur

Diploma Programmes
- Electrical Engineering
- Biomedical Technology
- Information Systems Engineering
- Mechatronics
- Renewable Energy Systems

10 semesters

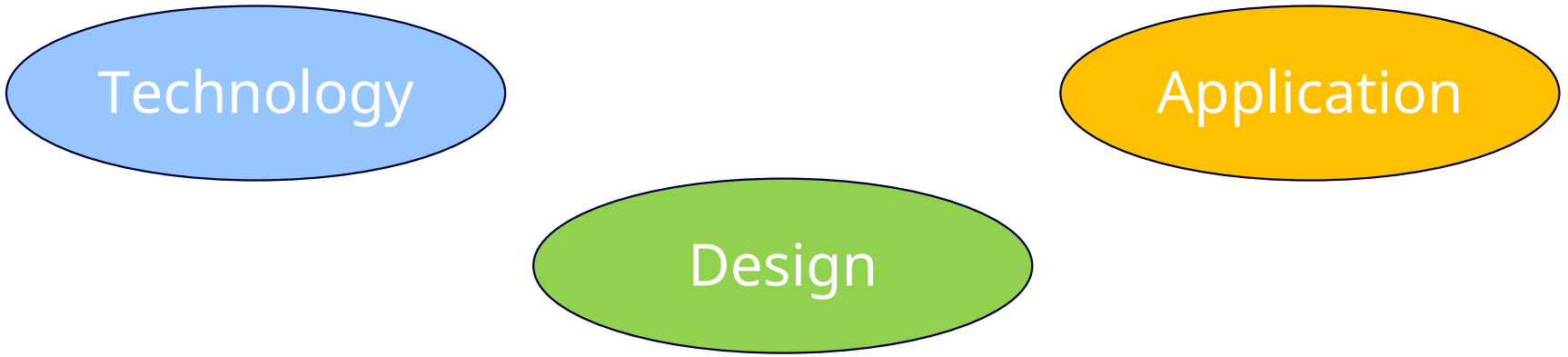
Bachelor

research oriented
Master's Programme
Nanoelectronic Systems (M.Sc.)
4 semesters

Structured
PhD Programme Dr.-Ing.
3 years

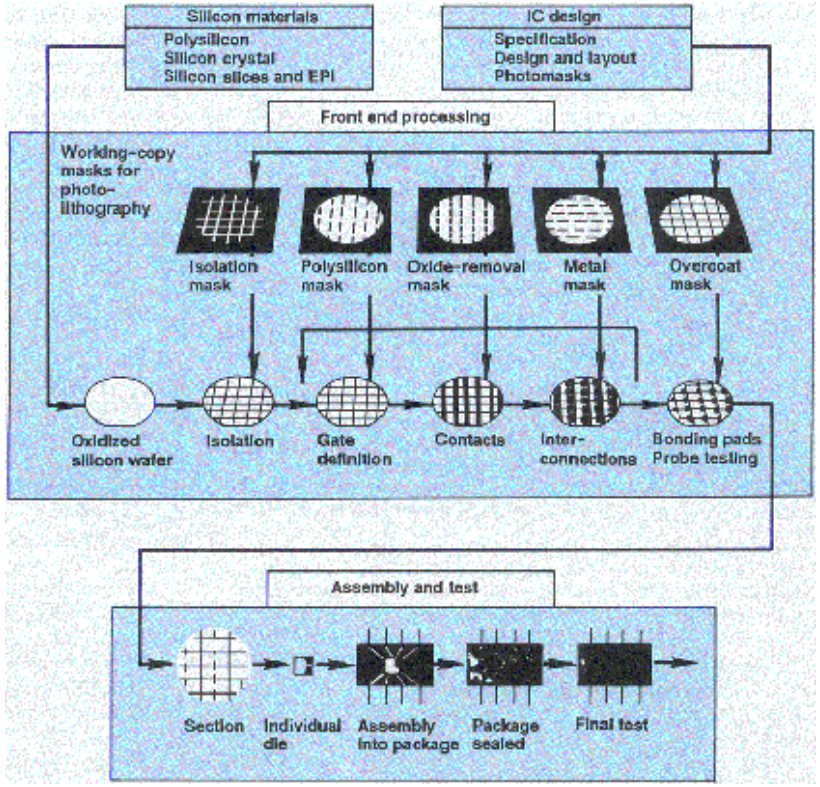
Master's programme Nanoelectronic Systems

The Master's programme Nanoelectronic Systems focuses on three key areas:

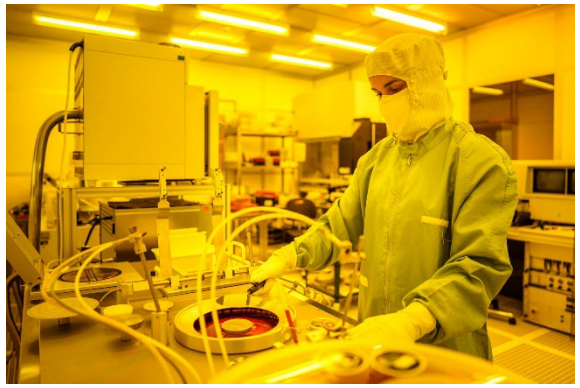


In the elective area, you are free to choose modules from only one specialization or across all specializations.

