Call for 2016 DESY-ONACPR Fellowship Applicants

## **Research Laboratory: DESY (*Please reference to DESY-ONACPR-2016-18)***

### Division/Group: FS/CFEL-3

### Supervising scientist: Prof. Dr. B. Ziaja-Motyka & Prof. Dr. R. Santra Email/Phone: ziaja@mail.desy.de/+494089986303

### Research Field: Condensed matter- or plasma physics

**Position:** Postdoctoral Researcher in Theoretical Physics (Photon Science)

**Research Area:**

We are an interdisciplinary theory group investigating intense light-matter interaction. The proposed project aims at tracing non-equilibrium evolution of electronic and atomic structure of solids under intense x-ray fields. The considered radiation doses should be high enough to transfer solids into the unexplored regime between solid state and plasma, in which local order is still preserved. We intend to treat this transition rigorously, using a dedicated ab-initio approach. With this methodology warm-dense-matter formation can also be described. If it works successfully, a novel theoretical tool to bridge between solid-state and plasma state will be constructed – a milestone achievement in this research field.

study the properties of irradiated materials in the unexplored regime at the radiation doses above the damage and in the vicinity of the melting threshold. This is the intermediate regime between solid state and plasma physics, in which the local order is still preserved. We could treat such states rigorously, using the ab-initio method [46] for band structure description. With the same methodology a novel approach to describe warm-dense-matter state could be proposed. With this milestone achievement, we could build a bridge between

solid-state-physics and warm-dense-matter.

**Specific Requirements:**

Interested candidates with excellent grades holding a Master Degree or equivalent in theoretical physics are invited to apply. Good programming skills, experience in analytical calculations, and a solid mathematical background are expected.

**Work Place:** Hamburg

**Earliest Start:** December 2016

**Language Requirement:** (please note that we require for all candidates proven records of English, e.g. CAE certificate) *English*

**Further Remarks:** None