Title: Boundary N=2 Theory, Floer Homologies, Affine Algebras, and the Verlinde Formula

Abstract:

I will explain how topologically-twisted N=2 gauge theory on a four-manifold with boundary, will allow us to furnish purely physical proofs of (i) the Atiyah-Floer conjecture, (ii) Munoz's theorem relating quantum and instanton Floer cohomology, (iii) their monopole counterparts, and (iv) their higher rank generalizations. In the case where the boundary is a Seifert manifold, one can also relate its instanton Floer homology to modules of an affine algebra via a 2d A-model with target the based loop group. As an offshoot, we will be able to demonstrate an action of the affine algebra on the quantum cohomology of the moduli space of flat connections on a Riemann surface, as well as derive the Verlinde formula.