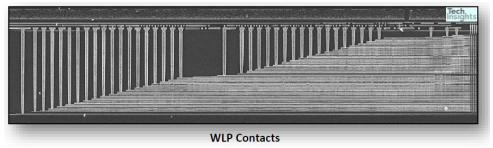
TECHNOLOGY

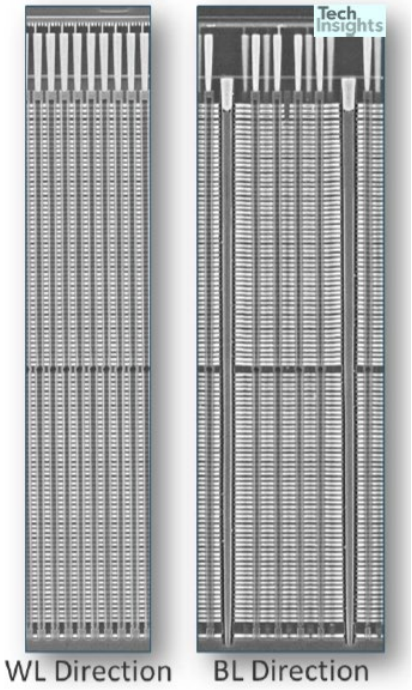


Typical process flow in semiconductor technology



Inside the cleanroom of TUD

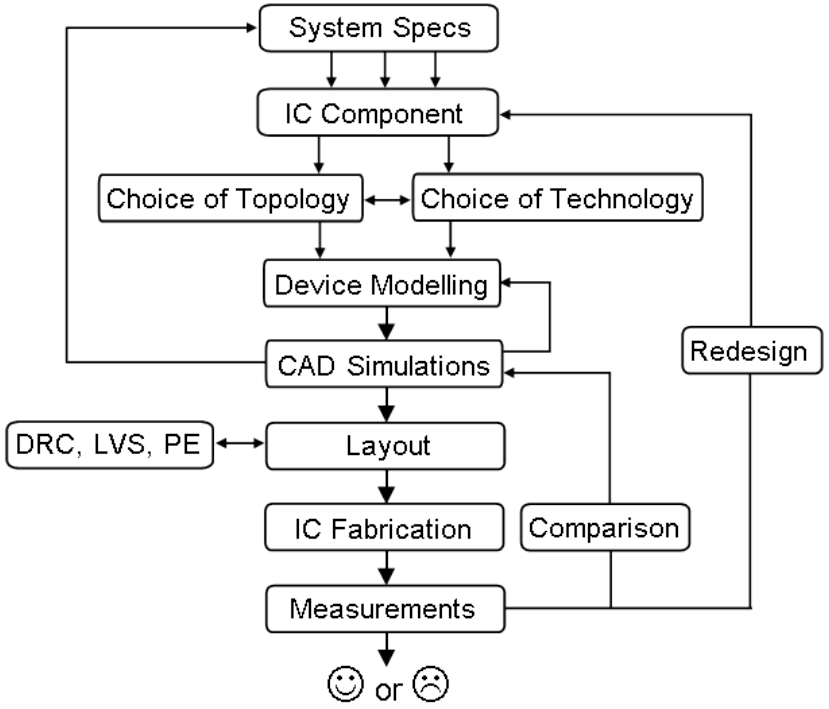




3D NAND cross section

DESIGN

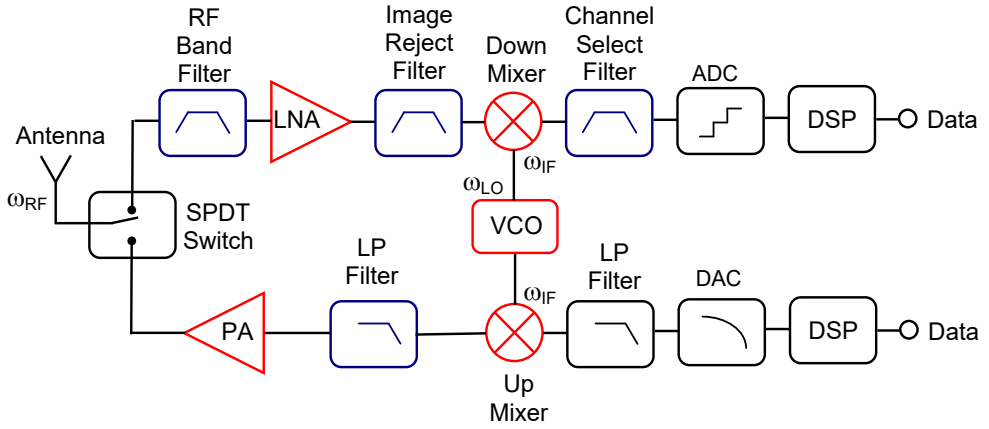
Procedure Chip Design



***Example* Theory**

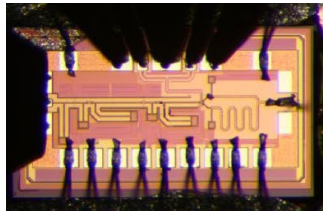
$V_{out}/V_{in} = g_m R_L > 1$

Example Transceiver Architectures for Wireless Communications



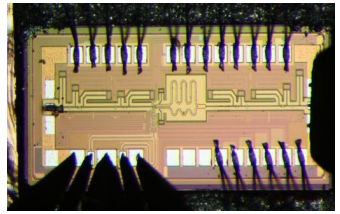
Example Chips for 6G communications, 200 GHz, 50 Gb/s wireless

