PT restoration via increased loss and gain in the-symmetric Aubry-André model[1] CHARLES LIANG, Columbia University, Department of Applied Physics and Applied Mathematics, DEREK SCOTT, YOGESH JOGLEKAR, Indiana University - Purdue University Indianapolis, Department of Physics — In systems with "balanced loss and gain," the PT symmetry is broken by increasing the non-Hermiticity or the loss-gain strength. We show that finite lattices with oscillatory, PT-symmetric potentials exhibit unexpected PT-symmetry breaking and restoration. We obtain the PT phase diagram as a function of potential periodicity, which also controls the location complex eigenvalues in the lattice spectrum. We show that the sum of PT potentials with nearby periodicities leads to PT-symmetry restoration, where the system goes from a PT-broken state to a PT-symmetric state as the average loss-gain strength is increased. We discuss the implications of this transition for the propagation of a light in an array of coupled waveguides. Reference [1] C. H. Liang, D. D. Scott, and Y. N. Joglekar, Phys. Rev. A **89**, 030102 (2014).

Charles Liang
Columbia University

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