

Position Profile for Chinese Applicants running for 2019 Helmholtz – OCPC – Program

PART A (Info about the Position)

Helmholtz Centre and institute: DESY

Title of the project: Towards extreme ultraviolet frequency comb spectroscopy of highly charged ions and nuclei

Project leader: Dr. Christoph M. Heyl (Young investigator group leader)

Web-address: This is a new research activity - website under construction. For further information about the project please contact Christoph.heyl@desy.de

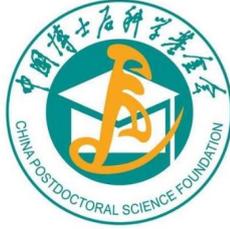
Description of the project (max. half page):

Optical frequency combs, ultra-stable lasers emitting thousands of narrow lines of distinct color, form the key element for today's most precise measurements. These include the test of fundamental theories as well as everyday-life applications like GPS and telecommunication. While their potential is well explored in the visible spectral regimes, great challenges are waiting within the extreme ultraviolet (XUV). These include the first laser (comb) excitation of highly charged ions and nuclei such as ^{229}Th .

Our laboratory hosts state-of-the-art frequency comb equipment including modern frequency comb lasers, so far mostly in the infrared spectral region. We are currently setting up an XUV comb source, which will complement existing XUV sources at the DESY campus, hosting some of today's leading free electron laser and synchrotron sources. We will use this comb for direct frequency comb measurements of narrow transitions in the XUV spectral region.

This project aims at pushing the limits of XUV comb technology. Taking into account recent advances in the field, we see great potential to push this technology beyond today's limits towards higher repetition rates and photon energies. In addition, we can employ the technological platform previously used for XUV comb generation for future single attosecond pulse sources. The main project focus can be adjusted depending on the candidate's research interest. You will be working under guidance of experts in the field: Dr. Christoph Heyl (DESY, Hamburg, and Helmholtz-Institute Jena, Germany), who only recently pushed XUV comb technology into mW power regimes together with researchers in Jun Ye's lab in Boulder, US. Additional support will be provided on-site by Dr. Ingmar Hartl (DESY, Hamburg, Germany), an experienced laser and frequency comb expert who pioneered the world's first 100 W frequency comb system.

We encourage outstanding applicants with a background in experimental nonlinear optics /laser physics to apply.

**Required qualification of the post-doc:**

- PhD in Physics or Electrical Engineering
- Experience with lasers and nonlinear optics
- Additional skills in electronics / frequency combs are beneficial

PART B (Materials and Procedures)

The applicants shall submit the following documents to a Chinese postdoc station affiliated to a research institution or a university, after passing through the internal selection, the qualified application shall be forwarded to OCPC, and then to Helmholtz for evaluation:

- Detailed description of the interest in joining the project (motivation letter)
- Curriculum vitae, copies of degrees
- List of publications
- 2 letters of recommendation
- Proof of command of English language

PART C (General Conditions)**Additional requirements on the postdoctoral fellows:**

- Chinese citizenship from Mainland China (allows application while staying abroad)
- Max. age of 35 years, PhD degree not more than 5 years by submission of application
- Very good command of English language
- Strong ability to work independently and in a team