GROUPS, LOGIC, AND COMPUTATION. GAGTA-2025

Andrey Nikolaev

Stevens Institute of Technology

Nonstandard Group Theory.

June 6–13, 2025

Abstract:

Interpretation in integers allows us to define nonstandard models of finitely or recursively presented groups, which we call nonstandard groups. In this talk, we describe basic structure and some properties of nonstandard groups, introduce the notion of a nonstandard presentation, and give some examples of nonstandard groups. In particular, we show that under certain assumptions, ultrapowers of a group can be viewed as nonstandard groups. This allows to describe the structure of the ultrapowers in terms of the structure of nonstandard models of natural numbers, offering insight into a longstanding question of Malcev and Tarski. (Joint work with A.Miasnikov.)