



Master your Master!

Find out more about your favourite Master's programme in engineering and technology at ETH Zurich



Christian Frei

Coordinator MSc BME

ETH zürich

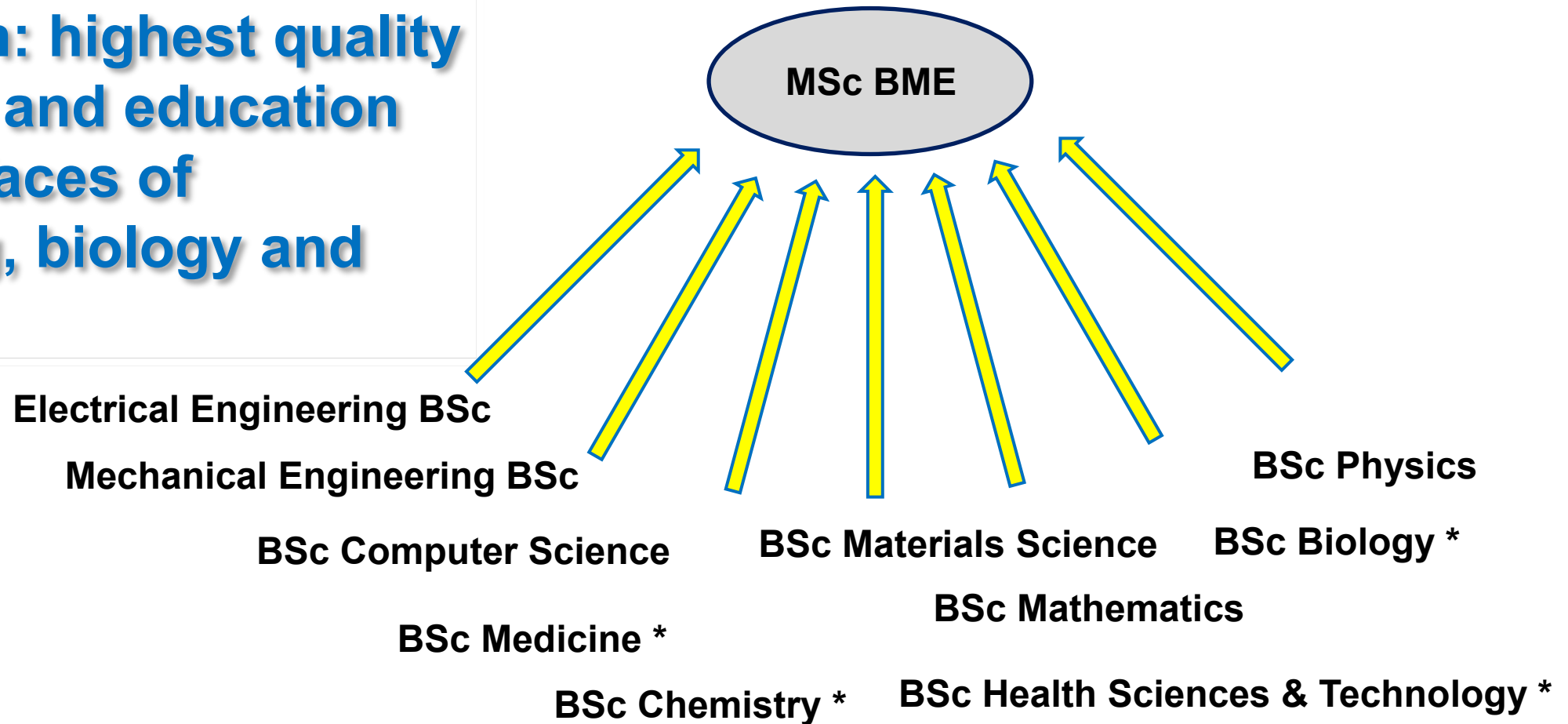
**BIOMEDICAL
ENGINEERING**



MSc Biomedical Engineering (BME)

A specialized Master hosted by the departments D-ITET (leading house), D-HEST, D-MAVT and D-PHYS

Our mission: highest quality of research and education at the interfaces of engineering, biology and medicine



*: does not qualify for all tracks (see below)

MSc Biomedical Engineering: five tracks

- Bioelectronics
 - Bioimaging
 - Biomechanics
 - Medical Physics
 - Molecular Bioengineering
-
- Ø 2013-2022: 48 new students/year
 - Ø 2013-2022: 52.8% CH-Bachelors

