



Departmental Seminar Series presents:

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November 15, 3:00pm, Cohn Hall 133

*Nanopterion-stegoton traveling waves in mass and
spring dimer Fermi-Pasta-Ulam-Tsingou lattices*



ABSTRACT

The Fermi-Pasta-Ulam-Tsingou (FPUT) lattice is an infinite chain of particles connected by nonlinear springs and constrained to move horizontally. Such a lattice is a simple, effective prototype for the dispersion of waves in granular media. I will present results for two species of heterogeneous lattices: the mass dimer (which has alternating particle masses and identical spring forces) and the spring dimer (which has constant masses but alternating forces). In each case, the traveling waves are not classical solitary waves, which decay exponentially fast to zero at infinity, but instead are *nanopterions*. That is, the wave profile is the sum of an exponentially decaying function and a periodic function, so that at infinity the wave is asymptotically periodic. As much as possible, I will provide background on the underlying techniques from functional analysis, Fourier analysis, and bifurcation theory for the audience's exposition and entertainment. These results constitute the majority of my dissertation, which has been directed by J. Douglas Wright at Drexel University.

This talk will be accessible to Juniors and Seniors.

Refreshments will be served