

## CURRICULUM VITAE

NAME: Robert W. Batterman  
ADDRESS: Department of Philosophy  
Talbot College 307F  
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### EDUCATION:

Ph.D.: University of Michigan (1987)  
M.A.: University of Michigan (1984)  
B.A.: Cornell University (1980)

### GRANTS AND FELLOWSHIPS:

Rotman Canada Research Chair in Philosophy of Science (2005– )  
SSHRC Standard Research Grant (2008–2011)  
NSF Research Grant (2000–2001)  
NSF Research Grant (1996–1997)  
NSF Research Grant (1992)  
NSF Research Grant (1990)  
NSF Postdoctoral Fellowship (1988), Declined  
Rackham Pre-doctoral Fellowship (1985–1986)

### HONOURS:

Fellow of the Royal Society of Canada, (Elected June, 2009)

### AREAS OF SPECIALIZATION:

Philosophy of Physics, Philosophy of Science

### AREAS OF COMPETENCE:

Epistemology, Metaphysics, Logic

### PROFESSIONAL ACTIVITIES:

### PUBLICATIONS:

- BOOKS:

– Editor *The Oxford Handbook of Philosophy of Physics*, Oxford University Press. Forthcoming 2010.

- *The Devil in the Details: Asymptotic Reasoning in Explanation, Reduction, and Emergence*, Oxford University Press (New York), 2002.
- *The Devil in the Details: Asymptotic Reasoning in Explanation, Reduction, and Emergence*, Oxford University Press (New York), paperback edition, 2007.

• ARTICLES:

1. “On the Explanatory Role of Mathematics in Empirical Science,” Forthcoming, in *The British Journal for the Philosophy of Science* (doi:10.1093/bjps/axp018).
2. “Emergence in Physics,” Forthcoming in *Routledge Encyclopedia of Philosophy Online*, Routledge.
3. “Reduction and Renormalization,” Forthcoming in A. Hüttemann and G. Ernst, eds. *Time, Chance, and Reduction*, Cambridge University Press.
4. “Idealization and Modeling,” *Synthese*, 169, 2009, pp. 427–446.
5. “On the Specialness of Special Functions (The Nonrandom Effusions of the Divine Mathematician),” *The British Journal for the Philosophy of Science*, vol. 58, No. 5, 2006, pp. 263–286.
6. “Hydrodynamics versus Molecular Dynamics: Interttheory Relations in Condensed Matter Physics,” *Philosophy of Science* vol. 73, 2006, pp. 888–904.
7. “Reduction,” Entry in Borchert, Donald, ed. *Encyclopedia of Philosophy*, 2nd edition. Detroit: Macmillan Reference USA, 2006.
8. “Critical Phenomena and Breaking Drops: Infinite Idealizations in Physics,” *Studies in History and Philosophy of Modern Physics*, Vol. 36, No. 2, 2005, pp. 225–244.
9. “Response to Belot’s ‘Whose Devil? Which Details?’,” *Philosophy of Science*, Vol. 72, No. 1, 2005, pp. 154–163.
10. “Falling Cats, Parallel Parking, and Polarized Light,” *Studies in History and Philosophy of Modern Physics*, Vol 34B, No. 4, 2003, pp. 527–557.
11. “George Gabriel Stokes,” *The Dictionary of Nineteenth-Century British Philosophers* (2002), Thoemmes Press, pp. 1082–1084.
12. “Asymptotics and the Role of Minimal Models,” *The British Journal for the Philosophy of Science*, Vol. 53, No. 1, 2002, pp. 21–38.
13. “Interttheory Relations in Physics,” *The Stanford Encyclopedia of Philosophy* (January, 2001), Edward N. Zalta (ed.), URL = <http://plato.stanford.edu/entries/physics-interrelate/>
14. “A ‘Modern’ (= Victorian?) Attitude Towards Scientific Understanding,” *The Monist*, Vol. 83, No. 2, 2000, pp. 228–257.

