



Differential Equations and Applied Math Seminar

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11am-12pm March 8th, 2019

336 Derrick Hall

Title: Oscillations and Patterns in Reaction-Diffusion Systems

Abstract: When vapor ammonia and hydrogen chloride react, under certain conditions a special type of pattern known as Liesegang rings form. A threshold kinetic function is introduced that combines two prevailing theories and demonstrate that the pattern is a result of oscillations in the reaction front of the two chemicals. As the equations will be a system of parabolic PDEs, a continuous Galerkin FEM scheme is implemented for the spatial discretization in both one and two dimensions and a Crank-Nicholson scheme is used for the temporal discretization. The figure shows Liesegang rings in hydrogen chloride and ammonia from experiment and simulation.

