Popular science project summary

Classifying first-order theories by methods of model theory is often done by considering some combinatorial configurations, whose absence in a given theory indicates some desired properties of a theory which allow us to understand it better.

Among the most important conditions of this type there are: the order property, whose absence is equivalent to stability of a theory, and the tree property, whose absence is equivalent to simplicity.

Another, less explored condition of this kind it the tree property of the first kind (TP$_1$). The results obtained recently by Chernikov and Ramsey indicate that theories without this property (so-called NTP$_1$ theories) also have some properties which allow, to a certain degree, to analyze them by methods analogous to those used in stability theory and simplicity theory. On the other hand, the class of NTP$_1$ theories contains a bigger variety of examples, also ones considered in classical branches of mathematics.

The goal of our project is to obtain a better understanding of theories with NTP$_1$, and also to find more interesting examples of theories with this property. We believe that the project will lead to a significant improvement of the knowledge about NTP$_1$ theories, allowing to understand better the dividing lines considered in model theory.