



The THz&Nanophotonics Group of the Photonics Institute at TU Wien invites applications for a

PhD Position: Nanophotonics Devices with Ultrastrong Light-Matter Coupling

The research pursued by the THz&Nanophotonics Group focuses on the generation of THz radiation from semiconductor quantum structures and ultrashort laser pulses and its applications for studying quantum transitions and other fundamental excitations in semiconductor nanostructures.

Job Description

The candidate will experimentally work on the investigation of strong light-matter coupling in modern semiconductor quantum structures embedded in nano-resonators. The responsibilities include the conceptualization, design and preparation of nanophotonic devices in the state-of-the-art cleanroom of the TU Wien and their spectral and electrical characterization in the fully equipped THz laboratories.

The goal of the PhD project is to extend the knowledge of optical transitions in semiconductors strongly coupled to the light-field. The strong-coupling between electrons and photons is enabled by nano-cavities and leads to a hybridization of the light- and matter states, which are called polaritons. These states have promising properties, opening new possibilities for the next generation of nanophotonic devices. In previous work¹ we have demonstrated strong light-matter coupling in resonant tunneling diodes. The candidate will perform research on the frontiers of physics such as on Casimir Photons and Cavity Enhancement effects.

Further information about the institute and ongoing research projects can be found on the webpages of the institute <http://www.photonik.tuwien.ac.at> and the research group <http://thzlabs.at>.

¹B. Limbacher et al., Appl. Phys. Lett. 116, 221101 (2020) <https://doi.org/10.1063/5.0007118>

Requirements:

- Masters degree in Electrical Engineering, Physics or equivalent
- Good knowledge of English
- Education in optics/photonics, lasers and quantum physics
- Skillful, enthusiastic, determined and capability to work independently
- Good social skills and ability to work in a team in an international environment

Offer:

- Employment in the scope of a research project with the Austrian Science Fund (FWF)
- The starting salary, as fixed by FWF, is 2300 € per month before taxes (14 times a year)
- Full health and social insurance
- The position is available by Nov. 1st, 2022
- Fringe benefits as provided by the TU Wien are found at https://jobs.tuwien.ac.at/Content/files/Fringe_Benefit_Katalog_TUW_englisch_ck.pdf

Applications consisting of a CV and a motivation letter should be sent by email to
Dr. Benedikt Limbacher, benedikt.limbacher@tuwien.ac.at
Prof. Dr. Karl Unterrainer, karl.unterrainer@tuwien.ac.at