

Singular integral affine structures and completely integrable Hamiltonian systems

Daniele Sepe (UFF)

Abstract:

Given a symplectic manifold, a completely integrable Hamiltonian system on it is a set of sufficiently many Poisson commuting functions which are, in some sense, independent, e.g. a spinning top with conserved energy and angular momentum. Under some mild assumptions and away from singularities (which dynamically correspond to equilibria), such systems can be classified using ideas due to Duistermaat and Dazord and Delzant: the key observation being that the moment map image inherits an integral affine structure, which is a rigid geometric structure of its own interest. The aim of this talk is to present a way to incorporate singularities in this framework using a differential-geometric notion of singular integral affine structures; these allow to unify and extend known results on the classification of completely integrable Hamiltonian systems with singularities. Some examples will be presented to illustrate the theory developed so far. This is (very much!) ongoing work with Rui Loja Fernandes.