

## Diploma/Master Thesis

**Title:** Investigation of Amorphous Ge Nanosheets for Bolometric Applications

**Institute:** Institute of Solid State Electronics

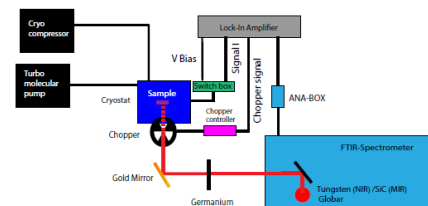
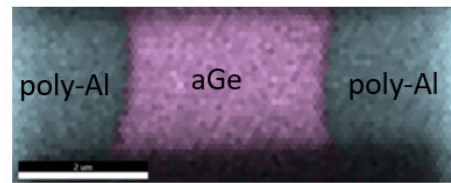
**Supervisor:** Ao.Prof. Jürgen Smoliner

**Languages:** German, English

### Description:

Bolometers are sensitive broadband infrared sensors with applications in analytical chemistry, physics and astronomy.

We are investigating a thermally induced Al-Ge exchange reaction between thin amorphous Ge (aGe) nanosheets and Al contact pads. The Al-Ge exchange is performed using a rapid thermal annealing process. Aiming to fabricate highly sensitive bolometer, employing this fabrication scheme allows the wafer-scale integration of aGe nanosheets on membrane chips with an absorber patterned on the back-side. In a first step, temperature-dependent resistance measurements will be carried out to analyze the temperature coefficient of resistance (TCR) of the devices. Further, using Lock-In and FTIR spectrometer techniques the spectral response of aGe nanosheet bolometers will be measured in the temperature range from 4 K to 300 K and the corresponding figures of merit will be calculated. The duration of the master thesis is 6 months with a payment according to the FWF scholarship (438,05 €/month).



### Scope of the work:

- Fourier spectroscopy measurements
- Electrical characterization at ambient conditions and cryogenic temperatures

### Who can apply:

The cross-disciplinary nature of the projects invites students with background in microelectronics, physics and chemical engineering.

### Contact:

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