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I am interested in higher recursion theory, abstract set theory, descriptive set theory and in the application of set theory to questions in model theory. My earliest work was an application of Jensen's Square Principle and Silver's work on the Singular Cardinal Hypothesis to study Post's problem in higher recursion theory (*Negative Solutions to Post's Problem II*, Annals of Mathematics, Vol. 113, 1981. pp. 25–43). A few years later I became interested in the application of forcing and infinitary model theory to the study of admissible ordinals, second order arithmetic and Scott ranks. I then began an extensive investigation of Jensen's coding method, which resulted in my book *Fine structure and class forcing*, de Gruyter, 2000. Using coding, other methods of class forcing and Kleene's Recursion Theorem, I refuted Solovay's Π^1_2 singleton conjecture, proved Solovay's admissibility spectrum conjecture and answered Jensen's question regarding the existence of reals which are minimal but not set-generic over L. In later work on coding (*Genericity and large cardinals*, Journal of Mathematical Logic, Vol. 5, No. 2, pp. 149–166, 2005) I produced reals which are class-generic but not set-generic and also preserve Woodin cardinals.

More recently I have been looking at connections between set theory and model theory, as well as several new programmes within set theory. In work with Hyttinen and Rautila (*Classification theory and* $0^{\#}$, Journal of Symbolic Logic, Vol. 68, No. 2, pp. 580–588, 2003) I showed that a first order theory is classifiable in the model-theoretic sense exactly if its models are classifiable in a sense that arises naturally in set theory. The paper *Internal consistency and the inner model hypothesis* (Bulletin of Symbolic Logic, Vol.12, No.4, December 2006, pp. 591–600) introduces the *internal consistency programme*, which aims to build inner models witnessing the consistency of set-theoretic statements, and which has also led to strong absoluteness principles, the most important of which is the Strong Inner Model Hypothesis (SIMH). The aim of the *outer model programme* (see *Large cardinals and L-like universes*, *Set theory: recent trends and applications*, Quaderni di Matematica, vol. 17, pp. 93–110, 2007) is to create Gödel-like models for large cardinal axioms. A third programme, closely related to the internal consistency programme, aims to prove the consistency for large cardinals of a wide range of combinatorial properties known to be consistent for small cardinals. A key advance on this latter programme was made in *Perfect trees and elementary embeddings* (Journal of Symbolic Logic, vol. 73, no. 3, pp. 906–918, 2008, joint with Katie Thompson), which introduced perfect set forcing into the large cardinal context, reproving old results with easier proofs as well as establishing many new results. An example of the latter is my joint work with Magidor (*The number of normal measures*, Journal of Symbolic Logic, to appear) concerning the possible number of normal measures on a measurable cardinal.

Most recently, I have turned to descriptive set theory. My work with Motto Ros (*Analytic equivalence relations and bi-embeddability*, http://www. logic.univie.ac.at/ sdf/papers/) shows that any analytic pre-order is Borel equivalent to an embeddability relation. With Fokina and Törnquist I have developed the (overlooked) effective theory of Borel equivalence relations, with some unexpected results.