

## Germanium-based qubits

### Post-doc Position (f/m/d) in the LaTEQS Laboratory

A 3-year post-doctoral research position (f/m/d) is available at the LaTEQS laboratory of CEA in Grenoble <https://www.lateqs.fr>. The experimental researcher will join an existing team (3 PhDs, 3 staff researchers, 2 engineers) focusing on the development of novel quantum electronics based on Ge/SiGe heterostructures. This emerging material, which embeds a high-mobility two-dimensional hole gas, has been identified as a promising candidate for spin qubits and hybrid superconductor-semiconductor qubits<sup>1</sup>. Along this line, we have already obtained some first encouraging results, such as the demonstration of ballistic hole transport over long distances<sup>2</sup> and the realization of Josephson field-effect transistors and gate tunable SQUIDs<sup>3</sup>.

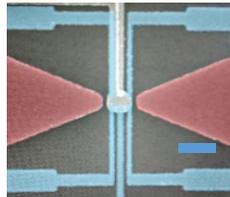
Candidates are expected to have:

- PhD in experimental physics
- Experience in one or, hopefully, more of the following areas :
  - ✓ Nano-fabrication
  - ✓ High-frequency measurement techniques
  - ✓ low-temperature electronic transport
- Ability and interest in the supervision of graduate and undergraduate students

The LaTEQS laboratory, located on the Minatec campus of CEA, hosts multiple dilution refrigerators, mostly dry and equipped with vector magnets and high-frequency/low-noise measurement electronics. The proposed research activity is led by Romain Maurand, François Lefloch and Silvano De Franceschi. It is part of a large multi-institutional initiative on silicon-based quantum information which gathers researchers and engineers from CEA, CNRS, and University Grenoble Alpes. We receive support from the EU via multiple grants, including an ERC Synergy Grant, and from the French National Research Agency, notably through the French Quantum Plan. For more information: <https://www.quantumsilicon-grenoble.eu>.

The post-doctoral salary includes social security and it takes into account the educational and professional path of the candidate.

1. G. Scappucci, et al., Nature Reviews Materials 6, 926–943 (2021).
2. R Mizokuchi, et al., Nano letters 18, 4861–4865 (2018).
3. F. Vigneau et al., Nano letters 19, 1023–1027 (2019).



*Example of a two-layer gate structure defining a hole quantum dot in a Ge/SiGe heterostructure. This structure was fabricated in our cleanroom. Scale bar: 100nm*

Applications, including CV, publication list and preferentially two reference letters, should be sent  
[silvano.defranceschi@cea.fr](mailto:silvano.defranceschi@cea.fr)

CEA is one of the largest and most dynamic research Institution in France covering a wide range of subjects. With its 9 research centers distributed throughout France, it offers a broad scientific spectrum going from fundamental research to industry. The CEA Grenoble center hosts the IRIG institute, focusing on basic research, and several institutes for applied research, such as LETI, with its industrial-scale CMOS fabrication platform. The city of Grenoble offers unique opportunities to discover the French Alps and to enjoy many related outdoor activities.

