

---

Prof. Dr. Alexandre Obertelli  
Institut für Kernphysik, Fachbereich 05 Physik  
Schlossgartenstr. 9, 64289 Darmstadt  
aobertelli@ikp.tu-darmstadt.de



## Master thesis in Experimental Nuclear Physics

### Development of a scintillator trigger barrel

### **PUMA: probing the density tail of radioactive isotopes with antiprotons**

A Master thesis project is proposed at the Institute of Nuclear Physics (IKP) of TU Darmstadt.

#### *Project description:*

PUMA aims at probing the nuclear density tail of short-lived nuclei by use of trapped antiprotons at CERN. The project is now in its development phase. The first part of PUMA consists of designing a penning trap, its cryostat, a solenoid and the corresponding detection system. The measurement of PUMA consists of detecting charged pions from the annihilations of antiprotons with protons or neutrons at the surface of the nucleus. PUMA is a project funded by the European Research Council.

The Master project focuses on the design, construction and test of a scintillator barrel which will compose the detection system. The design will be based on a Monte-Carlo simulation performed during the thesis. A prototype barrel will be assembled and tested with a prototype electronics. After the validation of the full detection chain, the detector will be built and combined mechanically with the PUMA time projection chamber when available.

#### *Candidate profile:*

Only candidates holding a Bachelor degree in physics or engineering may apply.

Interested candidates should contact Sabrina Zacarias, [szacarias@ikp.tu-darmstadt.de](mailto:szacarias@ikp.tu-darmstadt.de) and Prof. Alexandre Obertelli, [aobertelli@ikp.tu-darmstadt.de](mailto:aobertelli@ikp.tu-darmstadt.de).

The preparation period for the Master thesis can start as soon as 01/12/2019. It is expected to start at the latest in 04/2020.

---