

Spin-photon quantum interface in quantum dots

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Realization of a quantum interface between flying photonic qubits and stationary spin qubits is expected to play a key role, both in quantum repeaters and realization of quantum networks. Thanks to their superior optical properties and the possibility of integration in photonic nanostructures, semiconductor quantum dots confining a single spin are particularly well suited for this purpose. In this work, we will describe our recent observation of spin-photon entanglement and our ongoing efforts aimed at demonstrating quantum teleportation from a propagating photonic qubit to a stationary spin qubit.

References

- [1] W. B. Gao, P. Fallahi, E. Togan, J. Miguel-Sanchez & A. Imamoglu, *Nature* **491**, 426–430 (2012)