Transmitter



Bond-wire antennas

Receiver

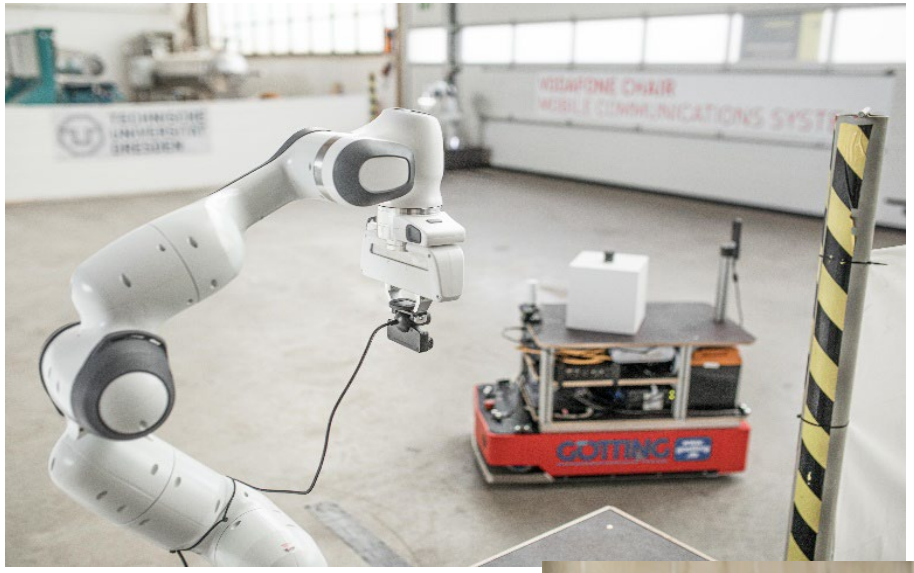


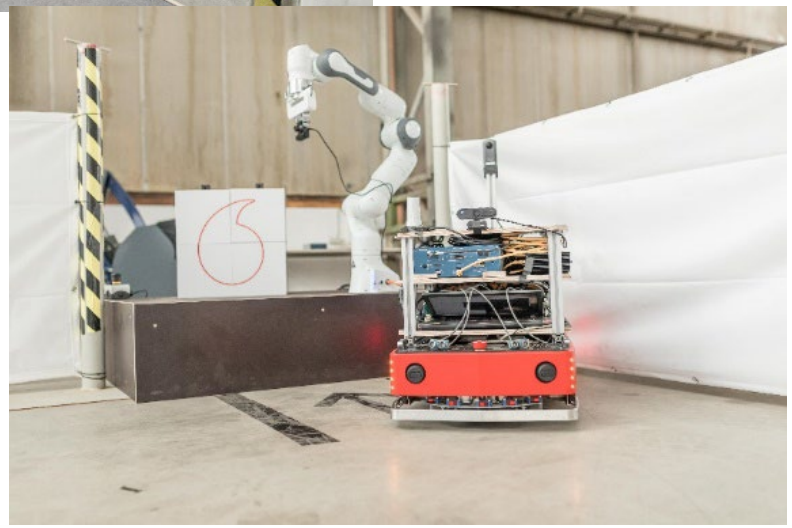
Fritsche, Stärke, Carta, Ellinger, A Low-Power SiGe BiCMOS 190 GHz Transceiver Chipset with Demonstrated Data Rates up to 50 Gbit/s using On-Chip Antennas, IEEE Trans. on Microwave Theory and Tech., March 2017, © IEEE

