**2018 Helmholtz – OCPC – Program**

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

**DESY\_OCPC\_2018-02**

**PART A**

**Title of the project: Imaging and controlling nanoparticles for x-ray diffractive imaging**

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

**Project leader: Dr. Daniel Horke, Prof. Jochen Küpper**

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

**Description of the project:**

Within this project, you will use our newly developed sources for cold nanoparticles and bio-molecules, such as cryogenic buffer-gas cells, and develop advanced methods to strongly control these systems [1,2]. The shock-frozen, cold samples emitted from the buffer-gas cell can be further controlled using strong inhomogeneous electric fields [3]. This allows one to select single structural isomers, i.e., different structural arrangements such as folded vs. globular proteins, based on their distinct interactions with the field. Furthermore, in combination with strong ac electric or laser fields these systems can be aligned and oriented in space [4], rendering the individual molecules practically identical even in laboratory space.

The developed experimental setups will be employed for novel diffractive-imaging experiments, both at FEL facilities as well as in laboratory based setups [5].

[1] *Chem. Rev.* **112**, 4803 (2012)

[2] *Opt. Express* **21**, 30492 (2013)

[3] Chang, Horke, Trippel, Küpper, *Int. Rev. Phys. Chem.* **34**, 557 (2015)

[4] Filsinger, Stapelfeldt, Meijer, Küpper, *Phys. Chem. Chem. Phys.* **11**, 9912 (2009)

[5] Barty, Küpper, Chapman, *Ann. Rev. Phys. Chem.* **64**, 415 (2013)

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

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

* Excellent PhD in experimental physics, physical chemistry or a related field
* Experience with lasers, vacuum equipment, aerosols, optical imaging is essential
* Additional skills in electrostatic manipulation, laser spectroscopy, programming (Python) are 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