

Job Position

Experienced Researcher* position (2 years) in Experimental Particle Physics,
in the Aristotle University of Thessaloníki, Greece, to work in the ATLAS experiment at CERN.

* The position is fully funded by the European Commission's FP7 Marie Curie Actions IAPP (Industry-Academia Partnerships and Pathways) program “Fast Tracker for Hadron Colliders – FTK”, Project No. 324318. In accordance with the IAPP funding conditions, candidates must have **between 4 (four) and 10 (ten) years of full-time equivalent research experience, including the years spent on PhD studies, and must not have resided or carried out their main employment activity in Greece for more than 12 months in the 3 years immediately prior to the date of appointment.**

The position is for 2 years, to start the earliest on February 1, 2014 and no later than April 1, 2014. The salary is about 63.5k euros per year, gross, with about one third going to social security and taxes.

Job Description

The Aristotle University of Thessaloniki (AUTH) invites applications for a 2-year position to work in the FTK project of the ATLAS experiment at CERN.

The IAPP “FTK” Project aims to develop an extremely fast but compact processor, with supercomputer performances, for pattern recognition, data reduction, and information extraction in high-quality image processing. The first goal of the “FTK” project consists in demonstrating that the system can perform online track reconstruction of full events at the highest luminosities of the LHC and sLHC at CERN, beyond the limits of any existent or planned device and despite the overwhelming confusion due to the very high track multiplicity and the exceedingly large event pile-up.

With this aim, we participate to the construction, testing and commissioning of a high precision real-time hardware tracking processor built for the ATLAS experiment's Trigger&DAQ system: the Fast Track (FTK) processor. The FTK combines the power of Associative Memories (AM), implemented on ASICs, for fast pattern recognition, and of commercial FPGAs for precise tracking. It will operate on all events accepted by the Level-1 trigger – at a rate of 100 kHz – and will reconstruct particle trajectories with $p_T > 1$ GeV in a few tens of microseconds. It will then make the tracks available to the High Level Trigger (HLT), before the event processing starts. Thus, the HLT will start with a major problem solved (the time-consuming track reconstruction) and will be able to spend most of its time on sophisticated algorithms, instead of the tracking. The FTK will start taking data in the Run II of the LHC (starting in 2015), in a staging manner.

AUTH is involved in board development (firmware with VHDL) and testing, commissioning the system, and on simulation. The recruited fellow is expected to participate to the following activities:

- Simulation: both the simulation of the hardware, inside the FTKSim package, and on the physics case, with HLT algorithms exploiting the FTK tracks to enhance the physics reach of the experiment. Given the duration of the contract, the recruited fellow will have the possibility to verify with data the expected physics gain.
- Testing and commissioning: work on the setup in AUTH to test the boards produced for the AM part of the system, and spend significant time at CERN to participate in the integration, commissioning and running of the FTK in ATLAS.
- Online monitoring of the system inside the ATLAS TDAQ framework

Candidate Profile

Suitable candidates should have experience in FTK (preferably on the AM system and/or on the input board to the FTK system, the FTK_IM board), and, more importantly, must have solid C++ skills.

The following skills will also be taken in consideration for evaluation:

- Experience with the ATLAS software (preferably online) and ROOT
- Above average familiarity with UNIX (Linux) operating systems
- Experience in physics analysis

The candidate must have good written and oral English.

Applications and Deadline

Applicants should send to Lecturer K. Kordas (kostas.kordas@cern.ch)

- a short Cover Letter,
- a Curriculum Vitae, and
- a list of the most relevant publications,

They should also provide the names and emails of two (2) people able to provide a reference, and arrange with them to send the reference directly to the above email.

Please submit application materials by **January 25th 2014**

For more info, please contact: Lecturer Kostas Kordas

Email: kostas.kordas@cern.ch

Emails should use the title: “FTK-IAPP job at AUTH” + candidate name