



Goethe University Frankfurt is a top research university in Germany, operating at a leading international level in numerous research fields. The research group for **Ultrafast Optics and Terahertz Spectroscopy group** headed by Prof. Dr. Hartmut G. Roskos is inviting applications for a position as a

Postdoc (f/m/d)

in a research project devoted to the investigation of

Coherent THz Emission from an Array of Resonant Tunneling Diodes (RTDs)

The main task of this position is to help filling the “terahertz gap” by an innovative interdisciplinary power-combing approach for emitters, which is based on two hitherto unconnected advanced technologies. The work is part of a project granted within the framework of the DFG priority program “INtegrated TERAhertz sySTems Enabling Novel Functionality (INTEREST)”. The Priority Programs aim to give clear impetus to the advancement of science and the humanities through coordinated multi-location funding for important new topics. A particular feature of the Priority Programs is the nationwide collaboration between its participating researchers.

This project involves two research groups: That of Prof. Masahiro Asada and Prof. Safumi Suzuki at the Tokyo Institute of Technology in Japan and that of Prof. Hartmut G. Roskos at Goethe-University Frankfurt am Main in Germany. Prof. Asada’s group develops and optimizes resonant tunneling diodes (RTDs) as compact, chip-based electronic terahertz emitters, and they have become a world-leading laboratory for this type of terahertz radiation source. Their RTDs can now operate from tens of GHz up to 1.94 THz, and thus cover a large part of the “terahertz gap”. But the output power of the RTDs remains limited to hundreds of microwatt, which is not sufficient for most of the envisaged terahertz applications, and no good strategy has been visible to substantially increase the output power. We now suggest a novel synergistic approach to this problem. By combining a terahertz cavity with an array of RTDs, we aim to substantially increase the output power of the RTDs leading to coherent superradiant emission from the array.

The successful candidate will design the integrated RTDs arrays and fabricate them in the Asada lab with the support of the Japanese team. It is envisaged that the he/she will travel to Japan twice per year.

The applicant should have a Ph. D. degree in experimental physics or electrical engineering. Expertise in the following scientific fields is required: semiconductor microprocessing technology and THz spectroscopy. Good communication skills, strong motivation for science, and the spirit to work in an interdisciplinary team are important.

The position is available as of now and limited initially to two years with the possibility for extension. Please submit the application as PDF via email to fmeng@physik.uni-frankfurt.de by August 1, 2022 with reference to project “RTDs” in the subject line, including a dedicated cover letter, curriculum vitae, publication list, list of up to three references, and certificates of degree(s).

For further information, please contact Dr. Fanqi Meng (Tel.: +49 (0) 69 798 47209, E-Mail: fmeng@physik.uni-frankfurt.de).