

## **ALAN R. BAKER**

Chair, Department of Philosophy  
Swarthmore College  
Swarthmore, Pennsylvania 19081 USA  
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### **EDUCATION**

**Princeton University**, Princeton, New Jersey  
Ph.D. in Philosophy, 1999; M.A. in Philosophy, 1995  
Ph.D. Dissertation: “Indispensability and the Existence of Mathematical Objects”  
Advisors: Paul Benacerraf, Gideon Rosen  
  
**University of Cambridge**, Emmanuel College, Cambridge  
B.A. Honours, First Class, in Philosophy, 1991  
Part Ia, Mathematics Tripos, 1989

### **AREAS OF SPECIALIZATION**

Philosophy of Mathematics, Philosophy of Science

### **AREAS OF COMPETENCE**

Logic, Philosophy of Mind, Metaphysics, Early Modern Philosophy

### **ACADEMIC POSITIONS HELD**

**Swarthmore College**, Swarthmore, Pennsylvania  
Full Professor, Department of Philosophy, 2016 – present  
Chair, Department of Philosophy, 2019 – present  
Associate Professor, Department of Philosophy, 2008 – 2016  
Assistant Professor, Department of Philosophy, 2003 – 2008  
Acting Chair, Department of Philosophy, 2012 – 2013, 2015 – 2016  
Coordinator, Cognitive Science Program, 2012 – 2014

#### **University of Oxford**

Associate Fellow, CABDyN Complexity Centre, 2009 – present

#### **Xavier University**, Cincinnati, Ohio

Assistant Professor, Department of Philosophy, 2000 – 2003

#### **University of Oxford**, St. John’s College

Tutor in Philosophy, Hilary Term, 1999

#### **University of Cambridge**, Wolfson College

Director of Studies in Philosophy, 1999 – 2000

Junior Research Fellow, 1998 – 2000

#### **University of Ghana**, West Africa

Assistant Lecturer, Department of Philosophy, 1991 – 1992

## TEACHING EXPERIENCE

### **Swarthmore College**, 2003 – present

Philosophy 1: *Introduction to Metaphysics and Epistemology*, Spring 2004

Philosophy 7/1E: *Paradox and Rationality*, Spring 2006, 2018

Philosophy 12: *Logic* (1 section) Fall 2003, 2004, 2005, 2007, 2009, 2010, 2012;  
(2 sections) Fall 2013, 2015, 2016, 2017, 2019, 2020, 2021, 2023

Philosophy 18: *Philosophy of Science*, Spring 2004, 2006; Fall 2009, 2010; Spring 2020, 2022

Philosophy 25: *Philosophy of Mathematics*, Spring 2006, 2011

Philosophy 31: *Advanced Logic*, Spring 2005, 2008, 2010, 2013, 2017, 2021

Philosophy 86: *Philosophy of Mind*, Fall 2004, 2010, 2012, 2013; Spring 2016, 2017

Philosophy 118: *Philosophy of Mind and Cognitive Science (Honors Seminar)*, Fall 2003, 2005, 2007, 2009; Spring 2020, 2022

Philosophy 119: *Philosophy of Science (Honors Seminar)*, Spring 2005, 2008, 2010, 2011, 2014, 2016; 2018; 2021

Philosophy 125: *Philosophy of Mathematics (Honors Seminar)*, Spring 2004

### **University of Oxford**, 2012

*Philosophy of Mathematics*, Hilary Term 2012 (course of 8 lectures)

### **Aarhus University**, Denmark, 2011

10 ECTS: *Emergence, Explanation and Complexity* (summer school, PhD level course)

### **University of Tartu**, Estonia, 2007

Philosophy 03.074: *Nominalism in Mathematics*, Spring 2007

Philosophy 03.075: *Explanation in Science*, Spring 2007

### **Xavier University**, Cincinnati, 2000 – 2003

Philosophy 290: *Theory of Knowledge*, Fall 2000; Spring / Fall 2001, 2002; Spring 2003

Philosophy 311: *Symbolic Logic*, Fall 2000; Fall 2001; Fall 2002

Philosophy 320: *Philosophy of Science*, Spring 2001

English / Math / Philosophy 394: *Complexity and the Origin of Order*, Spring 2002

Philosophy 345: *Seminar in Philosophy of Mathematics*, Spring 2003

### **University of Cambridge**, England, 1998 – 2000

Philosophy Tripos, Part II: *Abstract Objects*, Easter Term 2000 (course of 4 lectures)

