Title: Yetter-Drinfel'd Hopf Algebras and Their Extensions

Abstract: The definition of a Hopf algebra is meaningful in any quasisymmetric monoidal base category. For ordinary Hopf algebras, this base category is the category of vector spaces. In the category of vector spaces, the tensor product of two algebras becomes again an algebra by interchanging the two middle tensor factors and then multiplying inside the originally given algebras. In other base categories, this interchange operation is replaced by a more general quasisymmetry.

For Yetter-Drinfel'd Hopf algebras, the base category is the category of Yetter-Drinfel'd modules. Yetter-Drinfel'd Hopf algebras appear in the theory of ordinary Hopf algebras when considering the appropriate notion of semidirect product, the so-called Radford biproduct, where one of the two factors is in general not an ordinary Hopf algebra, but rather a Yetter-Drinfel'd Hopf algebra.

Following the now classical theory of group extensions, the extension theory for ordinary Hopf algebras has been developed over a long period of time, starting at least in the sixties of the twentieth century. The corresponding theory for Yetter-Drinfel'd Hopf algebras has a special feature, as in examples the so-called cleaving and cocleaving maps are not morphisms in the base category. In the talk, we give an introduction to Yetter-Drinfel'd Hopf algebras and then cover these aspects of their extension theory.