Lectures on **Geometry of word equations in simple algebraic groups**

Speaker: Kunyavskii

Abstract:
The main object of this talk is the equation w(x,y)=g where g is an element of a group G and solutions (x,y) are sought among pairs of elements of G. The focus is on the case where G is the group of k-points of a simple linear algebraic k-group.

In the first part of the talk, I will give a survey of recent developments in the investigation of such word equations over special fields: complex, real, p-adic (or close to such), or finite.

In the second part, based on a recent joint work with Bandman and Skorobogatov, we consider the case G=SL(2,k). We show that the affine variety S(g) of solutions of this word equation is closely related to an explicit smooth conic bundle over the associated 'trace surface' in the 3-dimensional affine space, and the birational type of S(g) depends only on the trace of g and the trace polynomial of w.

When w=[x,y] is the commutator word, we use the unramified Brauer group to show that the variety S(g) can be irrational if k is not algebraically closed, answering a question of Rapinchuk, Benyash-Krivetz, and Chernousov.

Shcedule: Fenruary 24, 26 at 11:00 a.m.