



Prof. Susanne Yelin

(Physics Department, University of Connecticut)

From negative refraction to single photon control: New frontiers of quantum optics

Coherence effects in quantum ensembles can be utilized for a multitude of linear and nonlinear optics. I will introduce two novel applications in order to demonstrate potential uses of these ideas: First, how to electromagnetically induce chirality and how to use it to create media with negative refraction, as needed, for example, for the so-called "superlens"? Second, how to produce and use ultracold molecules - for example in quantum computing and low-intensity nonlinear optics?



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Universität Ulm, Raum H8 N25
Albert-Einstein-Allee 11, 89081 Ulm

