February 11: Maxim Vybornov (MIT), "A quiver for the BGG category $\mathcal{O}$: recent developments and a combinatorial challenge."

Explicit description of representation-theoretic categories in terms of quivers had been a significant part of I.M. Gelfand's philosophy in the 60s and 70s. The problem of finding such a description for the BGG category $\mathcal{O}$, though partially solved by the historic breakthrough of the Kazhdan-Lusztig theory, defied the complete solution for about 30 years now.

In this talk we use our results on perverse sheaves to explain how this problem is now reduced to a combinatorial challenge of finding intertwiners between certain representations of the polynomial coinvariants of the Weyl group.

Our construction of perverse sheaves, or IC-modules, does not use the derived categories and t-structures and makes sense for a wide variety of stratified spaces including toric varieties, affine Grassmannians, and locally symmetric spaces.