TU Dresden Chair for Circuit Design and Network Theory

APPLICATION

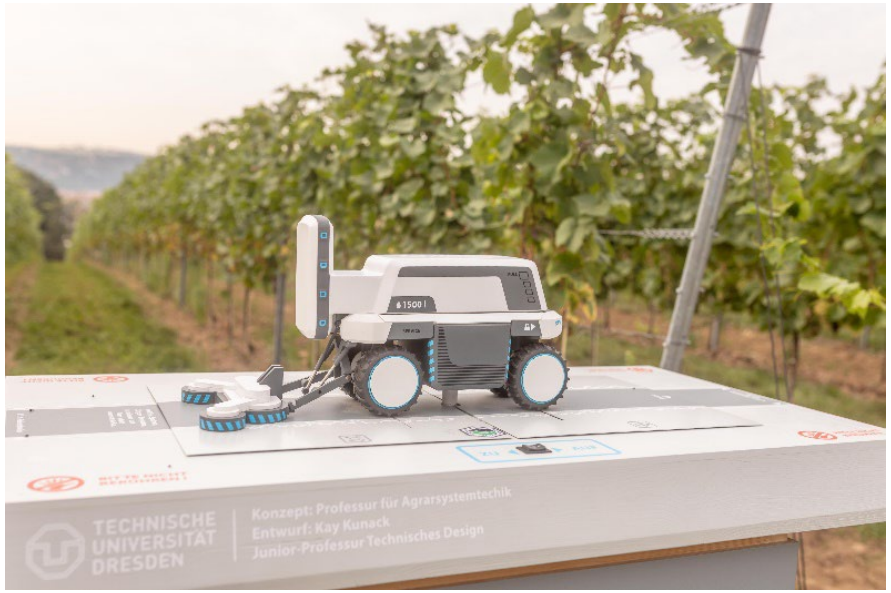
Automated Industry 4.0 scenario





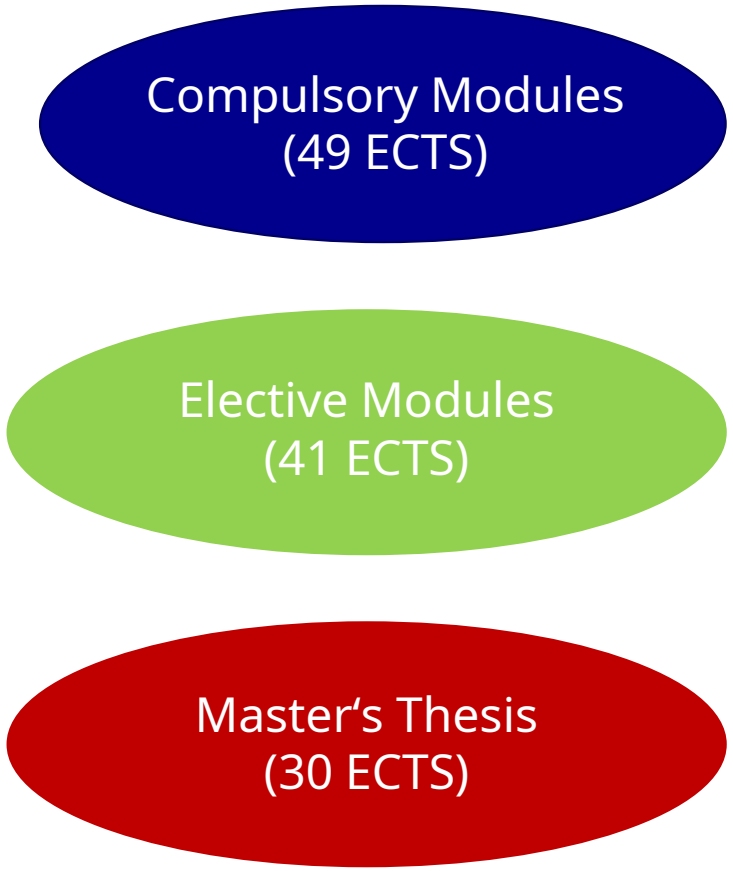
Demo of automated robot arms and an AGV (automated guided vehicle). The AGV can be controlled remotely from anywhere in the world and connects two production lines, for example.

Mixed-Reality application in agriculture



The MR demo (Mixed Reality) shows a model of an autonomous fruit harvesting robot in a vineyard. Using an app, the model (later the "real" vehicle) can be scanned and then, by clicking on the video image in the app, provides information about individual components and, for example, maintenance instructions, which are then showed on the "real" video.

Study plan of the NES programme



1st Sem.	2nd Sem.	3rd Sem.	4th Sem.
Lab Sessions (7 ECTS)		Academic and Scientific Work (5 ECTS)	Master's Thesis
Semiconductor Technology (8 ECTS)		Project Work (10 ECTS)	
Confidential Computing (6 ECTS)	Radio Frequency Integrated Circuits (8 ECTS)	15 ECTS	
16 ECTS	Hardware/ Software Codesign (5 ECTS)		
	10 ECTS		
30 ECTS	30 ECTS	30 ECTS	30 ECTS

Lab Sessions (2 parts)

Winter semester: RoboLab

RoboLab

Search...

Browse

Home

RoboLab Praktikum

Willkommen

Einschreibung

RoboLab Sessions

Welcome

Enrolment

Knowledge

Dates

	Winter term 2025/2026
Period	October 2025 until January 2026
Final demonstration	January 2026, by appointment, room TBA
Introduction	**17.10.2025, 13:00** room HÜL/S186/H
Topic introductions	Schedule will be provided soon

Registration

Registration on OPAL is required!

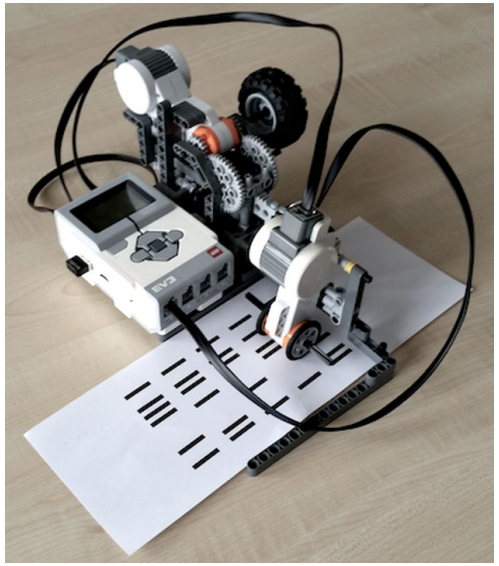
Registering on Opal is required in order to participate.
Also, you need to enrol into your corresponding module(s) on Selma.

