November 3: Roman Bezrukavnikov (Northwestern), "Cohomology of tilting modules over quantum groups at roots of unity." FOllOWED BY DINNER.

Let g be a semi-simple Lie algebra, and U_q be the Lusztig's quantum enveloping algebra at a root of unity q (where the order of q is large and prime to 6). For a module M over U_q its cohomology $H(M) = H^*(u_q, M)$ carries a natural action of the algebra $H^*(u_q) \cong O(N)$ where $O(N)$ is the algebra of regular functions on the nil-cone $N \subset g$ (the isomorphism is due to Ginzburg and Kumar). Thus $H(M)$ defines a coherent sheaf on N, which carries a natural G-equivariant structure. J. Humphreys conjectured what the support of the sheaf $H(T)$ is where T is a tilting module. I will give an explicit description of $H(T)$ as a coherent IC sheaf; the description also implies Humphreys' conjecture. The method is based on the Koszul duality formalism, and some results (joint with Arkhipov and Ginzburg) which allow to eventually reduce the statement to purity of IC sheaves on the affine flag variety.