Call for a Bachelor's or Master's Thesis

„FABRICATION AND OPTIMIZATION OF GRAPHENE FIELD-EFFECT TRANSISTOR (GFET) BIOSENSORS"

Project Description

Our interdisciplinary team develops graphene field-effect transistors (GFETs) for biosensing of target biomolecules. The goal is reliable, ultra-sensitive, and selective detection in aqueous electrolytes with minimal noise and drift. The thesis focuses on **fabrication and systematic optimization** of GFET biosensors — from cleanroom process development to biofunctionalization and measurement in liquid environments.

Aims of the Thesis
- Establish a cleanroom process flow for GFET devices (graphene transfer, lithography, patterning, metallization).
- Implement and compare biofunctionalization strategies suitable for liquid-phase sensing.
- Quantitatively evaluate device performance (sensitivity, limit of detection, selectivity, stability, noise/drift).
- Identify key process parameters that govern sensing figures of merit and propose optimization guidelines.

Learning Outcomes
- Practical skills in microfabrication (photolithography).
- Use of common characterization techniques for 2D materials (Raman spectroscopy, AFM, SEM) and electrical characterization.
- Experience with surface chemistry for biosensing and microfluidic measurement setups.
- Competence in experimental design, data analysis, uncertainty/noise considerations, and scientific writing.

Prerequisites
- Responsible, well-structured working style; ability to work independently with meticulous laboratory practice.
- Interest in graphene/2D materials, transistor technology, surface chemistry, or microfluidics.
- Advantageous: foundational knowledge of solid-state physics and 2D materials; prior cleanroom experience; basic Python/Matlab/R for data analysis.

Please email one PDF containing your CV, current transcript, and a brief statement of interest (max. 1 page) including your preferred start window.

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