

**Abstract for GR-TR Conference on Statistical Mechanics
and Dynamical Systems**

Plenary Invited

Invited Talk

**Chaotic Destruction of Anderson Localization in Nonlinear
Lattices**

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We discuss what happens to Anderson localization in a disordered lattice if a nonlinearity is present. The situation is relevant for lattices of coupled oscillators, for a Bose-Einstein condensate (described by a nonlinear Gross-Pitaevsky equation) in a disordered potential, and to light propagation in a disordered nonlinear medium. Our main model is a discrete Anderson chain with a nonlinear term (nonlinear Schroedinger lattice with disorder). We discuss three problems: (i) How an initially localized wave packet spreads; (ii) How a regular wave is transmitted through a nonlinear disordered layer; and (iii) How a thermalization in a finite disordered lattice occurs. In all cases nonlinearity leads to a weak chaos and delocalization.