

## Philosophy of Mathematics

Professor Joel David Hamkins and Dr. Wesley Wrigley

Tuesdays 11-1

The seminar will be co-taught by Professor Hamkins and Dr. Wrigley. All sessions will be held online using the Zoom meeting platform. Updated information about how to access the seminar and the readings will be posted at:

<http://jdh.hamkins.org/philosophy-of-mathematics-graduate-oxford-tt20/>

The Zoom meetings will not be recorded or posted online and will only be available to live participants.

The broad theme for the seminar will be incompleteness, including the incompleteness of our mathematical theories, as exhibited in Gödel's incompleteness theorems, and also the incompleteness of our mathematical domains, as exhibited in mathematical potentialism.

The first four sessions, in weeks 1-4, will be led by Dr. Wrigley and concentrate on his current research on the incompleteness of mathematics and the philosophy of Kurt Gödel. Weeks 5-8 will be led by Professor Hamkins, who will concentrate on topics in potentialism.

Discussion will be based on the following readings:

Weeks 1 & 2 (28th April and 5th May) Kurt Gödel "Some basic theorems on the foundations of mathematics and their implications (\*1951)", in: Feferman, S. et al. (eds) Kurt Gödel: Collected Works Volume III, pp.304-323. OUP (1995). And Wrigley "Gödel's Disjunctive Argument" (Available on Canvas).

Week 3 (12th May) Donald Martin, "Gödel's Conceptual Realism", Bulletin of Symbolic Logic 11:2 (2005), 207- 224 <https://www.jstor.org/stable/1556750>. And Wrigley "Conceptual Platonism" (Coming soon on Canvas).

Week 4 (19th May) Bertrand Russell "The Regressive Method of Discovering the Premises of Mathematics (1907)", in: Moore, G. (ed) The Collected Papers of Bertrand Russell, Volume 5, pp.571-580. Routledge (2014). And Wrigley "Quasi-Scientific Methods of Justification in Set Theory" (Coming soon on Canvas).

Week 5 (26th May) Øystein Linnebo & Stewart Shapiro, "Actual and potential infinity", Noûs 53:1 (2019), 160-191, <https://doi.org/10.1111/nous.12208>. And Øystein Linnebo. "Putnam on Mathematics as Modal Logic," In: Hellman G., Cook R. (eds) Hilary Putnam on Logic and Mathematics. Outstanding Contributions to Logic, vol 9. Springer, Cham (2018). [https://doi.org/10.1007/978-3-319-96274-0\\_14](https://doi.org/10.1007/978-3-319-96274-0_14)

Week 6 (2nd June) The topic this week is: tools for analyzing the modal logic of a potentialist system. This seminar will be based around the slides for my talk "Potentialism and implicit actualism in the foundations of mathematics," given for the Jowett Society in Oxford last year. The slides are available at: <http://jdh.hamkins.org/potentialism-and-implicit-actualism-in-the-foundations-of-mathematics-jowett->

[society-oxford-february-2019](#). Interested readers may also wish to consult the more extensive slides for the three-lecture workshop I gave on potentialism at the Hejnice Winter School in 2018; the slides are available at <http://jdh.hamkins.org/set-theoretic-potentialism-ws2018>. My intent is to concentrate on the nature and significance of control statements, such as buttons, switches, ratchets and railyards, for determining the modal logic of a potentialist system.

Week 7 (9th June) Joel David Hamkins and Øystein Linnebo. “The modal logic of set-theoretic potentialism and the potentialist maximality principles”. *Review of Symbolic Logic* (2019). <https://doi.org/10.1017/S1755020318000242>. arXiv:1708.01644. <http://wp.me/p5M0LV-1zC>. This week, we shall see how the control statements allow us to analyze precisely the modal logic of various conceptions of set-theoretic potentialism.

Week 8 (16th June) Joel David Hamkins, “Arithmetic potentialism and the universal algorithm,” arxiv: 1801.04599, available at <http://jdh.hamkins.org/arithmetic-potentialism-and-the-universal-algorithm>. Please feel free to skip over the more technical parts of this paper. In the seminar discussion, we shall concentrate on the basic idea of arithmetic potentialism, including a full account of the universal algorithm and the significance of it for potentialism, as well as remarks of the final section of the paper.