

# Joel David Hamkins

<http://jdh.hamkins.org>

## Academic Credentials

Ph.D. in Mathematics, May 1994, University of California, Berkeley  
C.Phil. in Mathematics, December 1991, University of California, Berkeley  
B.S. in Mathematics, May 1988, California Institute of Technology  
M.A. by Resolution, September 2018, Oxford University

## Academic Appointments

University of Oxford, 2018–present

Professor of Logic, Faculty of Philosophy, University of Oxford  
Affiliated Faculty, Mathematical Institute, University of Oxford  
Sir Peter Strawson Fellow in Philosophy, University College, Oxford

The City University of New York, 1995–2018, with various leaves

College of Staten Island of CUNY, Mathematics

Distinguished Professor 2020, Full Professor since 2003, tenure granted 2000

Associate Professor 1999–2002, Assistant Professor 1995–1998

The Graduate Center of CUNY

Doctoral Faculty in Philosophy since 2013

Doctoral Faculty in Computer Science since 2002

Doctoral Faculty in Mathematics since 1997

Isaac Newton Institute of Mathematical Sciences, Cambridge, U.K.

Visiting Fellow, August–October, 2015

Visiting Fellow, March–April, June, 2012

New York University

Visiting Professor of Philosophy, January–June, 2015

Visiting Professor of Philosophy, July–December, 2011

Fields Institute, University of Toronto

Scientific Researcher, August, 2012

University of Vienna, Kurt Gödel Research Center, Guest Professor, June, 2009

Universiteit van Amsterdam, Institute for Logic, Language & Computation

Visiting Professor, April–August 2007

NWO Bezoekersbeurs visiting researcher, June–August 2005, June 2006

Universität Münster, Institut für mathematische Logik, Germany

Mercator-Gastprofessor, DFG, May–August 2004

Georgia State University, Associate Professor Mathematics and Statistics, 2002–2003

Carnegie Mellon University, Visiting Associate Professor of Mathematics, 2000–2001

Kobe University Graduate School of Science & Technology, Japan

JSPS Research Fellow, January–December 1998

University of California at Berkeley

Visiting Assistant Professor of Mathematics, 1994–1995

## Areas of Specialization

Logic, mathematical logic, philosophical logic, philosophy of mathematics, set theory, philosophy of set theory, the mathematics and philosophy of the infinite, forcing and large cardinals, computability theory, infinitary computability, infinitary game theory, infinitary utilitarianism.

## Distinguished Grants, Fellowships and Awards

2016–2017	PSC-CUNY Research Award
2014–2015	PSC-CUNY Enhanced Research Award
2013–2014	CUNY Collaborative Incentive Research Grant
2013–2014	PSC-CUNY Research Award
2011–2016	Simons Foundation research grant (\$35,000)
2008–2011	National Science Foundation research grant (\$210,000)
2011–2012	PSC-CUNY Enhanced Research Award
2010	PSC-CUNY Research Award
2008–2009	Templeton Foundation grant (\$100,000 with 3 co-PIs)
2007	CUNY Fellowship Leave Award (sabbatical)
2006–2007	NWO Bezoekersbeurs Visiting Researcher grant (funded by the Dutch government)
1996–2008	PSC-CUNY Research Awards, won annually
2006	CSI Presidential Research Award
2005	NWO Bezoekersbeurs Visiting Researcher grant (funded by the Dutch government)
2005–2007	CUNY Research Foundation Collaborative Incentive Grant award
2004	DFG Mercator-Gastprofessor (funded by the German government)
1999–2002	National Science Foundation (NSF) Research Grant (\$74000)
1999–2001	NATO Joint Research Grant
1999–2001	CUNY Collaborative Incentive Research Grant
2000	CUNY Performance Excellence Award
1997–2000	CUNY Faculty Development Grant (for the CUNY Logic Workshop)
1998	Japan Society for the Promotion of Science Research Fellowship
1998	CUNY Scholar Incentive Award
1996–1998	CUNY Research Foundation Collaborative Incentive Grant
1997–1998	CSI Presidential Research Award
1996	CSI Summer Research Stipend
1995–1996	CSI Research Released-time Award
1993–1994	UC Berkeley Graduate Research Fellowship
1991–1992	USDE Graduate Fellowship
1988–1991	NSF Graduate Fellowship
1988	Caltech Ryser Scholar

## Books

- [1] Joel David Hamkins. *Lectures on the Philosophy of Mathematics*. In production, 331 pages. MIT Press, 2020.
- [2] Joel David Hamkins. *Proof and the Art of Mathematics*. In production. MIT Press, 2020.
- [3] Joel David Hamkins. *Proof and the Art of Mathematics: Examples and Extensions*. In production. MIT Press, 2020.
- [4] Joel David Hamkins. *Topics in Logic for Philosophers*. Book manuscript, 221 pages, in preparation. 2019.
- [5] Joel David Hamkins. *A Mathematician's Year in Japan*. 156 pages. Amazon Kindle Direct Publishing, 2015. <http://www.amazon.com/dp/B00U618LM2>.
- [6] N. Greenberg, J. D. Hamkins, D. R. Hirschfeldt, and R. G. Miller, eds. *Effective Mathematics of the Uncountable*. Vol. 41. Cambridge University Press, ASL Lecture Notes in Logic, 2013. ISBN: 9781107014510. <http://wp.me/s5M0LV-emu>.
- [7] Joel David Hamkins. *Tutor On Paper*. 93 pages. Berkeley, CA: Vargon Publishers, 1992.

