

PhD position on TOF PET with ultra-fast flat panel detectors

Host institutions: [Faculty of Mathematics and Physics](#), University of Ljubljana and [J. Stefan Institute](#), Ljubljana, Slovenia

Period: 4 years, starting October 2021, application deadline July 15.

Supervisors:

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We are offering a PhD position on development of advanced time-of-flight positron emission tomography (TOF PET) detectors, to be conducted in a highly interdisciplinary research environment: the training will take place within the [Medical Physics Group](#) at the Faculty of Mathematics and Physics, University of Ljubljana, in cooperation with the [Experimental Particle Physics Department](#), Jožef Stefan Institute. The TOF PET detector development will be a part of an international collaboration with participation of institutions from Italy (Fondazione Bruno Kessler), Spain (University of Barcelona) and the USA (Massachusetts General Hospital). The members of the team are recipients of a prestigious ERC advanced grant FAIME and are also involved in the R&D of advanced particle detectors in the framework of Belle II, ATLAS and LHCb collaborations and the AIDAInnova project.

The objective of this thesis will be to explore the performance and optimize the design of a PET device that uses ultra-fast flat panel detectors using physical simulations. Established tools for simulations and reconstruction in nuclear medicine (GATE, CASToR) will be used to optimize the scanner geometry. The candidate will also be involved in the development of image reconstruction algorithms, optimized for the open geometry of PET devices with flat panel detectors, and in the experimental work, testing the performance of integrated PET detectors and their components (photodetectors, electronics, scintillation crystals).

Requirements:

- **Education:** Master degree in physics, computer science, applied mathematics or equivalent
- **Programming skills:** C/C ++, Python, general scripting languages (GATE, CERN ROOT)
- **Prior experience** with Geant4, GATE, CASToR or CERN ROOT would be an advantage
- **Language:** English
- **Application:** should be sent by July to rok.dolenec@fmf.uni-lj.si and should include a CV, a motivation letter, and a copy of the Master Thesis; the candidate should also arrange for two letters of reference to be sent directly to rok.dolenec@fmf.uni-lj.si