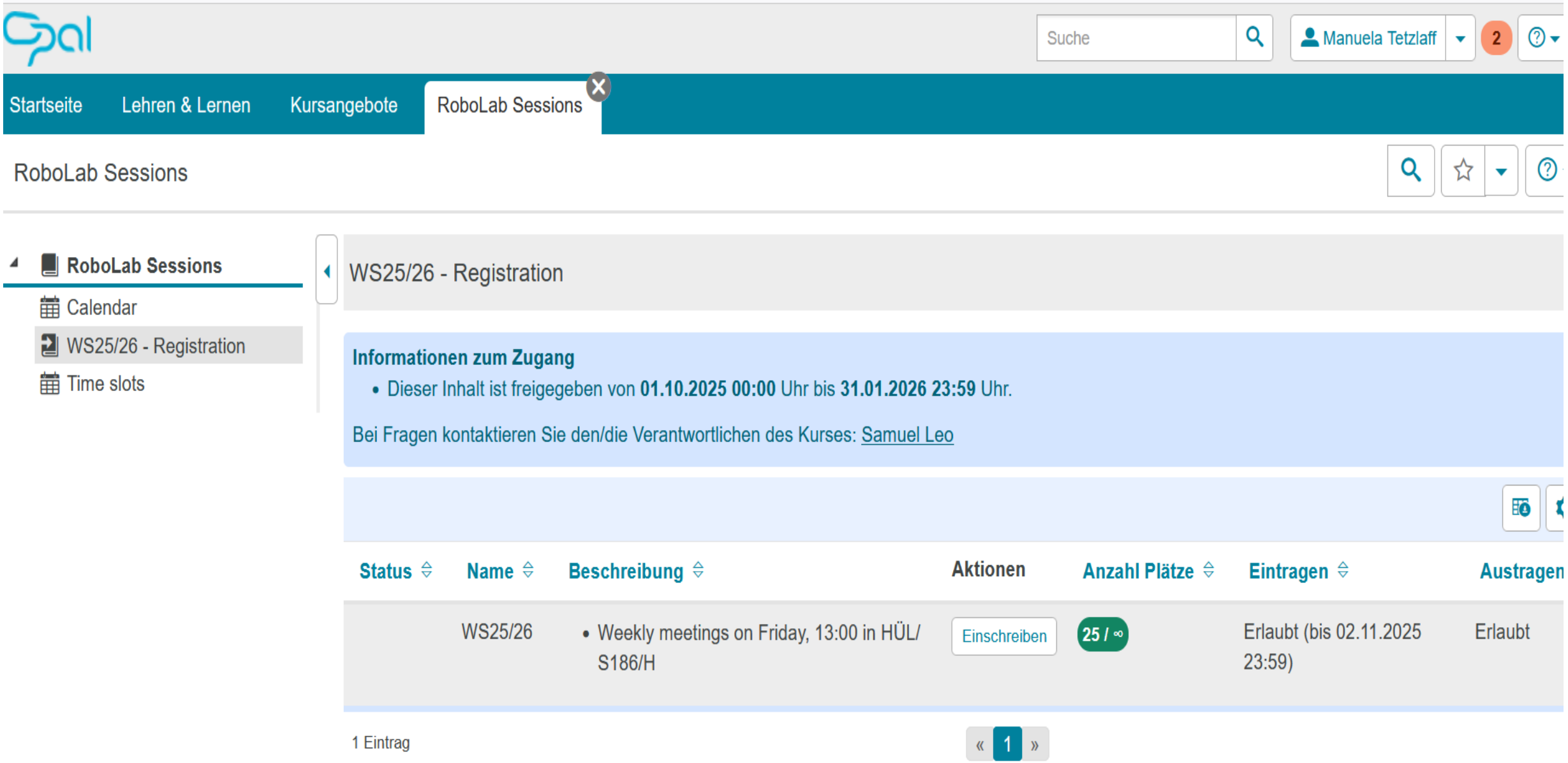
Master Nanoelectronic Systems

- Module **M1200-50040 Lab Sessions** (INF-NES-C-LabS)

Summer semester, choice 1 of 3:

1. **Semiconductor Technology Lab**
2. **Hardware/Software Codesign Lab**
3. **Emerging Photovoltaics Lab**