ETH zürich

**BIOMEDICAL
ENGINEERING**



Track Bioelectronics

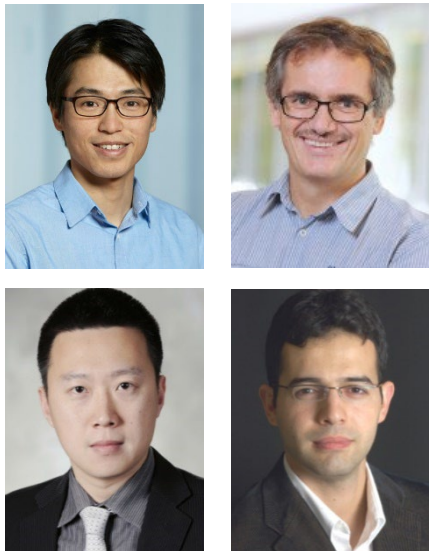
Track advisors

Taekwang Jang

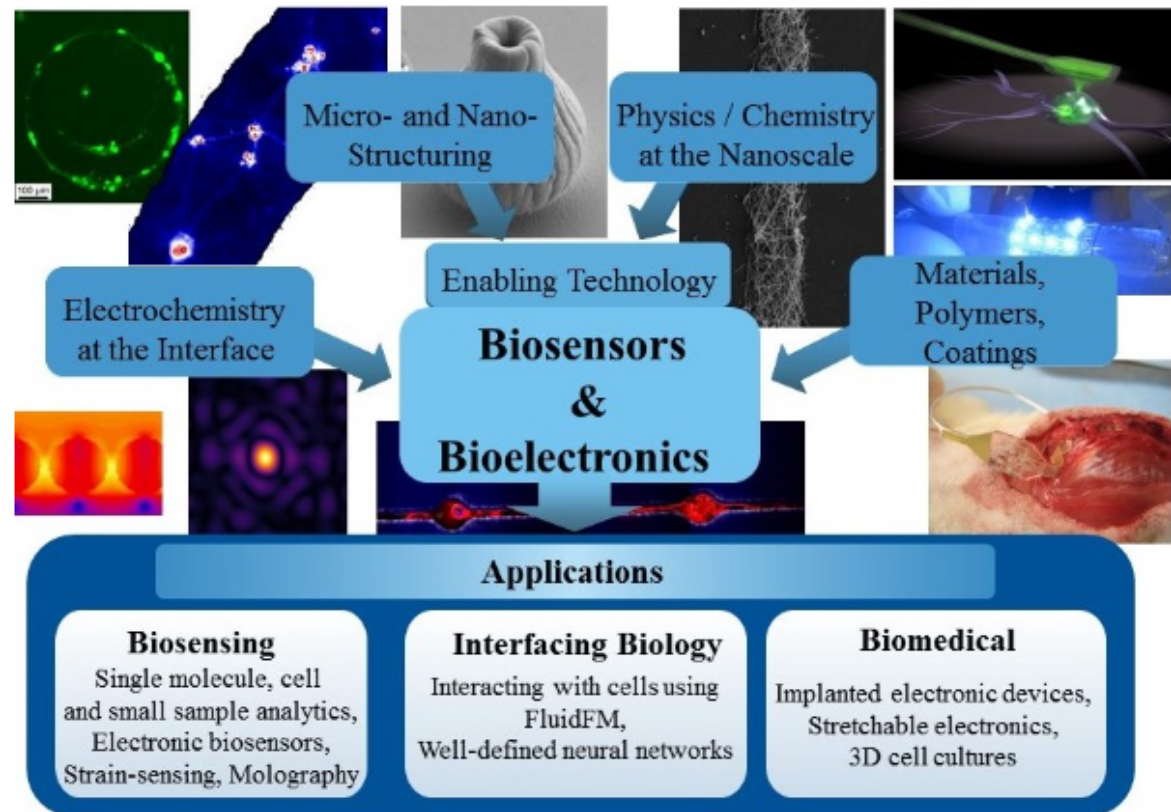
Janos Vörös

Hua Wang

Mehmet Fatih Yanik



We conduct interdisciplinary research at the interface between engineering, nanotechnology, materials science, medicine, and biology. We are interested in answering basic research questions that are related to molecular and cellular processes at electrified interfaces and to **neural networks** →. We apply our knowledge for developing new nanoscale tools (e.g. the **FluidFM** ↗) and methods for **biosensing, diagnostics** →, and **interfacing biology** →. We also develop new **biomedical devices** → using stretchable electronics.

