Abstracts of invited talks in the Special Session on Set Theory

▶ ELIZABETH THETA BROWN, *Uncountable tree forcing*.
Department of Mathematics and Statistics, James Madison University, Harrisonburg, Virginia 22807, USA.
E-mail: `brownet@math.jmu.edu`.

Forcing via partial orders whose conditions are trees on omega, introduced by Sacks, Laver, Miller and others, has been applied to produce results in diverse areas, including cardinal invariants, degrees of constructibility, and nonstandard analysis.

We will discuss forcing with trees over regular uncountable cardinals. As filters over uncountable cardinals behave differently than filters over omega, properties of the generic function and applications do not always parallel the countable case. Even where results can be directly generalized, they are often true for different reasons than at omega. The talk will describe uncountable versions of Miller and Laver forcing, characterize their generic functions, and give sufficient conditions for cardinal preservation, along with some applications.

A short bibliography of some other work in the general area of uncountable forcing will also be provided.

▶ JOHN CLEMENS, *Complemented sets and difference sets*.
Mathematics Department, Penn State University, University Park, State College, PA 16802, USA.
E-mail: `clemens@math.psu.edu`.

A set X of natural numbers is complemented if there is another set Y of natural numbers such that every natural number n is uniquely represented as $n = x + y$ with x in X and y in Y. A set X is a difference set if there is another set Y such that $X = \{|n - m| \colon n, m \text{ in } Y\}$. I will discuss several descriptive complexity results concerning these sets, in particular that the collection of complemented sets is a complete analytic set, as is the collection of sets which contain an infinite difference set.

▶ NATASHA DOBRINEN, *κ-stationary sets are necessary in the investigation of relationships between general distributive laws and infinitary games in Boolean algebras*.
Mathematics Department, Penn State University, University Park, State College, PA 16802, USA.
E-mail: `dobrinen@math.psu.edu`.

For some time, we have been investigating relationships between general distributive laws and infinitary cut-and-choose games (first introduced and investigated by Jech) in complete Boolean algebras. When $\mu \leq \kappa \leq \lambda$ there is an interesting interplay between the $(\kappa, \lambda, < \mu)$-distributive law, whether Player I has a winning strategy for the game $\mathcal{G}^{\kappa}_{<\mu}(\lambda)$, and κ-stationarity of $V \cap [\lambda]^{\leq\kappa}$. The flavor of our results is represented by the following two theorems. If $\mu \leq \kappa^{<\kappa} = \kappa \leq \lambda$ and B is $(< \kappa, \kappa)$-distributive, then B is $(\kappa, \lambda, < \mu)$-distributive and B preserves κ-stationarity of $[\check{\lambda}]^{\leq\kappa} \cap V$ iff Player I does not have a winning strategy for $\mathcal{G}^{\kappa}_{<\mu}(\lambda)$. If B preserves stationarity of $[\check{\lambda}]^{\omega} \cap V$, then B satisfies the weak (ω, ω)-d.l. iff B satisfies the weak (ω, λ)-d.l.

▶ TODD EISWORTH, *Generalizing properness*.
Department of Mathematics, University of Northern Iowa, Cedar Falls, IA 50614, USA.
E-mail: `eisworth@math.uni.edu`.

Proper forcing is an important concept because of two salient properties: (1) it does not collapse $\aleph_1$, and (2) it is preserved by countable support iterations.

We look at the problem of generalizing proper forcing to cardinals larger than $\aleph_1$. We outline the obstacles that show that naive generalizations cannot work, and then discuss recent progress together with some applications.

► TETSUYA ISHIU, *Applications of guessing sequences to general topology*.
Department of Mathematics, University of Kansas, Lawrence, Kansas 66045-7523, USA.
E-mail: ishiu@math.ukans.edu.

Guessing sequences, including $\diamondsuit$-sequences, $\clubsuit$-sequences, and club guessing sequences, have been effectively used in general topology. I will talk about recent applications of the sequences and new methods to construct a guessing sequence with some properties, which were motivated by interests in topology.

► BERNHARD KOENIG, *Preservation of forcing axioms*.
Department of Mathematics, UC Irvine, Irvine, CA 92697-3875, USA.
E-mail: bkoenig@math.uci.edu.

We show that in Banach-Mazur games of length ω_1, it makes a huge difference if we allow either player Empty or Nonempty to play at limit stages. It is folklore, that we can add a $\Box$-sequence with a poset for which Nonempty wins but only if he's allowed to play at limit stages. This is optimal in the following sense: If we force over a model of MM and Nonempty wins the game on the forcing poset in even the stronger sense, then neither ω_2-Aronszajn-trees nor non-reflecting sets are added. We go on to show that full PFA is not preserved by this stronger closure property, but PFA is actually preserved by $< \omega_2$-closed forcings.

This is joint work with Yasuo Yoshinobu.

► BEN MILLER, *Unwed and without direction*.
University of California, Berkeley, USA.
E-mail: bdm@its.caltech.edu.

Modifications of ideas of Dougherty-Jackson-Kechris and Shelah-Weiss can be used to classify a variety of objects other than hyperfinite equivalence relations. We will describe one such example. A Borel forest of lines is undirectable if it is not the (orbit) graph generated by an aperiodic Borel automorphism. Up to a descriptive version of Kakutani equivalence, there is exactly one such forest (in fact, there are exactly three Borel forests of lines up to this notion of equivalence). Such forests are intimately related to the sorts of Borel marriage problems which were studied by Laczkovich and Klopotowski-Nadkarni-Sarbadhikari-Srivastava, and our proofs shed new light on these problems.

► STUART ZOBLE, *Mouse reflection*.
Department of Mathematics, Boise State University, 1910 University Drive, Boise , Idaho 83725-1555, USA.
E-mail: szoble@math.boisestate.edu.

We discuss aspects of the core model induction in the context of the proof (joint with John Steel) that AD holds in $L(R)$ assuming the saturation of the non-stationary ideal together with a suitably formulated notion of mouse reflection in $H(\omega_3)$.