

Recruiting a Research Scientist on *ferroelectric spintronics*

The candidate will join SPINTEC's Concepts Group, in the "Topological Spintronics" team, with the aim of leading the ferroelectric spintronics activity within SPINTEC.

IRIG and SPINTEC

Located in the French Alps and surrounded by an exceptional natural environment, the international city of Grenoble represents an extremely rich ecosystem, with public research entities (CEA, CNRS, ESRF, ILL), Grenoble Alpes University (UGA) and numerous high-tech companies.

As part of the CEA's Fundamental Research Division, the IRIG institute in Grenoble is developing its activities in the field of material science, applied to new technologies for energy and the environment, nanoscience, biology and health. The wide range of topics developed at IRIG facilitates the development of excellent multidisciplinary research, supported by outstanding research platforms and infrastructure. Research work is generally carried out in the context of national and international academic partnerships and leads to numerous applications, enabling IRIG to develop industrial partnerships with start-ups, SMEs and large companies.

At the crossroads of science and technology, SPINTEC (SPINtronics and Component Technology, <https://www.spintec.fr/>) is one of IRIG's 10 laboratories, and one of the world's leading spintronics research laboratories. SPINTEC was set up in 2002 and has grown rapidly to employ 120 people, including 52 permanent staff from CEA, CNRS and Grenoble-Alpes University. The aim of the laboratory is to create a bridge between fundamental research and applications in spin electronics. As such, the laboratory's markers are not only scientific publications and communications at international conferences, but also the creation of a coherent patent portfolio and the implementation of relevant functional demonstrators and device nanofabrication. The laboratory has launched six start-ups in the last 15 years. This synergy places SPINTEC at the forefront of spintronics research, having actively contributed to the emergence in industry of spintronic memories known as MRAMs, on which the laboratory holds key patents. SPINTEC benefits from a local environment rich in innovation, with a wide range of opportunities.

Within SPINTEC, the "Topological spintronics" team currently consists of 3 permanent researchers, and of postdocs, PhD students and trainees. The team aims to manipulate spin currents in nanostructures, particularly in topological insulators or Weyl semi-metals, or at oxide interfaces. The team is also exploring new functionalities offered by mixed spintronic/ferroelectric structures, which hold great promise for ultra-low-power memory solutions and non-volatile logic for tomorrow's electronics.

POSITION

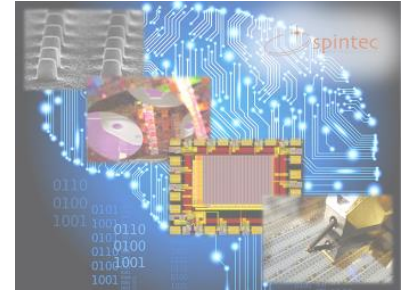
The increasing energy consumption of information and communication technologies requires new paradigms for calculating and storing information, in a non-volatile way, with much more energy-efficient operation. In this context, the coupling of ferroelectricity with spintronic concepts is extremely promising for applications where high endurance, low energy consumption and low operating voltage are required, such as in Artificial Intelligence and logic applications. The Topological Spintronics team recently demonstrated that spin-charge interconversion can be sign-controlled via spin-orbit coupling, in a non-volatile manner, by a ferroelectric state. This opens up new programmable functionalities, such as the FESO (Ferro Electric Spin Orbit) technology, which by enabling the non-destructive reading of a ferroelectric state for logic and AI applications is of particular interest. This research program covers everything from materials, fabrication and characterization to the theory and design of integrated circuits.

We are looking for candidates to lead the ferroelectric spintronics activity within SPINTEC. The candidate will lead cutting-edge and innovative research activities in this field, and develop partnerships and collaborations at French and European level. He/she will :

- benefit from an already well-developed activity, with an existing experimental park of the group and of SPINTEC, with several material deposition and clean room facilities and advanced characterization equipment.
- benefit from and develop internal collaborations with other teams in the laboratory (design, theory, other experimental teams).
- benefit from a large network of existing collaborations at national and international level, including the PEPR Electronics and Spin).
- contribute to the creation of a joint laboratory with a new start-up on this subject.
- manage the research carried out in collaboration with the start-up through the joint laboratory.

PROFILE

SPINTEC is looking for candidates who already have solid experience in the field of ferroelectric spintronics. The candidate must hold a PhD and have research experience in several of the following fields: spintronics, ferroelectric materials, materials science, magneto-transport, nanofabrication. International experience is a definite advantage. The ability to lead successful research and development activities on targeted topics in a multidisciplinary environment is essential.



HOW TO CANDIDATE

Candidates should send a letter of application and detailed CV by email to Lucian Prejbeanu, SPINTEC Director, at lucian.prejbeanu@cea.fr.

Application deadline: 15 July 2024.

In a letter of application, the candidate should describe how his/her experience and vision would complement and benefit the long-term interests of the host institution, to conduct original research, and to have the ability to establish and manage research collaborations with academic and industrial partners.

The selected candidates will then be promptly informed and invited for an interview scheduled for early September 2024.



Additional information: This offer concerns an indefinite-term position at the French Atomic and Alternative Energy Commission (CEA, www.cea.fr). Offered salary depends on experience.