May 6, 2015: Harold Williams (University of Texas at Austin), *Cluster Algebras as Microlocal Knot Invariants.*

We explain a new connection between cluster algebras and Legendrian knots. The starting point is a recently introduced microlocal invariant of Legendrian knots due to Shende-Treumann-Zaslow. It is a moduli space of objects which can be viewed in various ways: constructible sheaves, objects in a Fukaya category, or augmentations of the Chekanov-Eliashberg dga. For specific choices of knot, it turns out these invariants recover essentially all examples of cluster varieties related to the group SL_n. Cluster varieties are spaces whose coordinate rings are equipped with canonical bases and which appear in many guises in geometry and representation theory. They include character varieties of punctured surfaces and various strata of algebraic groups and homogeneous spaces. Using the microlocal interpretation of these spaces we explain how their cluster structure and the associated combinatorics of bicolored surface graphs reflects in a precise way relationships among exact Lagrangian fillings of the associated Legendrian knot. This is joint work in progress with Vivek Shende, David Treumann, and Eric Zaslow.