Applied Dynamical Systems Seminar

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Friday, March 2, 2012
1:00pm, HH-3017

Finite-time blow-up of solutions to semilinear parabolic
integro-differential equations'

Abstract:

The first part of this talk will be dedicated to a brief review of the theory of finite-time blow-up of solutions to semilinear parabolic PDEs on bounded or unbounded spatial domains Ω. The second part of the talk will focus on semilinear parabolic integro-differential equations where the reaction term is now nonlocal and given a by Volterra-type memory term. I will describe the recently obtained (jointly with Lizao Li) extension of Fujita's fundamental 1966 result for PDEs to such nonlocal problems on $\Omega = \RR^{N}$. However, for other unbounded spatial domains $\Omega \varsubsetneq \RR^{N}$ many key questions remain to be answered. The talk will conclude with a short discussion of current and future work on the computational solution of semilinear parabolic integro-differential equations.