## Published Articles (following general practice in my research area, co-authors are listed alphabetically)

- [8] D. Dakota Blair, Joel David Hamkins, and Kevin O'Bryant. "Representing Ordinal Numbers with Arithmetically Interesting Sets of Real Numbers". *Integers* (2020). arXiv:1905.13123. <https://wp.me/p5M0LV-1Tg>.
- [9] Andreas Blass, Jörg Brendle, Will Brian, Joel David Hamkins, Michael Hardy, and Paul B. Larson. "The rearrangement number". *Trans. Amer. Math. Soc.* 373.1 (2020), pp. 41–69. ISSN: 0002-9947. DOI: 10.1090/tran/7881. arXiv:1612.07830. <http://jdh.hamkins.org/the-rearrangement-number>.
- [10] Neil Barton, Andrés Eduardo Caicedo, Gunter Fuchs, Joel David Hamkins, Jonas Reitz, and Ralf Schindler. "Inner-model reflection principles". *Studia Logica* (2019). DOI: 10.1007/s11225-019-09860-7. arXiv:1708.06669. <http://jdh.hamkins.org/inner-model-reflection-principles>.
- [11] Jörg Brendle, Will Brian, and Joel David Hamkins. "The subseries number". *Fund. Math.* 247.1 (2019), pp. 49–85. ISSN: 0016-2736. DOI: 10.4064/fm667-11-2018. arXiv:1801.06206. <http://jdh.hamkins.org/the-subseries-number>.
- [12] François G. Dorais and Joel David Hamkins. "When does every definable nonempty set have a definable element?" *Mathematical Logic Quarterly* 65.4 (2019), pp. 407–411. DOI: 10.1002/malq.201700035. arXiv:1706.07285. <http://jdh.hamkins.org/definable-sets-with-definable-elements>.
- [13] Marcia J. Groszek and Joel David Hamkins. "The implicitly constructible universe". *Journal of Symbolic Logic* 84.4 (2019), pp. 1403–1421. ISSN: 0022-4812. DOI: 10.1017/jsl.2018.57. arXiv:1702.07947. <http://jdh.hamkins.org/the-implicitly-constructible-universe>.
- [14] Miha E. Habič, Joel David Hamkins, Lukas Daniel Klausner, Jonathan Verner, and Kameryn J. Williams. "Set-theoretic blockchains". *Archive for Mathematical Logic* (2019). ISSN: 1432-0665. DOI: 10.1007/s00153-019-00672-z. arXiv:1808.01509. <http://wp.me/p5M0LV-1M8>.
- [15] Joel David Hamkins and Øystein Linnebo. "The modal logic of set-theoretic potentialism and the potentialist maximality principles". *Review of Symbolic Logic* (2019). DOI: 10.1017/S1755020318000242. arXiv:1708.01644. <http://wp.me/p5M0LV-1zC>.

- [16] Ali Enayat and Joel David Hamkins. “ZFC proves that the class of ordinals is not weakly compact for definable classes”. *Journal of Symbolic Logic* 83.1 (2018), pp. 146–164. DOI: 10.1017/jsl.2017.75. arXiv:1610.02729. <http://jdh.hamkins.org/ord-is-not-definably-weakly-compact>.
- [17] Gunter Fuchs, Victoria Gitman, and Joel David Hamkins. “Ehrenfeucht’s Lemma in Set Theory”. *Notre Dame Journal of Formal Logic* 59.3 (2018), pp. 355–370. DOI: 10.1215/00294527-2018-0007. arXiv:1501.01918. <http://jdh.hamkins.org/ehrenfeuchts-lemma-in-set-theory>.
- [18] Victoria Gitman and Joel David Hamkins. “A model of the generic Vopěnka principle in which the ordinals are not Mahlo”. *Archive for Mathematical Logic* (May 2018), pp. 1–21. ISSN: 0933-5846. DOI: 10.1007/s00153-018-0632-5. arXiv:1706.00843. <http://wp.me/p5M0LV-1xT>.
- [19] C. D. A. Evans, Joel David Hamkins, and Norman Lewis Perlmutter. “A position in infinite chess with game value  $\omega^4$ ”. *Integers* 17 (2017), Paper No. G4, 22. arXiv:1510.08155. <http://wp.me/p5M0LV-1c5>.
- [20] Gunter Fuchs, Victoria Gitman, and Joel David Hamkins. “Incomparable  $\omega_1$ -like models of set theory”. *Math. Logic Q.* (2017), pp. 1–11. ISSN: 1521-3870. DOI: 10.1002/malq.201500002. arXiv:1501.01022. <http://jdh.hamkins.org/incomparable-omega-one-like-models-of-set-theory>.
- [21] Michał Tomasz Godziszewski and Joel David Hamkins. “Computable Quotient Presentations of Models of Arithmetic and Set Theory”. In: *Logic, Language, Information, and Computation: 24th International Workshop, WoLLIC 2017, London, UK, July 18-21, 2017, Proceedings*. Ed. by Juliette Kennedy and Ruy J.G.B. de Queiroz. Springer, 2017, pp. 140–152. ISBN: 978-3-662-55386-2. DOI: 10.1007/978-3-662-55386-2\_10. arXiv:1702.08350. <http://wp.me/p5M0LV-1tW>.
- [22] Joel David Hamkins and Thomas Johnstone. “Strongly uplifting cardinals and the boldface resurrection axioms”. *Archive for Mathematical Logic* 56.7 (2017), pp. 1115–1133. ISSN: 1432-0665. DOI: 10.1007/s00153-017-0542-y. arXiv:1403.2788. <http://wp.me/p5M0LV-1E>.
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- [24] Victoria Gitman and Joel David Hamkins. “Open determinacy for class games”. In: *Foundations of Mathematics, Logic at Harvard, Essays in Honor of Hugh Woodin’s 60th Birthday*. Ed. by Andrés E. Caicedo, James Cummings, Peter Koellner, and Paul Larson. AMS Contemporary Mathematics. Newton Institute preprint ni15064. 2016. arXiv:1509.01099. <http://wp.me/p5M0LV-1af>.
- [25] Victoria Gitman, Joel David Hamkins, and Thomas A. Johnstone. “What is the theory ZFC without Powerset?” *Math. Logic Q.* 62.4–5 (2016), pp. 391–406. ISSN: 0942-5616. DOI: 10.1002/malq.201500019. arXiv:1110.2430. <http://jdh.hamkins.org/what-is-the-theory-zfc-without-power-set>.
- [26] Joel David Hamkins. “Upward closure and amalgamation in the generic multiverse of a countable model of set theory”. *RIMS Kyôkyûroku* (2016), pp. 17–31. ISSN: 1880-2818. arXiv:1511.01074. <http://wp.me/p5M0LV-1cv>.
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- [29] Yong Cheng, Sy-David Friedman, and Joel David Hamkins. “Large cardinals need not be large in HOD”. *Annals of Pure and Applied Logic* 166.11 (2015), pp. 1186–1198. ISSN: 0168-0072. DOI: 10.1016/j.apal.2015.07.004. arXiv:1407.6335. <http://jdh.hamkins.org/large-cardinals-need-not-be-large-in-hod>.
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- [37] Joel David Hamkins and Thomas Johnstone. “Resurrection axioms and uplifting cardinals”. *Archive for Mathematical Logic* 53.3-4 (2014), p. 463–485. ISSN: 0933-5846. DOI: 10.1007/s00153-014-0374-y. arXiv:1307.3602. <http://jdh.hamkins.org/resurrection-axioms-and-uplifting-cardinals>.
- [38] Arthur W. Apter, James Cummings, and Joel David Hamkins. “Singular cardinals and strong extenders”. *Central European Journal of Mathematics* 11.9 (2013), pp. 1628–1634. ISSN: 1895-1074. DOI: 10.2478/s11533-013-0265-1. arXiv:1206.3703. <http://jdh.hamkins.org/singular-cardinals-strong-extendors/>.
- [39] Samuel Coskey and Joel David Hamkins. “Infinite time Turing machines and an application to the hierarchy of equivalence relations on the reals”. In: *Effective Mathematics of the Uncountable*. Vol. 41. Lect. Notes Log. Assoc. Symbol. Logic, La Jolla, CA, 2013, pp. 33–49. arXiv:1101.1864. <http://jdh.hamkins.org/ittms-and-applications/>.

