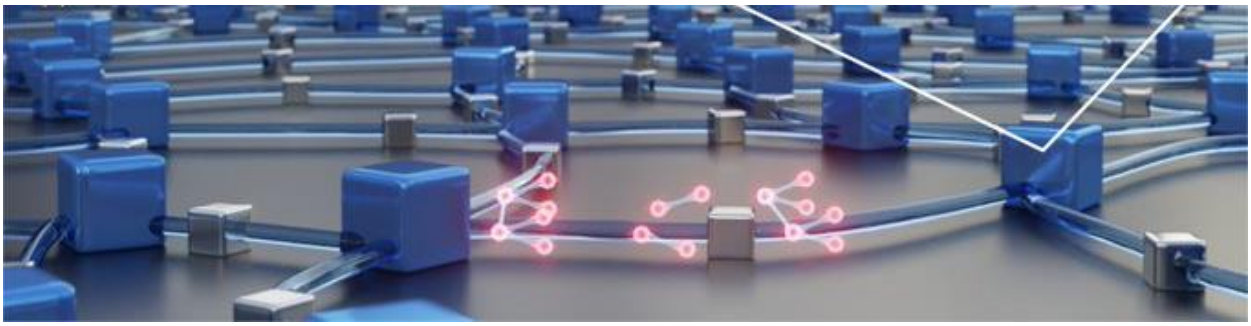
PhD positions within Scalable Photonic Quantum Networks

At the Niels Bohr Institute at University of Copenhagen we currently have a job opening as PhD fellow within experimental quantum photonics. Employment date is August 1st, 2021 or as soon as possible thereafter.

The position is embedded in the Quantum Photonics Group within the Center of Excellence "Hybrid Quantum Networks Hy-Q" We carry out fundamental and applied research on quantum-information processing with solid-state quantum emitters embedded in photonic nanostructures. The quest of the current research programme is to scale the basic quantum functionalities to obtain large and complex quantum networks[1].

Vacancies

The current PhD project concerns applying single-photon quantum hardware for quantum simulations[2]. The goal is to use quantum dot coupled to photonic nanostructures[3] for generation of advanced multi-photon entangled cluster states. This is achieved by using the coherent spin-photon interfaces[4] integrated into the photonic chip. Small-scale cluster states will be fused together for forming larger entangled states and applied for proof-of-concept quantum simulations of dynamical quantum chemistry problems. Both theoretical modelling of the quantum algorithm and experimental implementation will be part of the project.



Further information

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[1] Quantum-dot based photonic quantum networks, Quantum Science and Technology 3, 013001 (2018)
[2] Single-photon quantum hardware: towards scalable photonic quantum technology with a quantum advantage arXiv:2103.01110 (2021)
[3] Interfacing single photons and single quantum dots with photonic nanostructures, Rev. Mod. Phys. 87, 347 (2015)
[4] Coherent Spin-Photon Interface with Waveguide Induced Cycling Transitions, Phys. Rev. Lett. **126** (2021)