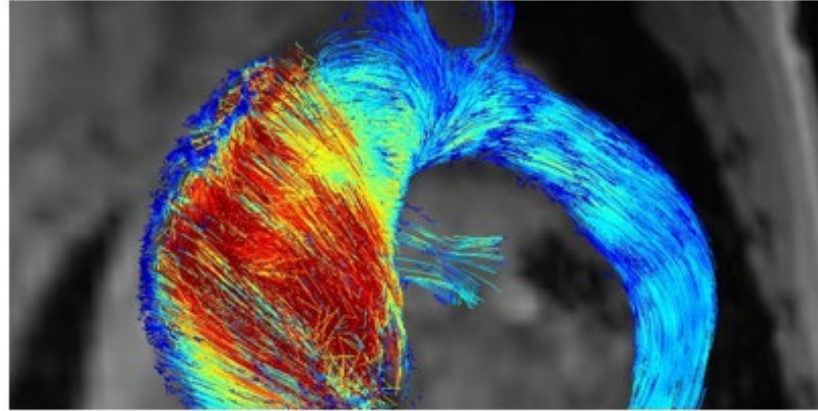


Track Bioimaging

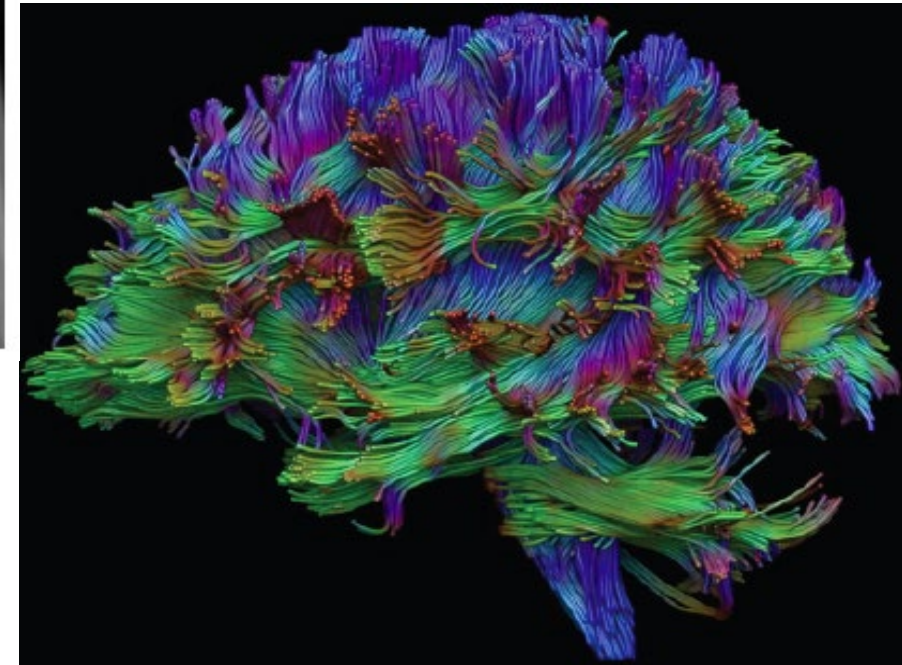
- Track advisor
Klaas Prüssmann



Blood flow in the aorta



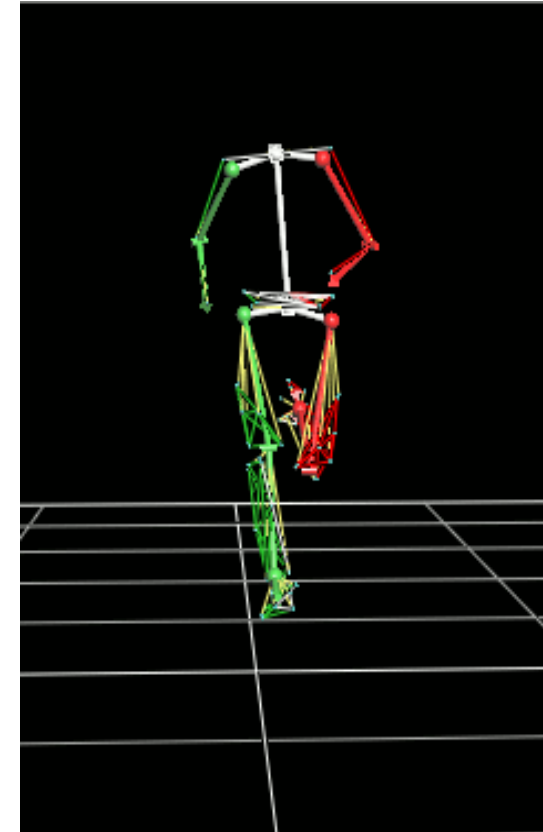
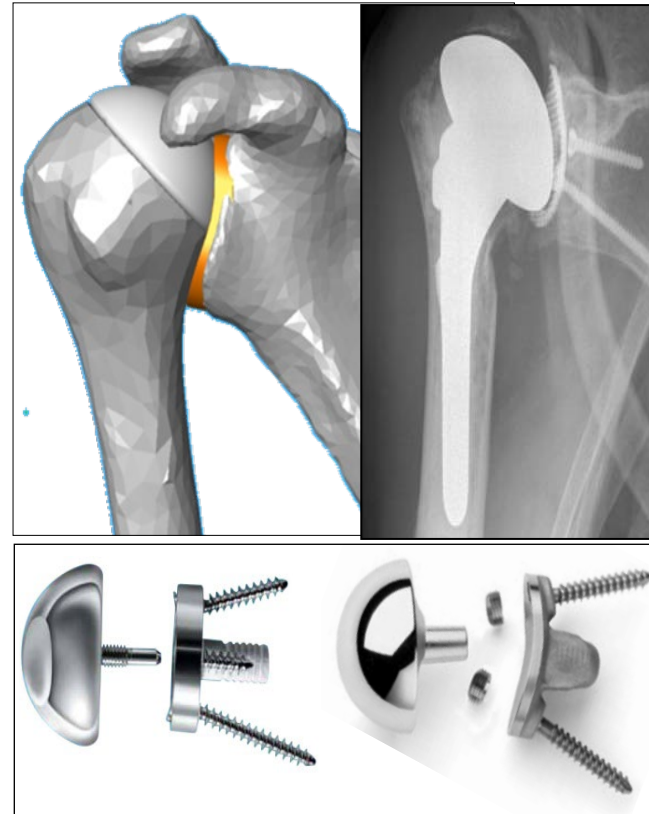
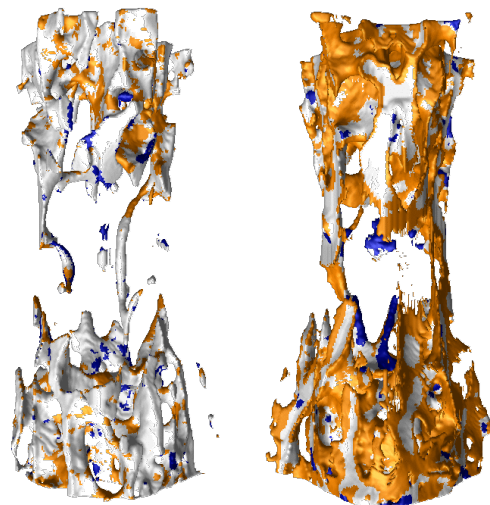
MRI technology



