Welcome at D-ITET!
Welcome Event for new doctoral students

30 November 2021
Welcome

Prof. Sebastian Kozerke

- Head of the Cardiovascular Magnetic Resonance Group at the Institute for Biomedical Engineering
- Director of Studies at D-ITET
Welcome

Sean Weaver
- Doctoral student at the Laboratory of Biosensors and Bioelectronics
- President of VMITET

Reto Kreuzer
- Coordinator of studies and student advisor D-ITET
- Head of student administration D-ITET

Maja Bügler
- Head of Human Resources (HR) for D-ITET
Programme

1. ETH and D-ITET
2. Introduction VMITET
3. Doctoral studies, research and teaching
4. Some employment information
5. Further information & contact persons
6. Code of Conduct
7. Case studies
Top university in Europe

- THE World University Ranking, Times Higher Education (2021):
  Nr. 15 worldwide
  **Nr. 9 in Electrical & Electronic Engineering**

- Academic Ranking of World Universities (2021):
  Nr. 21 worldwide
  **Nr. 16 in Electrical & Electronic Engineering**

- QS World University Ranking of Quacquarelli Symonds Ltd (2021):
  Nr. 8 worldwide
  **Nr. 7 in Electrical & Electronic Engineering**
Mission

Connecting the physical and digital realms

- Information & Communication
- Energy
- Biomedical Engineering & Neuroinformatics
- Electronics & Photonics
Faculty – Information and Communication
Department Management

Head of Department
Klaas Enno Stephan

Deputy Head of Department
Florian Doerfler

Director of Studies
Sebastian Kozerke

PR Delegate
Mathieu Luisier
## Statistics

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2010</th>
<th>2015</th>
<th>2020</th>
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<tr>
<td><strong>Students</strong></td>
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<tr>
<td>Bachelor students</td>
<td>1262</td>
<td>1254</td>
<td>1624</td>
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<tr>
<td>Master students</td>
<td>605</td>
<td>509</td>
<td>672</td>
<td>834</td>
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<td>Guest students, Post-graduate students</td>
<td>306</td>
<td>375</td>
<td>507</td>
<td>815</td>
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<td>Doctoral students</td>
<td>33</td>
<td>27</td>
<td>42</td>
<td>55</td>
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<td></td>
<td>318</td>
<td>343</td>
<td>403</td>
<td>459</td>
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<tr>
<td><strong>Professors (FTE)</strong></td>
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<td></td>
<td></td>
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<td>Full Professors</td>
<td>23</td>
<td>26.7</td>
<td>32.7</td>
<td>36</td>
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<tr>
<td>Assistant professors (incl tenure track)</td>
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<td>21.7</td>
<td>28.7</td>
<td>29.6</td>
</tr>
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<td></td>
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<td>4</td>
<td>6.4</td>
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<tr>
<td><strong>Personnel (FTE)</strong></td>
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<td></td>
<td></td>
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<tr>
<td>Scientific staff</td>
<td>442</td>
<td>452.8</td>
<td>529.1</td>
<td>643</td>
</tr>
<tr>
<td>Technical, IT and administrative staff (including apprentices)</td>
<td>365</td>
<td>377.7</td>
<td>455.3</td>
<td>571.8</td>
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<tr>
<td></td>
<td>77</td>
<td>75.1</td>
<td>73.8</td>
<td>71.2</td>
</tr>
</tbody>
</table>
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Introduction VMITET

Sean Weaver,  **vmitet**
President

Contact Details

https://www.vmitet.ethz.ch
vmitet@ee.ethz.ch
weaver@biomed.ee.ethz.ch
vmitet is the association of the Mittelbau at ITET

#1 What is vmitet?
#1.1 What is the Mittelbau?
vmitet is the association of the Mittelbau at ITET
#2 What do we do?

