



Open Post-doctoral position in solid-state quantum optics

Laboratory: C2N (Center for Nanoscience and Nanotechnologies, south of Paris)

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Research project:

Controlling light-matter interaction at the single quantum level is a crucial and fascinating challenge, opening a wide range of perspectives for quantum technologies. In this respect, we have recently developed efficient light-matter interfaces in the solid state [1], using semiconductor quantum dots embedded in optimized microcavity structures. This led to a number of achievements in the last few years: the demonstration of an optical nonlinearity at the single-photon limit [2], the development of near-optimal sources of pure and indistinguishable single photons [3], and the demonstration of an efficient spin-photon interaction [4].

Using the current state-of-the-art devices, it now becomes possible to interface single spins with single photons for various applications. We aim at performing fundamental quantum measurements on the spin system, and demonstrating multipartite entanglement between a spin and several photons. An important goal of such research is the development of deterministic quantum gates, to go beyond the current limitations of quantum computing with probabilistic gates.

Profile:

We welcome applications from excellent candidates with a strong background in optics with solid-state systems and/or quantum optics. The successful candidate will drive experimental activities in the solid-state quantum optics groups in C2N or/and lead the technological efforts in the development of the next generation of electrically-controlled light-matter interfaces.

[1] Giesz et al, **Nature Commun.** **7**, 11986 (2016)
[3] Somaschi et al, **Nature Photonics** **10**, 340 (2016)

[2] De Santis et al, **Nature Nanotech.** **12**, 663 (2017)
[4] Arnold et al, **Nature Commun.** **6**, 6236 (2015)