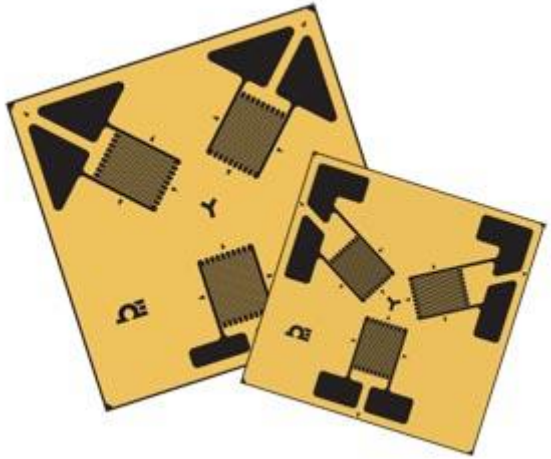
WWU MÜNSTER

MÜNSTER NANOFABRICATION FACILITY

CeNTech CENTER FOR NANOTECHNOLOGY

Master Thesis: **Can single phonon detectors become reality?**

Superconducting nanowire single photon detectors represent nowadays the fastest and most efficient devices for detecting single quanta of light. Their working principle is based on the destruction of their superconducting state after the absorption of a photon, which then generates a recordable electric signal.
Such nanowires can also be electrically driven on the transition edge between the superconducting and normal state. This is an extremely sensitive region since small fluctuations of the environmental conditions can induce a huge change in their resistance. Hot electron bolometers, for instance, exploit this working principle. In this project, we are instead interested in studying the effect of strain on the edge resistance to realize micrometric and nanometric scale strain gauges. The final goal will be to determine the ultimate sensitivity limit of these device and explore the possibility of realizing mechanical sensors with quantum sensitivity.
The **project** comprises: simulation, design, realization and electro-mechanical characterization of superconducting nanowires and strain gauges, as well as the optimization of a cryogenic measurement setup for their characterization.
During **your activity** in our group you will be introduced to our circuit design software, our state-of-art cryogenic setups, our new cleanroom environment and all the nanofabrication tools you will need for realizing and testing your devices.
English language and basic Python programming skills are desirable, but we mainly ask you to **share with us your curiosity and passion** for an interesting topic.



Source: www.omega.co.uk

For further information, please, contact:
Simone Ferrari simone.ferrari@uni-muenster.de
or Prof. Dr. Wolfram Pernice wolfram.pernice@uni-muenster.de

https://www.uni-muenster.de/Physik.PI/Pernice/
https://www.uni-muenster.de/MNF/