

Abstract Submitted
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Strongly interacting photons MOHAMMAD MAGHREBI, Joint Quantum Institute, OFER FIRSTENBERG, MIT, ALEXEY GORSHKOV, Joint Quantum Institute — We develop a quantum theory of light strongly interacting via long-range Rydberg-Rydberg interactions within the framework of the electromagnetically induced transparency. We elaborate on the interaction between photons, and discuss attractive as well as repulsive regimes. Specifically, we find solitonic bound states of photons, and explain their propagation inside the medium. Finally, we discuss the possibilities of many-body phases of strongly interacting light.

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