

Logic Seminar

Compactness/Reflection and Rigidity in Set Theory

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Abstract: A broad question guiding much contemporary research in set theory is the extent to which the set-theoretic universe resembles certain "inner models" such as Gödel's constructible universe L . One way of cashing out this resemblance is the extent to which certain Rigidity principles, such as Jensen's square principles, hold in the model of interest. Many of these rigidity principles imply the failure of other combinatorial principles of interest, ones which exhibit a sizable amount of "reflection" or "compactness," and of which the Tree Property and Stationary Reflection are examples. We thus have two classes of interesting combinatorial principles (rigidity on the one hand, and compactness/reflection on the other), instances of which are often inconsistent.

Given this tension, a fruitful line of contemporary research investigates when instances from these classes are jointly consistent. In this talk, we will discuss a joint result of the speaker with Omer Ben-Neria which contributes to the study of this tension; our result is that Club Stationary Reflection is consistent with the Special Aronszajn Tree Property on ω_2 . After briefly surveying "rigidity and compactness", we will discuss the main obstacles to obtaining our result, focusing on how the above-mentioned tension arises. Then we outline the main tools for overcoming these problems, namely, our notions of posets which are Strongly Proper or Completely Proper with respect to the weakly compact filter. As time permits, we

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will also discuss our new preservation theorems for stationary sets and Aronszjan trees.

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