15. "Multiple Realizability and Universality," *The British Journal for the Philosophy of Science*, Vol. 51, 2000, pp. 115–145.
16. "Why Equilibrium Statistical Mechanics Works: Universality and the Renormalization Group," *Philosophy of Science*, Vol. 65, No. 2, 1998, 183–208.
17. "Game Theoretic Explanations and the Evolution of Justice," with Justin D'Arms and Krzysztof Górný, *Philosophy of Science*, Vol. 65, No. 1, 1998, pp. 76–102.
18. "'Into a Mist': Asymptotic Theories on a Caustic," *Studies in History and Philosophy of Modern Physics*, Vol. 28, No. 3, 1997, pp. 395–413.
19. "Chaos and Algorithmic Complexity," with Homer White, *Foundations of Physics*, 26, No. 3, 1996, pp. 307–336.
20. "Chaos: Algorithmic Complexity vs. Dynamical Instability," *Law and Prediction in the Light of Chaos Research*, Paul Weingartner and Gerhard Schurz (eds.), *Lecture Notes in Physics* (Springer, Berlin), 1996, pp 211–235.
21. "Theories Between Theories: Asymptotic Limiting Intertheoretic Relations," *Synthese*, 103, 1995, pp. 171–201.
22. "Defining Chaos," *Philosophy of Science*, Vol. 60, No 1, 1993, pp. 43–66.
23. "Explanatory Instability," *Nous*, 26, 1992, pp 325–348.
24. "Quantum Chaos and Semiclassical Mechanics," *PSA 1992, volume 2*, 1993, pp. 50–65.
25. "Chaos, Quantization, and the Correspondence Principle," *Synthese* 89, 1991, pp. 189–227.
26. "Randomness and Probability in Dynamical Theories: On the Proposals of the Prigogine School," *Philosophy of Science*, Vol. 58, No. 2, 1991, pp. 241–263.
27. "Irreversibility and Statistical Mechanics: A New Approach?," *Philosophy of Science*, Vol. 57, No. 3, 1990, pp. 395–419.

• REVIEWS:

1. 'Hydrodynamic History,' review of *Worlds of Flow: A History of Hydrodynamics from the Bernoullis to Prandtl*, by Olivier Darrigol, *Metascience*, 16, pp. 475–477, 2007.
2. *Quantum Mechanics and its Emergent Macrophysics*, by Geoffrey Sewell *The British Journal for the Philosophy of Science*, Forthcoming.
3. *Physics and Chance: Philosophical Issues in the Foundations of Statistical Mechanics*, by Lawrence Sklar, *The Philosophical Review*, Vol. 104, No. 4. 1995.

4. *Time, The Physical Magnitude*, by O. Costa de Beauregard *Philosophy of Science*, Vol. 56, No. 4, 1989.

WORK IN PROGRESS:

- “The World is a Singular Place.”
- “Essential Models and Explanatory Mathematics”

PAPERS PRESENTED:

1. “Singularities and Divergences: Philosophical Lessons from Condensed Matter Physics”, 7 Pines Symposium on *Effective Field Theories in Condensed Matter Physics*, The Outing Lodge, Stillwater, Minnesota (May 2009).
2. “Essential Models and Explanatory Mathematics”, Philosophy of Science Association Meeting, Pittsburgh (November, 2008)
3. “Reduction and Emergence in Physics”, Emergence in the physical and biological world: A notion in search of clarification, Erice Italy (April 2008).
4. “Mathematical Asymptotics and Explanation”, Séminaire d’histoire et philosophie de la physique, Paris (February, 2008)
5. “Idealization and Modeling”, Department of Physics, University of Guelph (January 2008)
6. “Mathematical Asymptotics and Explanation”, Department of Applied Mathematics, University of Western Ontario (January 2008)
7. “As Common as Dirt: Scientific Idealizations of Everyday Stuff” Library Lecture, London, ON Public Library (October 2007)
8. “Controllable vs. Uncontrollable Idealizations”, Idealizations in Science Workshop, University of Tilburg, The Netherlands (October 2007)
9. “Essential Models and Explanatory Mathematics,” Models and Simulations II, University of Tilburg, The Netherlands (October 2007)
10. “Mathematical Asymptotics and Explanation,” Boston Colloquium for the Philosophy of Science, Boston University (April 2007).
11. “Idealization and Modeling,” Department of Physics, University of Western Ontario, (February 2007).
12. “On the Specialness of Special Functions (The Nonrandom Effusions of the Divine Mathematician),” Department of Applied Mathematics, McGill University, (January 2007).
13. “Idealization and Modeling,” University of Toronto, (December, 2006)

