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Symplectic quotients and their cohomology

Suppose M is a manifold equipped with a nondegenerate closed 2-form (a symplectic manifold, the generalization of the phase spaces of classical mechanics). If M has a symmetry group which acts preserving the symplectic form, it is often possible to divide out the symmetry group and form a new symplectic manifold, the symplectic quotient. In this lecture I shall talk about one problem which has occupied my recent research, which is the determination of the cohomology of the symplectic quotient: as a group (dimensions of cohomology groups) and as a ring (cup product or intersection pairing).