Representation Theory, Geometry & Combinatorics Seminar

Organizer: M. Haiman and N. Reshetikhin

Wednesday, 4:00–6:00pm, 939 Evans

Apr. 14 **Ivan Shestakov**, IME-USP, São Paolo

Nonassociative Lie Theory

The theory of Lie algebras is one of the corner-stones of modern mathematics and physics. They usually relate with associative structures, such as groups, associative algebras, Hopf algebras. There were various attempts to generalize them to a 'non-associative' setting. In this way were introduced Lie triple systems, Malcev algebras, Bol algebras, Akivis algebras, etc. Recently, all these concepts were generalized and unified in the framework of so called *Sabinin algebras* which appeared first in geometry and then were transferred to algebra. The first results about these algebras and their universal enveloping algebras look very promising and show that they may be considered as a proper candidate for developing a 'non-associative Lie theory.' A series of important aspects of the Lie theory were well generalized to Sabinin algebras. Roughly speaking, the Lie theory and its relation with Hopf algebras may be generalized to nonassociative setting when we substitute Lie algebras with Sabinin algebras, Hopf algebras with nonassociative bialgebras, (formal, Lie) groups with (formal, analytic) loops, etc. In our talk, we will give a survey of these results.

A. Yu. Volkov, Steklov Mathematical Institute, St. Petersburg

On the Periodicity Conjecture for Y-systems

Y-systems are a certain family of algebraic recurrence equations, which emerged in the early nineties in the study of the Thermodynamic Bethe Ansatz. They are naturally associated to arbitrary pairs of Dynkin diagrams, and the periodicity conjecture asserts that all solutions to those systems are periodic with period equal to twice the sum of the respective Coxeter numbers. Although this conjecture has by now been largely proved, there remain open questions. In this talk, I will review several approaches to the problem and present some recent developments.