Undergraduate supervisions for Wolfson College, Queens College, Newnham College, Cambridge in: *Metaphysics and Philosophy of Mind* (Part Ia, Part Ib); *Philosophy of Science* (Part Ib, Part II); *Logic* (Part Ia, Part Ib)

### **University of Oxford**, England, 1999

Undergraduate tutorials for St. John's College, Oxford, in: *Descartes* (PPE Prelims); *Logic*, (PPE Prelims); *Philosophy of Mathematics* (Mathematics and Philosophy)

### **University of Ghana**, West Africa, 1991 – 1992

Philosophy Part 2: *Philosophy of Mind*

Philosophy Part 1: *Deductive Logic*

## PUBLICATIONS

- Indispensability* (co-authored with Alexander Paseau), Cambridge Elements, Philosophy of Mathematics Series, Cambridge University Press (2023)
- “Puzzling Out the Epistemic Role Puzzle for Mathematical Practice,” in *The Philosophy of Jody Azzouni*, ed. O. Bueno, Dordrecht: Springer [forthcoming]
- “The Mathematical Stance: Realism, Explanation, and Centers of Gravity,” in *The Explanatory and Heuristic Power of Mathematics*, ed. M. Antonutti, S. Bangu & E. Ippoliti, *Synthese*, 200: 53 (2022)
- “Simplicity,” in *The Stanford Encyclopedia of Philosophy* (2022)
- “Counterpossibles in Mathematical Practice: the Case of Spoof Perfect Numbers,” in *The Handbook of the History and Philosophy of Mathematical Practice*, ed. B. Sriraman, Springer (2021)
- “Circularity, Indispensability, and Mathematical Explanation in Science,” *Studies in the History and Philosophy of Science*, 88, 156 – 163 (2021)
- “Bipedal Gait Costs: A New Case Study of Mathematical Explanation in Science,” *European Journal for Philosophy of Science*, 11, 95 (2021)
- “Schemas for Induction,” *Studies in the History and Philosophy of Science, Part A*, 82, 114 – 119 (2020)
- “Non-Deductive Methods in Mathematics,” *Stanford Encyclopedia of Philosophy* (2019)
- “Mathematical Spandrels,” *Australasian Journal of Philosophy*, 95(4), 779 – 793 (2017)  
(Listed under ‘Notable Writings’ in *The Best Writing on Mathematics 2018*, ed. M. Pitici, Princeton University Press.)
- “Mathematics and Explanatory Generality,” *Philosophia Mathematica*, 25(2), 194-209 (2017)
- “Critical Review: Philosophies of Mathematics,” *American Mathematical Monthly*, 124(2), 188-192 (2017)
- “Parsimony and Inference to the Best Mathematical Explanation,” *Synthese*, 193, 333-350 (2016)
- Review of *Autonomy Platonism and the Indispensability Argument* by Russell Marcus, *Philosophia Mathematica*, 24(3), 422-424 (2016)
- “Non-Optional Projects: Mathematical and Ethical,” in *Explanation, Ethics and Mathematics*, ed. U. Leibowitz & N. Sinclair, Oxford University Press (2016)
- Review of *Mathematics and Scientific Representation* by Christopher Pincock, *British Journal for the Philosophy of Science*, 66, 695-699 (2015)
- “Mathematical Explanation in Biology,” in *Explanation in Biology*, ed. C. Malaterre, Springer, 229-247 (2015)
- “Complexity, Networks, and Non-Uniqueness,” *Foundations of Science*, 18, 687-705 (2013)
- “Science-Driven Mathematical Explanation,” *Mind*, 121, 243-267 (2012)

