

Abstracts

Speaker: Sandra Müller (TU Wien)

Title: The mystery of Woodin limits of Woodin cardinals

Abstract: Set theory provides a natural framework and powerful tools for calibrating the consistency strength of questions: the large cardinal hierarchy and inner models. The inner model program has been very successful since the 1980's. However, recent results by Larson, Sargsyan, and Trang show that inner models with a Woodin limit of Woodin cardinals are far out of reach of available methods. The inner model program has reached a turning point. In this talk I will propose two scenarios to attack this barrier: infinite games on natural numbers that last uncountably many steps and supercompact measures on the first uncountable cardinal under determinacy.

Speaker: Rahman Mohammadpour (TU Wien)

Title: A devil's staircase perspective on the saturation of the non-stationary ideal

Abstract: In this talk, I discuss a well-known and long-standing open problem in set theory about the non-stationary ideal on the second uncountable cardinal, namely, whether the non-stationary ideal on the second uncountable cardinal is saturated modulo the right cofinality. I give an overview of the known related results, discuss the significance of the problem and propose a strategy to tackle the problem based on a forcing notion with virtual models of two types as side conditions developed previously by Velickovic and the speaker.

Speaker: Monroe Eskew (University of Vienna)

Title: Dense ideals

Abstract: We present a forcing for getting dense ideals on all ω_n simultaneously and discuss some consequences. This is joint work with Yair Hayut.

Speaker: Boban Velickovic (Paris)

Title: The side condition method

Abstract: The method of side conditions is a very powerful tool both for building nicely behaved forcing notions as well as iterating them. We will give a few examples of how this method is used and then discuss the general question : given a problem P when can we add a solution to P by a poset in a given class K of forcing notions. Some of this work is joint with B. De Bondt and O. Kasum

Speaker: Gabriel Goldberg (UC Berkeley)

Title: The HOD conjecture.

Abstract. Woodin's HOD conjecture has been a central open problem in set theory for the past two decades. This talk will outline the origins of the problem and the key developments of the last ten years, touching on aspects of the HOD dichotomy, independence results, and the emerging evidence from the theory of large cardinals beyond choice that the conjecture is false. Finally, we will consider the ramifications of the failure of the HOD conjecture for set theory and the prospects for the inner model theory of supercompact cardinals.

Speaker: Steve Jackson (University of North Texas)

Title: Successor cardinals in determinacy models.

Abstract: We summarize previously known results and present several new results concerning the properties of successor cardinals in determinacy models. In particular we investigate the cofinalities and partition properties of these cardinals. For example, we show that there are cofinally many successor cardinals in $L(\mathbb{R})$ below Θ which have the partition property with exponent δ_1^2 , but do not have the weak partition property. This investigation also leads to some new properties and questions about measures which we present.

Speaker: Dima Sinapova (Rutgers)

Title: The tree property and stationary reflection

We show that from large cardinals, it is consistent to have stationary reflection at $\aleph_{\omega+1}$ together with the tree property, and actually the ITP, at $\aleph_{\omega+2}$. Our construction uses a Mitchell-like version of diagonal extender based forcing. Then we do a Prikry type iteration to also obtain stationary reflection.

Since the tree property at the double successor of a singular strong limit cardinal implies that SCH fails, this is a strengthening of the getting the failure of SCH at \aleph_ω together with stationary reflection at $\aleph_{\omega+1}$. Our result fits into the broader context of obtaining compactness type principles together with instances of incompactness.

This is joint work with Alejandro Poveda

Speaker: James Cummings (CMU)

Title: Collapsing cardinals

Abstract: I will discuss an innocent sounding problem (still open) with connections to PCF, the continuum, forcing axioms and Chang's conjecture.

Speaker: Chris Lambie-Hanson (Prague)

Title: Set theory and derived limits

Abstract: Since the early days of homological algebra, it has been evident that set theoretic techniques are relevant to the study of the inverse limit and its derived functors. In this talk, we will survey some of the history of the interaction between set theory and the study of derived limits, present some recent breakthroughs, and outline some of the prominent remaining open problems. Along the way, we will discuss some connections with topics coming both from pure set theory, such as the study of coherent Aronszajn trees, and from other fields, including homology theory and functional analysis.

