April 23: Pavel Etingof (MIT), " Representations of Cherednik algebras."

More than 10 years ago Cherednik introduced double affine Hecke algebras corresponding to root systems, which played a fundamental role in his proof of the famous Macdonald conjectures. It was soon realized that these algebras are very interesting objects by themselves, maybe even more interesting than the conjectures for proving which they had been introduced.

In the recent years, much attention was paid to representation theory of the double affine Hecke algebras and their trigonometric and rational degenerations, which may be collectively called "Cherednik algebras." This representation theory is very rich and is related to equivariant K-theory of the affine Steinberg variety (Vasserot) and representations of p-adic loop groups (Gaitsgory-Kazhdan). Nevertheless, relatively little explicit information about representations (e.g. dimensions, characters) is available. This makes the representation theory of Cherednik algebras an attactive topic of study.

I will discuss what is known about representations of Cherednik algebras, focusing on finite dimensional representations (which are somewhat better understood than general representations), specifically on type A (the best understood case). In this case, there is a complete picture worked out by Cherednik, Berest-Etingof-Ginzburg, and Oblomkov. Time permitting, I will briefly discuss the much more difficult type B case, which we recently studied with T. Chmutova.