# RESEARCH STATEMENT

HEIKE MILDENBERGER

I am working on cardinal characteristics, combinatorics in $\aleph_1$, and sometimes I work with large cardinals.

The main technique in my work is forcing, and an important aim on the technical side is to develop forcing techniques. I also have been working in the analysis of existing notions of forcing with respect to new properties. Cardinal characteristics of the continuum often depict important combinatorial features of the ZFC models in question. A cardinal characteristic of the continuum locates the smallest size of a set with a property that is usually not exhibited by any countable set and that is exhibited by at least one set of size of the continuum. However, sometimes a mathematical statement is derived from some delicate stratification of the set-theoretic universe that cannot (yet) be reduced to cardinal equations. This can in particular be the case for set-theoretic universes that are established with not so conventional forcing constructions.

In the Bonn conference I will talk about my current work on weak diamonds, which is a continuation of [2] and [1]. We show that some weakenings of the club principle do not imply the existence of a Souslin tree. We show that $\diamondsuit(2^\omega, [\omega]^\omega,$ is constant on) together with CH and "all Aronszajn trees are special" is consistent relative to ZFC. This implies the analogous result for a double weakening of the club principle. In [2] we showed: There are completeness systems $\mathbb{D}$ such that proper $\mathbb{D}$-complete forcings can be so mild that a generic condition over a countable elementary submodel is even given by a Borel function of the code of the countable model. Now this is used in a modified way.

## References

[1] Heike Mildenberger. Creatures on $\omega_1$ and weak diamonds. *To appear in the Journal of Symbolic Logic*, 2008.

[2] Heike Mildenberger and Saharon Shelah. Specializing Aronszajn trees and preserving some weak diamonds. *Submitted*, 2005.

Kurt Gödel Research Center for Mathematical Logic, Währinger Str. 25, 1090 Wien, Austria

*E-mail address*: heike@logic.univie.ac.at