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- [41] Joel David Hamkins, David Linetsky, and Jonas Reitz. “Pointwise definable models of set theory”. *Journal of Symbolic Logic* 78.1 (2013), pp. 139–156. ISSN: 0022-4812. DOI: 10.2178/jsl.7801090. arXiv:1105.4597. <http://jdh.hamkins.org/pointwisedefinablemodelsofsettheory/>.
- [42] Joel David Hamkins and Benedikt Löwe. “Moving up and down in the generic multiverse”. *Logic and its Applications, ICLA 2013 LNCS 7750* (2013). Ed. by Kamal Lodaya, pp. 139–147. DOI: 10.1007/978-3-642-36039-8\_13. arXiv:1208.5061. <http://wp.me/p5M0LV-od>.
- [43] Arthur W. Apter, Victoria Gitman, and Joel David Hamkins. “Inner models with large cardinal features usually obtained by forcing”. *Archive for Math. Logic* 51 (3 2012), pp. 257–283. ISSN: 0933-5846. DOI: 10.1007/s00153-011-0264-5. arXiv:1111.0856. <http://jdh.hamkins.org/innermodels>.
- [44] Dan Brumleve, Joel David Hamkins, and Philipp Schlicht. “The Mate-in- $n$  Problem of Infinite Chess Is Decidable”. In: *How the World Computes*. Ed. by S. Barry Cooper, Anuj Dawar, and Benedikt Löwe. Vol. 7318. Lecture Notes in Computer Science. Springer, 2012, pp. 78–88. ISBN: 978-3-642-30869-7. DOI: 10.1007/978-3-642-30870-3\_9. arXiv:1201.5597. <http://wp.me/p5M0LV-f8>.
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- [64] Joel David Hamkins. “A Survey of Infinite Time Turing Machines”. In: *Machines, Computations, and Universality - 5th International Conference MCU 2007*. Ed. by Jérôme Durand-Lose and Maurice Margenstern. Vol. 4664. Lecture Notes in Computer Science. Orleans, France, 2007, pp. 62–71. DOI: 10.1007/978-3-540-74593-8\_5. <http://wp.me/p5M0LV-3d>.
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## Publications, accepted for publication, to appear

- [106] Victoria Gitman, Joel David Hamkins, Peter Holy, Philipp Schlicht, and Kameryn Williams. “The exact strength of the class forcing theorem”. *to appear in Journal of Symbolic Logic* (2020). arXiv:1707.03700. <http://wp.me/p5M0LV-1yp>.
- [107] Joel David Hamkins and Ruizhi Yang. “Satisfaction is not absolute”. *to appear in the Review of Symbolic Logic* (2014), pp. 1–34. arXiv:1312.0670. <http://wp.me/p5M0LV-Gf>.

