

Engineer position at "Institut FOTON"

Diamond processing for NV-based quantum sensing

INSA Rennes is hiring an engineer with strong experience in clean-room technologies. Diamond processing will be employed to develop high-end quantum sensing applications with industrial and academic partners.

Starting date: November 2026

Job type, duration and salary: Full-time, 4 months (renewable up to 12 months), salary starting from 2500 € monthly gross salary depending on experience

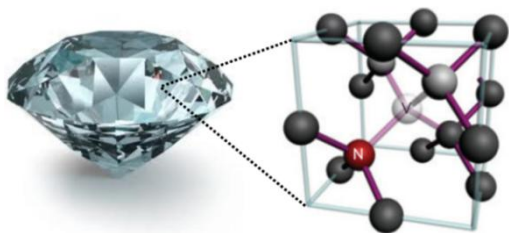
Scientific supervisor: Paul Huillery

Involved FOTON teams: OHM (INSA Rennes), SP (Lannion)

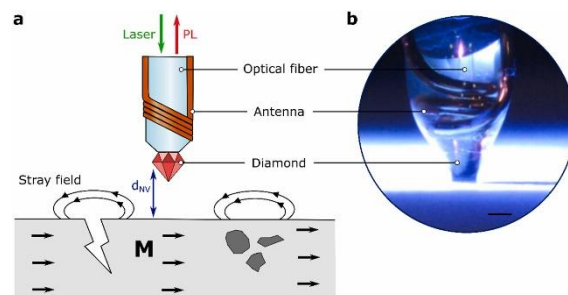
Keywords: Nanotechnologies, Integrated photonics, Diamond NV centers, Quantum sensing.

Position context

Quantum sciences are currently being turned into technological devices that exploit quantum properties of fundamental particles to push further the fields of computing, communication or sensing. Among the impressive diversity of quantum systems that are investigated in this context of quantum technologies, diamond Nitrogen-Vacancy (NV) centers play a prominent role, especially as quantum sensors. Thanks to a singular interplay between optical and spin degrees of freedom, NV centers have been for example employed to build sensitive magnetometers having an unprecedented nanometric spatial resolution¹. The room temperature operation of NV-based quantum sensors together with its solid-state packaging – the diamond – augur further development of a broad range of sensing applications going from biomedical sciences to industrial nondestructive testing (NDT).



Diamond NV center



NV-endoscope for NDT³

To fully realize the potential of NV-based quantum sensors and develop new applications, current challenges are to enhance sensors sensitivity², miniaturize their size or again to develop new sensing modalities such as endoscopic sensors (see figure). Photonic sciences, acting as an enabling technology, represent a clear path to address those challenges, by realizing integrated, cost- and energy-effective devices. In this context, dry etching processes can be used to produce sub-millimetric diamond pieces from bulk diamond samples suitable for further integration into photonic devices. The role of the recruited engineer will be to develop and realize such etching processes.

Main duties

- Lead diamond etching activities, including optimization and device production
- Develop and perform deep diamond etching processes
- Develop and perform etching processes with non-conventional geometries
- Communicate within the team and with partners about the obtained results

About the candidate

- The candidate must hold an engineering degree in material sciences.
- Strong experience with clean room technologies is required, including ICP-RIE etching, and SEM imaging.
- The candidate should have experience in integrated photonics.
- Autonomy, creativity, independent thinking and teamwork skills are being sought

Partnership

The project will benefit from all the already existing local, national and international collaborations of the group. This includes the members of the equipex+ e-Diamant (coord. J.F. Roch) and in particular the group of Jocelyn Achard (LSPM) for quantum grade diamond fabrication. Our group is also collaborating with the company Kwan-tek⁴, specialized in NV based quantum sensors, offering ideal conditions for the valorization of the research work.

About “Institut FOTON” laboratory

“Institut FOTON” is a research unit of the French National Centre for Scientific Research (CNRS) associated to University of Rennes and the National Institute for Applied Sciences (INSA) of Rennes. This thematic research institute covering the broad field of Photonics is composed of three research teams: the “Optoelectronics, Heteroepitaxy and Materials” (OHM) team and the “laser Dynamics, microwave photonics, Polarimetry, terahertz, imaging” (DOP) team located in Rennes, and the “Photonic Systems” (SP) team located in Lannion. The successful candidate will carry out research at both the OHM team in Rennes and the SP team in Lannion. In particular, he/she will work within the clean rooms and technological platforms of CCLO (Lannion) and NanoRennes (Rennes), member of the Renatech+ network.

More information about FOTON can be found at: www.institut-foton.eu

Contact & How to apply

Applications must be sent to paul.huillery@insa-rennes.fr by September 11, 2026 at the latest. Selected candidates will be then invited to an interview.

Your application should include:

- Motivation letter
- Detailed curriculum vitae (CV)
- Recommendation letters or references of people to contact for recommendation (to be included in the CV)

More information available from Paul Huillery, Junior Professor: paul.huillery@insa-rennes.fr

¹ Maze et al. *Nature* **455**, 644–647 (2008)

³ Vindolet et al. *NDT & E International* **155**, 103439 (2025)

² Barry et al. *Rev. Mod. Phys.* **92**, 015004 (2020)

⁴ <https://www.kwan-tek.com>