Non-commutative symmetric functions and related Hopf algebras

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102 Bradley Hall, 4:00 pm
(Tea 3:30 pm Math Lounge)

Abstract

We start by recalling the construction of the descent algebra of Solomon. This is a subalgebra of the symmetric group algebra with ties to free Lie algebras on one hand and to the representation theory of the symmetric group on the other.

Next we enlarge the picture to include non-commutative and commutative symmetric functions. We give a brief overview of the significance of the Hopf algebra structure of these objects from the point of view of representation theory.

We then discuss the construction of a closely related Hopf algebra of permutations through Schur-Weyl duality and the convolution of endomorphisms, due to Malvenuto and Reutenauer.

Finally, we mention some generalizations involving other dualities or other products of endomorphisms, which is the subject of work in progress.

This talk should be accessible to general faculty.