# SET THEORY RESEARCH SEMINAR, JUNE 28, 2022

15:00-15:25, Fortunato Maesano
*Title*: Set versions of star compact and star Lindelöf properties
*Abstract*: Given a topological space $X$ and an open cover $\mathcal{U}$ of it, the star of a subset $A$ of $X$ with respect to $\mathcal{U}$ is the set $st(A, \mathcal{U}) = \bigcup\{U \in \mathcal{U} : U \cap A \neq \emptyset\}$. For a space, the properties to be covered by stars founded on a finite or a countable subset of the cover are called star compact and star Lindelöf properties, both are weaker tha countable compactness and stronger than their pseudo covering property counterpart. We present a new class of star covering properties, namely the set star covering properties, wich were introduced by Kočinac, Konca and Singh, and consist on a generalization both of the previously cited ones and other already known. This is a joint work with M. Bonanzinga (University of Messina).

15:30-15:55, Lukas Schembecker
*Title*: Partitions of Baire space into compact sets
*Abstract*: We define a c.c.c. forcing which adds a maximal almost disjoint family of finitely splitting trees on $\omega$ (a.d.f.s. family) or equivalently a partition of Baire space into compact sets of desired size. Furthermore, under CH we construct a Sacks-indestructible maximal a.d.f.s. family (by countably supported iteration and product). This is joint work with V. Fischer.

16:00-16:15, Marlene Koelbing
*Title*: Covering arrays and independent families
*Abstract*: For ordinal numbers $N$ and $k$ a covering array is an $N \times k$ matrix with entries in some set $v$ such that in every $N \times t$ subarray, each element of $v^t$ occurs. First I will discuss some facts about finite covering arrays, then I will show the existence of an $\omega \times \mathfrak{c}$ covering array, using the connection between covering arrays and independent families.

16:15-16:30, Alexander Wendlinger
*Title*: Ideals associated to independent families
*Abstract*: In this talk we will introduce and briefly discuss two ideals, which are naturally associated to independent families and capture important relevant properties.

16:45-17:40, Ömer Faruk Bag

*Title*: Global Mad Spectra

*Abstract*:: We address the issue of controlling the spectrum of maximal almost disjoint families globally, i.e. for more than one regular cardinal $\kappa$ simultaneously. Assuming we show that there is a cardinal-preserving generic extension satisfying $\forall\kappa \in C(\mathfrak{sp}(\mathfrak{a}_\kappa) = B(\kappa))$ where $C$ denotes the class of successors of regular cardinals together with $\aleph_0$ and $B(\kappa)$ is a prescribed set of cardinals to which we refer as a $\kappa$-Blass spectrum. This is joint work with V. Fischer and S. D. Friedman.

17:45-18:10, Julia Millhouse

*Title*: Suslin trees and Sacks coding

*Abstract*: In recent years, a proper forcing notion was introduced by S. Friedman and V. Fischer, a variation of Sacks forcing that uses perfect trees as a tool for coding subsets $Y$ of $\omega_1$, where $Y$ is generic over the constructible universe $L$ and in $L[Y]$ cofinalities have not been changed. Primary applications of this coding technique have been to produce combinatorial objects of a certain projective complexity, such as well orderings of the reals, mad families, and cofinitary groups. In this talk I will define and state the main properties of this forcing notion which will be of importance to the result I then sketch, showing that if there is a Suslin tree in the ground model, then it remains Suslin after Sacks coding; a 1993 theorem of T. Miyamoto then allows this preservation result to extend to countable support iterations. This is joint work with V. Fischer and C. B. Switzer.

18:15-18:30, Roman Doerner

*Title*: On gaps in ${}^\omega\omega$

*Abstract*: Given a gap in ${}^\omega\omega$, we discuss its behaviour under forcing with certain classes of partially ordered sets. We present selected results regarding the destructibility and indestructibility of gaps under forcing and give an example of a forcing that renders a given gap indestructible.