

## Postdoctoral position at CPPM on the ClearMind project

### Description

The imXgam research team of CPPM is participating together with the CEA Irfu and the IJCLab in the ANR project ClearMind. This project aims at developing a “scintronic” crystal detector for fast timing applications in the field of gamma ray imaging. It consists in depositing a photocathode with a high refraction index directly on the surface of a monolithic lead tungstate crystal, so that scintillation and Cherenkov light extraction from the crystal onto the photocathode does not encounter total reflection. The detection of the Cherenkov light produced by photoelectric conversion of gamma rays in the lead tungstate will allow to optimize the timing performance of the device, targeting tens of picoseconds resolution by encapsulating the “scintronic” crystal within the vacuum tube of micro-channel plate photo-multiplier for the detection of the photoelectrons generated on the photocathode.

To assess the potential of “scintronic” crystal detectors for TOF-PET, the ClearMind modules will be modelled by GATE and the Monte Carlo model will be validated against measurements. For this, a pair of ClearMind detectors will be mounted on tomXgam, a mechanical bench dedicated to tomographic experimentation that will enable to acquire data in a TOF-PET configuration and reconstruct images of positron emitting point sources and phantoms.

A 2-years postdoctoral position is offered to take part to the development and to the Monte Carlo modelling of the ClearMind detectors, and to master tomographic data acquisition with ClearMind detector prototypes embedded on the tomXgam mechanical bench. This includes the commissioning of the installation of tomXgam in the CPPM imaging room and to carry out the development of its control interface under LabVIEW.

### Qualification

- PhD in physics with experience in nuclear instrumentation and Monte Carlo simulation
- Fluent in English
- C/C++ and Python computing skills
- Experience in LabVIEW programming would be an asset

### Application

Start of work is expected before end 2020. Candidates are invited to send their applications by email to Prof. Christian Morel ([morel@cppm.in2p3.fr](mailto:morel@cppm.in2p3.fr)) before end of June 2020, including a statement of research interests, CV, list of publications and three reference letters. For further information, do not hesitate to contact Prof. Morel directly (phone: +33 4 91 82 76 73).