- “Science and Mathematics: the Scope and Limits of Mathematical Fictionalism,” Book Symposium, *Metascience*, 21, 269-294 (2012)
- “Indexing and Mathematical Explanation” (co-authored with Mark Colyvan), *Philosophia Mathematica*, 19, 323-334 (2011)
- “Explaining the Applicability of Mathematics in Science,” *Interdisciplinary Science Reviews, Special Issue: The Unreasonable Effectiveness of Mathematics*, 36.3, 255-267. (2011)
- “Mathematical Induction and Explanation,” *Analysis*, 70(4), 681-689 (2010)
- “No Reservations Required? Defending Anti-Nominalism,” *Studia Logica*, 96, 129-141 (2010)
- “Complexity,” *The Reasoner*, 4(3), 44 (2010)
- “Simulation-Based Definitions of Emergence,” *Journal of Artificial Societies and Social Simulation*, 13(1) (2010)
- “Complexity,” in *Key Terms in Logic*, ed. J. Williamson, Continuum, p. 15 (2010)
- “Inference to the Best Explanation,” in *Key Terms in Logic*, p. 37 (2010)
- “A Medley of Philosophy of Mathematics: Review of *Philosophy of Mathematics: Set Theory, Measuring Theories, and Nominalism* eds. G. Preyer & G. Peter,” *Metascience*, 19(2), 221-224 (2010)
- “William of Ockham,” in *Key Terms in Logic*, ed. J. Williamson, Continuum (2010)
- “Mathematical Explanation in Science,” *British Journal for the Philosophy of Science*, 60, 611-633 (2009)
- “Mathematical Accidents and the End of Explanation,” in *New Waves in the Philosophy of Mathematics*, ed. O. Bueno & Ø. Linnebo, Palgrave Macmillan, 137-159 (2009)
- “Emergence and Simulation,” *Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, Volume 5: Complex Sciences* (2009)
- “Experimental Mathematics,” *Erkenntnis*, 68, 331-344 (2008)  
Reprinted in *An Historical Introduction to the Philosophy of Mathematics*, ed. R. Marcus & M. McEvoy, Bloomsbury, 767-780 (2016)
- “Complexity Unfavoured,” *Analysis*, 68(1), 85-88 (2008)
- “Mathematical Skepticism,” *Acta Universitatis Latviensis*, 739, 7-21 (2008)
- “Putting Expectations in Order: a Response to Nover and Hájek,” *Philosophy of Science*, 74(5), 692-700 (2007)
- “Occam's Razor in Science: a Case Study from Biogeography,” *Biology and Philosophy*, 22, 193-215 (2007)
- “A Counter on Counterpossibles,” *The Reasoner*, 1(2), 7-8 (2007)
- “Drinking Discretely: Parsons’s Old Peculiar,” *Analysis*, 67(4), 318-21 (2007)
- “Is There a Problem of Induction for Mathematics?” in *Mathematical Knowledge*, ed. M. Leng, A. Paseau, & M. Potter, Oxford University Press, 59-73 (2007)

- “Complex Thinking: the Emergence of Everything?”, in *The Baltic International Yearbook of Cognition, Logic and Communication, Volume 2: Complex Cognition and Qualitative Science*. ed. J. Skilters, Latvijas Universitate, 137-148 (2007)
- “Ambiguity in Inclusive and/or Exclusive Disjunction,” *Contemporary Philosophy*, 27(1-2), 49-56 (2006)
- Review of *A Structural Account of Mathematics* by Charles Chihara, *Notre Dame Journal of Formal Logic*, 47(3), 435-442 (2006)
- “Are There Genuine Mathematical Explanations of Physical Phenomena?” *Mind*, 114, 223-238 (2005)  
Reprinted in *Philosophy of Mathematics*, ed. A. Paseau, Routledge (forthcoming)
- “Malebranche’s Occasionalism: a Strategic Reinterpretation,” *American Catholic Philosophical Quarterly*, 79(2), 251-272 (2005)
- “Maximizing Principles in Mathematical Methodology,” *Logique et Analyse*, 45, 269-281 (2004)
- “Malebranche on Laws of Nature and God’s General Volitions,” *Logical Analysis and the History of Philosophy*, 7, 121-133 (2004)
- “Does the Existence of Mathematical Objects Make a Difference?” *Australasian Journal of Philosophy*, 81(2), 246-264 (2003)
- “Quantitative Parsimony and Explanatory Power,” *British Journal for the Philosophy of Science*, 54, 245-259 (2003)
- “The Indispensability Argument and Multiple Foundations for Mathematics,” *Philosophical Quarterly*, 53, 49-67 (2003)
- “The New Science of Complexity,” in *History and Philosophy of Science for African Undergraduates*, ed. H. Lauer, Hope Publications, 373-382 (2003)
- Review of *The Foundations of Mathematics in the Theory of Sets* by J.P. Mayberry, *Australasian Journal of Philosophy*, 80(4), 533-4 (2002)
- “Philosophy and Complexity,” *Proceedings of the Fourth International Conference on Complex Systems* (2002)
- “Mathematics, Indispensability and Scientific Progress,” *Erkenntnis*, 55(1), 85-116 (2001)
- “Are the Laws of Nature Deductively Closed?” in *Causation and Laws of Nature (Australian Studies in the History and Philosophy of Science)*, ed. H. Sankey, Kluwer, 91-109 (1999)
- “Classical Negation and the Definition of Logical Connectives,” *LOGICA Yearbook ‘97*, 128-140 (1998)
- “Aspects of Indispensability: Infinitesimals and Quaternions,” in *Proceedings of the Canadian Society for the History and Philosophy of Mathematics* (1997)
- “The Classification of Defects from Ultrasonic Data using Neural Networks,” *NDT International*, 22, 97-108 (1989)

## **Other Publications**

“Mis (kui üldse miski) on ameerika filosoofia?” [“What (If Anything) Is American Philosophy?”], (in Estonian), *SIRP*, 25, June 15 2007, p. 14.