Welcome to vmitet, the association of the Scientific Staff at ITET

- Representation of Doctoral Students, Post-Docs, Scientific Staff
- Personal development: Career talks, Seminars
- Social Events: Welcome Events, Apéros, Movie-Nights
#2 What do we do?
Representation in ITET Commissions

DK

UK

PK

Professors only
#2 What do we do?
Personal development events

Career Talks
- Alumni come by to tell you about their careers

Diversity events
#2 What do we do?
Social Events

“Ours”

- **vmitet Monthly Apéro**
- Welcome event for doctoral students and PostDocs

This event!
#3 What *else* can we do?
Personal development events

**Workshops**
- Open Access Research
- Sustainable data storage
- Leadership
- ...

**Seminars**
- vmitet meets TIK / IfA / ’your lab name’
- Postdoc/PhD career day

BYOI
Bring Your Own Ideas

We take care of the beers 😊
Diversity and Inclusion at ITET

- **Nako Nakatsuka:**
  - Senior Scientist at the Laboratory of Biosensors and Bioelectronics.
  - Member of D+ITET Diversity Team and AVETH Diversity Team at ETH Zurich.

- **Leonard Deuschle:**
  - PhD Student at the Computational Nanoelectronics group.
  - Member of D+ITET Diversity Team.
Diversity and Inclusion at D-ITET

Mission Statement

• Create an open **discussion culture** that enables building of **empathy** about difficult topics regarding discrimination.

• **Transform institutional culture** so that the potential of people with diverse backgrounds, personalities and working styles and can be leveraged.
Past D+ITET Events

Overcoming Bias in Academia

How to Leverage Diversity?

Food Bazaar

Role of Diversity in Innovation
Diversity and Inclusion at D-ITET

Contact us

diversity@ee.ethz.ch

https://www.vmitet.ethz.ch/diversity.php
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Research Activities

What is "Research"?

What is *new to me* versus what is *new to the world*

- **School**
  - Undergraduate studies
- **Graduate studies**
  - Research degree (PhD)
Research Activities

How is "Research" structured?

- **Learn state-of-the-art**
- **Identify limitations**
- **Formulate hypotheses**
- **Acquaint with “tools”**

- **Project research**
- **Objectives, Methods**
- **Results, Discussion**
- **Conclusion**

**year #1**

**Research Plan**

~3+1 project sketches incl. background, hypotheses and approximate milestones

**year #2**

**year #3**

**year #4**

**PhD Exam**

report and defend on what is **new to the world**
(and not how I spent my time)
Research Activities

What is a "research" (or doctoral) plan?

2 Projects

2.1 Custom made porous silicon micro- and nanoparticles for hyperpolarized silicon MRI

The field of silicon particle hyperpolarization mostly relies on commercially available particles and lacks a systematic study of particle properties which require a controlled and reproducible production process. For this project we collaborate with the pharmaceutical physics group from the University of Eastern Finland (UEF) and especially Konstantin Tomarov and agreed on a joint first-authorship for the intended publication. We combine their knowledge about controlled particle production with our measurement expertise. The project aims at a systematic study of parameters influencing the final signal intensity.

Objectives:
- Evaluation of the optimal doping level of the base material
- Comparison of different etching and oxidation methods
- Breakdown to nanoparticles and comparison with the host microparticles
- Comparison with particles from high-energy ball milling

2.2 Dynamic nuclear polarization and simulation of small silicon nanoparticles for magnetic resonance imaging

We have found a silicon sample with 20nm average particle diameter which has build-up and room temperature; times which are very similar to much larger samples (Diam-Phar) [1]. These particles might represent a major step towards potential imaging applications, if they can be polished to a sufficiently high level as these particles even the blood-brain barrier [12] and possibly possess long circulation times in the body [9, 13].

Reported values for the spin diffusion in silicon are estimated to $D = 6 	imes 10^{10}$ cm$^2$.s$^{-1}$ [14]. Using this value to calculate the diffusion time for 1000 particle radius of 20nm, we obtain a build-up time of 170s which is far away from the experimental time of several 2th. Furthermore, the theory does not explain why the decay at room temperature is much faster than decay and build-up at low temperatures if we assume that the spin diffusion is the limiting factor. To this end, microscopic simulations of the spin diffusion should bring new insights and enable a better understanding of this important process.
Research Activities

Any "Research” advice?

