

Rebecca Weber

Curriculum Vitae

Associate Professor, Dartmouth College
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Employment

- 2011– Dartmouth College, Associate Professor
- 2005–2011 Dartmouth College, Assistant Professor
- 2009 University of Notre Dame, Visiting Scholar
Fall semester, on Junior Faculty Fellowship from Dartmouth
- 2006 University of Florida, Visiting Assistant Professor
Fall semester of UF's Special Year in Logic
- 2005 Victoria University of Wellington, New Zealand
Postdoctoral Researcher, June–September
- 2004–2005 The Pennsylvania State University, Lecturer
- 1999–2004 University of Notre Dame, Graduate Student and Teaching Assistant

Education

- 2004 Ph.D., mathematics University of Notre Dame
Peter Cholak, thesis advisor
- 2002 M.S., mathematics University of Notre Dame
- 1999 B.S. with honors, mathematics University of Richmond
magna cum laude

Research

My research is in computability (recursion) theory, a field of mathematical logic that seeks to understand the basic concept of computability (as established by Turing, Church, Post, Kleene, and others) and its interplay with other areas of mathematics. Within that area I am most interested in the connections between algebraic (“static”) and computability-theoretic (“dynamic”) properties in the computably enumerable sets and Π_1^0 classes, such as in degree invariance [4,7,12,16]. The other major track of my research is algorithmic randomness and its extension to objects other than binary sequences [5,6,8,9,14], as well as randomness-theoretic weakness and related notions [3,6,9,15]. I have written an undergraduate textbook on computability to be published by the AMS [13].

Support:

National Science Foundation Focused Research Group in Algorithmic Randomness (award #0652326), July 2007–June 2010; co-PI, total award \$532,000.

Junior Faculty Fellowship, Fall 2009 (extra non-resident term).

Publications:

16. On sets automorphic to low sets, with Peter Cholak. In preparation.
15. Reals that are low for information, with Denis Hirschfeldt. Submitted.
14. Effective randomness of unions and intersections, with Douglas Center. Submitted.
13. *Computability Theory*, American Mathematical Society Student Mathematical Library. Anticipated publication April 2012.
12. Degree invariance in the Π_1^0 classes. *Journal of Symbolic Logic*, **76**(2011): 1184–1210.
11. Immunity and non-cupping for closed sets, with Doug Cenzer, Takayuki Kihara, and Guohua Wu. *Tbilisi Mathematical Journal*, **2**(2009): 77–94.
10. Immunity of closed sets, with Doug Cenzer and Guohua Wu. *Mathematical Theory and Computational Practice (CIE 2009)*, eds. K. Ambos-Spies, B. Loewe and W. Merkle, Springer Lecture Notes in Computer Science **5635**(2009): 109–117.
9. K -triviality of closed sets and continuous functions, with George Barmpalias, Doug Cenzer, and Jeff Remmel. *Journal of Logic and Computation* **1**(2009): 3–16.
8. Algorithmic randomness of continuous functions, with George Barmpalias, Paul Brodhead, Doug Cenzer, and Jeff Remmel. *Archive for Mathematical Logic*, **45**(2008): 533–546.
7. Prompt simplicity, array computability and cupping, with Rod Downey, Noam Greenberg, and Joe Miller. In Chong et. al. (eds.), *Computational Prospects of Infinity*, Lecture Notes Series of the Institute for Mathematical Sciences, NUS, vol. 15, World Scientific (2008): 59–78.
6. K -trivial closed sets and continuous functions, with George Barmpalias, Doug Cenzer, and Jeff Remmel. *CIE 2007, Computation and Logic in the Real World*, Third Conference on Computability in Europe, Siena, Italy, June 2007, S.B. Cooper, B. Loewe and A. Sorbi (Eds.), *Springer Lecture Notes in Computer Science* **4497**(2007): 135–145.
5. Algorithmic randomness of closed sets, with George Barmpalias, Paul Brodhead, Doug Cenzer, and Seyyed Dashti. *Journal for Logic and Computation*, **17**(2007): 1041–1062.
4. Totally ω -computably enumerable degrees I: bounding critical triples, with Rod Downey and Noam Greenberg. *Journal of Mathematical Logic* **7**(2007): 145–171.
3. Lowness and Π_2^0 nullsets, with Rod Downey, André Nies, and Liang Yu. *Journal of Symbolic Logic*, **71**(3)(2006): 1044–1052.
2. Invariance in \mathcal{E}^* and \mathcal{E}_Π . *Transactions of the American Mathematical Society* **358**(2006): 3023–3059.
1. *A definable relation between c.e. sets and ideals*. Ph.D. thesis under the supervision of Peter Cholak, University of Notre Dame, 2004.

