Nonlinear quantum optics mediated by Rydberg interactions

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By mapping the strong interaction between Rydberg excitations in ultra-cold atomic ensembles onto single photons via electromagnetically induced transparency it is now possible to realize a nonlinear optical medium which can modify light on the level of individual photons. We review the theoretical concepts and the experimental state-of-the-art of this exciting new field, and discuss first applications in the field of all-optical quantum information processing.

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- QIPC [3]
- RySQ [4]
- 01.30.+r Quantum states and dynamics as a resource for information processing [5]
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