

Towards an array of Rydberg atoms in a nanofiber system

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I will first overview the study of micrometer-scale systems such as optical nanofibers, photonic-crystal fibers, microcells, and waveguides, for the applications in quantum information science. Combined with Rydberg atoms, the systems are able to form multiple quantum-bits and quantum gates in these strongly nonlinear atomic medium. I will mention the method to generate single-photon source based on strongly interacting Rydberg atoms via four-wave-mixing (FWM) and photon blockade effect from a room temperature microcell^[1]. Finally, a proposal of building an array of Rydberg atoms in a nanofiber system will be discussed.

[1] F. Ripka, H. Kübler, R. Löw, T. Pfau, “A room temperature single-photon source based on strongly interacting Rydberg atoms”, arXiv:1806.02120