Connectivity in the brain

Track Biomechanics

- Track advisor
Ralph Müller



Track Medical Physics

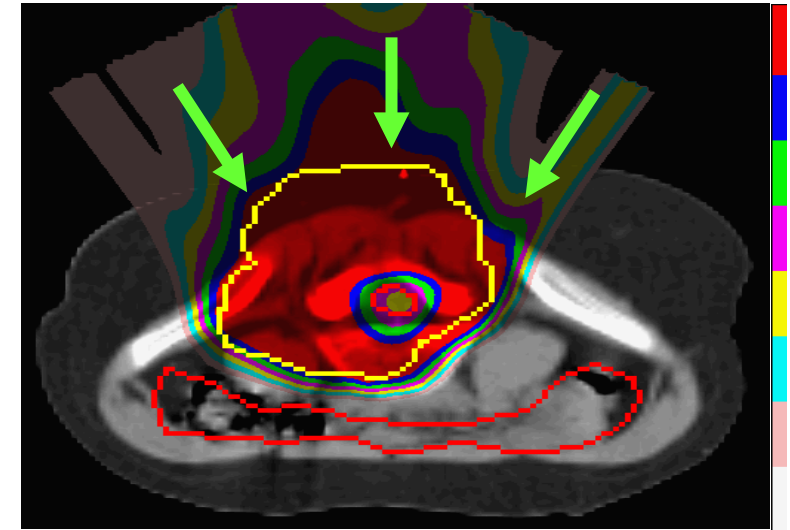
- Track advisors

Tony Lomax

Marco Stampanoni



Paul Scherrer Institute, Villigen



The MSc runs in parallel with the MAS (Master of advanced studies) in Medical Physics

