

On Connections between Forcing Relations

MICHEL VIANA SMYKALLA 1*

Taltech, Tallinn, Estonia

HUGO LUIZ MARIANO 2†

Ime-usp, São Paulo, Brazil

Keywords: Forcing, model theory, Boolean-valued models, sheaf theory

Forcing was first introduced by Paul J. Cohen in his work on the independence of the Continuum Hypothesis, see [1] and [3]. Inspired by the ideas of Cohen, other formulations of forcing appeared using Model Theory [7], Boolean-valued Models [2], and Topos Theory [4]. There is a well-known claim that these three approaches are the *same*, at least at the level of their *mathematical content*¹. In this talk, we will present two results not found in the literature toward establishing connections between these versions of forcing.

References

- [1] Paul J. Cohen. The independence of the continuum hypothesis. i. Proceedings of the National Academy of Sciences, 50:1143–1148, 1963.
- [2] John L. Bell. Set theory: Boolean-valued models and independence proofs. 3rd ed. Oxford University Press, 2005.
- [3] Paul J. Cohen. The independence of the continuum hypothesis. II. Ibid, 51:105–110, 1964.
- [4] Saunders Mac Lane and Ieke Moerdijk. Sheaves in Geometry and Logic: a first introduction to topos theory. Springer-Verlag New York, 1 edition, 1994.
- [5] Dana S. Scott. A proof of the independence of the continuum hypothesis. Mathematical Systems Theory, 1:89–111, 1967.
- [6] Michel V. Smykalla. Forcing: Posets, boolean algebras and sheaves. Master’s thesis, Instituto de Matemática e Estatística da Universidade de São Paulo, São Paulo, Brasil, September 2024.
- [7] Jon Barwise. Handbook of mathematical logic. North Holland, 1 edition, vol 90, 1999.
- [8] Thomas Jech. Set Theory: The third millennium edition. Revised and expanded. Springer, 2003.
- [9] Kenneth Kunen. Set Theory. Revised edition. College Publications, 2011.
- [10] Gonzalo E. Reyes, Houman Zolfaghari. Topos-theoretic approaches to modality. In: Carboni, A., Pedicchio, M.C., Rosolini, G. (eds) Category Theory. Lecture Notes in Mathematics, vol 1488. Springer, Berlin, Heidelberg, 1991.

*michel.viana@taltech.ee

†hugomar@ime.usp.br

¹As Mac Lane and Moerdijk mention in [4] page 283.