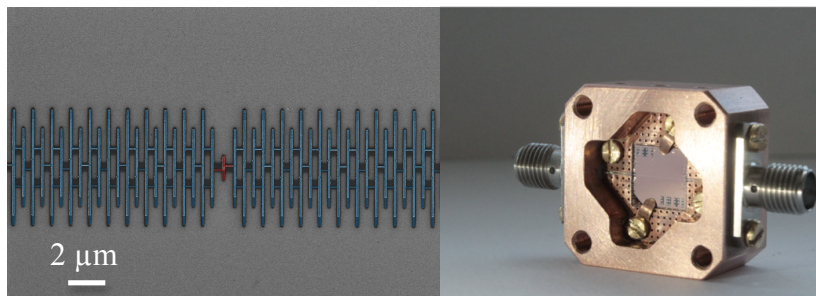


Post-doctoral position : novel superconducting devices

The superconducting circuits group at Néel Institute in Grenoble offers a postdoctoral position. Over the recent years, our team has specialized in large kinetic inductance superconducting quantum circuits working at milliKelvin temperatures [1] with applications ranging from novel superconducting qubits to state-of-the-art quantum limited amplifiers [2]. Your main task will be to build much-anticipated devices such as broadband single photon detectors or quantum limited amplifiers, leveraging our Traveling Wave Parametric Amplifiers (TWPA) expertise.



Left: Example of a Josephson meta-material we engineer in our lab. It is made of thousands of Josephson junctions and behaves as a “superinductance”, which is several orders of magnitude larger than what is usually found in standard electronic circuits. Right: we are one of the few teams in the world able to design, fabricate and measure Josephson Traveling Wave Parametric Amplifiers (JTWPA), which are revolutionizing the way superconducting quantum circuits are measured.

[1] Observation of quantum many-body effects due to zero point fluctuations in superconducting circuits, S. Leger, et al. *Nature Communications* 10, 5259 (2019). [2] A photonic crystal Josephson traveling wave parametric amplifier, L. Planat, et al. *Phys. Rev. X* 10, 021021 (2020).

Context: This position is funded within the project AVaQus (Annealing-Based Variational Quantum Processors, <http://www.avaqus.eu>). This project aims at building a small-scale, fully coherent quantum annealer that is entirely programmable. You will benefit strongly from interactions with the AVaQus consortium.

Means available: Our team specializes in the coherent control and manipulation of superconducting quantum circuits. You will benefit from a dedicated, state-of-the-art setup combining very low temperatures (around 10 mK), fast electronics and quantum-limited microwave detection chains. The devices are fabricated in the clean room of the Neel Institute (Nanofab), offering state-of-the-art equipment (100 keV e-beam writer, dedicated Plassys evaporator, ALD and PE-CVD machines...).

Required profile: PhD degree with a solid background in quantum physics. A strong experience in at least one of the following areas is required: nano-fabrication, microwave and digital electronics, advanced cryogenic equipment (dilution refrigerators), theory of quantum circuits.

Foreseen start for the position: Fall 2021

Gross Salary: From 2648 €/month to 3768 €/month, depending on the candidate experience

Duration: From 24 up to 48 months

Application and Contact: Your application should include a CV, a publication list and a brief cover letter explaining your motivation. To be sent to Nicolas Roch (nicolas.roch@neel.cnrs.fr)

More information: <http://perso.neel.cnrs.fr/nicolas.roch> and <http://neel.cnrs.fr>



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