

TEMPORARY CONTRACT AT DEDIP/IRFU – LCAE/LIST (CEA Paris-Saclay, France)
**DEVELOPMENT OF OPTICAL MICROMEGAS READOUT FOR BETA IMAGING AND NEUTRON
RADIOGRAPHY**

24 months from starting date. To be filled June 2021, at CEA Paris-Saclay, France.

We are currently seeking a talented and highly qualified candidate to contribute to the development of optical Micromegas readout for beta imaging and neutron radiography.

Recent developments have shown that coupling a Micromegas detector on a glass substrate with a transparent anode and a CCD camera enable the optical readout of Micromegas detectors with an impressive spatial resolution (440 μm) showing that the glass Micromegas detector is well suited for imaging.

Based on these results, we would like to develop this approach for two different applications. The first one is development of a novel beta-imager. The aim is to build a detector prototype to perform cell sorting by quantifying the exact dose of the tritium-labeled radio-cancer injected drugs. The second one will be devoted to real-time neutron radiography capabilities under high radiation constraints.

The postdoc will work on the characterization, understanding and optimization of two prototypes. This study will involve both Monte-Carlo simulation and experimental tests in laboratory in order to estimate the effect of several parameters (gas composition, neutron converter, drift gap, electric field configuration, etc.) and to assess its performances for beta imaging and neutron radiography.

The candidate will particularly work closely with the gaseous detector physicists (DEDIP/IRFU) and image reconstruction specialists (LCAE/LIST).

The prototype dedicated to neutron radiography will be tested at the SAPHIR platform (CEA Paris-Saclay), which houses an electron accelerator. Prior to these experiments, the postdoc will design and optimize the heavy water-based neutron source by Monte-Carlo simulation.

Candidate profile:

- PhD in applied nuclear physics or high-energy physics;
- Experience in Monte Carlo simulation codes such as MCNP6 or GEANT4, and eventually with the Garfield++ toolkit;
- Interest in designing detectors and performing experimental tests;
- High motivation to work within a multidisciplinary project;
- Curiosity and enthusiasm.

Interested candidates should submit cover letter, curriculum vitae with a publication list to:

- Adrien Sari: adrien.sari@cea.fr
- Thomas Papaevangelou: thomas.papaevangelou@cea.fr
- Esther Ferrer Ribas: esther.ferrer-ribas@cea.fr