JONATHAN FISHER, University of Toronto
The Kirwan method in hyperkähler geometry

Following ideas of Atiyah and Bott, Kirwan studied symplectic reductions M//K using K-equivariant Morse theory on M. In particular, she proved that the Kirwan map, a natural map from the K-equivariant cohomology of M to the ordinary cohomology of the reduced space M//K, is surjective. In hyperkähler geometry, there is a quotient construction analogous to symplectic reduction, but it is not known in general whether the hyperkähler Kirwan map is surjective. I will describe recent work in which we develop the requisite Morse theory, at least when K is abelian. This gives surjectivity results for all hypertoric varieties, as well as certain Nakajima quiver varieties and some related quotients. This is joint work with Lisa Jeffrey.