Abstract

In this talk, first we introduce the notion of a post-group, which is an integral object of a post-Lie algebra. Then we find post-group structures on Butcher group and $\huaP$-group of an operad $\huaP$. Next we show that a relative Rota-Baxter operator on a group naturally split the group structure to a post-group structure. Conversely, a post-group gives rise to a relative Rota-Baxter operator on the subadjacent group. We prove that a post-group gives a braided group and a solution of the Yang-Baxter equation. Moreover, we obtain that the category of post-groups is isomorphic to the category of braided groups and the category of skew-left braces. What's more, we give the definition of a post-Lie group and show that there is a post-Lie algebra structure on the vector space of left invariant vector fields, which verifies that post-Lie groups are the integral objects of post-Lie algebras. Finally, we utilize the post-Hopf algebras and post-Lie Magnus expansion to study the formal integration of post-Lie algebras.