## Book Reviews

- [108] Joel David Hamkins. “book review of G. Tournakis, Lectures in Logic and Set Theory, vols. I & II”. *Bulletin of Symbolic Logic* 11.2 (2005), p. 241. <http://jdh.hamkins.org/tournakisbookreview/>.
- [109] Joel David Hamkins. “book review of The Higher Infinite, Akihiro Kanamori”. *Studia Logica* 65.3 (2000), pp. 443–446. ISSN: 0039-3215. DOI: 10.1023/A:1017327516639. <http://wp.me/p5M0LV-16>.
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## Preprints submitted for publication, currently under review

- [111] Alfredo Roque Freire and Joel David Hamkins. “Bi-interpretation in weak set theories”. *Mathematics arXiv* (2020). Under review. arXiv:2001.05262. <http://jdh.hamkins.org/bi-interpretation-in-weak-set-theories>.
- [112] Victoria Gitman, Joel David Hamkins, and Asaf Karagila. “Kelley-Morse set theory does not prove the class Fodor theorem”. *ArXiv e-prints* (2019). Manuscript under review. arXiv:1904.04190. <http://wp.me/p5M0LV-1RD>.
- [113] Joel David Hamkins and Kameryn J. Williams. “The  $\Sigma_1$ -definable universal finite sequence”. *ArXiv e-prints* (2019). Under review. arXiv:1909.09100.
- [114] Ali Enayat, Joel David Hamkins, and Bartosz Wcisło. “Topological models of arithmetic”. *ArXiv e-prints* (2018). Under review. arXiv:1808.01270. <http://wp.me/p5M0LV-1LS>.
- [115] Joel David Hamkins. “The modal logic of arithmetic potentialism and the universal algorithm”. *ArXiv e-prints* (2018). Under review, pp. 1–35. arXiv:1801.04599. <http://wp.me/p5M0LV-1Dh>.
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- [119] Joel David Hamkins and Jonas Reitz. “The set-theoretic universe  $V$  is not necessarily a class-forcing extension of HOD”. *ArXiv e-prints* (2017). Manuscript under review. arXiv:1709.06062. <http://jdh.hamkins.org/the-universe-need-not-be-a-class-forcing-extension-of-hod>.
- [120] Joel David Hamkins and W. Hugh Woodin. “The universal finite set”. *ArXiv e-prints* (2017). Manuscript under review, pp. 1–16. arXiv:1711.07952. <http://jdh.hamkins.org/the-universal-finite-set>.
- [121] Joel David Hamkins. “The Vopěnka principle is inequivalent to but conservative over the Vopěnka scheme”. *ArXiv e-prints* (2016). Under review. arXiv:1606.03778. <http://wp.me/p5M0LV-1IV>.
- [122] Raffaella Cutolo and Joel David Hamkins. “Choiceless large cardinals and set-theoretic potentialism” (). Under review, 10 pages.

- [123] Joel David Hamkins, Russell Miller, and Kameryn J. Williams. “Forcing as a computational process” (). Under review.

## Micropublishing and other online content

1. MathOverflow.net, a Q&A forum for advanced mathematics research. I am the leading contributor and top user by ‘reputation’ score, out of over 65,000 mathematicians on MathOverflow, a distinction I have held continuously since 2010. I have made over 1500 posts there, each a brief technical essay on a graduate-research-level topic, mostly logic, and these have been cited in dozens of instances in the regular research literature. My MathOverflow contributions have reportedly reached 3.3 million people.
2. Mathematics.StackExchange.com, a companion Q&A site for general mathematics. I am in the top 2% of users by reputation score out of nearly 400,000 mathematics users on this general mathematics site, and my posts have reached 862,000 people.
3. Cantor’s Attic. I co-founded this wikipedia-style compendium on the large cardinal hierarchy, with hundreds of posts containing detailed technical information about all the different large cardinal notions. The site has nearly a million views.
4. My blog: Mathematics and Philosophy of the infinite. I have written several hundred research-level expository posts on diverse topics in logic, mathematics, and philosophy. My Math for Kids series, describing fun mathematical activities for children, has proved extremely popular, sometimes breaking into tens of thousands of views in the first few days of a new post and several times making it to the front pages of Reddit and Hacker News. Several of my most popular posts have been translated into French, Italian, and Mandarin.
5. See also my popular logic, math and philosophy posts on Twitter: @JDHamkins, over 3750 followers.

## Collaboration and mentoring

I serve as a high-degree connection vertex in the graph of research collaboration in logic, with over 40 research collaborators in recent years, coming from essentially all parts of mathematical and philosophical logic and beyond. My collaborators span the range from established senior research colleagues to junior or mid-career researchers, with whom I often take a mentorship role. My research projects and collaborations have drawn together researchers from distant research areas.

## Popular recognition

I was interviewed by Theodor Nenu for his *Philosophical Trials* interview series, an in-depth discussion of issues in the philosophy of mathematics, April 2, 2020.  
<https://youtu.be/Z1A6BENfS-o>

My work on infinite chess served as the basis for the PBS Infinite Series video, “Infinite Chess,” March 2017, with over 200,000 channel subscribers and over 1000 lively mathematical comments posted on this particular video. <https://youtu.be/PN-I6u-AxMg>

I was interviewed by Richard Marshall for 3:AM Magazine, “Playing Infinite Chess,” appearing March 25, 2013, as a part of his series of interviews with prominent philosophers and public intellectuals. <http://www.3AMmagazine.com/3AM/playing-infinite-chess>