14. "Reduction and Renormalization," Philosophy of Science Association Meetings, Vancouver (November 2006).
15. "Idealization and Modeling," University of Waterloo, (October, 2006).
16. "Idealization and Modeling," Models and Simulations Conference, Paris, France (June, 2006)
17. "Reduction and Renormalization," The Robert and Sarah Boote Conference in Reductionism and Anti-Reductionism in Physics, University of Pittsburgh (April, 2006).
18. Comment on Mathias Frisch, *Inconsistency, Asymmetry, and Non-Locality*, Pacific Division Meetings of the American Philosophical Association, Portland, OR (March, 2006).
19. "Reduction and Renormalization," Workshop on *Time, Chance, and Reduction: Philosophical Aspects of Statistical Mechanics*, Munich, Germany (March, 2006).
20. " 'Fundamental' Theory: Molecular Dynamics vs. Hydrodynamics," University of Michigan (October, 2005).
21. "On the Specialness of Special Functions (The Nonrandom Effusions of the Divine Mathematician)," University of Western Ontario (September, 2005).
22. "Questions about Evidence in Condensed Matter Physics," Assessing Evidence in Physics Conference, University of Western Ontario (May, 2005).
23. " 'Fundamental' Theory: Molecular Dynamics vs. Hydrodynamics," Central Division Meetings of the American Philosophical Association, Chicago, IL (April, 2005).
24. " 'Fundamental' Theory: Molecular Dynamics vs. Hydrodynamics," Philosophy of Science Association Meetings, Austin, TX (November, 2004).
25. "Phase Transitions and Breaking Drops: Infinite Idealizations in Physics," Invited paper for The European Science Foundation Network for Philosophical and Foundational Problems of Modern Physics: ESF Conference on Philosophical and Foundational Issues in Statistical Physics, Utrecht, The Netherlands (November, 2003).
26. "Phase Transitions and Breaking Drops: Infinite Idealizations in Physics," at Indiana University Department of History and Philosophy of Science (October, 2003).
27. "Limiting Models," Invited paper for the conference on *Models, Simulation, and the Application of Mathematics*, ZiF Universität Bielefeld, (June, 2003).

28. Author Meets Critics: *The Devil in the Details: Asymptotic Reasoning In Explanation, Reduction, and Emergence*, Pacific Division Meeting of the American Philosophical Association (March, 2003).
29. “Gibbs and Asymptotic Relations Between Theories,” Invited paper for the Symposium *J. Willard Gibbs and his Legacy: A Double Centennial*, University of Maryland (March, 2003).
30. “Asymptotics: Explanation and Reduction,” Invited paper for Computations in Science Seminar, University of Chicago Dept. of Physics (February, 2003).
31. “Falling Cats, Parallel Parking, and Polarized Light”, University of California, Irvine (November, 2002).
32. “Limiting Reductions and Emergence”: University of Wisconsin, Madison (December, 2001), Universität Düsseldorf (July, 2002).
33. “Asymptotics and the Role of Minimal Models,” Invited Symposium paper, Philosophy of Science Association Meetings, Vancouver, BC (November, 2000).
34. “Asymptotics and Explanation,” Invited paper for the U. C. Irvine Conference on the Philosophy of Physics, Laguna Beach, CA (February, 2000).
35. “Multiple Realizability and Universality,” at the University of Illinois, Champaign-Urbana (October, 1998);
36. “Multiple Realizability and Universality,” University of Pittsburgh (March, 1999).
37. “Multiple Realizability and Universality,” University of Alberta (March, 1999).
38. “Multiple Realizability and Universality,” University of Minnesota (November, 1999).
39. “Explanation and Understanding: G. G. Stokes and Asymptotic Reasoning,” Invited paper for Stokes Summer School 98, in Skreen, County Sligo, Ireland (August, 1998).
40. “Game Theoretic Explanations and the Evolution of Justice,” with Justin DArms, Invited paper for Author Meets Critic Session on Brian Skyrms book, *Evolution of the Social Contract* at the American Philosophical Association Group meeting of the Society for Value Inquiry, Pacific Division Meetings, Los Angeles, CA (March, 1998).
41. “Why Equilibrium Statistical Mechanics Works: Universality and the Renormalization Group,” Invited Paper; Conference: “New Trends in the Foundations of Physics”; Universiteit Utrecht, Netherlands (March, 1998);

