2020 HGF – OCPC – Programme

for the involvement of postdocs in bilateral collaboration projects

Title of the project:

Terahertz Generation and Acceleration

Helmholtz Centre, division/group:

DESY - Center for Free-Electron Laser Science

Project leader:

Prof. Dr. Franz X. Kärtner

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Department/Group:

Photon Science / Ultrafast Optics & X-rays Group

Programme Coordinator (Email, telephone and telefax)

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Description of the project (max. 1 page)**:**

We develop high energy single-cycle and multi-cycle Terahertz (THz) sources with milli-Joule energies with high energy optical lasers to accelerate and manipulate electron bunches up to the 100 keV range. In this project, we want to push THz pulse generation to the multi-milli-Joule level to generate relativistic electron beams. The generated electron bunches will be used for demonstrating compact ultrafast X-ray sources as well as for ultrafast electron diffraction (UED). Various beamlines both for ultrafast X-ray imaging and spectroscopy as well as UED shall be developed and applied to the investigation of biochemical processes as well as two-dimensional quantum materials.

We seek candidates with strong background/experience in THZ generation, ultrafast nonlinear optics, accelerator physics, beam physics, high-vacuum technology, programming/numerical skills (Matlab, C++, LabView) are highly advantageous. The successful candidate should be self-motivated and will work in a team with PhD students and other postdocs in a first-class scientific environment on cutting-edge topics at the current frontiers of laser technology, extreme light-matter interactions and attosecond science. Research is performed within international collaborations, e.g., with groups at MIT, Arizona State University, DESY and CFEL.

Description of existing or sought Chinese collaboration partner institute (max. half page)**:**
Institute of Physics, Chinese Academy of Sciences, Beijing

Required qualification of the post-doc:

- PhD in Physics, Chemistry of Electrical Engineering
- Experience with Ultrafast Lasers and THz Technology
- Additional skills in Programming
- Language requirement: English fluent in writing and speaking