

2017 HGF – GSI – OCPC – Programme

for the involvement of postdocs in bilateral collaboration projects

Part A:

Title of the project:

Fundamental Symmetry Tests in Dysprosium

Helmholtz Centre and institute:

Helmholtz-Institute Mainz

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Description of the project (max. 1 page):

The Matter-Antimatter Asymmetry-Section (MAM) at the Helmholtz Institute Mainz focuses on testing fundamental symmetries of nature in experiments that utilize the methods of atomic, molecular, and optical physics. This includes measurement of atomic parity violation and other symmetry tests in ytterbium and dysprosium.

The high mass of dysprosium and the small energy separation between the opposite-parity states will lead to enhancement of weak mixing effects, making thus a promising system for the study of parity non-conservation. Furthermore, the availability of isotopes with nuclear spin allow for the possibility of measuring the anapole moment.

The project involves operating a modern laser spectroscopy/atomic beam experiment, modeling, and data analysis.

It comprises using the methods of atomic physics and magnetic resonance in experiments with matter and antimatter that are probing fundamental symmetries of Nature and searching for particles and fields that could constitute dark matter and dark energy.

At MAM, successful applicants will tackle the most important questions in fundamental physics using atomic, molecular and optical methods, magnetic resonance and many more!

The Helmholtz Institute Mainz devoted to cutting-edge physics research is collaboration between GSI (Helmholtzzentrum für Schwerionenforschung) and the renowned Johannes Gutenberg-University in Mainz. Its internationally recognized scientific activities and excellent infrastructure and facilities offer an ideal springboard for your future career!

Description of existing or sought Chinese collaboration partner institute (max. half page):

The MAM-section already has extensive collaborations in China, including the Peking University (PKU) in Beijing and the University of Science and Technology (USTC) in Hefei.

The project mentioned could best fit with the following institutions: PKU, USTC, Fudan University, and Xinhua University.

Required qualification of the post-doc:

- PhD in Physics
- Experience with lasers, vacuum
- Additional skills in modelling and data analysis
- Language requirements: English (good oral and written proficiency)

Part B:

Documents to be provided by the post-doc:

- Detailed description of the interest in joining the project (motivation letter)
- Curriculum vitae (CV)
- copies of degrees as a proof of education qualification
- List of publications (if any)
- 2 letters of recommendation

Part C:

Additional requirements to be fulfilled by the post-doc:

- PhD degree not older than 5 years
- Very good command of the English language
- Strong ability to work independently and in a team