## Selected Recent Invited Conference and Colloquia Talks

1. “*Bi-interpretation of weak set theories*,” Oberwolfach Mathematics Institute, 5–11 April 2020. (Cancelled on account of Covid-19)
2. “*Bi-interpretation in set theory*,” Logic and Set Theory Seminar, University of Bristol, 25 February 2020.
3. “*Philosophy meets maths*,” Oxford Philosophy Taster, 10 January 2020.
4. “*Modal model theory*,” Set-theory in the United Kingdom (STUK 4), Oxford, 14 December 2019.
5. “*I know that you know that I know that you know...*,” Oxford Philosophy Faculty, welcome talk for new students, 16 October 2019.
6. “*Alan Turing’s theory of computation*,” Oxford and Cambridge Club, London, 6 June 2019.
7. “*Computational self-reference and the universal algorithm*,” Theory Seminar, research group in Theoretic Computer Science, Queen Mary University of London, 4 June 2019.
8. “*Is there just one mathematical universe?*,” Wijgerig Festival *Ontology*, DRIFT 2019, Amsterdam, 11 May 2019.
9. “*The modal logic of potentialism*,” Institute of Logic, Language and Computation, University of Amsterdam, 11 May 2019.
10. “*Kelley-Morse set theory does not prove the class Fodor Principle*,” CUNY Set Theory Seminar, 22 March 2019.
11. “*Forcing as a computational process*,” Set Theory in the United Kingdom (STUK 1), Cambridge, 16 February 2019.
12. “*Potentialism and implicit actualism in the foundations of mathematics*,” Jowett Society lecture, Oxford Faculty of Philosophy, 8 February 2019.
13. “*An infinitary-logic-free proof of the Barwise end-extension theorem, with new applications*,” Logic Oberseminar, Logic Institute, University of Münster, 11 January 2019.
14. “*A new proof of the Barwise extension theorem, without infinitary logic*,” CUNY Logic Workshop, 15 December 2018.

15. Faculty respondent to paper of Ethan Jerzak on Paradoxical Desires, Oxford Graduate Philosophy Conference, 10 November 2018, University of Oxford.
16. “*On set-theoretic mereology as a foundation of mathematics,*” Oxford Phil Math seminar, 29 October 2018, University of Oxford.
17. “*The rearrangement number: how many rearrangements of a series suffice to validate absolute convergence?*” Warwick Mathematics Colloquium, 19 October 2018, University of Warwick.
18. “*Parallels in universality between the universal algorithm and the universal finite set,*” Oxford Math Logic Seminar, 9 October 2018, University of Oxford.
19. “*Set-theoretic potentialism and the universal finite set,*” Scandinavian Logic Symposium SLS 2018, June 11-13, 2018, University of Gothenburg, Sweden.
20. “*Determinacy for open class games is preserved by forcing,*” CUNY Set Theory Seminar, April 27, 2018, CUNY Graduate Center, New York.
21. “*The universal finite set,*” Rutgers Logic Seminar, April 2, 2018, Rutgers University, New Jersey.
22. “*Nonamalgamation in the Cohen generic multiverse,*” CUNY Logic Workshop, March 23, 2018, CUNY Graduate Center, New York.
23. “*Self reference in computability theory and the universal algorithm,*” Ouroboros: Formal Criteria of Self-Reference in Mathematics and Philosophy, February 16-18, 2018, Universität Bonn, Germany.
24. “*Modal principles of potentialism,*” Faculty of Philosophy, January 29, 2018, Oxford University, Oxford, U.K.
25. “*Set-theoretic potentialism,*” Invited lecture series at Winter School in Abstract Analysis, January 27-February 3, 2018, Hejnice, Czech Republic.
26. “*The universal algorithm and the universal finite set,*” Prague Gathering of Logicians & The Beauty of Logic conference, January 25-27, 2018, Prague, Czech Republic.
27. “*On the strengths of the class forcing theorem and clopen class game determinacy,*” Prague set theory seminar, January 2018, Prague Academy of Sciences, Czech Republic.
28. “*A universal finite set,*” CUNY Logic Workshop, November 17, 2017, CUNY Graduate Center, New York.
29. “*The modal principles of potentialism in mathematics,*” Logic and Metaphysics Workshop, November 6, 2017, CUNY Graduate Center, New York.
30. “*Arithmetic potentialism and the universal algorithm,*” CUNY Logic Workshop, September 8, 2017, CUNY Graduate Center, New York.
31. “*The inner-model and ground-model reflection principles,*” CUNY Set Theory seminar, September 1, 2017, CUNY Graduate Center, New York.