• Be pilot and driver of your projects
• Take ownership and communicate
• Seek feedback and advice from your advisors
• Arrange for regular personal meetings
• Keep work-life balance (despite bumpy roads)
Research Activities

Why “Research” papers?

• A research project is never finished – a paper forces you to report, discuss and conclude your current results and relate them to overall progress in the field
• You learn to defend your work objectively and critically during review process
• Papers document your progress relative to your peers and hence allow you to gauge your performance
• Papers make your data & results accessible to outside world (PhD theses hardly do)
Co-advisor

Transition to New Doctoral Ordinance

• All doctoral students, currently enrolled included, must agree on a **co-advisor** by **June 30, 2022** – contact your (first/main) supervisor

• Co-advisor provides additional academic mentoring and support to doctoral student.

• Co-advisor must hold a PhD
Yearly updates

What is the “annual feedback meeting”?

• Discussion between doctoral student and supervisor on the progress of the research project, doctoral studies, work situation in research group, as well as development opportunities.
• Mandatory for all doctoral students once per year
• First Annual Feedback Meeting around time of submission of research plan ("doctoral plan")

www.ee.ethz.ch/studies/forms-and-documents.html
Important

During your doctoral studies, you must acquire a total of at least 12 credits (cp) ECTS form courses.

- **Students enrolled before 31.12.21:** At least one third must be acquired outside the field of research.

- **Students enrolled after 31.12.21:** Must acquire credits in three areas, that
  - Deepen knowledge in the area of research field and extend knowledge outside of it
  - Enable cross-disciplinary competences
  - Integrate into the scientific community.

For more information and details see: [www.ee.ethz.ch/doctoral-studies](http://www.ee.ethz.ch/doctoral-studies) - currently only track (1) above
Preparing the exam – co-examiners and date

• 3 years after start of your doctorate

   The department’s **doctoral committee** must have approved to of **at least one co-examiner** (if they are not professors of ETH Zurich)

• 6 to 3 months before the (planned) exam date

   Look for an approx. examination date, define any further co-examiners and the exact thesis topic

**NOTE:** The **doctoral committee** only meets once a month (see **upcoming dates**), act accordingly
Preparing the exam – final steps

• At the latest 6 weeks before the doctoral exam
  – Agree on an exact examination date with the examiner and the co-examiner(s)
  – Submit thesis to co-examiner(s) for review
  – Notify the department’s doctoral administration of the desired examination date

• At least 15 working days before the doctoral exam the complete registration form with all necessary confirmations must be submitted to the ETH doctoral administration
Education at ETH: BSc/MSc study programmes

• **A large offer**: currently over 20 BSc and close to 50 MSc programmes

• **Compact** study programmes:
  - **Bachelor's Degree Programme**: 6 semester (3 years), teaching language **mainly German** in 1st + 2nd year and largely English in 3rd year
  - **Master's Degree Programme**: 4 semester (2 years), teaching language **English**

• **A research university**: Teaching at ETH is a combination of sound scientific foundations and practical application in industry and research.
Bachelor's and Master's Curriculum at D-ITET

Main ("consecutive") Master's Degree Programme
Semester 7-9: courses and semester projects

Semester 10: Master's Thesis (6 months)

Interdisciplinary Master’s Programmes

Areas of specialization
Semester 5 and 6 (courses, labs and bachelor's thesis)

- Communications
- Computers and Networks
- Electronics and Photonics
- Energy and Power Electronics
- Systems and Control
- Biomedical Engineering

Compulsory Basic Courses
Semester 1 to 4 (2 years)

Admission of external candidates upon application (ca. 40-60% of cohort at D-ITET, depending on MSc)

Bachelor (3 years) 800 students

Master (2 years) 800 students
The Master's Degree Programmes at D-ITET

Programmes offered

- MSc Electrical Engineering and Information Technology (consecutive)
- MSc Biomedical Engineering (interdisciplinary)
- MSc Energy Science and Technology (interdisciplinary)
- MSc Quantum Engineering (interdisciplinary)

