February 18: Alexander Braverman (Brown University), "Instanton counting via affine Lie algebras." FOLLOWED BY DINNER.

This talk will consist of two parts. The purpose of the first part is to define and study the connection between the following objects attached to a semisimple group G:

1) (The generating function of) certain genus 0 Gromov-Witten invariants of (partial) flag manifolds.
2) (Certain mathematical versions of) the partition function of $N = 2$ SUSY gauge theory in 4 dimensions (these words appear in the abstract just in order to "scare" you; everything will be completely mathematical and rather elementary).

More precisely, we shall explain how to think about 2 as an "affine" version of 1.

In the second part of the talk we shall explain how to compute 1 and 2 using representation theory of certain Lie algebras (finite-dimensional in case 1 and affine in case 2). In case 1 this will enable us to reprove some results of Givental-Kim; in case 2 this leads to certain formulas which in particular allow to prove a certain conjecture of N. Nekrasov for arbitrary G as above (for $G = SL(n)$ it was proved by Nekrasov-Okounkov and by Nakajima-Yoshioka by totally different methods).

The results are partially joint with Finkelberg-Gaitsgory and with P. Etingof.