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## Algebraic structures of Steinberg modules 2: Indecomposables

*Thursday 12 June 2025 09:00 (50 minutes)*

I will begin by describing a conjecture of Rognes regarding high connectivity of a certain simplicial complex called the common basis complex. This complex appears when studying rank filtrations of algebraic K-theory. I will describe the relationship between this simplicial complex and Steinberg modules. In particular, the homology of the common basis complex computes the derived commutative indecomposables of the equivariant ring built out of the Steinberg modules. Using this observation, we will see that Rognes' connectivity conjecture is intimately related to the Church—Farb—Putman vanishing conjecture. Following joint work with Patzt and Willson, I will sketch a proof of this connectivity conjecture in the case of fields and describe the Koszul dual of the ring built out of Steinberg modules. These results are equivariant versions of results of Galatius—Kupers—Randal-Williams. Time permitting, I will describe similar results for other families of groups such as symplectic groups (joint with Scalumandre and Sroka) and  $\mathrm{Aut}(F_{<n>})$  (joint with Brück and Piterman).

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