1153-20-279 **Farid Aliniaeifard** and **Nathaniel Thiem*** (thiemn@colorado.edu). *A categorification of the Malvenuto–Reutenauer algebra via a tower of groups.*

There is a long tradition of categorifying combinatorial Hopf algebras by the modules of a tower of algebras (or even better via the representation theory of a tower of groups). From the point of view of combinatorics, such a categorification supplies canonical bases, inner products, and a natural avenue to prove positivity results. Recent ideas in supercharacter theory have made fashioning the representation theory of a tower of groups into a Hopf structure more tractable. As a demonstration, this talk reports on the results of the following challenge: (1) Pick a well-known combinatorial Hopf algebra, (2) Find a way to categorify the structure via a tower of groups. In this case, we show how to find the Malvenuto—Reutenauer algebra in the representation theory of a tower of elementary abelian p-groups. (Received August 30, 2019)