1126-35-358   **Ziad Musslimani***, Department of Mathematics, Tallahassee, FL 32311. *Integrable nonlocal nonlinear equations,.*

A nonlocal nonlinear Schrodinger (NLS) equation was recently found and shown to be an integrable infinite dimensional Hamiltonian equation. Unlike the classical (local) case, here the nonlinearly induced "potential" is PT symmetric thus the nonlocal NLS equation is also PT symmetric. In this talk, new reverse space-time and reverse time nonlocal nonlinear integrable equations are introduced. They arise from remarkably simple symmetry reductions of general AKNS scattering problems where the nonlocality appears in both space and time or time alone. They are integrable infinite dimensional Hamiltonian dynamical systems. These include the reverse space-time, and in some cases reverse time, nonlocal NLS, modified Korteweg-deVries (mKdV), sine-Gordon, (1+1) and (2+1)dimensional three-wave interaction, derivative NLS, "loop soliton," Davey–Stewartson (DS), partially PT symmetric DS and partially reverse space-time DS equations. Linear Lax pairs, an infinite number of conservation laws, inverse scattering transforms are discussed and one soliton solutions are found. (Received January 17, 2017)