

15 March 2024, Prague

Director

of the Institute of Experimental and Applied Physics, CTU in Prague, Husova 240/5
110 00 Praha 1, announces the job vacancy:

Data analysis coordinator for ATLAS-Timepix3: A detector network for measurement of luminosity and the radiation fields in the ATLAS cavern

Workplace: CTU in Prague, Institute of Experimental and Applied Physics

Work period: 2 years

Employment type: Full-time

Expected starting date for the position: 1 July 2024 (later start dates can be
negotiated – please indicate in your application)

Salary based on conditions of the call (65 000 CZK/month).

Description of work:

A network of ~13 two-layer Timepix3 pixel detectors have been installed in ATLAS with the aim of measuring luminosity and providing information about the radiation field composition at different locations in the ATLAS cavern.

Timepix3 is a cutting-edge hybrid pixel detector with 256 x 256 pixels each of area 55 x 55 μm^2 . The pixelated sensor is coupled to the readout ASIC, which provides the information of the time-of-arrival (particle interaction time, precision ~2 ns) and the time-over-threshold (energy) in each pixel. Ionizing radiation interacting in the sensor is then seen as imprints in the pixel matrix with characteristic shapes depending on the particle of interest. With the two-layer approach, we further facilitate the separation of charged and neutral particles and improve impact angle determination.

The time resolution of the devices and synchronization with the LHC orbit clock allows to resolve the bunch structure of the LHC beams, so that we expect to be able to measure the luminosity bunch-by-bunch, for the first time with hybrid pixel detectors. The capability to separate different particle classes shall be exploited to reduce the systematic errors of the luminosity measurement. Comparison of measured particle fluences and ATLAS simulations will be used to assign safety factors for radiation dose estimation and improve the understanding of radiation tolerance needed for detectors at the HL-LHC.

Responsibilities:

Within the project,

- you will be responsible for the analysis of data taken with ATLAS-Timepix3 and represent the team in the offline luminosity meetings and the radiation simulation group of the ATLAS experiment;
- you will develop improved analysis methodology and define tasks for your coworkers;
- you will be responsible for the preparation of publications and conference contributions.

The position will help you to significantly improve your research profile by increasing leadership and mentoring skills. You will work in an international and interdisciplinary team with coworkers at different stages of their career.

You will work in the department of “Electronics and Software” of IEAP CTU, which is a leading group in the development of pixel detector readout systems, related detector control software and novel analysis methodology. The latest activities are [here](#) or in a compact form [here](#).

Requirements:

Requirements

- Ph.D. in physics
- Interest in data analysis, not being scared of large data sets,
- English (fluent speaking, understanding and writing)
- Programming skills in C++, knowledge of ROOT.
- Experience with leading a small team is not needed but an advantage.
- Previous experience about work flow in large collaborations (e.g., in ATLAS) is beneficial.

Mandatory documents:

- Application
- Professional CV with a reference to publishing activities in English
- Copies of diplomas
- Documents proving activities outside of CZE for at least 2 years in the past 3 years or studying of Ph.D. (can be listed in the CV)
- Brief description of the candidate proposed research work, justification of its necessity and benefits for the candidate and the IEAP CTU workplace.
- Consent to the processing of personal data for the purpose of this tender.

Contact:

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The application and listed mandatory documents can be sent till **31 May 2024** to the email address Alice.Mariasova@cvut.cz with a copy to benedikt.bergmann@utef.cvut.cz (Mentor and department head).