RESEARCH STATEMENT

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Part of the progress in the study of forcing axioms includes the search for restricted forms of these axioms imposing limitations on the size of the real numbers. For example, it was proved by Justin Moore that BPFA implies $2^{\aleph_0} = \aleph_2$. Currently there are several proofs known of this implication (and, more generally, of the weaker fact that PFA implies $2^{\aleph_0} = \aleph_2$), but all of them involve applying the relevant forcing axiom to a partial order collapsing ω_2. Therefore, it becomes natural to ask whether or not the forcing axiom for the class of all proper cardinal–preserving posets, or even the forcing axiom for the class of all proper posets of size $\aleph_1$ (which we will call PFA(ω_1)), implies $2^{\aleph_0} = \aleph_2$.

In a recent work with David Asperó I proved that PFA(ω_1) does not impose any bound on the size of the continuum. The corresponding proof is quite technical and uses some new ideas regarding forcing iteration. Actually we are planning to apply these new tools for proving similar results in the context of small fragments of the P-ideal dichotomy or the Open Coloring Axiom.