MATH DEPARTMENT COLLOQUIUM

DR. OKSANA BIHUN

FEBRUARY 24, 2015
12:30PM-1:30PM
OSB A327

REFRESHMENTS AT 12:15PM
STUDENTS ARE ENCOURAGED TO ATTEND

Goldfishing: Solvable N-Body Problems and Beyond

Poincare showed that the integrability of Hamiltonian systems is not a generic property. However, the discussion of exceptional integrable systems is important in understanding various phenomena, in particular the interaction of N particles subject to Newtonian forces. Zakharov compares the mathematician who uses the dressing method to find a new integrable system to a fisherman who tries to catch a goldfish. A recently discovered, by the speaker and Francesco Calogero, goldfish-type N-body model featuring 19 arbitrary parameters and three-body interactions will be presented. We will discuss the conditions under which this system is isochronous (all the solutions are periodic with the same period independent of the initial data). We will see how the linearization of this system about its equilibria leads to a discovery of new and remarkable properties of the Jacobi polynomials.