1014-65-1434 **Dan Stanescu*** (stanescu@uwyo.edu), 1000 E. University Avenue, Dept. of Mathematics, Laramie, WY 82071. *Numerical Study of Interacting Particles Approximations for Integro-Differential Equations.*

The talk presents a numerical method based on the interacting particles approximation (propagation of chaos) for the solution of a large class of evolution problems involving the fractional Laplacian operator and a nonlocal quadratic-type nonlinearity. Coupled stochastic differential equations driven by Lévy symmetric α-stable processes are integrated numerically using Euler's method and the solutions of the governing equations are obtained from their statistics. The method is tested on several one- and two-dimensional examples, and established analytical properties of the solutions are verified for the numerical approximates when they are available. For initial conditions that are either integrable or monotone bounded functions, it is shown that these methods represent viable tools for constructing the solution to the Cauchy problem. (Received September 28, 2005)