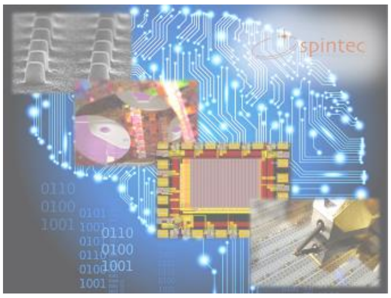
Recruiting a 30-month post-doctoral position in applied spintronics – Si-embedded vertical MTJs



SPINTEC

Positioned at the crossroad of science and technology, **SPINTEC** (**SPINtronique et TEchnologie des Composants**, https://www.spintec.fr) is one of the leading spintronics research laboratories worldwide. SPINTEC was created in 2002 and rapidly expanded to currently exceed 120 persons, of which 54 permanent staff from CEA, CNRS and Grenoble-Alpes University. The lab aims at bridging the gap between fundamental research and applications in spin electronics. As such, the outcome of the laboratory is not only scientific publications and communications at international conferences, but also a consistent patent portfolio and implementation of relevant functional demonstrators and device nanofabrication. The lab has launched six start-up companies in the past 20 years. This synergy has placed SPINTEC at the forefront of spintronics research, having actively contributed to the emergence in industry of spintronic memories called MRAM, on which the laboratory holds key patents and develops further exploiting magnetic tunnel junctions for various technologies.

SPINTEC benefits from an idea local environment with a large spectrum of opportunities:

- SPINTEC belongs with the Interdisciplinary Research Institute of Grenoble (IRIG), gathering 10 laboratories with of total of 1000 researchers, technicians, doctoral and post-doctoral students. IRIG covers interdisciplinary skills (physics, chemistry, biology), and provides access to cutting-edge scientific and technological platforms such as PTA cleanroom, and nano-characterization PFNC.
- The Giant Campus Site (also called Scientific Presqu'Île) offers an exceptional scientific environment with partners such as CEA-LETI, Néel Institute and major European facilities (ESRF and ILL on the EPN Campus).
- The entire Campus of Grenoble Alpes University, whose excellence was recently recognized by the national IDEX award, bears a collective dynamics of research challenges in all fields of knowledge.

Grenoble is a cosmopolitan city at the heart of the French Alps. One out of five people living there works in the field of research, innovation or higher education. In addition, Grenoble offers various cultural and sportive opportunities all year round.

CONTEXT

Context. Magnetic Random Access Memories are now commercial products as cache memories or fast/low-power memories such as in FPGAs. Opening new markets such as fast and massive RAM memories for processors requires to further increase the areal density, and ideally shift to a 3D design similar to 3D NAND flash. A first move along this path was the proposal of the Perpendicular Shape Anisotropy (PSA) MRAM, made independently by two groups, Tohoku in Japan, and SPINTEC in France. The proof-of-concept of R/W operation was made down to 5 nm electrical diameter (Fig.1). However, a bottleneck remains as regards fabrication, preventing to turn the concept in a practical device: so far the nanopillars have been obtained by aggressive etching and lateral trimming, severely limiting their integration in somewhat dense architectures.

The aim of the present project is to demonstrate the fabrication of fully-functional magnetic tunnel junctions compatible with microelectronic industry standards. The magnetic free layers will be embedded in state-of-the-art <25nm vertical vias, and magnetic tunnel junctions will be fabricated atop these.

POSITION

The mission of the position is to develop the magnetic tunnel junctions to enable vertical magnetic memory points in microelectronics Si vias.

Activities involve:

- Develop, carry out in a clean room, and monitor the nanofabrication of electrical contacts for individual memory points
- Carry out and analyze magnetic and electrical characterizations of memory points or their subcomponents. Techniques will include, for example, magneto-optics, vibrating sample magnetometry, magnetic force microscopy, or electron holography, manual or automatic point testers
- With the assistance of simulation experts, perform spintronic micromagnetic simulations of memory points and analyze them
- Write reports, draft publications, and give oral presentations

Required expertise:

- Significant experience in experimental nanomagnetism and spintronics
- Experience in cleanroom technology
- Ability to work independently and as part of a team
- Good command of English and scientific English, both spoken and written
- Ability to supervise doctoral students or interns

The position will be assigned jointly to the Spin Textures and MRAM teams at SPINTEC, under the joint supervision of Olivier FRUCHART and Kevin GARELLO. The position will interface with the theory team and the technical teams. The mission will be part of the ANR M-bed-RAM project work program, interfacing with a CEA project conducted jointly with CEA-LETI, which is in charge of and will supply the lower part of the magnetic memory points on 300mm silicon technology. The project duration is one year with a secured extension of 18-month.

How to apply: contact olivier.fruchart@cea.fr and kevin.garello@cea.fr, application at https://emploi.cnrs.fr/Offres/CDD/UMR8191-OLIFRU-006/Default.aspx by 24 March 2026, start of position 1st July 2026.