**2018 Helmholtz – OCPC – Program**

**for the involvement of postdocs in bilateral collaboration projects**

**DESY\_OCPC\_2018-06**

**PART A**

**Title of the project: Molecular superrotors**

**Helmholtz Centre and Research Group: DESY, CFEL Controlled Molecule Imaging**

**Project leader: Dr. Andrey Yachmenev, Prof. Jochen Küpper**

**Web-address:** http://controlled-molecule-imaging.org

**Description of the project:**

In this project we perform theoretical investigations of highly rotationally excited molecules (super-rotors). Interest in molecular quantum-super-rotors was recently raised with the invention of a robust experimental scheme, that employs a short laser pulse whose linear polarization axis rotates with acceleration. Such pulse exerts extreme rotational excitation in molecules. We will investigate how different molecular superrotors can efficiently be prepared, how they can be detected and characterized, and how they can be utilized to transfer unidirectional angular momentum into observables, such as photoelectron angular disctributions or light from high-harmonic-generation – in the search of avenues for, e.g., generating novel metamaterials or ultrashort light pulses with controllable polarization state.

**Description of existing or sought Chinese collaboration partner institute:**

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

* Excellent PhD in physics, theoretical chemistry, applied mathematics or computer science, or a related field
* Knowledge of quantum mechanical approaches in chemistry and spectroscopy is essential
* Extensive experience with programming languages, such as Python, C, C++, Fortran is highly desirable.
* Fluent in written and spoken English

**PART B**

**Documents to be provided by the post-doc, necessary for an application to OCPC via a postdoc-station:**

* + 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**

**Additional requirements to be fulfilled by the post-doc:**

* Max. age of 35 years
* PhD degree not older than 5 years
* Very good command of the English language
* Strong ability to work independently and in a team