Suche
Manuela Tetzlaff
2
Startseite
Lehren & Lernen
Kursangebote
RoboLab Sessions
RoboLab Sessions
RoboLab Sessions
Calendar
WS25/26 - Registration
Time slots
WS25/26 - Registration
Informationen zum Zugang
• Dieser Inhalt ist freigegeben von 01.10.2025 00:00 Uhr bis 31.01.2026 23:59 Uhr.
Bei Fragen kontaktieren Sie den/die Verantwortlichen des Kurses: Samuel Leo
Status
Name
Beschreibung
Aktionen
Anzahl Plätze
Eintragen
Austragen
WS25/26
• Weekly meetings on Friday, 13:00 in HÜL/ S186/H
Einschreiben
25 / ∞
Erlaubt (bis 02.11.2025 23:59)
Erlaubt
1 Eintrag
« 1 »

Dresden University of Technology

Information for | EN | Search

Faculty of Electrical and Computer Engineering

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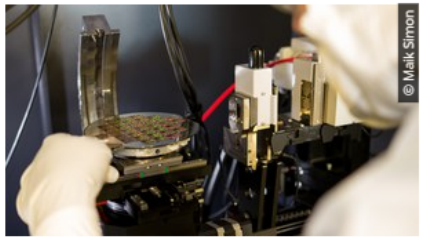
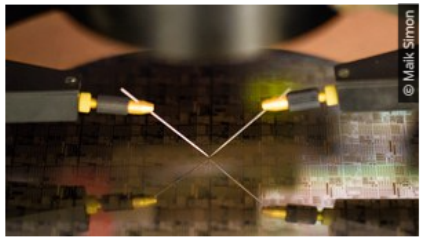




MASTER'S PROGRAMME NANOELECTRONIC SYSTEMS

The ongoing miniaturization in the microelectronics industry leads to systems that are now being referred to as nanoelectronic systems. Such systems offer a variety of applications, but their design and implementation is becoming increasingly complex.

The Master's programme Nanoelectronic Systems focuses on three key areas:

- Technologies for nanoelectronic systems
- Design of nanoelectronic systems
- Applications of nanoelectronic systems

LEARN MORE

Prospective Students

New Students

Students

STUDENTS

Class Schedules

1st semester timetable for winter semester 2025/26
(as of 1st of October, 2025)

3rd semester timetable for winter semester 2025/26
(as of 2nd September, 2025)

List of modules that are currently in the 3rd semester timetable but can also be taken in 1st semester according to the recommendation of the lecturer

modules descriptions, links to OPAL, official study documents...

Important Websites

- Modules and Study Guide
- Living and Studying in Dresden
- Exams
- Project work / Master's theses

MODULES AND STUDY GUIDE

Compulsory Modules

Academic and Scientific Work (NES-12 ASW-14.1 // new study regulations: Eul-NES-C-ASW)

Elective modules

- Catalogue of about 40 elective modules (is updated every semester!).
- You have to select elective modules with at least **41 credit points.**
- You can choose modules of the catalogue by your own choice. The classification of modules (Application, Technology, Design) is a guideline for you only.
- If possible**, register for the module on**  (OPAL) or the course website - links can be found on website *Modules and Study Guide.*

OPAL - the **o**nline **p**latform for **a**cademic teaching and **l**earning - is the central learning platform of the TU Dresden and other Saxon universities. It can be used by all members of the TU Dresden with a valid ZIH user login.

What do I find in OPAL?

- lecture notes and material
- tests and tasks
- course enrolments
- learn and working groups

Exam registration

Registration period: **January/February** (announced by the examination office)

1. Register for the **module** on **selma**
2. Register for the **exam** on **selma**.

Main exam period: **9th February 2026 to 7th March, 2026.**

The self-management portal of TU Dresden **Selma** is a service for applicants, students and lecturers, where a variety of functions are available: e.g. Access to personal documents and data, as well as online application.
The portal can be used for registering and de-registering from examinations

Solving problems

- Visit the website of the program
  https://tu-dresden.de/ing/elektrotechnik/studium/studieren-an-der-fakultaet/master-nes
- Ask fellow students or your mentor
- **Contact the academic advisor (study course, general problems,…)**

  Manuela Tetzlaff, BAR 161, phone: +49 351 463 37363

  email: master-nes@mailbox.tu-dresden.de
  Tuesday: 01:00 pm – 03:00 pm

  You can come by at any time. If I am not in the office, please try again or contact me by phone or e-mail.

- **Contact the examination office (questions about exams, (de-)registration, grades, …)**

  Denise Hartfiel, BAR 177a, phone: +49 351 463 42280
  Office hours: Tue 01:00 – 03:00 pm
  Counseling service by phone or by appointment: Thu 09:00 – 11:00 am

  Please send your emails to the examination office only via ticket system!

