

Speaker: Muhittin Mungan, Bogazici University Physics Dept. and the Feza Gursey Institute.

Title: Frenkel-Kontorova Models, Pinned Particle Configurations and Burgers Shocks

Abstract:

We analyze the relationship between the lowest energy configurations of an infinite harmonic chain of particles in a periodic potential and the evolution of characteristics in a periodically-forced inviscid Burgers equation. The shock discontinuities in the the Burgers evolution arise from thermodynamical considerations and play an important role as they separate out flows related to lowest energy configurations from those associated with higher energies. We study in detail the exactly solvable case of an external potential consisting of parabolic segments, and calculate analytically the lowest energy configurations, as well as excited states containing discommensurations. This is joint work with my former MS student Cem Yolcu.