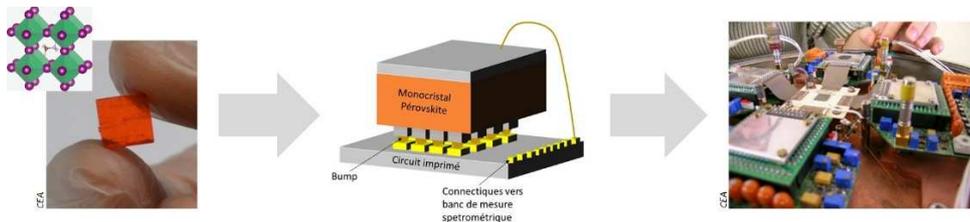


2-YEARS POST-DOCTORAL FELLOWSHIP OFFER AT CEA GRENOBLE

Perovskites based Spectrometric Imagers

Context: CEA LETI and IRFU have been involved for many years in the development of semiconductor-based X-ray and gamma-ray spectrometric imagers (2keV-1MeV). The main applications targeted are medical imaging, nuclear, security and astronomical observations. Recently, it has been demonstrated that thick single crystals of hybrid perovskites (organic/inorganic) could be promising candidates for gamma-ray spectrometry. Gains in performance (spatial resolution, spectral resolution and field of view) coupled to a low-cost sensor could revolutionize radiation imaging. This is a hot new subject and several research teams are working on it. In this context, CEA LITEN and the Néel Institute of the CNRS, have set up a protocol to grow perovskite single crystals by solution process at low temperature. This fellowship is funded by a CEA transversal program that should facilitate scientific and technical exchanges between CEA actors in instrumentation and detection.

Objective: The objective of this two-year project is to develop all the technological steps to move from perovskite crystal to the detection device. Pixelated spectrometric detectors will be manufactured, hybridized on a test platform to be characterized, and performances will be positioned in relation to existing technologies in the field. The envisioned approach goes well beyond the state of the art of the devices already made on this family of materials. To reach this goal, the post-doctoral fellow will pilot the manufacturing process from the as grown crystal to the production of a small pixelated imager. He will optimize the nature of the electrodes and interfaces in order to block the dark current, effectively collect photo-generated charges, and guarantee the electrical stability of the device. Finally, the post-doctoral fellow will participate to the development of the hybridization process of these pixelated crystals on a test platform, and its characterization in gamma-ray spectrometric mode.



Environment: The work will take place on the CEA Grenoble site, in partnership with various laboratories with complementary skills: LETI, LITEN and IRFU (Saclay). The candidate will rely on the work of two doctoral students working on the development and characterization of perovskite crystals. Collaborations with external French and European laboratories are planned.

Required skills: The candidate must have skills in semiconductor physics and materials science. Experience in the field of perovskites will be appreciated. The subject is addressed to a motivated, rigorous candidate with a sense of experimental work and teamwork ability.

Terms: Duration: 2 years, beginning October 2019.

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