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My research centres around the classification of relational structures (e.g. orders, graphs) and those with extra topological structure (e.g. ordered spaces, Boolean algebras) via the embeddability relation. An embedding is generally an injective structure-preserving map between structures. For example, for linear orders, the ordering is preserved in embeddings. The embeddability relation, $A \leq B$ iff A can be embedded into B, is a quasi-ordering of the structures. I study many aspects of this quasi-order: the top (universal structures or families), the bottom (prime models and bases) and internal properties of the embeddability structure (chains and antichains, the bounding number). Results in these areas are often independent of ZFC and require additional cardinal arithmetic assumptions, combinatorial principles (e.g. diamond, club guessing), forcing techniques (as exotic as oracle-proper) or forcing axioms (e.g. PFA) to decide them.

In studying these questions, I developed a technique together with S. Friedman known as the "tuning fork method". This is a way of using uncountable versions of Sacks forcing ([4]) to change some properties (e.g. cardinal arithmetic) at measurable cardinals while preserving the measurability. Previously this had been done with Cohen forcing by Woodin and Gitik ([3]); our technique is not only simpler but also leads to additional applications. Friedman and I for instance combined this method with Prikry forcing to give a model in which there is no universal graph at the successor of a singular cardinal. The tuning fork method has also been used by Friedman and Magidor ([2]) to control the number of normal measures at a measurable cardinal. J. Cummings and I are working on extending these results to control configurations of measures in the Mitchell order.

My long-term projects are to look into models of set theory where GCH fails everywhere ([1]) and also models where the continuum is at least $\aleph_3$.

For a list of my papers, see

http://www.logic.univie.ac.at/∼thompson

References

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2. S. Friedman and M. Magidor, *The number of normal measures*, Journal of Symbolic Logic **74** (2009), no. 3, 1069–1080.

3. M. Gitik, *The negation of the singular cardinal hypothesis from* $o(\kappa) = \kappa^{++}$, Annals of Pure and Applied Logic **43** (1989), no. 3, 209–234.
4. A. Kanamori, *Perfect-set forcing for uncountable cardinals*, Annals of Mathematical Logic **19** (1980), 97–114.