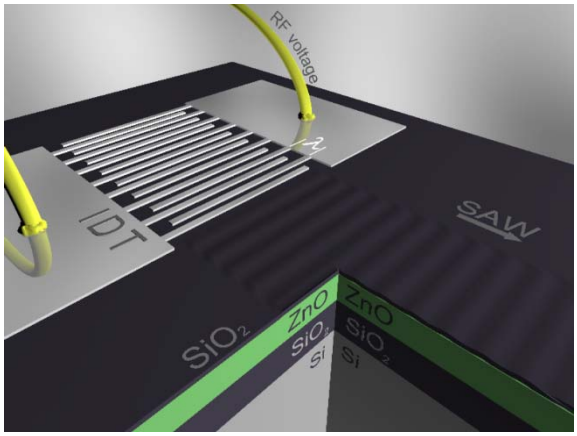
BSc/MSc project

NanoElectronics Group
www.nano-electronics.nl

Title: **Acousto-electronic transport in silicon**
Supervisor: Robert Ukropec (PhD student)



Goal and motivation

Surface acoustic waves (SAWs) have been used as RF filters in communication technology since the 1970s. In the last decade, intensive research has been done to investigate their potential role in electronic transport (acousto-electronic transport) and quantum devices, e.g. sensor applications, single charge transport, and as interconnects between qubits (quantum acoustics). However, nearly all experiments have been conducted on piezoelectric substrates such as GaAs or LiNbO3 which present challenges to further integration with existing CMOS technology. Recently, generation of ultra high frequency (24GHz) surface acoustic waves on piezoelectric multilayers on silicon has been successfully demonstrated [1]. Further research of acousto-transport phenomena on piezoelectric mulitlayers on silicon is still essential for further application.

The assignment

- Fabrication of devices in the NanoLab cleanroom at MESA+ using photo and nano-imprint lithography.
- Device quality control using SEM and optical microscopy.
- Measurement and characterisation of produced devices.
- Analysis of acquired device data.

Candidate Profile

You should have a background in nanotechnology, (applied) physics or electrical engineering or a related field. If you like to be part of a young, international team and you are motivated to learn and discover new interesting physics, then you are a perfect candidate for us.

Graduating in NE

As a student in NE you are a full group member and expected to give an active contribution to ongoing research. You are involved in specific aspects of research (device fabrication, measurements and analysis) and your work is likely to be part of a scientific publication. Besides you are also encouraged to participate in the regular social activities.

Contact

Prof.dr.ir. Wilfred van der Wiel
W.G.vanderWiel[at]utwente.nl

[1] Büyükköse, S. et al. Ultrahigh-frequency surface acoustic wave transducers on ZnO/SiO_2/Si using nanoimprint lithography. Nanotechnology 23, 315303 (2012).