Lehrstuhl für Schaltungsentwurf
Fakultät für Elektrotechnik und Informationstechnik
Technische Universität München

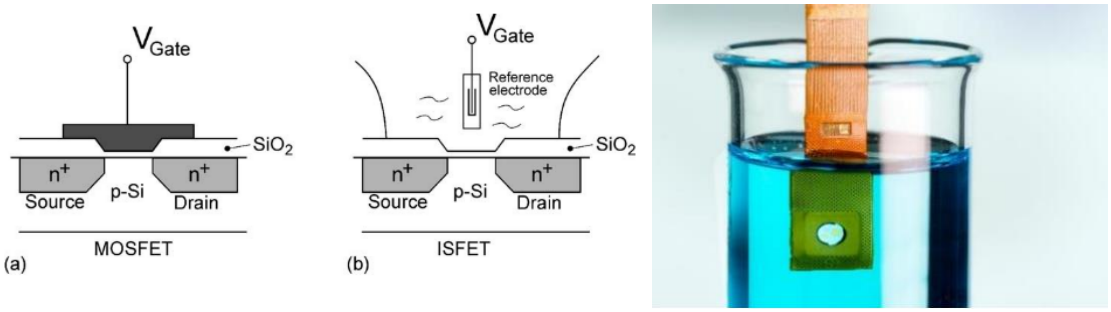
Ion-Sensitive Field Effect Transistors for Environmental and Health Monitoring

Forschungspraxis with the possibility for Masterthesis
In Cooperation with Fraunhofer EMFT

Some background:
Sensors are the bridge between the real and the digital world. With increasing health-risks coming from environmental pollution, it becomes more and more important to monitor our health and environment in a comprehensive and accessible way. Therefore, our chair works on the development of cost-effective biosensors for the detection of ions (e.g. for water quality or health monitoring).

What does the work look like?
After understanding the theory behind Ion-Sensitive Field Effect Transistors (ISFETs) and their measurement method, you will get hands-on experience in chemical and electronic labs. Our chair develops the ion-sensitive membrane, whereas Fraunhofer EMFT provides the ISFETs. Therefore, you will be mostly working in their lab (close to Heimeranplatz) with the support of experts from TUM and Fraunhofer.

The goal of the work is to modify the ISFETs by coating them with our ion-sensitive membrane (Na+, K+, or Ca2+). This is followed by characterization of the ISFETs and evaluation of the measurement results. If the results are promising, there is the option to continue the project e.g. with a master thesis.



Source: [1] P. Bergveld, "Thirty years of ISFETOLOGY - What happened in the past 30 years and what may happen in the next 30 years," Sensors and Actuators B vol. 88, pp. 1–20, 2003 2002.; [2] M. Steinmaßl, "Simple and Powerful encapsulation through Hybrid Packaging for Electrochemical Transducers," 2021

What are good pre-requisites for starting this work?

- Interest in sensor-, semiconductor -, and biotechnology
- Hands-on attitude and interest in working in the lab
- Basic experience with electronic measurement devices and transistor theory
- Communication skills, team spirit, and interest in learning ☺
- Please note: Not all pre-requisites are mandatory and everyone is encouraged to apply

Interested?	→ contact:	Eva Korek eva.korek@tum.de Tel. +4989/289-22930