Applied Physics Seminar

The Many Faces of "Discreteness":
From Acoustic Crystals and Layered Optical Media to Multi-Component Bose-Einstein Condensates and Beyond

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Abstract:

In this talk, we'll touch on different aspects of discrete systems, as they arise in a variety of recent experiments pertinent to physical applications. We will start from the ``traditional'' spatial discreteness and how it affects elastic travelling waves in so-called acoustic or phononic crystals. We will continue with a form of discreteness (or, more accurately, periodicity) in the evolution variable for pulses passing through a so-called layered optical medium and we will end with an example where the discrete number of components plays a crucial role in the dynamics of two coupled Bose-Einstein condensates in atomic physics. In each example, we will present the relevant dynamical models and we will attempt to mesh the mathematical analysis and numerical computations with experimental results. Finally, we will present some current and near future mathematical, computational and experimental questions of interest along these directions.

Biography:

After earning a B.S. (Physics) from the University of Athens in 1996 and an M.S. (1998), M.Phil and Ph.D. (Physics) in 2000 from Rutgers University, as well as spending a post-doctoral year between Princeton University and the Los Alamos National Laboratory, Professor Kevrekidis joined UMass, Amherst as an Assistant Professor in Mathematics and Statistics in 2001. In 2005, he was awarded tenure and was promoted to Associate Professor. He has published more than 250 research papers and delivered more than 80 invited talks in conferences and seminars around the world. Professor Kevrekidis has received, among others, a CAREER award in Applied Mathematics from the U.S. National Science Foundation, a Humboldt Research Fellowship from the Alexander von Humboldt Foundation and an Outstanding Paper Prize from the Society for Industrial and Applied Mathematics (SIAM).

Friday May 22nd

3:00pm-4:00pm.

Lees Kubota Hall - Guggenheim 101

Refreshments will be available in the Guggenheim Lobby following the seminar