Fachanerkennung *Schweizerische Gesellschaft für Strahlenbiologie und Medizinische Physik (SGSMP)*

Track Molecular Bioengineering

- Track advisor
Mark Tibbitt
Marcy Zenobi



BioFabrication

- 2-Photon Polymerization
- Electrospinning
- Bioprinting

Therapeutic Approach

- Inflammatory Pathway Knockdown
- Oxygen Tension
- Drug Delivery

TISSUE REGENERATION

Cells for Regeneration

- Chondroprogenitors
- Mesenchymal Stem Cells
- Chondrogenic Reporters
- Neural Stem Cells

BioMaterials

- ECM Scaffolds
- QuickStick Adhesion
- Sulfated Biopolymers
- Neuron Hydrogels

How to enter our program

- Application through the Rectorate (Admission's office)
- November 1 - December 15, or April 1 - April 30 (Bachelors from Switzerland only)
- (ESOP application: Nov.-Dec. only)
- Start of the MSc: Autumn semester

- Documents required:
- Bachelor degree (the same rules apply as in your consecutive BSc)
- Transcripts (Pdf of «Leistungsübersicht» from mystudies)
- Motivation letter, CV, GRE (Graduate Record Examinations; suggested) and two letters of reference (ETH-Bachelors are exempt)
- Holders of a Swiss matriculation certificate (Matura) and/or an ETH Bachelor: No English language certificate required

Qualifying Bachelor degrees

a. For admission to the tracks “Bioelectronics” and “Bioimaging”:

- Electrical Engineering
- Mechanical Engineering
- Physics
- Material Science
- Computer Science
- Mathematics
- Chemical Engineering
- Biotechnology
- Computational Science and Engineering
- Biomedical Engineering

b. For admission to the tracks “Biomechanics”:

All disciplines listed in Subpara. a and:

- Health Sciences and Technology
- Human Movement Sciences
- Life Sciences and Technology

c. For admission to the tracks “Mol. Bioengineering”:

All disciplines listed in Subpara. a and:

- Biology
- Chemistry
- Health Sciences and Technology
- Human Movement Sciences
- Life Sciences and Technology
- Medicine

d. For admission to the tracks “Medical Physics”:

All disciplines listed in Subpara. a and:

- Biology
- Chemistry
- Health Sciences and Technology
- Life Sciences and Technology
- Medicine

How to enter our program

- Selection committee (about 5 members): Evaluation of all applications
- Positive evaluation: Admission to one particular track

MSc Biomedical Engineering is a 120 CP Master

- a. Specialization courses
 - Core courses of specialization (min. 12 cp)
 - Elective courses of specialization (-- cp)
 - Biology courses (-- cp)
 - b. Projects and practicals
 - Semester project (min. 12 cp)
 - Group- and Research projects (24 cp)
 - Internship in industry (12 cp)
 - c. Science in Perspective (D-GESS)
 - d. Master Thesis
- min. 52 credits Learning agreement with track advisor
- min. 12 credits
- min. 2 credits
- 30 credits
- The minima of compulsory cp sum up to 96 cp. The remaining 24 cp can be obtained from categories a. and/or b. (but not c. and d.).

The screenshot shows the website header with the ETH Zurich logo and navigation links: Student portal, Alumni association, Login, Contact, and language (en). The main navigation includes Education, Research, Admission, People, Documents, News & Events, and Links. A breadcrumb trail reads: ETH Zurich > D-ITET > Masters in Biomedical Engineering. The main content area features a video player with a green-tinted image of 3D-printed fluorescent tubes. The video title is "Molecular Bioengineering" and the subtitle is "3D-printed fluorescent tubes". To the right of the video is a text box: "Biomedical Engineering is an exciting and growing field which resides at the interfaces between engineering, biology and medicine. The broad goal of biomedical engineering is to solve human health problems through advances in diagnosis, treatment and/or prevention of human disease."

