

RESEARCH STATEMENT

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My main interests in the area of set theory are forcing theory and descriptive set theory. Also, I am deeply interested in the relation between set theory, analysis and topology, especially in obtaining consistency results on these areas.

In my first year as a doctoral student I have been studying applications of forcing to obtain consistency results about cardinal invariants, especially in the case when the continuum is large. Recently, using results about properties preserved in finite support iterations of c.c.c. forcing (see [3], [5] and [7]) and matrix iterations (see [4] and [2]), I have obtained consistency results about Cichon's diagram using several distinct values.

Other particular problem I am interested in is getting models with many distinct cardinal invariants parameterized by reals, like those presented in [6], [8], [9] and [10].

References

- [1] Bartoszynski, Tomek; Judah, Haim. *Set Theory. On the Structure of the Real Line*. A. K. Peters, Massachusetts, (1995).
- [2] Blass, Andreas; Shelah, Saharon. *Ultrafilters with small generating sets*. Israel Journal of Mathematics, vol. 65, (1984), pp. 259-271.
- [3] Brendle, Jörg. *Larger cardinals in Cichon's diagram*. J. Symbolic Logic 56 (1991), no. 3, 795-810.
- [4] Brendle, Jörg; Fischer, Vera. *Mad families, splitting families and large continuum*. J. Symbolic Logic 76 (2011), no. 1, 198-208.
- [5] Goldstern, Martin. *Tools for your forcing construction*. In Haim Judah, editor, *Set theory of the reals*, Israel Mathematical Conference Proceedings, 305-360. Bar Ilan University (1992)
- [6] Goldstern, M. and Shelah, S. *Many simple cardinal invariants*. Arch. Math. Logic 32 (1993), 203-221.
- [7] Judah, Haim; Shelah, S. *The Kunen-Miller chart (Lebesgue measure, the Baire property, Laver reals and preservation theorems for forcing)*. J. Symbolic Logic 55 (1990), no. 3, 909-927.
- [8] Kellner, J. *Even more simple cardinal invariants*. Arch. Math. Logic 47 (2008), 503-515.
- [9] Kellner, J. and Shelah, S. *Decisive creatures and large continuum*. J. Symbolic Logic 74 (2009), 73-104.
- [10] Kellner, J. and Shelah, S. *Creature forcing and large continuum: the joy of halving*. Arch. Math. Logic. 51 (2012), 49-70.