Combinatorial Hopf Algebra

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(Tea 3:30 pm Math Lounge)

Abstract

Combinatorial Hopf algebras are graded connected Hopf algebras with basis indexed by combinatorial objects. There has been renewed interest in these spaces in recent years (e.g., Conne-Kreiner Hopf algebra of trees or Loday-Ronco Hopf algebra). One particularly interesting aspect of recent work has been to realize a given combinatorial Hopf algebra as the Grothendieck Hopf algebra of a tower of algebras.

The prototypical example is the Hopf algebra of symmetric functions viewed, via the Frobenius characteristic map, as the Grothendieck Hopf algebras of the modules of all symmetric group algebras. The multiplication is given via induction and the comultiplication is the sum over some restrictions. The Schur symmetric functions are then canonically defined as the Frobenius image of the simple modules.

There are many more examples of this kind of connection

This talk should be accessible to graduate students.