Speaker: Farmer Schlutzenberg (TU Wien)

Title: The scale property

Abstract: Scales play a central role in descriptive set theory, both in a pure sense and in understanding its connection to other aspects of set theory. We will discuss scales and the scale property somewhat in general, and outline a method for construction of scales which proceeds directly from large cardinal and/or mouse existence hypotheses.

Speaker: Jouko Väänänen (Helsinki)

Title: Descriptive Set Theory in Generalized Baire Spaces: Applications of set theory to model theory.

Abstract: I will describe the project of extending the Scott-analysis of countable models to the realm of uncountable models. This leads us to Generalized Baire Spaces and to set theoretical problems arising from them.

Speaker: Siskind, Benjamin (TU Wien)
Title: Normalizing iteration trees

Abstract: A fairly recent technical development in inner model theory has been the realization, due to Schlutzenberg and Steel, that many iterates of models of set theory (premise, mostly) are actually normal iterates—that is, iterates via single normal iteration trees (roughly, normal iteration trees are ones in which we do not move generators along branches). This has proven to be very useful in inner model theory and has been essential to some applications to descriptive set theory. While most of this work involves looking at iteration trees in fine-structural settings, the basic ideas make sense in the coarse setting of nice iteration trees on V . We'll present an overview and discuss some applications before going through the basics of how to normalize some iteration trees in the coarse setting, where no familiarity with (fine-structural) inner model theory will be necessary.

Speaker: Stevo Todorcevic (Toronto)
Title: Finding useful forcing axioms

Abstract. This will be a short overview of known attempts of finding useful forcing axioms in order to treat particular problems from other fields of mathematics. While some historical perspective will be given the main purpose of the lecture is to point towards some open problems.

Speaker: Assaf Rinot
Title: May the successor of a singular cardinal be Jonsson?

Abstract: We'll survey what's known about the question in the title.

Speaker: David Chodounsky (Prague)

Title: Wadge classes on ω_1

Abstract: We propose to investigate comparative complexity of classical combinatorial objects of 'height' ω_1 . Examples of object we are looking at are gaps in $P(\omega)$, nontrivial coherent families of functions, Aronszajn trees, and sets cofinal in ω_1 . Joint work with J. Bergfalk, O. Guzman and M. Hrusak.

Speaker: Jan Hubicka (Prague)

Title: Introduction to big Ramsey degrees

Abstract: A structure K is said to have finite big Ramsey degrees if, for every finite substructure A of K , there exists an integer n such that any finite coloring of embeddings of A into K admits an embedding F of K into itself such that colouring restricted to embeddings of A to $F[K]$ takes at most n colours.

We discuss classical result of Devlin and Laver on big Ramsey degrees of rationals which is based on an application of the Milliken tree theorem. Next we review an adaptation of this proof to the Rado graph by Laflamme, Sauer and Vuksanovic.

Recently this area has been revitalized by work of Dobrinen who shown that the big Ramsey degrees of triangle-free graphs are finite. Her proof is based on application of the method of forcing and has been generalized by Dobrinen and Zucker to forbidding arbitrary irreducible substructures.

We give a short proof that the big Ramsey degrees of triangle-free graphs are finite based on an application of the Carlson-Simpson theorem. Based on this connection we show a new Ramsey-type theorem proved recently by Balko, Chodounsk, Dobrinen, myself, Konecny, Nešetřil and Zucker and discuss its applications.

Speaker: Jindrich Zapletal (University of Florida)

Title: Ultrafilters and locally countable structures

Abstract: In the field of Borel locally countable structures and descriptive combinatorics, one can ask which tasks can be performed with the help of a nonprincipal ultrafilter on natural numbers. I will give a survey of what is known in this direction; the main problems remain open.