

PhD position available

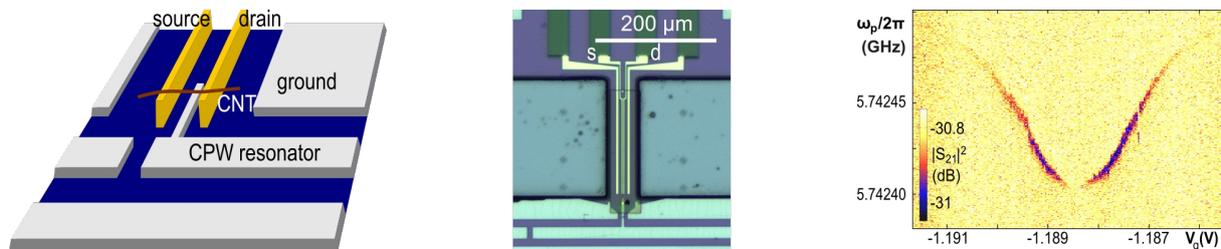
start date 1 March 2021

Microwave optomechanics of the transversal carbon nanotube vibration

26. November 2020

This DFG-funded Heisenberg project is the direct continuation of ongoing work in Regensburg. We have recently demonstrated strong enhancement of the optomechanical coupling between a suspended carbon nanotube and a superconducting coplanar microwave resonator, which was also recognized with the Walter Schottky Prize of the German Physical Society.^{1,2} Objective of the project is the detection and control of the nanomechanical motion of such a single macromolecule towards its quantum limit, and research into the interplay of single electron transport and nano- / optomechanics – all the way towards quantum state transfer between single electron, mechanical, and microwave degrees of freedom.

You will in your PhD project develop and fabricate novel superconducting circuits integrating suspended carbon nanotubes and superconducting coplanar waveguide resonators. Your measurements will take place in one of our ultra-low temperature setups, characterizing the device properties in the millikelvin / Gigahertz parameter range. You hold a Master's degree in physics or a closely related subject, preferably with a focus in nanotechnology, superconductivity, or microwave technology. A solid background in electrodynamics and solid state physics is required. Certainly helpful is knowledge of electronics, semiconductor nanostructures, superconductivity, or low temperature physics, as well as basic familiarity with Linux and basic programming experience.



Regensburg is a lively historical city approx. 100km from München, with its intact medieval center declared UNESCO world heritage. The university is a modern foundation within walking distance of the city center, having just celebrated its 50th anniversary. Its physics department has a strong and successful focus on nanoscience, and is consistently at one of the top places in Germany regarding research grants.

Applications should include your CV, degree documents, transcripts and grade reports, and a brief cover letter regarding your relevant experience and motivation, all in English or German and preferably as one single PDF file.

Questions? Interested?

Contact Andreas K. Hüttel (andreas.huettel@ur.de)

- 1 "Quantum capacitance mediated carbon nanotube optomechanics", [Nature Comm. 11, 1636 \(2020\)](#)
- 2 <https://www.dpg-physik.de/auszeichnungen/dpg-preise/walter-schottky-preis/preistraeger>