favour of a long-standing conjecture asking whether Turing determinacy implies the axiom of determinacy.

Abstract prepared by Clovis Hamel
E-mail: chamel@math.toronto.edu

Andreas Lietz, ***Forcing "*NS_{ω_1} *is* ω_1*-Dense" from Large Cardinals.*** Universität Münster, Münster, Germany. 2023. Supervised by Ralf Schindler. MSC: Primary 03E57, Secondary 03E35, 03E55, 03E60, 03E25. Keywords: nonstationary ideal, forcing axioms, large cardinals, axiom $(*)$.

Abstract

We answer a question of Woodin [3] by showing that "NS_{ω_1} is ω_1-dense" holds in a stationary set preserving extension of any universe with a cardinal κ which is a limit of $<\kappa$-supercompact cardinals. We introduce a new forcing axiom Q-Maximum, prove it consistent from a supercompact limit of supercompact cardinals, and show that it implies the version of Woodin's $(*)$-axiom for $\mathbb{Q}_{\max}$. It follows that Q-Maximum implies "NS_{ω_1} is ω_1-dense." Along the way we produce a number of other new instances of Asperó–Schindler's $\mathrm{MM}^{++} \Rightarrow (*)$ (see [1]).

To force Q-Maximum, we develop a method which allows for iterating ω_1-preserving forcings which may destroy stationary sets, without collapsing ω_1. We isolate a new regularity property for ω_1-preserving forcings called respectfulness which lies at the heart of the resulting iteration theorem.

In the second part, we show that the κ-mantle, i.e., the intersection of all grounds which extend to V via forcing of size $<\kappa$, may fail to be a model of AC for various types of κ. Most importantly, it can be arranged that κ is a Mahlo cardinal. This answers a question of Usuba [2].

REFERENCES

[1] D. Asperó and R. Schindler, *Martin's Maximum*$^{++}$ *implies Woodin's axiom* $(*)$. ***Annals of Mathematics (2)***, vol. 193 (2021), pp. 793–835.

[2] T. Usuba, *Extendible cardinals and the mantle*. ***Archive for Mathematical Logic***, vol. 58 (2019), pp. 71–75.

[3] W. Woodin, ***The Axiom of Determinacy, Forcing Axioms, and the Nonstationary Ideal***, Walter de Gruyter, Berlin, 2010.

Abstract prepared by Andreas Lietz
E-mail: andreas.lietz@tuwien.ac.at.
URL: https://andreas-lietz.github.io/resources/PDFs/AJourneyGuidedByTheStars.pdf.

Zhansaya Tleuliyeva. ***Algorithmic Properties of Rogers Semilattices*** Nazarbayev University. Supervised by Manat Mustafa and Nikolay Bazhenov. MSC: 03D45. Keywords: theory of numberings, computable numbering, Rogers semilattice, limitwise monotonic, analytical hierarchy, projective determinacy, types of isomorphism.

Abstract

The thesis uses various approaches to explore the algorithmic complexity of families of subsets of natural numbers. One of these approaches involves investigating upper semilattices

https://doi.org/10.1017/bsl.2024.12 Published online by Cambridge University Press