

Seminari de Geometria Algebraica 2009/2010 (UB-UPC)

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Morse theory and stable pairs

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For compact symplectic manifolds with a hamiltonian action by a connected, compact Lie group G , a theorem of Kirwan states that the Morse theory of the square of the moment map gives a stratification that is perfect for G -equivariant cohomology. Atiyah-Bott showed that the space of unitary connections on a bundle over a Riemann surface gives an infinite dimensional example of this phenomenon.

In this talk I will discuss some recent results on certain singular versions of this picture obtained when one looks at bundles coupled with a holomorphic section of an associated bundle. Specific examples include Higgs bundles and Bradlow pairs. I will show how calculations of equivariant cohomology of moduli spaces is still possible, even though the Morse stratification fails in general to be perfect.