“Philosopher in Residence,” Feature Story, Swarthmore College homepage  
<http://www.swarthmore.edu/x9389.xml>, January 2007

“I Think, Therefore I Pass,” *New York Times Educational Supplement*, Nov. 6 2005, p. 39.

## **SABBATICAL / VISITING POSITIONS HELD**

### **Kyoto University, Japan**

Visiting Researcher, Research Institute for Mathematical Sciences (RIMS)  
JSPS Senior Fellow, Department of Philosophy, January – July 2019

### **University of Oxford, UK**

Stipendiary Lecturer, Wadham College, January – July 2012

### **Aarhus University, Denmark**

Visiting Professor, Aarhus Summer University, July – August 2011

### **Santa Fe Institute, Santa Fe, New Mexico**

Visiting Scholar, March 2010

### **Northeastern University, Boston, Massachusetts**

Visiting Research Professor, Department of Physics, August 2009

### **University of Oxford, UK**

Visiting Scholar, Wolfson College, September 2008 – July 2009

University Fellow, James Martin Institute, September 2008 – July 2009

### **University of Warwick, UK**

Visiting Scholar, Department of Philosophy, September 2008 – July 2009

### **London School of Economics, UK**

Visiting Researcher, Department of Philosophy, Logic & Scientific Method, January 2008

### **University of Tartu, Estonia**

Fulbright Scholar, Department of Philosophy, January – May 2007

### **Whitehall Museum House, Middletown, Rhode Island (former home of George Berkeley)**

Scholar in Residence, July 2006; August – September 2008; July – August 2010; July 2013; June – July 2015; June – July 2016; June – July 2018; June – July 2022

## **GRANTS AND AWARDS**

James A. Michener Faculty Fellowship (\$60,000), Swarthmore College, for 2<sup>nd</sup> semester sabbatical leave support, 2022 – 2023

Long-Term Visiting Scholar Award (\$25,000), Japanese Society for the Promotion of Science, for six-month research collaboration at the University of Kyoto, Japan, 2019

- Eugene M. Lang Faculty Fellowship (\$60,000), Swarthmore College, for 2<sup>nd</sup> semester sabbatical leave support, 2018 – 2019
- Digital Humanities Curricular Development Grant (\$1,500), Swarthmore College, for project to use argument mapping software in the philosophy of mind, 2017
- National Science Foundation Scholars Award (\$150,000), for four summers of research and collaboration with Swarthmore undergraduate students, on the cross-disciplinary project, “Mathematical Explanation in Science,” 2015 – 2018
- Mellon TRICO Root Grant Award (\$6,000), Project Leader, Working Group in Mathematics and Philosophy, 2014 – 2016
- ‘New Directions’ Post-Fellowship Award (\$50,000), Andrew W. Mellon Foundation, for two summers of research and collaboration in the area of complex systems, 2012 – 2013
- Mary Albertson Fellowship (\$40,000), Swarthmore College, for 2<sup>nd</sup> semester sabbatical leave support, 2011 – 2012
- Mellon TRICO Seed Grant Award (\$2,300), History and Philosophy of Mathematical Practice, 2011 – 2012
- Research Award (\$2,000), Swarthmore College, for research collaboration at the Santa Fe Institute, 2011
- Mellon TRICO Seed Grant Award (\$2,150), Project Leader, Science Studies, 2010 – 2011
- Penn Humanities Forum, Regional Fellowship (\$3,000), for participation in a weekly seminar on “Connections,” University of Pennsylvania, 2009 – 2010
- Mellon TRICO Seed Grant Award (\$3,000), Project Leader, Working Group in Mathematics and Philosophy, 2009 – 2010
- ‘New Directions’ Fellowship (\$224,000), Andrew W. Mellon Foundation, to study complexity science for one year in the UK, 2008 – 2009
- The Sir Karl Popper Essay Prize, finalist, 2008
- Mellon TRICO Seed Grant Award (\$2,200), Project Leader, Working Group in Mathematics and Philosophy, 2008 – 2009
- Lang Discretionary Fund Award (\$1,800), for travel to attend Venice Summer School on Science and Religion, 2008
- Lakatos Research Fellowship (\$3,000), for travel, archival research, and Visiting Researcher position at the London School of Economics, 2007 – 2008
- Mellon TRICO Seed Grant Award (\$3,000), Project Leader, Working Group in Mathematics and Philosophy, 2007 – 2008
- Inter-Country Travel Grant (\$500), Finnish Fulbright Commission, 2007
- Fulbright Scholarship (\$25,000), University of Tartu, Estonia, 2007
- Swarthmore College Cognitive Science Program Travel Grant (\$1,500), to attend Cognitive Science Society Conference in Vancouver, 2006

