**2017 Helmholtz – OCPC – Programme**

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

**PART A**

**Title of the project:**  **High brightness photoinjector and its application**

**Helmholtz Centre and institute: DESY**

**Project leader: Dr. Frank Stephan,** [frank.stephan@desy.de](mailto:frank.stephan@desy.de), +49 33762 77338

**Web-address:** http://pitz.desy.de/

**Description of the project** (max. 1 page)**:**

As part of the accelerator R&D program of the Helmholtz Association the research program at the **P**hoto **I**njector **T**est facility at DESY in **Z**euthen (PITZ) currently includes:

* Ultimate optimization and characterization of electron source brightness by generating (quasi) 3D ellipsoidal electron bunches through photo cathode laser pulse shaping
* Time resolved slice emittance study of space charge dominated beams
* Reliable and stable operation of a normal conducting L-band photoinjector with both high peak gradient and long RF pulse length
* Ultrashort bunch and ultralow emittance beam optimization and characterization for MeV femtosecond electron diffraction and microscopy applications
* Accelerator based THz beam generation and characterization for applications in pump-probe experiments
* Electron beam driven wake field experiment, such as self-modulation, high transformer ratio in Plasma and dielectric structures

**The position**

* Work in one of the world-leading international groups of physicists and engineers for the development of photo injectors
* Development of innovative concepts and techniques for the optimization, diagnostics and application of high-quality laser and electron beams
* Participate in one of the research topics listed above, perform analytical analysis, numerical simulations, experimental characterizations and optimizations
* Participate in the shift operation of PITZ for accelerator R&D

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

Collaboration with a Chinese institute experienced in accelerator R&D and especially in high brightness photo injector R&D would be of advantage for both sides.

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

* Excellent university degree in physics or engineering with a PhD degree
* Good knowledge of accelerator physics and technology
* Experience in beam dynamics simulations and numerical methods is required
* Experience in beam diagnostics and beam characterization is of advantage
* Knowledge of laser technology and incoherent optics is of advantage

**PART B**

**Documents to be provided by the post-doc:**

* + Detailed description of the interest in joining the project (motivation letter)
  + Detailed curriculum vitae in tabular form, with a description of the methods and tools  
     up to now
  + Grades list from undergraduate school up to your current state of scientific education,   
     copies of degrees
  + Evidence of competence in English
  + List of publications
  + Research interests
  + 2 letters of recommendation

**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