

ICTS Seminar

Title : Geometry and Integrability of Mechanics on Curved Spaces

Speaker : Sumanto Chanda, S.N. Bose National Centre for Basic Sciences,
Kolkata

Date : Wednesday, August, 8, 2018

Time : 2:00 PM

Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore

Abstract : The topic of integrable systems deals with ideally solvable non-linear differential equations, such as those dealt with in the study of mechanics on curved spaces. Such systems are also suspected to be various reductions of Yang-Mills systems. In this seminar, I will explore formulation of Jacobi metric for a time-independent spacetime metric as an effective reduction of the geodesic to lower dimensions. A similar formulation will then be demonstrated for a spacetime metric dependent on time, involving the Eisenhart-Duval lift as a vital step, followed by the application of Jacobi metric formulation to Kepler and oscillator systems. I will then talk about the generalized Darboux-Halphen system as a reduction of self-dual Yang-Mills equation, and the formulation of its Lax-Pair and Hamiltonian, followed by its connection to the self-dual Bianchi-IX gravitational instanton. Finally, I will briefly discuss the geometric formulation of relativistic mechanics for accelerating bodies on curved spaces.