

Very attractive slow photons

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Photons are boring: they all move at one speed and do not interact with one another. I will present an unusual optical medium that is nonlinear at the quantum scale: In this medium, photons travel slowly, acquire mass, and exhibit strong mutual attraction, so strong that two photons can even form a two-body bound state. The medium can also be made to transmit one, but absorb two photons. This and other progress in the field will enable novel quantum optical devices, such as a strongly interacting quantum gas of photons, an optical transistor gated by just one photon, or a device that can detect and count optical photons without destroying them.