Thursday, November 13, 2014
4 pm in Hume 331

Dynamics of some Fermi–Ulam models

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Fermi acceleration is a mechanism which allows an interacting particle to extract arbitrarily large amounts of energy from a stationary environment. In the early 1940's Fermi and Ulam designed simple dynamical systems to model this phenomenon, they made numerical experiments and obtained results which corroborated the ideas which were then used to explain the occurrence of high energy cosmic rays ("On the origin of cosmic radiation" [Fermi, 1949]).

In this talk I will describe the dynamics of a number of dynamical systems inspired by the work of Fermi and Ulam; I will report on recent and ongoing work, based on a combination of ideas from classical KAM (Kolmogorov-Arnold-Moser) theory and modern techniques in hyperbolic dynamics.

This is part of a joint project with D. Dolgopyat.