Representation Theory, Geometry & Combinatorics Seminar

Organizer(s): M. Haiman, K. Reshetikhin, D. Hill & J. Sussan

Monday, 1:00–3:00pm, 939 Evans

10/20/2008 **A.J. Tolland**, UCB
Gromov-Witten Invariants for $\mathrm{pt}/\mathbb{C}^\times$

Gromov-Witten invariants are the intersection numbers of a completion of the stack of maps from smooth complex curves to a smooth projective variety X. In this talk, I'll explain how to define analogous invariants when X is instead the classifying stack $\mathrm{pt}/\mathbb{C}^\times$, i.e., when our moduli stack is the stack $\mathcal{M}_{g,n}(\mathrm{pt}/\mathbb{C}^\times)$ of smooth complex curves carrying algebraic principal $\mathbb{C}^\times$ bundles.

This is slightly tricky for two reasons: First, $\mathcal{M}_{g,n}(\mathrm{pt}/\mathbb{C}^\times)$ is always an Artin stack (its points have continuous families of automorphisms), and second, none of the completions of $\mathcal{M}_{g,n}(\mathrm{pt}/\mathbb{C}^\times)$ which are suitable for our purposes are of finite type. Consequently, in cohomology, there is no way to "integrate" over our moduli stack and so obtain intersection numbers. We'll see, however, that one can carry out the required "integrations" in K-theory. In particular, we'll show that the indices of tautological K-theory classes on the most natural completion of $\mathcal{M}_{g,n}(\mathrm{pt}/\mathbb{C}^\times)$ always have support on a substack of finite type.