April 5: Gus Lonergan (MIT), *Frobenius twist in geometric Satake*

Geometric Satake gives an equivalence of tensor categories between the category of spherical perverse sheaves mod p on the (complex) affine Grassmannian for G and representations of the mod p Langlands dual group $G^\vee$. One natural question is to understand which operation on perverse sheaves corresponds to the Frobenius twist on the representation category. We give a description in terms of a relative of the Beilinson-Drinfeld deformation and a Gysin homomorphism.

As a somewhat technical enhancement of this, we upgrade the "pth convolution power" functor on the equivariant derived category to a functor which takes values in the equivariant derived category of $k[\mathbb{Z}/p\mathbb{Z}]$-modules, with a view to eventually constructing a (conjectural) "derived Frobenius twist on the affine Grassmannian."