Lie Group and Representation Theory Seminar

Date: October 12 (Tue), 2004, 16:30–17:30
Place: RIMS Room 402
Speaker: Bernhard Krötz (RIMS)
Title: Lagrangian submanifolds and moment convexity

Abstract:

Consider a Hamiltonian torus action $T \times M \to M$ on a compact and connected symplectic manifold $M$. Associated to this data is the moment map $\Phi : M \to t^*$. It is a remarkable structural fact, due to Atiyah and Guillemin-Sternberg, that the image of $\Phi$ is a convex polytope. The AGS-theorem was generalized by Duistermaat who showed that if $Q$ is Lagrangian submanifold of $M$ which arises as the fixed point set of a $T$-compatible anti-symplectic involution, then $\Phi(Q) = \Phi(M)$ is a convex polytope.

In this talk we present a result which extends Duistermaat’s Theorem in the sense that it substantially enlarges the class of Lagrangians $Q \subset M$ for which $\Phi(Q) = \Phi(M)$ holds. As an application one can give now symplectic proofs of all known convexity statements in Lie theory. As a prominent new example we will outline a symplectic proof of Kostant’s non-linear convexity theorem.

The talk will be preceeded by a 60 min introductory lecture on Hamiltonian torus actions.

References


Prior to this seminar, Kroetz will give an introductory lecture on Hamiltonian torus actions from 15:00-16:00 in the same room.