★ Guest editor (and coauthor of preface, with Doug Cenzer) for *Archive for Mathematical Logic* **45**(2008) dedicated to the Special Year in Logic at the University of Florida and the Conference on Computability and Complexity in Analysis (November 2006, Gainesville, Florida).

★ Referee for *Annals of Pure and Applied Logic*, *Archive for Mathematical Logic*, *Journal of Logic and Computation*, *Journal of Mathematics and the Arts*, *Journal of Symbolic*

Logic, Mathematical Foundations of Computer Science, Mathematical Logic Quarterly, Notre Dame Journal of Formal Logic, and Theoretical Computer Science.

Teaching

★ Thesis advisor to mathematics graduate student Seth Harris.

Recent Courses

2012 Winter Math 24: Honors Linear Algebra
2012 Winter Math 89: Seminar in Logic (Set Theory)
2011 Fall Math 8: Calculus II
2011 Spring Math 29: Computability Theory
2011 Spring Math 38: Graph Theory
2010 Fall Math 19/CS 19: Discrete Math for Computer Science
2010 Spring Math 10: Introductory Statistics
2009 Spring Math 29: Computability Theory
2009 Winter Math 13: Vector Calculus
2008 Fall Math 8 : Calculus II
2008 Fall Math 12: Calculus Plus
2008 Winter Math 8: Calculus II
2008 Winter Math 28: Combinatorics
2007 Fall Math 8: Calculus II
2007 Fall Math 39: Logic

Departmental Service

2011–2012 Graduate Program Representative
2005–2012 Graduate Program Committee
2010–2011 Graduate Admissions Committee
2006–2007 Brochure design (rewrite of departmental brochure)

Selected Talks

Apr 2011 Lowness for dimension
Dartmouth Logic Seminar
Apr 2011 Effective dimension
Dartmouth Logic Seminar
Nov 2010 Sets automorphic to low sets
Computability Theory Special Session Invited Talk
American Mathematical Society Sectional
University of Notre Dame
Mar 2010 The 5 W's of computability theory
Dartmouth College Mathematics Department
Prospective Graduate Student Open House
Mar 2010 Degree invariance in the Π_1^0 classes
Association for Symbolic Logic Annual Meeting Invited Address
George Washington University, Washington, DC

- Mar 2010 What is computability theory?
University of Richmond Mathematics Colloquium
- Feb 2010 Reals that are low for information
Southeastern Logic Symposium
University of Florida, Gainesville
- Dec 2009 Mutual information
Notre Dame Logic Seminar
- Nov 2009 Mutual information
University of Wisconsin–Madison Logic Seminar
- Oct 2009 Patterns and definability, 5-talk series
Notre Dame Working Seminar
- Sep 2009 Degree invariance in the Π_1^0 classes
Midwest Computability Seminar, University of Chicago
- Mar 2009 Do you know how much you know?
MIT Logic Seminar
- Mar 2009 What is computability theory?
MIT Women in Math Lecture Series
- Feb 2009 Do you know how much you know?
Connecticut Logic Seminar
- Mar 2008 Hierarchies
Dartmouth Mathematics Graduate Open House
- Sep 2007 Randomness of closed subsets of 2^ω
FRG Workshop: Effective Randomness
University of Chicago
- Mar 2007 Computability and randomness
Dartmouth College Mathematics Department
Prospective Graduate Student Open House
- Nov 2006 Tutorial: Π_1^0 classes (two parts)
Computability and Complexity in Analysis
Third International Conference, Gainesville, Florida
- Jul 2006 Making randomness rigorous
Summer Program for Women in Mathematics
undergraduate enrichment program
George Washington University
- May 2006 Randomness and Π_2^0 nullsets
2006 Greater Boston Logic Conference, MIT