



## Two 2-year postdoc positions in Quantum Photonics at Grenoble (France)

In the frame of the ANR project « A bright source of Indistinguishable Polarization-entangled On-Demand photon pairs » (start January 2020), the teams of Jean-Philippe Poizat (Institut Néel, CNRS Grenoble) and Julien Claudon and Jean-Michel Gérard (IRIG, CEA Grenoble) welcome applications for two 2-years postdoc positions. These two teams belong to the “NanoPhysics and SemiConductor” (NPSC) joint structure.

The goal of this project is to design, fabricate and use a single semiconductor quantum dot (QD) embedded in a photonic waveguide to produce polarization entangled photon pairs with a very high quantum efficiency. The specificity of this project is that we will use strain and electrostatic fields to tune the properties of the QD and produce a device satisfying all the requirements for a realistic implementation in a quantum communication set-up.

Institut Néel and IRIG are part of the largest French national research institutes in condensed matter physics. Grenoble features a unique scientific, industrial and cultural ecosystem. It offers one of Europe’s largest high-tech center. Grenoble has been identified as one of the three French Quantum Hubs together with Paris and Saclay. It benefits from an exceptional environment at the heart of the French Alps.

### **Position at CEA-IRIG: Design and fabrication of the samples.**

Modelling, clean room processing, preliminary optical characterization.

[Web site](#)

See below for details

Contact: [Julien.claudon@cea.fr](mailto:Julien.claudon@cea.fr)

### **Position at Institut Néel: Optical spectroscopy and quantum optics measurements**

Micro-photoluminescence, photon correlation experiments

[Web site](#)

See below for details:

Contact: [Jean-philippe.poizat@neel.cnrs.fr](mailto:Jean-philippe.poizat@neel.cnrs.fr)

## Postdoc position at CEA Grenoble Quantum photonics team

**Responsibilities and tasks:** The successful candidate will be in charge of:

- the clean room processing of the structures
- their preliminary optical characterization
- the co-supervision of a PhD student.

**Means available:** The team at CEA operates a molecular beam epitaxy chamber dedicated to the growth III-As semiconductor heterostructures. It has access to a shared academic clean room (Plateforme Technologique Amont) that is equipped with state-of-the-art processing tools (e-beam lithography, ICP dry etching, metal and dielectric thin film deposition...). A micro-photoluminescence setup dedicated to single quantum dot spectroscopy complete this equipment (spectrum, far-field mapping, time-resolved photoluminescence decay).

**Research team:** The team at CEA has made numerous contributions to quantum dot nanophotonics. In particular, it has pioneered the development of nanowire single-photon sources, and the one of quantum dot - nanowire hybrid mechanical systems (in close collaboration with Néel Institute). Current research interests include the fine tuning of quantum dot optical properties using external control fields, as well as the investigation of the interplay between photon coherence and nanowire vibrations.

**Profile of the candidate:** We are looking for a highly motivated post-doc with strong background in semiconductor physics, combined with a pronounced taste for the realization of devices (clean room processing). A complementary experience in optics would be a plus. The successful candidate will interact with a team of permanent researchers and PhD students.

**Start date:** Beginning of 2021.

**Duration:** 2 years. Possibility of 1-year extension depending on available funding.

**Salary:** Between 2 600 to 3 200 € gross monthly salary depending on experience.

**More information:** [julien.claudon@cea.fr](mailto:julien.claudon@cea.fr) or [jean-michel.gerard@cea.fr](mailto:jean-michel.gerard@cea.fr).

**How to apply:** Send a CV and a motivation letter to [julien.claudon@cea.fr](mailto:julien.claudon@cea.fr) or [jean-michel.gerard@cea.fr](mailto:jean-michel.gerard@cea.fr). Please arrange for two references.

**Application deadline:** until position is filled.

## Postdoc position at Néel Institute (Grenoble)

Together with a PhD student, the post-doc will design and operate the experimental set-up to tune the spectroscopic properties of the QD, carry out resonant photoluminescence experiments and perform the entanglement measurements. This work will be done in very close collaboration with a PhD student and a post-doc of the CEA-IRIG team that will be in charge of the design and fabrication of the samples.

**Responsibilities and tasks:** The successful candidate will be in charge of:

- Resonant two-photon micro-photoluminescence experiment
- Entanglement characterization with photon correlations
- the co-supervision of a PhD student.

**Means available:** The Institut Néel team operates a state of the art low temperature ( $T=4\text{K}$ ) resonant micro-photoluminescence set-up including a picosecond Ti:sapph laser, several tunable laser diodes, a high resolution ( $12\ \mu\text{eV}$ ) spectrometer with a CCD camera, avalanche photodiodes, and photon correlation software.

**Research team:** The Institut Néel team is specialized in quantum optics and optomechanics with semiconductor nanostructures. It has obtained several important results in photon correlation experiments, giant non-linearities, and single photon experiments with quantum dots.

[Web site](#)

**Profile of the candidate:** We are looking for a highly motivated post-doc with strong background in semiconductor optics and/or quantum optics. She/he must be able to supervise a PhD student and to conduct an experimental project with large autonomy. Work with Institut Néel technical staff and with our CEA-IRIG collaborators will require a strong team spirit.

**Start date:** Beginning of 2021.

**Duration:** 2 years.

**Salary:** Between 2 648 and 3768 € monthly gross salary depending on experience.

**More information:** [jean-philippe.poizat@neel.cnrs.fr](mailto:jean-philippe.poizat@neel.cnrs.fr)

**How to apply:** Send a CV and a motivation [jean-philippe.poizat@neel.cnrs.fr](mailto:jean-philippe.poizat@neel.cnrs.fr). Please arrange for two references.

**Application deadline:** until position is filled.