Diamond nanophotonics and electronics for bright single-photon emission

Solid-state single-photon sources play an important role in the implementation of photonics quantum technologies. Color centers in diamond have gained much attention in this context for their unique optical properties. However, a substantial basic research effort in materials science, nanophotonics and electronics is still required.

In my talk I will introduce single-photon emission and its applications. Next, I will discuss color centers in diamond and present nano-optical concepts to largely improve their optical properties. I will also present results pertaining to diamond implantation and characterization as well as on the design of antenna configurations that can significantly improve the out-coupling efficiency. Finally, I will discuss some ideas on the possibility of electrical pumping and the expected performances.