

## Algebraic K-Theory Seminar

### *Norms in motivic homotopy theory*

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**Abstract:** A standard feature of cohomology theories are additive transfers, like the proper pushforward on Chow groups or the flat proper pushforward in K-theory. Many cohomology theories also admit multiplicative transfers along finite covering maps, called norms, whose construction is typically more subtle. For example, Fulton and MacPherson constructed norms on Chow groups of smooth varieties in order to compute characteristic classes of vector bundles, and Joukhovitski constructed norms on the Grothendieck group  $K_0$ . In joint work with Tom Bachmann, we extend these norms to higher Chow groups and higher K-theory. This is done by developing a framework for norms that generalizes the notions of symmetric monoidal  $\infty$ -category and of commutative algebra in a rather different direction than the theory of  $\infty$ -operads. This allows us to speak of a "normed motivic spectrum", which is a strengthening of a motivic  $E_\infty$ -ring spectrum and is an analog of the notion of "G-commutative ring spectrum" in equivariant homotopy theory. Many motivic spectra arising from geometry are normed spectra (in particular motivic cohomology, K-theory, algebraic cobordism and its variants). This rich structure accounts for Voevodsky's power operations in motivic cohomology.

Wednesday, October 18 at 10:30 AM in SEO 1227