▸ GRIGORII STEPANOV,

The modal logic of forcing and inner models.

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In this talk, I present recent work on the interplay between modal logic and set theoretic truth. Building on earlier work by Hamkins, Inamdar, Leibman, and Löwe [1, 3, 2, 4], we study the modal logic of forcing and grounds, as well as forcing and inner models. In these systems, one modal operator is interpreted as "true in every forcing extension", while the other is interpreted either as "true in every ground" or "true in every inner model", depending on the context. The latter assertion poses certain definability challenges, which I also cover in the talk. We define two bi-modal logics that axiomatize the interaction between the relevant modal operators. For each logic, we establish completeness with respect to appropriate classes of Kripke frames, and follow by deriving completeness results for the corresponding set-theoretic interpretations. This is joint work with Juan P. Aguilera and Fernando Barrera.

[1] Hamkins, Joel and Löwe, Benedikt, *The modal logic of forcing*, ***Transactions of the American Mathematical Society***, vol. 360 (2008), no. 4, pp. 1793–1817.

[2] Hamkins, Joel David and Leibman, George and Löwe, Benedikt, *Structural connections between a forcing class and its modal logic*, ***Israel Journal of Mathematics***, vol. 207 (2015), no. 2, pp. 617–651.

[3] Inamdar, Tanmay and Löwe, Benedikt, *The modal logic of inner models*, ***The journal of symbolic logic***, vol. 81 (2016), no. 1, pp. 225–236.

[4] Hamkins, Joel David and Löwe, Benedikt, *Moving up and down in the generic multiverse*, ***Logic and Its Applications: 5th Indian Conference*** (ICLA 2013, Chennai, India), vol. 5, Publisher, 2013, pp. 139–147.