Common to all D-ITET master's degree programmes

- **Tutor-based** programmes: a professor helps students select courses
- 1-2 academic projects (14 weeks, part-time during the semester): Training for master thesis.
- A master’s thesis (6 months, full-time) is the culmination of the programme
## Your interaction with undergraduate (BSc/MSc) students

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course type</th>
<th>Specifics</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>Lectures</td>
<td>Ex-cathedra, usually held by a professor (graded exams)</td>
</tr>
<tr>
<td>All</td>
<td>Exercises</td>
<td>Solving exercises, usually in smaller groups, supervised by teaching assistants – doctoral students or senior undergraduate students (teaching assistants)</td>
</tr>
<tr>
<td>All</td>
<td>Exams</td>
<td>Various types (written, oral) and schedules (end-of-semester, session), corrected mostly by doctoral students</td>
</tr>
<tr>
<td>1 to 6</td>
<td>Lab courses</td>
<td>1 compulsory lab per semester (1&lt;sup&gt;st&lt;/sup&gt; / 2&lt;sup&gt;nd&lt;/sup&gt; year), afterwards free choice of lab courses, most labs offered by doctoral students.</td>
</tr>
<tr>
<td>3 to 6</td>
<td>Projects &amp; Seminars</td>
<td>Various type of small projects or seminars ranging form a few meetings to all-semester offers, various groups, usually supervised by doctoral students or self-supervised by student TA.</td>
</tr>
<tr>
<td>5 and 6</td>
<td>Group Projects</td>
<td>Small third year BSc projects in groups, usually supervised by doctoral students.</td>
</tr>
<tr>
<td>7 to 9</td>
<td>Semester Projects</td>
<td>Compulsory at the MSc level, alongside courses, 14 weeks, ca. 25h per week, routine, day-to-day supervision by doctoral students. Official supervision and grading by professor, projects finish with a written report and presentation</td>
</tr>
<tr>
<td>10</td>
<td>Master’s Theses</td>
<td>Final project, sometimes at very advanced academic level. Supervision, grading and presentation as in semester projects (doctoral students + professors)</td>
</tr>
</tbody>
</table>
In a nutshell

- Teaching at ETH is interdisciplinary, courses offered in various programmes / students with different backgrounds – keep in mind when addressing students' questions

- Admission of students without an ETH-Bachelor's degree further diversifies student body

- Students' workload in first two years of Bachelor programme is very high but varies largely in third year and higher

- Final exams play a very important role at ETH (few midterms), particular care in grading exams is important

- Semester projects and master’s theses are the culmination of each programme, different students need different levels of supervision

- If you encounter problems don't hesitate to ask!

Contact: info@ee.ethz.ch
Teaching Responsibilities … and Opportunities!

• Teaching is a **steppingstone** in any **academic career** – consider it an opportunity!

• There are **many levels of teaching**, starting at rather informal lab courses (P&S), managing exercises, supervision of projects/theses and regular teaching in ex-cathedra classes

• For **teaching in classes**, you should get a **teaching assignment** and **appear** in the course catalogue as **lecturer**

• Do you want to **get better at teaching**?
  Check out the **offers** of the group for **educational development**, e.g., didactic courses, teaching labs, refresh teaching, etc.
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Directives for doctoral students with employment at ETH

- **Duration of employment contracts**
  - Subsequent contracts 12 months each, final phase before doctoral examination 3 months possible
  - For students entering the program after 01.01.2022, first employment contract is 18 months

- **Employment level**
  - 100%, part-time employment only in special cases

- **End of employment for doctoral students**
  - Successful defense of doctoral thesis or non-admission
  - Matriculation until at least the end of the doctoral examination, up to 6 years

- **Extension rules**
  - Application for extension by Budget Officer must be done at least 2 months before expiry.
    Doctoral student must be informed of extension at least 3 months before expiry.
  - If the contract is not to be extended, the doctoral candidate must be informed (in writing) 6-4 months in advance.
Salary

