

THESIS ABSTRACTS

The Association for Symbolic Logic publishes abstracts of recent PhD theses in logic. The aim of this activity is to publish abstracts for the majority of recent PhD theses in logic world wide and submitted abstracts will therefore only be edited to ensure that they fall within the general area of logic and are appropriate in terms of length and content. This section will provide a permanent publicly accessible overview of theses in logic and thus make up for the lack of central repository for the theses themselves. The Thesis Abstracts Section is edited by Christian Rosendal. Any abstract should formally be submitted by the thesis advisor though it is expected to usually be prepared by the candidate. For detailed instructions for preparation and submission, including the required TeX template, please consult the link below: <http://aslonline.org/LogicThesisAbstracts.html>.

JAMES HOLLAND, *Weak Indestructibility and Reflection*, Rutgers University, New Brunswick, NJ, USA, 2023. Supervised by Grigor Sargsyan. MSC: 03E55, 03E35, 03E45. Keywords: forcing, indestructibility, strong cardinals, reflecting strong, core model.

Abstract

There is a balance between the amount of (weak) indestructibility one can have and the amount of strong cardinals. It's consistent relative to large cardinals to have lots of strong cardinals and all of their degrees of strength are weakly indestructible. But this necessitates the destructibility of the partially strong cardinals. Guaranteeing the indestructibility of the partially strong cardinals is shown to be harder. In particular, this work establishes an equiconsistency between:

1. a proper class of cardinals that are strong reflecting strong; and
2. weak indestructibility for $(\kappa+2)$ -strength for all cardinals κ in the presence of a proper class of strong cardinals.

These have a much higher consistency strength than:

3. weak indestructibility for all degrees of strength for a proper class of strong cardinals.

This discrepancy holds even if we weaken (2) from the presence of a proper class to just two strong cardinals. (2) is also equivalent to weak indestructibility for all λ -strength for λ far beyond $(\kappa+2)$; well beyond the next measurable limit of measurables above κ , but before the next μ that is $(\mu+2)$ -strong.

One direction of the equiconsistency of (1) and (2) is proven using forcing and the other using core model techniques from inner model theory. Additionally, connections between weak indestructibility and the reflection properties associated with Woodin cardinals are discussed, and similar results are derived for supercompacts and supercompacts reflecting supercompacts.

Abstract prepared by James Holland.

E-mail: jch258@scarletmail.rutgers.edu

URL: <https://sites.math.rutgers.edu/~jch258/assets/dis.pdf>

