Representation Theory, Geometry & Combinatorics Seminar

Organizer(s): M. Haiman and K. Reshetikhin

Wednesday, 4:00–6:00pm, 939 Evans

Jan. 28   **Peter Tingley**, Melbourne
The Fock space for affine $sl(k)$ and representations of $gl(n)$

We consider a certain 'Fock space' representation for affine $sl(k)$. This is reducible, but has many nice properties. In particular it has a basis indexed by partitions, and has a natural quantized version which is useful in studying the crystal of the fundamental representation. Finite dimensional irreducible representations of $gl(n)$ are also indexed by partitions (with at most n parts). Thus one might want to identify Fock space with the Grothendieck group of this category. In fact, there are functors on the category which, in the large n limit, act on the Grothendieck group as the Chevalley generators of the lower triangular part of affine $sl(k)$. These are kind of ad-hoc, but one can shift to an appropriate quantum group at a root of unity and they appear more natural. With some more work one can also understand the q-deformed Fock space, but then the construction is less functorial. This is joint work with Arun Ram. It is largely expository, but perhaps some of the packaging is new.