- **Fixed rates** for Doctoral students / Postdocs / Assistants, set by Executive Board of ETH / ETH Council / Swiss Federal Council to be aligned with SNF
- Payment is in 12 **monthly instalments**
- Automatic **increase** every year until 3rd-year-rate
- **Policy D-ITET**
  - each Institute or Professorship can select a fixed rate
  - this must be **applied consistently** for all group members
- Obligation to **top up** the salary **to at least the standard rate** (SNF) for doctoral students with a scholarship or, where possible, to the usual rate for the Institute / Professorship
- Employees **with children** of minor age or children in education receive a **family allowance**
Development opportunities in science and time constraints

- 6 years max. as Doctoral Student and Postdoc
- 6 years max. as Senior Assistant or Senior Collaborator

(Defined in: Ordinance governing scientific employees of the Swiss Federal Institute of Technology Zurich)
Vacation and Absences Regulation

• Duty to register absences in ETHIS – obligation for scientific personnel: negative time management only (vacation and absences)

• 5 weeks of vacations / year

• Vacation days must be taken in the year the entitlement arises, at least once 2 weeks in a row

• You supervisor is allowed to decide when vacations can be taken – plan your vacations early and get the OK in advance!

• Vacations are for regeneration, supervisors are not allowed to reduce vacation days of their employees

• Accidents must be reported by the injured person via the Human Resources webpage

• A doctor's certificate or accident certificate is required from the fourth day of absence at the latest.

Regulations for the recording of working time and absences
Personnel Law ETH domain
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Arrival in Switzerland
Working contract and salary
Before arrival and starting work
Language
Job search
Job applications
Insurance and Pension Fund
Taxes
Living/Housing
Departure
Living in Zurich
Family
Services und Downloads
More information on:
www.welcomecenter.ethz.ch
Doctoral administration

Reto Kreuzer (ETZ H 83)
Head of student administration D-ITET
reto.kreuzer@ee.ethz.ch
044 632 0815 (upon appointment)

Contact person for: Student counselling, curricula questions and regulations

Yasemin Tomaschett (ETZ H 85)
Doctoral administration D-ITET
doktorat@ee.ethz.ch
044 632 3336 (Monday, Wednesday, Thursday)

Contact person for:
All administrative steps regarding doctoral programme from official application to doctoral exam

Ask your supervisor and the administration/secretary of your lab for inside knowledge!
Human Resources

Maja Bügler (ETZ H 86)
personnel manager D-ITET
maja.buegler@hr.ethz.ch
044 633 94 98 (Tuesday – Friday)

Contact person for: provides support in operational personnel management, labour law issues, retention and development, conflicts, consulting

Denise Siegrist (OCT F 19)
personnel administration D-ITET
denise.siegrist@hr.ethz.ch
044 632 09 48 (Monday – Thursday)

Contact person for: residence and work permits, family allowance, social insurance, accident and sickness
Contact and Advice Services

- **Support contacts at D-ITET**: First point of contact: you can always turn to our designated D-ITET contact person (Director of Studies, Mr. R. Kreuzer for Teaching-related issues, Ms. M. Bügler for HR issues or finally the Head of Department etc.)

- **External / internal ETH** advice and conciliation service respect:
  Provides all members of ETH with advice and support regarding bullying, harassment and discrimination

- **Ombudsperson and confidants**: General contact point for conflicts and issues concerning integrity and scientific misconduct

- **Psychological Counseling Service**: Free of charge service open to all students and doctoral students at the UZH and ETH Zurich

- **Safety, Security, Health and Environment (SSHE)**: Responsible for safety and security as well as the health of the ETH members.

https://respekt.ethz.ch/en/contact-and-advice-services.html
More contacts for advice

- Counselling & Coaching
- Studies and Health
- Studying as a parent
- Studies and top-level sports
- Problems / legal advice

Other offices
- Equal opportunities
- Nightline Zurich

More information:
https://www.ethz.ch/students/en/advice.html
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Code of conduct

- Our principles, what is "inappropriate behavior" etc.
- How to react to inappropriate behavior
- Support, contact people

"At D-ITET, we maintain an inclusive, open and friendly environment, where our students, employees and faculty can thrive and achieve their highest potential, based on mutual respect. To preserve this cordial environment, we do not tolerate misbehavior of any kind, including threats, violence, bullying, sexual harassment, discrimination, or dishonesty in study and in research."