- Contact the **International Office** (questions about enrollment, visa, leave of absence, …)

  email: studium.international@tu-dresden.de

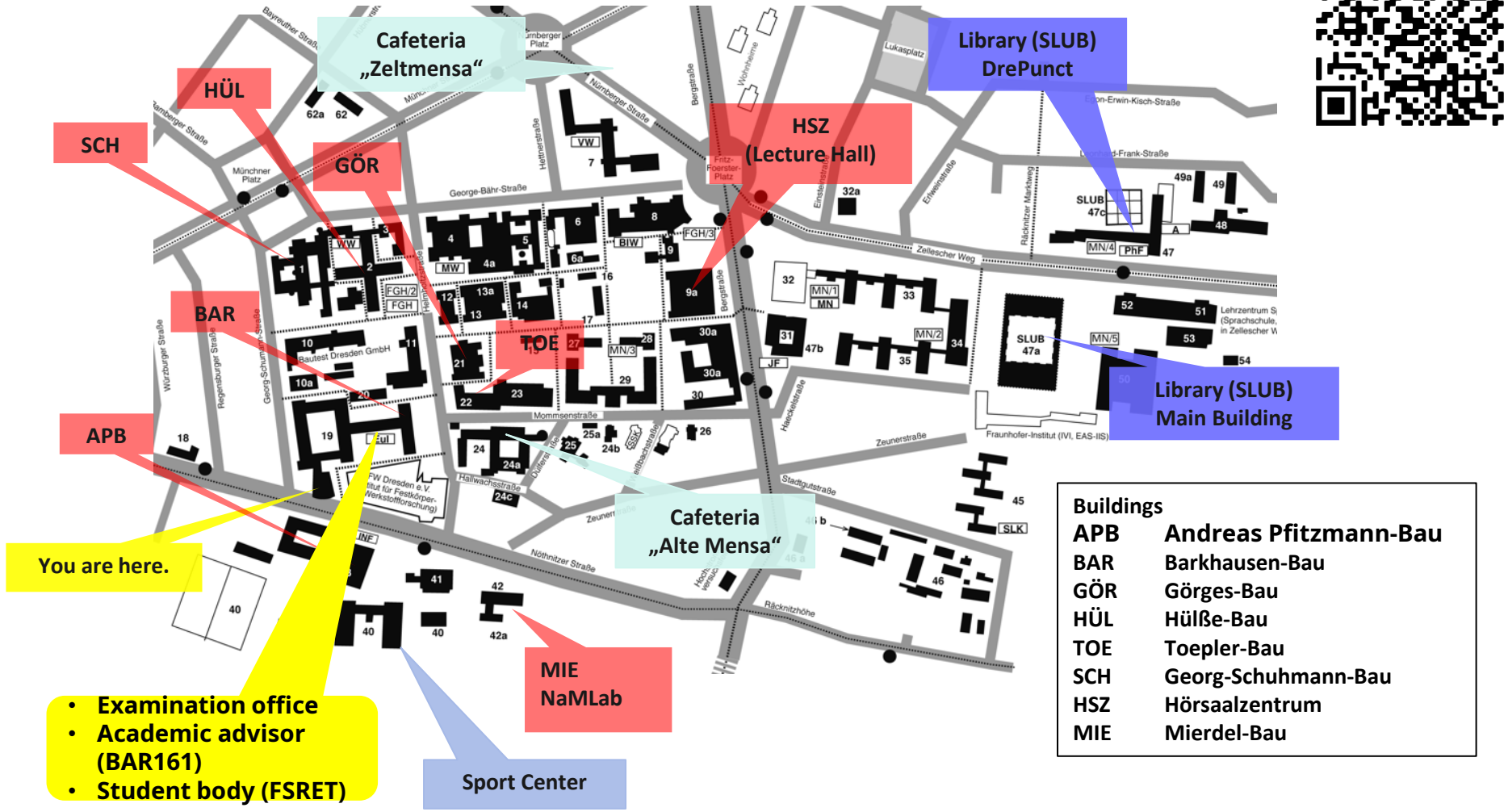
Orientation on the campus of the TU Dresden

Main campus Südvorstadt

Barkhausen building

CAMPUS NAVIGATOR TU DRESDEN

https://navigator.tu-dresden.de/



Buildings	
APB	**Andreas Pfitzmann-Bau**
BAR	Barkhausen-Bau
GÖR	Görges-Bau
HÜL	Hülße-Bau
TOE	Toepler-Bau
SCH	Georg-Schuhmann-Bau
HSZ	Hörsaalzentrum
MIE	Mierdel-Bau

The Campus Navigator is available for your Android or iOS smartphone. Search for "**Campus Navigator - TU Dresden**" in the official app stores.

- **Check regularly your TU Dresden email account** to ensure that you do not miss any important information!
- **Deadlines are very strict**, do not miss a deadline!

- You have a **maximum of 3 attempts for an examination –** important for compulsory modules.

- **Additional semester fee** of 500 Euro/semester from the 9th semester onwards.

- First **failed attempt at the Master's thesis** (grade 5,0), if it is not started before the 9th semester.

- **De-registration** if no examination results have been achieved within 4 semesters.

Studying in Germany

- 15 weeks lectures, tutorials and lab courses, 4 weeks exams afterwards
- Learning during the exam weeks only is not enough!
  → attend all classes every week, participate actively and start working on problems during the semester
  → treat your study like a 40hour, full-time-job
- Rule of thumb: 1 credit point is earned through 30 hours of work!