Korea Research Foundation Grant (\$3,000), for travel to South Korea to give three public lectures on “The Philosophy of Applied Mathematics,” 2005

Summer Research Fellowship, Xavier University, 2002

President’s Interdisciplinary Initiative Grant (\$75,000), “Engaging Our World of Complexity,” 2001

Fellowship for Research Release Time, Xavier University, 2000

Association of Princeton Graduate Alumni Award, 1996

*Mind* Association Travel Grant, to attend Mathematical Truth conference in Sicily, 1995

Graduate Fellowship, Princeton University, 1992 – 1997

M.T. Dodd’s Prize for Philosophy, Economics & History, Emmanuel College, Cambridge, 1991 (one prize awarded annually for best performance in university Tripos exams)

Hooper Scholarship, Emmanuel College, Cambridge, 1990

## PROFESSIONAL ACTIVITIES

Referee for *Mind*, *Australasian Journal of Philosophy*, *Philosophy of Science*, *Erkenntnis*, *Nous*, *British Journal for the Philosophy of Science*, *Dialectica*, *Synthese*, *European Journal for the Philosophy of Science*, *American Philosophical Quarterly*, *International Studies in the Philosophy of Science*, *Dialogue*, *Philosophical Studies*, *International Journal of Analytic Philosophy (Organon F)*, *Philosophy and Phenomenological Research*, *Philosophia*, and *Philosophical Quarterly*

Reviewer for *Notre Dame Journal of Formal Logic*, *Australasian Journal of Philosophy*, *Metascience*, *Philosophia Mathematica*, and *Mind*

Book manuscript reviewer for Oxford University Press

Invited plenary lecturer, Conference on “Simplicities and Complexities,” University of Bonn, May 2019 [declined]

External PhD Examiner, Vrije Universiteit Brussel, September 2017

MPhil thesis examiner, University of Ghana, 2014

Invited participant, Conference on “Simplicity: Ideals of Practice in Mathematics and the Arts,” New York, April 2013

External Examiner, Department of Philosophy and Classics, University of Ghana, 2012 -16

Examiner, Philosophy, Politics and Economics Prelims, University of Oxford, 2012

Editor, PhilPapers, Epistemology of Mathematics section, 2011 – present

Member, Board of Directors, Greater Philadelphia Philosophy Consortium, 2008 – 2019

Panelist, Fulbright Orientation for Europe and Eurasia, Washington DC, June 2007

Panelist, Cross-cultural Learning and Teaching Experiences, University of Tartu, Estonia,



May 2007

Consultant on proposal for BBC documentary program, “Counterfactuals in Science,” 2007

Consultant for Logic, Metaphysics, and Philosophy of Mathematics, Broadview Press, 2006

Co-organizer, GPPC Undergraduate Conference, Philadelphia, February 2005

Subject referee for Philosophy of Mathematics, Acumen Publishers, 2004

Committee member, Greater Philadelphia Philosophy Consortium, 2004 – present

Participant in ‘Emergence and Complexity’ Reading Group, Bryn Mawr College, 2003 – 8

Participant in Greater Philadelphia Philosophy Consortium, Philosophy of Science Reading Group, 2003 – present

Editorial consultant for textbook *History and Philosophy of Science*, ed. H. Lauer, Hope Publications, 2003

Consultant for online logic textbook, *Introductory Logic*, published by Teall Review, 2002

Steering Committee member for Xavier University’s Service Learning Program in Ghana, West Africa, 2002

Examiner, Part Ib Philosophy Tripos, University of Cambridge, 1999 – 2000

## **INVITED TALKS AND CONFERENCE PAPERS (since 2008)**

“Schemas for Induction,” Colloquium Talk, Center for Applied Philosophy and Ethics, Kyoto University, Kyoto, Japan, July 2023