42. "Why Equilibrium Statistical Mechanics Works: Universality and the Renormalization Group," Invited Symposium Paper; American Philosophical Association, Central Division Meetings, Pittsburgh, PA (April 1997).
43. "Universality, Unification, and Understanding," at the University of Oklahoma (November, 1997).
44. "Into a Mist': Asymptotic Theories on a Caustic," presented for the 1995-96 Annual Lecture Series, Center for Philosophy of Science, University of Pittsburgh, (January 1996).
45. "Between Theories," at The University of Texas, Austin (March 1995).
46. "Unpredictability and Chaos": University of Dayton (February, 1995); Kenyon College (February, 1995).
47. "Chaos: Algorithmic Complexity vs. Dynamical Instability," at the Conference on Law and Prediction in (Natural) Science in the Light of Our New Knowledge from Chaos Research, Internationales Forschungszentrum für Grundfragen der Wissenschaften, Salzburg, Austria (July 1994).
48. "Defining Chaos": Indiana University (February, 1993); University of Chicago (January, 1993); University of California, Irvine (January, 1992); University of Western Ontario (October, 1991); American Philosophical Association, Pacific Division Meetings, San Francisco, CA (March 1991).
49. "Quantum Chaos and Semiclassical Mechanics": University of Illinois, Urbana-Champaign (September, 1992); Philosophy of Science Association, (October. 1992).
50. "Explanatory Chaos": University of California at Davis (January, 1990); Duke University (January, 1990).
51. "Laws, States, and Irreversibility": Northwestern University (January, 1988); Case Western Reserve University (February, 1987); University of Illinois at Chicago (October, 1987).
52. "Irreversibility, Statistical Mechanics, and Physical States": Johns Hopkins University (April, 1986).

#### INVITED COMMENTS:

1. Professor Sir Michael Berry, "Asymptotic Relations Between Theories" Plenary Session, British Society for the Philosophy of Science, Glasgow, Scotland (July, 2002).
2. Alexander Rueger, "Limits for Reductive Explanations," American Philosophical Association, Pacific Division Meetings, San Fransisco, CA (March, 2001).

3. Tim Maudlin, “The Character of Chaos,” American Philosophical Association, Eastern Division Meetings, New York, NY (December, 2000).
4. Peter Vranas, “Epsilon-Ergodicity and the Success of Equilibrium Statistical Mechanics,” American Philosophical Association, Pacific Division Meetings, Los Angeles, CA (March 1998).
5. Mariam Thalos, “Explanatory Asymmetry and Humean Empiricism,” American Philosophical Association, Central Division Meetings, Chicago, IL (April, 1995).
6. Alberto Cordero, “Working-Level Science and the Individuation of Theories: The Case of Quantum Mechanics,” American Philosophical Association, Central Division Meetings, Chicago, IL (April, 1989).

#### OTHER PROFESSIONAL ACTIVITIES:

- Co-founder, Rotman Institute of Science and Values at the University of Western Ontario (2008)
- Member of the Editorial Advisory Board for *Oxford Studies in The Philosophy of Science*, Series Editor: Paul Humphreys (2008– )
- Associate Editor *Canadian Journal of Philosophy* (2007–2009 )
- Editorial Board, *Philosophy of Science* (2004– )
- Editorial Advisory Board, *Studies in the History and Philosophy of Modern Physics* (2001– )
- Panel Member, National Science Foundation—Science and Technology Studies (1998–2001)
- Program Committee Member, Central Division, American Philosophical Association (1996, 2001)
- Program Committee Member, Philosophy of Science Association (PSA 2002), (PSA 2006)
- Proposal evaluator for National Science Foundation (1994, 1996, 1998, 2001, 2002, 2003, 2004, 2005)
- Referee for *Philosophy of Science* (1988, 1989, 1991, 1993, 1996, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2007, 2009)
- Referee for *Nous* (1994, 2001, 2003, 2005, 2008)
- Referee for *Studies in History and Philosophy of Modern Physics* (1995, 1996, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2009)
- Referee for *Synthese* (1996, 2000, 2001, 2003, 2004, 2007, 2008)

- Referee for *Foundations of Physics* (1997, 1998)
- Referee for *Ethics* (1998)
- Referee for *British Journal for the Philosophy of Science* (1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009)
- Referee for *The American Philosophical Quarterly* (1999)
- Referee for *Canadian Journal of Philosophy* (2003)
- Referee for *Erkenntnis* (2008)

ACADEMIC WORK EXPERIENCE:

The University of Western Ontario (2005– ) Professor  
 Rotman Canada Research Chair in Philosophy of Science  
 Ohio State University, (2002–2005) Professor  
 Ohio State University, (1995–2002) Associate Professor  
 Ohio State University, (1990–1995) Assistant Professor  
 University of Illinois at Urbana-Champaign, (1988–1990)  
 Visiting Assistant Professor  
 University of Illinois at Chicago, (1987–1988)  
 Visiting Assistant Professor  
 University of Michigan, (1981–1987) Teaching Assistant