Important dates of the academic year

Winter semester 2025/26: 01.10.2025 until 31.03.2026

Courses and lectures: **Monday, 13.10.2025 until Saturday, 20.12.2025 and**

Monday, 05.01.2026 until Saturday, 07.02.2026

Lecture free periods and bank holidays:

- Reformation Day: Friday, 31.10.2025
- Day of Prayer and Repentance: Wednesday, 19.11.2025
- Turn of the year: Sunday, 21.12.2025 until Sunday, 04.01.2026
- Lecture-free period: Monday, 10.02.2026 until Tuesday, 31.03.2026

Main exam period: Monday, 09.02.2026 until Saturday, 07.03.2026

Academic Affairs Committee

Prof. Thomas Mikolajick (Dean of Studies)

Prof. Gerhard Fettweis

Prof. Kambiz Jamshidi

Student representatives:

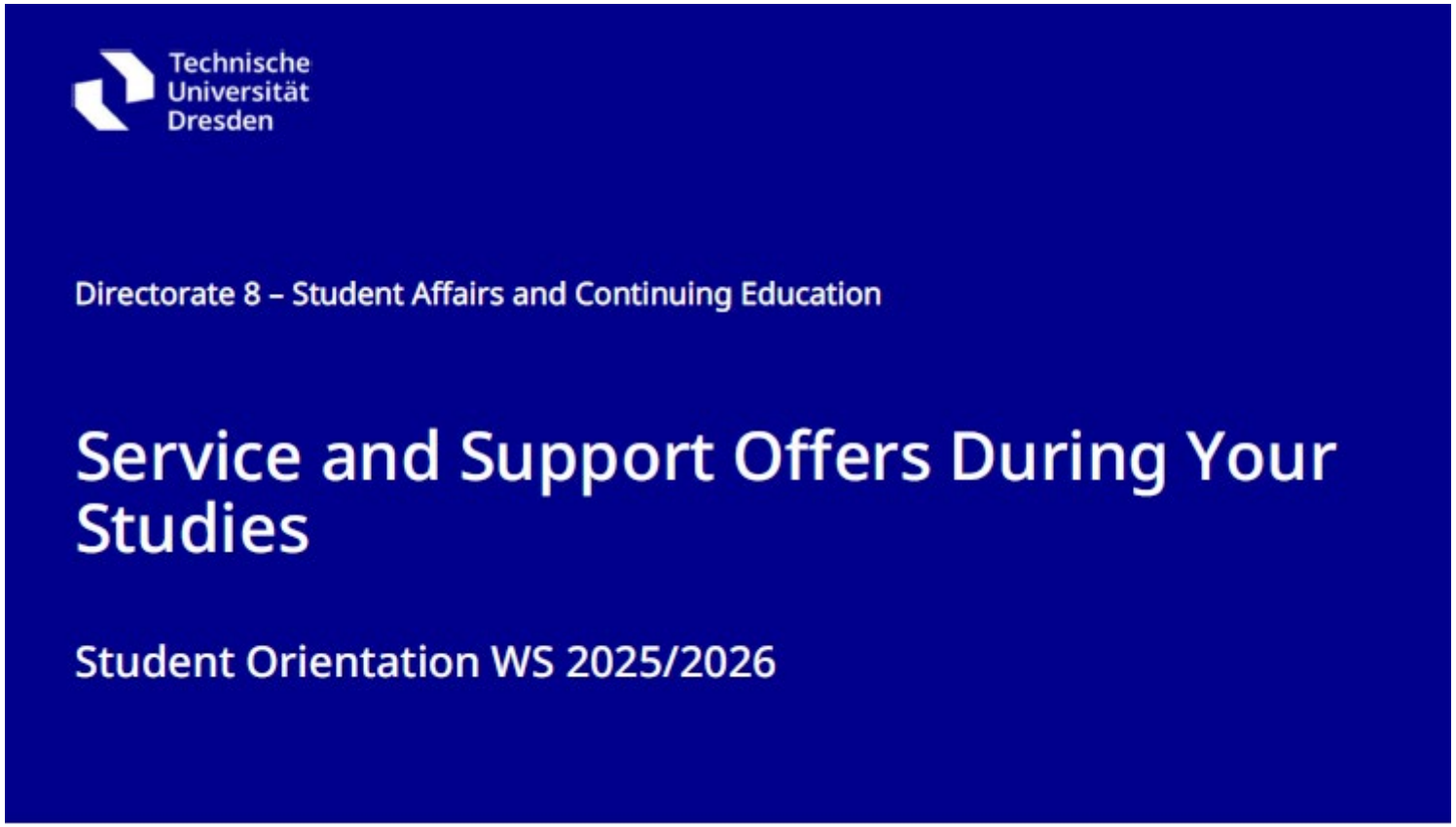
- Sanjai Palanisamy
- Ahmed Belal Safi
- Ayushman Singh

Studies Co-ordinator:

- Prof. Mikolajick
- Ayush Dileep

Examination Committee:

- Prof. Mikolajick
- Prof. Fettweis
- Prof. Mannsfeld
- Manuela Tetzlaff
- Raghuveer Pundaliksa Meharwade
- Rohul Sibi Murugan


Technische Universität Dresden
Directorate 8 – Student Affairs and Continuing Education
Service and Support Offers During Your Studies
Student Orientation WS 2025/2026

Buddy Programme

NANOELECTRONIC SYSTEMS
– WISE 25/26

Thank you! Danke!

Questions?