

Postdoc position (12 months, renewable)

Advanced characterization of Si-based lithium-ion batteries by transmission electron microscopy and FIB-SEM nano-tomography

A postdoc position is open at the Interdisciplinary Research Institute of Grenoble (<https://www.cea.fr/drf/irig>), a research institute which depends on both the CEA and of the Université Grenoble Alpes (UGA). This position is offered in the framework of the EU-funded **Eco2Lib** project (<https://www.eco2lib.eu/>) dedicated to the development of Si-based lithium-ion batteries with better endurance and improved sustainability.

Our objective is in particular to understand the ageing mechanisms of composite electrodes by combining various advanced characterization techniques: electrochemical measurements, electron microscopy and spectroscopy analysis, NMR, and *in situ* and *operando* x-ray and neutrons scattering experiment. In the small team dedicated to this project, the postdoc will be in charge of the structural characterizations by (S)TEM (imagery, EELS and EDX spectroscopies) and FIB-SEM nano-tomography. He is expected to interact strongly with other characterisation teams (RMN, *ex situ* and *operando* scattering techniques), as well as with the people in charge of modelling and simulation. The objective will be to provide a comprehensive picture of structural and electrochemical evolutions of Si-based electrodes, to quantify the impact of lithiation/delithiation processes, and to follow the SEI formation and evolution. This will be done on model materials as well as on commercial batteries.

Hosting teams

The postdoc will be hosted in the MEM laboratory (Laboratory for Modeling and Exploration of Materials, <https://www.mem-lab.fr/en>) of the IRIG institute. Our lab is part of the CEA-Grenoble nanocharacterization platform (PFNC), which gives us access to a wide range of state-of-the-art facilities such as 5 TEM (including two ThermoFisher Titan corrected microscopes), 5 SEM and 3 dual-beam FIBs (including a two Zeiss Crossbeam 550), as well as a lab dedicated to sample preparation. Our activity is mainly dedicated to nanoscale research (physics and chemistry of materials up to the atomic scale) using advanced instrumentation. Our laboratory is located in the "Polygone Scientifique" (https://en.wikipedia.org/wiki/Polygone_Scientifique), near the city centre of Grenoble, which offers an exceptional working environment as well as a very good quality of life, in the heart of the French Alps.

Qualifications

- PhD in physics, chemistry, materials science or equivalent
- Expertise in electron microscopy and associated spectroscopy techniques
- Knowledge on focused ion beam microscopy and/or on the analysis of materials for energy storage would be appreciated
- The candidate must be motivated to work in a multidisciplinary project, and interact with the electrochemists, chemists and physicists of IRIG, as well as with our European academic and industrial partners.

Application

Submit your application via email, including a motivation letter (with a brief summary of previous research activities), your CV and two references or reference letters.

Application Deadline: 04/04/2021 - **Contact:** Dr. Pierre-Henri Jouneau - pierre-henri.jouneau@cea.fr