32. “*Open and clopen determinacy for proper class games,*” Mid-Atlantic Mathematical Logic Symposium, April 1–2, 2017, Virginia Commonwealth University, Richmond, Virginia.
33. “*Set-theoretic geology and the downward directed grounds hypothesis,*” Logic Seminar, January 13, 2017, Hausdorff Center for Mathematics, Universität Bonn, Germany.
34. “*Transfinite game values in infinite chess, including new progress,*” Basic Notions Seminar, January 10, 2017, Universität Bonn, Germany.
35. “*Set-theoretic mereology as a foundation of mathematics,*” Logic and Metaphysics Workshop, October 24, 2016, CUNY Graduate Center, New York.
36. “*Recent advances in set-theoretic geology,*” Harvard Logic Colloquium, October 20, 2016, Harvard University.
37. “*The modal logic of set-theoretic potentialism,*” Mathematical Logic and Its Applications, workshop conference, September 26–29, 2016, Research Institute for Mathematical Sciences, Kyoto University, Japan.
38. “*Set-theoretic potentialism,*” CUNY Logic Workshop, September 16, 2016, CUNY Graduate Center, New York.
39. “*The rearrangement number: how many rearrangements of a series suffice to verify absolute convergence?*” Mathematics Colloquium, September 14, 2016, University of Pennsylvania, Philadelphia.
40. “*Set-theoretic geology and the downward-directed grounds hypothesis,*” CUNY Set Theory seminar, September 2 and 9, 2016 (two talks), CUNY Graduate Center, New York.
41. “*Pluralism-inspired mathematics, including a recent breakthrough in set-theoretic geology,*” Set-theoretic Pluralism Symposium, July 12–17, 2016, University of Aberdeen, Scotland.
42. “*Freiling’s axiom of symmetry, or throwing darts at the real line,*” CUNY Graduate Student Math Colloquium, April 11, 2016, CUNY Graduate Center, New York.
43. “*Open determinacy for games on the ordinals,*” Torino Logic Seminar, March 3, 2016, University of Torino, Italy.
44. “*The hypnagogic digraph, with applications to embeddings of the set-theoretic universe,*” AMS-ASL Special Session on Surreal Numbers, Joint Mathematics Meetings, January 6–9, 2016, Seattle, Washington.
45. “*The rearrangement number: how many rearrangements of a series suffice to verify absolute convergence?*” Vassar Mathematics Colloquium, November 10, 2015, Vassar College, Poughkeepsie, New York.
46. “*Open determinacy for games on the ordinals is stronger than ZFC,*” CUNY Logic Workshop, October 2, 2015, CUNY Graduate Center, New York.

47. “*Upward closure in the generic multiverse of a countable model of set theory*,” Recent Developments in Axiomatic Set Theory, September 16–18, 2015, Research Institute for Mathematical Sciences (RIMS), Kyoto University, Kyoto, Japan.
48. “*Universality and embeddability amongst the models of set theory*,” Computability Theory and Foundations of Mathematics (CTFM 2015), September 7–11, 2015, Tokyo Institute of Technology, Tokyo, Japan.
49. “*The absolute truth about non-absolute truth*,” Journées sur les Arithmétiques Faibles–Weak Arithmetics Days, July 7–9, 2015, CUNY Graduate Center, New York.
50. “*The weakly compact embedding property*,” Mid-Atlantic Mathematical Logic Symposium, Apter-Gitik celebration, May 30–31, 2015, Carnegie Mellon University, Pittsburgh, Pennsylvania.
51. “*I know that you know that I know that you know...*,” Plenary talk at the CSI Undergraduate Conference on Research, Scholarship, and Performance, April 30, 2015, College of Staten Island of CUNY, New York.
52. “*The continuum hypothesis and other set-theoretic ideas for non-set-theorists*,” CUNY Einstein Chair Seminar (two talks), April 27, 2015, CUNY Graduate Center, New York.
53. “*Embeddings of the universe into the constructible universe, current state of knowledge*,” CUNY Set Theory Seminar, March 6, 2015, CUNY Graduate Center, New York.
54. “*Tutorial on Boolean ultrapowers*,” BLAST 2015, January 5–9, 2015, University of New Mexico, Las Cruces, New Mexico.
55. “*An introduction to the theory of infinite games, with examples from infinite chess*,” University of Connecticut, December 5, 2014, Storrs, Connecticut.
56. “*The theory of infinite games: how to play infinite chess and win*,” VCU Math Colloquium, November 21, 2014, Virginia Commonwealth University, Richmond, Virginia.
57. “*Does definiteness-of-truth follow from definiteness-of-objects?*” NY Philosophical Logic Group, November 10, 2014, New York University, New York.
58. “*The span of infinity*,” panelist at roundtable discussion at The Helix Center, October 25, 2014, New York Psychoanalytic Society & Institute, New York.
59. “*The pluralist perspective on the axiom of constructibility*,” MidWest PhilMath Workshop, Notre Dame, October 18–19, 2014, University of Notre Dame, South Bend, Indiana.
60. “*When does every definable set have a definable member?*” CUNY Set Theory Seminar, October 10, 2014, CUNY Graduate Center, New York.
61. “*Large cardinals need not be large in HOD*,” International Workshop on Set Theory, September 29–October 3, 2014, Centre International de Rencontres Mathématiques (CIRM), Luminy, France.

62. “*A meeting at the crossroads — science, performance and the art of possibility*,” panel discussion, Underground Zero Festival, Intrinsic Value Project, July 9–10, 2014, New York.
63. “*Higher infinity and the foundations of mathematics*,” plenary General Public Lecture, AAAS 2014, American Association for the Advancement of Science (Pacific Division) annual meeting, June 17–20, 2014, University of California at Riverside, California.
64. “*Boldface resurrection and the strongly uplifting cardinals, the superstrongly unfoldable cardinals and the almost-hugely unfoldable cardinals*,” BEST 2014, June 18–20, 2014, held in conjunction with AAAS 2014, University of California at Riverside, California.
65. “*Transfinite game values in infinite chess and other infinite games*,” colloquium and workshop Infinity, computability, and metamathematics, May 23–25, 2014, Hausdorff Center for Mathematics, Universität Bonn, Germany.
66. “*Superstrong and other large cardinals are never Laver indestructible*,” ASL 2014 North American Annual Meeting, May 19–22, 2014, Boulder, Colorado.
67. “*Large cardinals need not be large in HOD*,” Rutgers logic seminar, April 21, 2014, Rutgers University, New Jersey.
68. “*Universal structures*,” GC MathFest, February 4, 2014, CUNY Graduate Center, New York.
69. “*Large cardinals need not be large in HOD*,” CUNY Set Theory Seminar, January 31, 2014, CUNY Graduate Center, New York.
70. “*Infinite chess and the theory of infinite games*,” Dartmouth Mathematics Colloquium, January 23, 2014, Dartmouth College, Hanover, New Hampshire.
71. “*Satisfaction is not absolute*,” Dartmouth Logic Seminar, January 23, 2014, Dartmouth College, Hanover, New Hampshire.
72. “*Embeddability amongst the countable models of set theory*,” plenary talk for ASL / Joint Math Meetings in Baltimore, January 18, 2014, Baltimore, Maryland.
73. “*Rubik’s cube competition*,” CSI, November 14, 2013. I ran a Rubik’s cube competition for the CSI Math club, College of Staten Island of CUNY, New York.
74. “*Win the game of Nim!*” CSI Math Club, October 31, 2013, College of Staten Island of CUNY, New York.
75. “*Workshop on paraconsistent set theory*,” University of Connecticut, October 26–27, 2013, Storrs, Connecticut.
76. “*Satisfaction is not absolute*,” Logic Seminar, Mathematics Department, October 25, 2013, University of Connecticut, Storrs, Connecticut.
77. “*Play with your ideas!*” Designated faculty speaker, Dean’s List Ceremony, College of Staten Island of CUNY, October 15, 2013, New York.