“Induction, Invalidity, and Explanation,” Invited Talk, Hokkaido University, Sapporo, Japan, July 2023

“Applied Mathematics in Practice: A Tale of Two Graphs,” Philosophies of Mathematics in Dialog Workshop, Princeton University, May 2023

“Applied Mathematics as Problem-Driven Game,” Conference on the Heuristic View: Logic, Mathematics, and Science, Sapienza University, Rome, February 2023

“The Social Structure of Science,” Guest Lecture, CSI 709: High Impact Research Questions, George Mason University, February 2023

“Enumerative Induction: Analogies and Disanalogies between Mathematics and Science,” Invited Talk, Conference on Mathematics and Analogical Reasoning, Munich, June 2022

“Thinking Through the Problem of Induction for Mathematics,” Guest Lecture, Philosophy of Mathematical Practice, Munich Centre for Mathematical Philosophy, January 2022

“Reasoning with Extreme Cases: Induction in Arithmetical Reasoning,” Invited Panel, Eastern Division Meeting, American Philosophical Association, Baltimore, January 2022

- “Quantum Mechanics, Realism, and Antirealism,” Guest Lecture, Phys 005: Spacetime and Quanta, Swarthmore College, December 2021
- “Enumerative Induction in Mathematics: The Lure of Small Numbers,” Guest Lecture, Phil 536, Philosophy of Mathematics, Princeton University, November 2021
- “Game Fictionalism,” Princeton Philosophy of Mathematics Reading Group, Princeton University, February 2020
- “Natures Patterns: Dragons, Dinosaurs, and Differential Equations,” Faculty Lecture, Swarthmore College, December 2019
- “Interpretations of Quantum Mechanics,” Guest Lecture, Phys 005: Spacetime and Quanta, Swarthmore College, December 2019
- “Emergence in the Philosophy of Mind,” Guest Lecture, Introduction to Cognitive Science, Swarthmore College, October 2019
- “Mapping Mathematics to the World,” Colloquium Talk, Department of Philosophy, Kyoto University, Kyoto, Japan, May 2019
- “Mathematics, Fictionalism, and Sherlock Holmes,” Tokyo Forum for Analytic Philosophy, Tokyo, Japan, May 2019
- “Induction and Invalidity,” Japan Association for Contemporary and Applied Philosophy Workshop, Kyoto, Japan, April 2019
- “Mapping Mathematics to the World,” Invited Talk, Department of Philosophy, Auburn University, October 2018
- “Induction, Explanation, and Applied Mathematics,” Invited Talk, PhilMath Intersem, University of Paris, June 2018
- “Applied Mathematics and Problem-Driven Games,” Invited Talk, Philosophy of Science Workshop, Bergen, Norway, May 2018
- “Quantum Mechanics and the Many-Worlds Interpretation,” Guest Lecture, Phys 005: Spacetime and Quanta, Swarthmore College, November 2017
- “Bamboos, Cicadas, and Number Theory,” Colloquium Talk, University of Southern Mississippi, March 2017
- “A Great Game? Mathematics as Sherlockian Fiction,” Invited Talk, Louisiana State University, March 2017

- “Philosophical Interpretations of Quantum Mechanics,” Guest Lecture, Phys 005: Spacetime and Quanta, Swarthmore College, December 2016
- “The History of the Resident Scholar Program,” Scholar in Residence Talk, Whitehall Museum House, Middletown, Rhode Island, July 2016
- “Mathematics and Explanatory Entanglement,” Invited Talk, Dartmouth Workshop on Idealization in Science, May 2016
- “What is it Like to Taste Chocolate?,” Guest Lecture, Swarthmore Alumni Group, Philadelphia, March 2016
- “Mathematical Spandrels,” Invited Talk, Mississippi State University, March 2016
- “Indispensability and Inference to the Best Mathematical Explanation,” Colloquium Talk, University of Mississippi, March 2016
- “Three Aspects of Mathematical Explanation: Bertrand’s Postulate,” Keynote Talk, Workshop on Mathematical Aims Beyond Justification, Brussels, Belgium, December 2015
- “Emergence in the Philosophy of Mind,” Guest Lecture, Introduction to Cognitive Science, Swarthmore College, November 2015
- “Does Mathematics Have a Language Within Which to Reason?,” Greater Philadelphia Philosophy Consortium Author Meets Critic Event for Danielle Macbeth’s *Realizing Reason*, Haverford College, September 2015
- “George Berkeley, Immaterialism, and Simplicity,” Scholar in Residence Talk, Whitehall Museum House, Middletown, Rhode Island, July 2015
- “Mathematical Explanations of Physical Phenomena: a Route to Generality,” Philosophy of Science Conference, Dubrovnik, Croatia, April 2015
- “Inference to No Explanation,” Invited Lecture, Department of Philosophy, Kyoto University, Japan, December 2014
- “Varieties of Emergence,” Guest Lecture, Introduction to Cognitive Science, Swarthmore College, November 2014
- “Do Experts Believe What They Say?” Invited Lecture, University of Ghana, West Africa, July 2014
- “Mathematics, Fictionalism, and the ‘Great Game’,” Invited Talk, University of Virginia, March 2014
- “Interpretations of Quantum Mechanics,” Guest Lecture, Phys 005: Spacetime and Quanta, Swarthmore College, December 2013

