

SCIENTIFIC REPORT FOR ESF SHORT VISIT GRANT

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The purpose of my visit to Vienna was to attend the ESI workshop on large cardinals and descriptive set theory. I had two main goals for attending the workshop. My first goal was to initiate research with colleagues, especially those in Europe, with whom I do not ordinarily have the opportunity to see face to face. My second goal was to communicate a recent result of mine concerning the Weak Reflection Principle, namely, that the Weak Reflection Principle does not imply the Reflection Principle, which solved a problem which had been open for almost twenty years.

With regards to the second goal, I gave a 50 minute invited lecture on my result at the workshop. I also had the opportunity to discuss the proof face to face with several colleagues. In particular, I initiated a new research project with Professor Thomas Johnstone of the New York City College of Technology. The original construction of a model which satisfies the Weak Reflection Principle but not the Reflection Principle used a supercompact cardinal. Professor Johnstone suggested that a much weaker large cardinal might be sufficient, namely, a strong unfoldable cardinal, a cardinal which is consistent with $V = L$.

I also initiated a new project with Miguel Angel Mota of the University of Barcelona and the University of Vienna. The problem concerns stationary reflection of subsets of $P_{\omega_1}(\lambda)$, where λ is a singular strong limit singular cardinal with uncountable cofinality. The main problem is to obtain the consistency that every stationary subset of $P_{\omega_1}(\lambda)$ contains a stationary subset which does not reflect to a set of size \aleph_1 . It appears difficult to force this statement directly, since in order to maintain that λ is a strong limit cardinal, the forcing should have kind of some closure or distributivity. Yet if $\lambda^\omega = \lambda$, it is impossible to add any new subset of $P_{\omega_1}(\lambda)$ with a distributive forcing poset. This suggests that the solution could be related to compactness. A specific question in this direction is, assuming dense non-reflection holds for all cardinals below λ , does dense non-reflection also hold at λ , where λ is a strong limit cardinal of uncountable cofinality?

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