

Model Theory and Its Applications

Conference Manual

I. Conference Basic Information

Conference Name: Model Theory and Its Applications (Model Theory and Interactions in the Yangtze Delta-Shanghai)

Date: November 24-28, 2025

Venue: Room 2301 (Glass Room), Guanghua Building, Handan Campus, Fudan University

II. Tutorial Session

Speaker: Ronnie Nagloo

Title: Functional Transcendence and the Model Theory of Differential Fields

Abstract: Over the past 15 years, following the work around the Pila-Wilkie counting theorem in the context of o-minimality, there has been a surge of interest in functional transcendence results - in part due to their connection with special points conjectures. A prime example is the Ax-Lindemann-Weierstrass (ALW) theorem and its role in the proof of the André-Oort conjecture.

III. Talks Session

3.1 Leo Jimenez

Title: Algebraic relations between solutions of Lotka-Volterra systems: a complete classification

Abstract: The classical Lotka-Volterra (LV) systems are used in population dynamics to provide a very simplified model of predator-prey interactions. It is natural to ask if there are any relations between solutions of these systems for different initial values and/or different parameters. As one of the simplest systems of non-linear algebraic differential equations, the LV systems are a good test case for recently developed model-theoretic methods to answer these questions. In this talk, I will provide a complete classification of algebraic relations between solutions of LV systems, and explain how model theory plays a key role in this endeavor. This is joint work with Yutong Duan and Christine Eagles, with some important input from work of Duan and Ronnie Nagloo.

3.2 Kyle Gannon

Title: Generic sampling and invariant measures on the space of k -uniform hypergraphs

Abstract: We prove a model-theoretic representation theorem for the distribution of an ergodic exchangeable k -uniform hypergraph: every such measure arises as the pushforward of the countably-iterated Morley product of a global Borel-definable Keisler measure over the countable universal homogeneous k -uniform hypergraph. We show this by starting with a Borel k -hypergraphon W and constructing a Keisler measure μ_W such that generic sampling with respect to μ_W yields the same invariant measure as does the standard hypergraphon sampling procedure with respect to W . When $k=2$, our results give a new representation theorem for ergodic exchangeable graphs via Keisler measures over a monster model of the Rado graph. This work is joint with Nathanael Ackerman, Cameron Freer, James E. Hanson, and Rehana Patel.

3.3 Daniel Hoffmann

Title: Decomposition of invariant measures in NIP

Abstract: Together with Tomasz Rzepecki, we deploy some machinery from my recent paper with Kyle Gannon and Krzysztof Krupiński on the $*$ -product and convolution semigroups. I plan to demonstrate how the $*$ -product might be used to describe ergodic measures in NIP theories, i.e., to decompose every invariant Keisler measure into basic components supported on Ellis groups of a certain minimal left ideal of a semigroup of types equipped with the $*$ -product.

3.4 Jan Dobrowoski

Title: The model theory of generic bilinear forms and some related topics

Abstract: I will discuss various developments in model theory of bilinear forms and some related topics, focussing on the two-sorted theory of generic symmetric/alternating bilinear forms introduced by Granger.

3.5 Manat Mustafa

Title: Computable numberings and Rogers semilattices

Abstract: TBA

3.6 Nikolay Bazhenov

Title: On the complexity of isomorphisms for computable and decidable models

Abstract: Mal'tsev (1961) introduced the notion of computable categoricity (or autostability). A computable model M is computably categorical if, for every computable model N that is isomorphic to M , there exists a computable isomorphism

from M onto N . Since the 1960s, computable categoricity (and its modifications) has become one of the central topics in computable structure theory. Over the last 15 years, investigations of effective categoricity have focused on the Turing complexity of isomorphisms. In this talk, I will give an overview of some recent results on effective categoricity for computable and decidable models.

3.7 Nurlan Markhabatov

Title: On the pseudofiniteness of some structures

Abstract: This talk examines pseudofinite structures and their associated model-theoretical properties. The first section introduces the basic concepts of pseudofinite theories and approximations of theories, discussing their key characteristics and construction methods. The second section analyzes the pseudofiniteness of several fundamental theories: the theory of acyclic graphs, the theory of Abelian groups, and the theory of unary algebras. Particular attention is given to pseudofiniteness criteria and their interpretation through finite fragments of models. The final section examines direct products of theories, exploring their pseudofiniteness and smooth approximability. The same properties are explored for the model companions of the theory. This research has been funded by the Science Committee of the Ministry of Science and Higher Education of the Republic of Kazakhstan (AP26194247).

IV. Conference Schedule

Date	Time	Activity
November 24	10:00-10:50	Tutorial by Ronnie Nagloo
	10:50-11:10	Tea break
	11:10-12:00	Tutorial by Ronnie Nagloo
	12:15-13:30	Lunch (Boxed Meal)
	14:00-15:00	Talk by Leo Jimenez
	15:00-16:00	Talk by Kyle Gannon
November 25	10:00-10:50	Tutorial by Ronnie Nagloo
	10:50-11:10	Tea break

	11:10-12:00	Tutorial by Ronnie Nagloo
	12:15-13:30	Lunch (Boxed Meal)
	14:00-15:00	Talk by Daniel Hoffmann
	15:00-16:00	Talk by Jan Dobrowoski
November 26	10:00-10:50	Tutorial by Ronnie Nagloo
	10:50-11:10	Tea break
	11:10-12:00	Tutorial by Ronnie Nagloo
	12:15-13:30	Lunch (Boxed Meal)
	14:00-15:00	Talk by Manat Mustafa
	15:00-16:00	Talk by Nikolay Bazhenov
	17:30-19:30	Dinner
November 27	10:00-10:50	Tutorial by Ronnie Nagloo
	10:50-11:10	Tea break
	11:10-12:00	Tutorial by Ronnie Nagloo
	12:15-13:30	Lunch (Boxed Meal)
	14:00-15:00	Talk by Nurlan Markhabatov
November 28	10:00-10:50	Tutorial by Ronnie Nagloo
	10:50-11:10	Tea break

	11:10-12:00	Tutorial by Ronnie Nagloo
	12:15-13:30	Lunch (Boxed Meal)