- “Explanation by Mathematical Induction”, Workshop: Proofs That and Proofs Why, Paris, France, November 2013
- “Scientific Explanation and Mathematical Explanation: One Topic or Two?”, IHPST Seminar, Paris, France, November 2013
- “Induction, Invalidity, and Explanation,” Invited Talk, University of Delaware, September 2013
- “George Berkeley, Mathematics, and Inconsistency,” Scholar in Residence Talk, Whitehall Museum House, Middletown, Rhode Island, July 2013
- “Mathematical Explanation in Science,” Invited Talk, Federal University of Minas Gerais, Belo Horizonte, Brazil, May 2013
- “Mathematical Explanation in Science,” Invited Talk, Federal University of Rio de Janeiro, Brazil, May 2013
- “Arguments from Mathematical Impossibility,” Invited Talk, University of Rochester, February 2013
- “Non-Optional Projects: Mathematical and Ethical,” Invited Talk, Ethics and Explanation Conference, Nottingham, UK, January 2013
- “Visualizing Information: Pros and Cons,” Guest Lecture, CS 380: Recent Advances in Computer Science – Science of Information, Bryn Mawr College, November 2012
- “Mathematical Properties and Explanation,” Invited Talk, Logic and Cognitive Science Lecture Series, North Carolina State University, November 2012
- “Scientific Images: Information and Misinformation,” Invited Talk, Mellon 23 Fall Workshop on Information, Bryn Mawr College, October 2012
- “Metametaphysics,” Faculty Lunch talk, Swarthmore College, October 2012
- “Numbers, Insects, and Mathematical Explanation,” Invited Lecture, University of Ghana, West Africa, July 2012
- “Mathematical Contributions to Explanation,” Wadham College Philosophy of Mathematics Workshop, Oxford, June 2012
- “Making Sense of Mathematical Counterfactuals,” Philosophy of Mathematics Seminar, University of Oxford, May 2012
- “Matching Mathematics to the World,” Department of Philosophy Seminar Series, University of Leeds, May 2012

- “Matching Mathematics to the World,” Philosophy Club, University of St. Andrews, March 2012
- “Absolutely Normal Numbers,” Mathematics Department Colloquium, Swarthmore College, November 2011
- “Matching Mathematics to the World,” Colloquium Talk, Institute for the History and Philosophy of Science, Paris, October 2011
- “Paradoxes for Mathematics: a Philosophical Perspective,” Invited Lecture, Ride the Tide Program for Admitted Students, Swarthmore College, April 2011
- “The Extended Mind,” Cognitive Science Group, Swarthmore College, April 2011
- “Inference to the Best Mathematical Explanation,” Workshop on Explanation in Mathematics, Toronto University, October 2010
- “Explanatory Relations Between Mathematical and Physical Hypotheses,” Workshop on Mathematics and Explanation, Aarhus University, Denmark, August 2010
- “Mad Science and Martian Science,” Invited Lecture, Ride the Tide Program for Admitted Students, Swarthmore College, April 2010
- “Varieties of Emergence,” Guest lecture, Introduction to Cognitive Science, Swarthmore College, April 2010
- “Emergence and Simulation,” Research Seminar, Santa Fe Institute, March 2010
- “Approaches to Characterizing Emergence,” Panel Discussion, Cooper Foundation Event on Examining the Sacred, Science, and Meaning, Swarthmore College, February 2010
- “The ‘New’ Science of Networks,” Faculty lunch talk, Swarthmore College, November 2009
- “Science-Driven Mathematical Explanation,” lunchtime talk, Center for Philosophy of Science, University of Pittsburgh, October 2009
- “Only Connections?,” Penn Humanities Forum, September 2009
- “Real Networks?,” Research Seminar, Department of Physics, Northeastern University, August 2009
- “Mathematical Induction and Explanation,” Work-in-Progress Seminar Series, Subfaculty of Philosophy, University of Oxford, July 2009
- “Emergence in Complex Systems,” Conceptual Foundations in Systems Biology Seminar Series, University of Oxford, June 2009

