Title:
Central extensions and $\mathbb{A}^1$-fundamental groups

Abstract:
We will describe the sheaf of $\mathbb{A}^1$-fundamental groups of a split reductive group and discuss some consequences. We will discuss how our main result uniformly explains the classical results of Matsumoto and Brylinski-Deligne on universal central extensions of split reductive groups and gives a new proof of these results only using foundational results from motivic homotopy theory. The key new tool is the introduction of a new homology theory for spaces, which is often entirely computable especially when the space in question admits a "nice" stratification. This talk is based on joint work with Fabien Morel.