Bernoullis Tafelrunde

Graduate Student Seminar

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Seminarraum 05.002, Spiegelgasse 5

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Geometry of the fibres of some integrable systems

Abstract

A Hamiltonian system on $\mathbb{R}^{2n}$ or $\mathbb{C}^{2n}$ is a system of first order linear differential equations of the form $\dot{q} = \frac{\partial H}{\partial p}, \dot{p} = -\frac{\partial H}{\partial q}$ with an energy function H depending on position q and momentum p, called the Hamiltonian. It is called integrable if there exist n independent constants of motion which are in involution. This can be generalized to symplectic manifolds or varieties.

The n constants of motion define a morphism $F : \mathbb{C}^{2n} \longrightarrow \mathbb{C}^n$ whose smooth fibres are known to be affine parts of complex tori. In this talk we try to understand the geometry of these fibres in some (two- or three-dimensional) examples.