



Departmental PhD Thesis Exam

Wednesday, July 3rd, 2024 at 2:00 p.m. (sharp)
via Zoom / BA6183

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Supervisors : Stevo Todorčević & Ilijas Farah

Thesis title : Forcing in Analysis and Combinatorics



Abstract

In this thesis, we explore some new applications of the forcing technique in the context of Analysis and Combinatorics by:

(1) Constructing a model of Set Theory in which strong measure zero subsets of the real line are meager-additive while Borel's conjecture fails, answering a long-standing question due to Bartoszyński and Judah.

(2) Constructing a model of Set Theory in which Jensen's \diamond_{\aleph_1} fails, there is a counterexample to Naimark's Problem, and there is a separably represented C^* -algebra with exactly two inequivalent irreducible representations. Such a C^* -algebra cannot satisfy the conclusion of Glimm's Dichotomy Theorem.

(3) Studying families of infinite block sequences of elements of the space FIN_k , Ramsey properties of such families, and Ramsey properties localized on selective or semiselective coideals and ultrafilters.