“Biological Systems and Biological Networks,” Conceptual Foundations in Systems Biology Seminar Series, University of Oxford, May 2009

“Networks as Representations and Networks in the World,” CABDyN Seminar Series, University of Oxford, May 2009

“Are Networks Real?,” Bath Institute for Complex Systems, May 2009

“Parts, Wholes, and Emergence,” Serious Metaphysics Group, University of Cambridge, May 2009

“Topological Definitions of Emergence,” 2<sup>nd</sup> EmergeNET Meeting, Glasgow, March 2009

“Emergence and Simulation,” First International Conference on Complex Sciences: Theory and Applications, Shanghai, China, February 2009

“Geometry, Indispensability and Explanation,” Philosophy of Mathematics Seminar, University of Oxford, January 2009

“Angles and Insects: Geometrical Explanation in Science,” Workshop on Explanation, Indispensability of Mathematics and Scientific Realism, University of Leeds, January 2009

“The Unreasonableness of Asking Why Mathematics is Effective,” Research Symposium: “Unreasonable Effectiveness?” Historical Origins and Philosophical Problems for Applied Mathematics, All Souls College, Oxford, December 2008

“Scientific Representation,” M.A. Research Seminar, University of Leeds, December 2008

“What (if Anything) Makes a Scientific Image ‘Fraudulent’?,” History and Philosophy of Science Seminar Series, University of Leeds, December 2008

“The Philosophy of Applied Mathematics,” Kyoto University, Japan, November 2008

“Mathematical Explanation in Science,” Keio University, Japan, November 2008

“Some Philosophical Perspectives on Complexity,” James Martin Institute for Science and Civilization, University of Oxford, October 2008

“Mathematical Explanation in Science: One Issue or Two?,” University of Liverpool, October 2008

“Simulation-Based Definitions of Emergence,” Epistemological Perspectives on Simulation III, Lisbon, October 2008

“Is the Applicability of Mathematics ‘Miraculous’?,” Venice Summer School on Science and Religion, May 2008

“Mathematical Accidents and the End of Explanation,” Invited Talk, New Waves in the Philosophy of Mathematics Conference, Miami, April 2008

“A State of Emergence: E,” Bryn Mawr Emergence Group, Bryn Mawr College, April 2008

“Mathematical Explanation in Science,” Department of History and Philosophy of Science, University of Cambridge, March 2008

## **COLLEGE ACTIVITIES AND SERVICE**

Committee member, Ad Hoc Committee on the Tenure Line Pool Process, 2020 – 2021

Committee member, Data Governance Committee, 2019 – 2021

Panelist, Quaker College Fair, Friends Center, Philadelphia, 2019

Participant, Aydelotte Foundation Faculty Seminar, “Collaboration,” 2016

Panelist, “Sound Breaks: The Gravity of the Situation,” Aydelotte Foundation, 2015

Participant, Mellon Tri-College Faculty Seminar, “Critical Making,” 2015

Committee member, Committee on Academic Responsibility, 2013 – 2014

Coordinator, Cognitive Science Program, Swarthmore College, 2012 – 2014

Organizer, 4<sup>th</sup> Annual Mathematics and Philosophy Colloquium, Swarthmore College, 2013

Campus coordinator, TRICO Mind Initiative, 2013 – 2014

Organizer, 3<sup>rd</sup> Annual Mathematics and Philosophy Colloquium, Swarthmore College, 2010

Committee member, Tri-College Mellon Committee, 2009 – 2011

Assistant Coach, Swarthmore College Men’s Squash Team, 2009 – 2011

Organizer, “Proof and Understanding,” Mathematics and Philosophy Colloquium, Swarthmore College, 2008

Participant, Mellon Tri-College Faculty Seminar, “Imaging in Science,” 2007 – 2008

Founder and organizer, Swarthmore College Shogi (Japanese Chess) Club, 2005 – present

Committee member, Cognitive Science Committee, 2003 – present

Committee member, Fellowships and Prizes Committee, 2003 – 2006