78. "*Universal structures: the countable random graph, the surreal numbers and the hypnagogic digraph,*" Swarthmore College Mathematics and Statistics Colloquium, October 8, 2013, Swarthmore, Pennsylvania.
79. "*Satisfaction is not absolute,*" CUNY Logic Workshop, September 27, 2013, CUNY Graduate Center, New York.
80. "*The role of the axiom of foundation in the Kunen inconsistency,*" CUNY Set Theory Seminar, September 20, 2013, CUNY Graduate Center, New York.
81. "*Exploring the Frontiers of Incompleteness,*" Exploring the Frontiers of Incompleteness conference series, August 31–September 1, 2013, Harvard University.
82. "*A multiverse perspective in mathematics and set theory: does every mathematical statement have a definite truth value?*" Metamathematics and Metaphysics workshop, June 15, 2013, Group in Mathematical Logic, Fudan University, Shanghai, China.
83. "*Universality, saturation and the surreal number line,*" invited lecture series, June 13–20, 2013, Fudan University, Shanghai, China.
84. "*Playful paradox with large numbers, infinity and logic,*" public lecture, sponsored by the group in Mathematical Logic, June 12, 2013, Fudan University, Shanghai, China.
85. "*The future of Infinity: Solving Math's most notorious problem,*" Infinity Salon, panelist, World Science Festival, May 29–June 2, 2013, New York.
86. "*Algebraicity and implicit definability in set theory,*" CUNY Set Theory Seminar, May 10, 2013, CUNY Graduate Center, New York.
87. "*The theory of infinite games, with examples, including infinite chess,*" joint meeting, Yeshiva University Mathematics Club, Yeshiva University Philosophy Club, April 30, 2013, Yeshiva University, New York.
88. "*Pluralism in mathematics: the multiverse view in set theory and the question of whether every mathematical statement has a definite truth value,*" Rutgers Logic Seminar, March 25, 2013, Rutgers University, New Jersey.
89. "*The omega one of chess,*" New York Set Theory Seminar, March 1, 2013, CUNY Graduate Center, New York.
90. "*On the axiom of constructibility and Maddy's conception of restrictive theories,*" CUNY Logic Workshop, February 15, 2013, CUNY Graduate Center, New York.
91. "*Superstrong cardinals are never Laver indestructible, and neither are extendible, almost huge and rank-into-rank cardinals,*" CUNY Set Theory Seminar, February 1, 2013, CUNY Graduate Center, New York.
92. "*Every countable model of set theory is isomorphic to a submodel of its own constructible universe,*" Set Theory Workshop, December 15, 2012, University of Barcelona, Catalonia.

93. “*Pluralism in set theory: does every mathematical statement have a definite truth value?*” GC Philosophy Colloquium, November 28, 2012, CUNY Graduate Center, New York.
94. “*The countable models of set theory are linearly pre-ordered by embeddability,*” Rutgers Logic Seminar, November 19, 2012, Rutgers University, New Jersey.
95. “*The least weakly compact cardinal can be unfoldable, weakly measurable and nearly  $\theta$ -supercompact,*” CUNY Set Theory seminar, September 14, 2012, CUNY Graduate Center, New York.
96. “*Recent progress on the modal logic of forcing and grounds,*” CUNY Logic Workshop, September 7, 2012, CUNY Graduate Center, New York.
97. “*Every countable model of set theory embeds into its own constructible universe,*” Toronto set theory seminar, August 24, 2012, Fields Institute, University of Toronto, Canada.
98. “*The mate-in- $n$  problem of infinite chess is decidable,*” Alan Turing Centenary Conference, June 18–23, 2012, Computability in Europe CiE 2012, Cambridge, U.K.
99. “*The hierarchy of equivalence relations on the natural numbers under computable reducibility,*” The Incomputable, part of Semantics and Syntax: A Legacy of Alan Turing, June 12-15, 2012, Kavli Royal Society International Centre, Chicheley Hall, Chicheley, Buckinghamshire, U.K.
100. “*The omega one of infinite chess,*” CUNY Set Theory Seminar, May 18, 2012, CUNY Graduate Center, New York.
101. “*Fun and paradox with large numbers, logic and infinity,*” Temple University Senior Problem Solving forum, April 24, 2012, Temple University, Philadelphia.
102. “*What happens when one iteratively computes the automorphism group of a group?*” Temple University Mathematics Colloquium, April 23, 2012, Temple University, Philadelphia.
103. “*Must there be numbers we cannot describe or define? Pointwise definability and the Math Tea argument,*” Bristol Set Theory Seminar, April 18, 2012, Bristol University, Bristol, U.K.
104. “*The automorphism tower problem for groups,*” Isaac Newton 20th Anniversary Lecture, University of Bristol, School of Mathematics, April 17, 2012, Bristol, U.K.
105. “*Must there be non-definable numbers? Pointwise definability and the math-tea argument,*” Advanced Introduction graduate series, Kurt Gödel Research Center, November 4, 2011, University of Vienna, Austria.
106. “*Generalizations of the Kunen inconsistency,*” Research Seminar, Kurt Gödel Research Center, November 3, 2011, University of Vienna, Austria.
107. “*A tutorial in set-theoretic geology,*” lecture series at the summer school, Set Theory and Higher-Order Logic: Foundational Issues and Mathematical Developments, August 1-6, 2011, University of London, Birkbeck, U.K.
108. “*What is the theory of ZFC-Powerset?*” Toronto Set Theory Seminar, April 22, 2011, Fields Institute, University of Toronto, Canada.

