Abstract

Beyond the Hopf algebra, another bialgebra theory on algebras is the infinitesimal bialgebra, associative first discovered by Joni and Rota from combinatorics in the 1970s. In a similar style, Lie bialgebras were introduced by Drinfeld in the early 1980s, evolving into a comprehensive theory including Manin triples, the classical Yang-Baxter equation, relative Rota-Baxter operators (O-operators) and pre-Lie algebras. After a parallel theory for the infinitesimal bialgebra was obtained in the 2000s thanks to the works of M. Aguiar and C. Bai, similar theories have been established for a large class of algebraic structures, more recently for algebraic structures equipped with uniary operations such as differential and Rota-Baxter operators. This talk gives an introduction to the background and some of these progresses. The talk includes joint works with Chengming Bai, Yanyong Hong, Tianshui Ma, Yunhe Sheng and others.