

Date : October 6th 2026

Post-doctoral position

Subject: Nanofabrication of Magnetic Tunnel Junctions for Sustainable Spintronics

General information

Workplace: Institut Jean Lamour, IJL (CNRS / UL), Nancy, FRANCE

Type of contract: FTC Scientist

Contract period: 1 year renewable 1 year

Expected date of employment: 1st December 2026

Proportion of work: Full time

Remuneration: 3072 € gross/monthly for a post-doc with less than 2 years of experience.

Desired level of education: PhD in Physics.

Experience required: clean room with e-beam lithography, strong background in spintronics

Missions / Activities

This position is part of the M-ERA.NET "GREEN MEM" project (ANR-25-MER3-0007-01), which aims to develop sustainable, non-polluting materials for advanced spintronics devices to address the unsustainable energy consumption of AI and big-data computing. The consortium includes partners in France (IJL), in Spain (IMDEA, U. Autonoma de Madrid) and Poland (SOLARIS)

The IJL team's role in the project is to develop complete nanodevices for spintronics applications, including current-induced spin-orbit torques (SOT) in magnetic tunnel junctions (MTJs) made from novel, sustainable materials. The successful candidate will:

1. Optimize the nanopatterning process in cleanroom by e-beam lithography to achieve the desired nanodevices geometry.
2. Adapt a setup to enable sub-nanosecond pulse measurements (down to 100 ps).
3. Test different materials (provided by IJL's growth facilities or partners) for the optimization of the control of the magnetization of the free layer of the MTJ. The tested systems will include graphene-intercalated systems.

Work context

The selected candidate will join the [SPIN research group](#), at Institute Jean Lamour, under the supervision of Dr. J. Carlos Rojas-Sánchez, and Dr. Sébastien Petit-Watelot. She/He will collaborate with the IJL's cleanroom, mechanical workshop, electronics department engineers, and also with the purchasing service members, as well as the international partners in the project.

Required Skills

The candidate must have a strong background in spin-electronics and clean room processes including especially **e-beam lithography**. She/He should have a base knowledge of spin-orbit torque, spin-transfer torque, spin-charge current interconversion and the underlying characterisation technics. The candidate should also have some experience in micromagnetic simulations (desirable), and good knowledge of LabVIEW or Python is a plus.

Constraints and risks

No major risk associated with role.

The position you are applying for is located in a scientific and technical protection sector.

Therefore, in compliance with French regulations, authorization from the French Ministry of Higher Education, Research, and Innovation is required for the candidate's appointment.

About Institut Jean Lamour

The project will be conducted within the SPIN team, <https://spin.ijl.cnrs.fr/>, at Jean Lamour Institut. SPIN team focuses on: developing innovative materials for spin-electronics devices, creating magnetic sensors, and fundamental studies of magnetism-related phenomena.

The Institut Jean Lamour (IJL) <https://ijl.univ-lorraine.fr/> is a joint research unit (UMR 7198) of CNRS and *Université de Lorraine*, specializing in materials science, metallurgy, plasmas, surfaces, nanomaterials, and electronics. It hosts 183 researchers/lecturers, 91 engineers/technicians/administrative staff, 150 PhD students and 25 post-doctoral fellows. IJL maintains partnerships with 150+ companies and collaborates with 30+ countries worldwide. Its state-of-the-art instrumental platforms are distributed across 4 sites, with the main campus located in Nancy (Artem).

Nancy is a vibrant French city with excellent connectivity: 1h30 by train to Paris and Strasbourg, <2 hours by car to Kaiserslautern (Germany). The SPIN group collaborates closely with others leading laboratories, including: Albert Fert Laboratory (Paris-Saclay), C2N (Paris-Saclay), IPCMS (Strasbourg), SPINTEC (Grenoble), University of Marseille, and Kaiserslautern Institute of Technology (Germany).

Application

Interested candidates should apply through CNRS website:

<https://emploi.cnrs.fr/Offres/CDD/UMR7198-MELDOG-055/Default.aspx?Lang=EN>

Pre-selected candidates will be contacted for an interview.

Further information:

- J. Carlos Rojas-Sánchez (CNRS Researcher) : juan-carlos.rojas-sanchez@univ-lorraine.fr
- Sébastien Petit-Watelot (Lorraine University Assistant Professor) : sebastien.petit@univ-lorraine.fr