## Teaching Awards and Recognition

I have been recognized for my teaching. I am actively involved in graduate education and have been PhD dissertation supervisor for fourteen graduate students. I regularly earn high teaching evaluations.

- I am rated as “Awesome” on RateMyProfessor.com, with the tags: Inspirational, Accessible outside class, Amazing lectures, Caring, Lots of homework, Respected, 91% would take again.
- Departmental nomination for CSI Presidential Teaching Award, 2006.
- Distinguished Undergraduate Teaching Award (“Teacher of the Year”), UC Berkeley Mathematics, 1995.
- Nikki Kose Memorial Teaching Award, UC Berkeley Mathematics, 1994.

My teaching experience is broad, and includes teaching courses at different institutions (both in the US and in Europe) and at all levels of instruction, including lower and upper division undergraduate courses, introductory and advanced graduate courses, seminars, undergraduate independent study Honors theses, graduate independent study and dissertation supervision.

## Graduate Student supervision

I have served or am serving as PhD dissertation supervisor for the following students:

- Sam Adam-Day, Oxford University
- Nuno Felipe Maia, Oxford University
- Robin Solberg, Oxford University (co-supervisor)
- Corey Bacal Switzer, Ph.D. 2020 (expected), CUNY Graduate Center
- Michał Tomasz Godziszewski, Ph.D. 2018, Institute of Philosophy, University of Warsaw (co-supervisor)
- Kameryn Williams, Ph.D. 2018, CUNY Graduate Center
- Miha Habič, Ph.D. 2017, CUNY Graduate Center
- Erin Carmody, Ph.D. 2015, CUNY Graduate Center
- Norman Perlmutter, Ph.D. 2013, CUNY Graduate Center
- Brent Cody, Ph.D. 2012, CUNY Graduate Center
- Jason Schanker, Ph.D. 2011, CUNY Graduate Center
- Thomas Johnstone, Ph.D. 2007, CUNY Graduate Center
- Victoria Gitman, Ph.D. 2007, CUNY Graduate Center
- Jonas Reitz, Ph.D. 2006, CUNY Graduate Center
- George Liebman, Ph.D. 2004, CUNY Graduate Center

Master’s Thesis Supervisor of:

- Ansten Morch-Klev, M.S. 2007, Universiteit van Amsterdam, Institute for Logic, Language and Computation

Thesis Committee member for:

- Paul Gorbow, Ph.D. 2018, University of Gothenburg, Sweden
- Kaethe Minden, Ph.D. 2017, CUNY Graduate Center
- Regula Krapf, Ph.D. 2017, University of Bonn
- Giorgio Audrito, Ph.D. 2016, University of Torino (I was president of the thesis committee)
- Kostas Tsaprounis, Ph.D. 2012, University of Barcelona
- Shoshana Friedman, Ph.D. 2010, CUNY Graduate Center
- Paul Ellis, Ph.D. 2009, Rutgers University
- Scott Schneider, Ph.D. 2009, Rutgers University
- Sam Coskey, Ph.D. 2008, Rutgers University
- Joost Winter, M.S. 2007, Universiteit van Amsterdam
- Can Baskent, M.S. 2007, Universiteit van Amsterdam
- Yurii Khomskii, M.S. 2007, Universiteit van Amsterdam
- Erez Shochat, Ph.D. 2006, CUNY Graduate Center
- Ivan Welty, Ph.D. 2006, Philosophy, Columbia University
- Sidney Raffer, Ph.D. 1999, CUNY Graduate Center

## Conference and Seminar Organizing at CUNY

Until I had left New York for Oxford last year, I was a principal force behind various research activities that had helped to establish the City University of New York as a vibrant center of research in logic. I was a founding co-organizer of the weekly CUNY Logic Workshop, which has run continuously for over twenty years and has become a focal point for researchers in mathematical logic in New York City, with a long list of distinguished speakers. I also founded the CUNY Set Theory Seminar, running now for over ten years, also with many distinguished speakers. In addition, I have organized or co-organized numerous conferences at CUNY, including the NYC Logic Conference series, several MAMLS meetings and conferences on the Effective Mathematics of the Uncountable. I have also served as advisor for the several New York Graduate Student Logic Conferences.

## Google Scholar metrics

All data is available at my [scholar.google.com](https://scholar.google.com) profile.

Number of Citations: 2416

H-Index: 25

i10 Index: 61