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**Hybrid atom-nanophotonic lattices for quantum optics and many-body physics**

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Interfacing light with cold atoms localized near photonic crystal cavities and waveguides presents new opportunities for realizing scalable quantum networks and novel quantum phases of light and matter. Such hybrid system could bring together excellent mobility of photons, and quantum non-linearity as well as control toolbox available for cold atoms in a highly engineered setting. In this talk, I will discuss recent experimental progress toward achieving strong atom-atom interactions in a nanophotonic lattice for light, and theory prospects for inducing long-range quantum dynamics for quantum network and many-body physics.