RESEARCH STATEMENT

PHILIPP SCHLICHT

Currently one of my main interests is the model theory of structures of uncountable regular size λ which omit certain substructures of size $\kappa \leq \lambda$. For example: Trees omitting κ-branches, linear orders omitting κ-chains, and posets omitting κ-chains or κ-antichains. For first-order theories, there are universal models of size λ if $\lambda^{<\lambda} = \lambda$, but in the present context there is typically no universal model, and the minimal size of universal families, i.e. such that every model embeds into a structure in the family, can be changed by forcing. Mekler-Väänänen [2] and Komjath-Shelah [1] independently provided one-step forcings to add a dominating structure for trees of size λ omitting λ-branches and graphs of size λ omitting κ-cliques, respectively. Every structure in the ground model embeds into the dominating structure and the forcing does not collapse cardinals. These forcings can be iterated to modify the universality and bounding numbers for these classes of structures. Katie Thompson and me have extended these results to other classes of structures such as posets omitting increasing κ-chains.

Another recent interest of mine is automatic structures. For example, Frank Stephan and me have looked at the linear orders recognized by infinitary automata and computed exact bounds for their ranks.

References

[1] P. Komjáth and S. Shelah. Universal graphs without large cliques. *Journal of Combinatorial Theory*, 63(1):125–135, 1995.

[2] A. Mekler and J. Väänänen. Trees and Π^1_1-subsets of ${}^{\omega_1}\omega_1$. *The Journal of Symbolic Logic*, 58(3):1052–1070, 1993.

E-mail address: schlicht at math.uni-bonn.de

Mathematisches Institut, Universität Bonn