Jan Reimann Curriculum Vitae

Assistant Professor
Pennsylvania State University
Department of Mathematics
318B McAllister, University Park, PA 16802

Tel: +1 814 863-9679 (office)
Tel: +1 814 308-9489 (home)
email: reimann@math.psu.edu
http://www.math.psu.edu/reimann

Education:

Dr. rer. nat. (PhD) in Mathematics, University of Heidelberg, Germany — Dec. 2004
Thesis: *Computability and Fractal Dimension*
(grade: magna cum laude, 1.0)

Diploma in Mathematics, University of Heidelberg, Germany — Dec. 1997
Thesis: *Topologische Spiele und resourcenbeschränkte Baire-Kategorie*
(grade: *sehr gut*, 1.2)

Awards and Grants:

NSF Award DMS-1201263 "Computability and Randomness in Dynamical Systems and Fractal Geometry ", *National Science Foundation* — 2012-2015

Distinguished Teaching Award, *Department of Mathematics, UC Berkeley* — 2009

NSF Award DMS-0801270 "Randomness in Recursion Theory and Effective Descriptive Set Theory", *National Science Foundation* — 2008-2010

John Templeton Foundation, Grant 13424 "Randomness and the Infinite" (with T. Slaman) — 2008-2010

Dissertation prize, *German Association for Mathematical Logic and Foundations of the Exact Sciences* (DVMLG) — 2004

Appointments:

Assistant Professor, Department of Mathematics, Pennsylvania State University, University Park — August 2010 – present

Morrey Assistant Professor, Department of Mathematics, University of California, Berkeley — July 2007 – June 2010

Visiting Assistant Professor, Department of Mathematics, University of California, Berkeley — July 2006 – June 2007

Wissenschaftlicher Assistent (Research Assistant, C1), Institute for Computer Science, University of Heidelberg, Germany — 2004 – 2007

Wissenschaftlicher Mitarbeiter (BAT IIa), Institute for Mathematics, University of Heidelberg, Germany — 2001 – 2004

Instructor for Statistical Quality Assurance, Robert Bosch GmbH, Germany — 1998 – 2001

SAP AG Walldorf, Germany, software development — 1996 – 1998

Research Interests:

Algorithmic Information Theory and Randomness, Computability Theory, Descriptive Set Theory, Measure Theory and Fractal Geometry

Invited Visits: (*longer than one month*)

Hausdorff Research Institute for Mathematics, Bonn, Germany, Program on *Universality and Homogeneity*	Sep. – Dec. 2013
University of Chicago, *Prof. Denis Hirschfeldt and Prof. Robert Soare*	May – Jun. 2007
National University of Singapore, IMS Program on *Computational Prospects of Infinity*	Jul. – Aug. 2005
University of California, Berkeley, *Prof. Theodore A. Slaman*	Mar. – Apr. 2005
Victoria University of Wellington *Prof. Rod Downey*	Aug. – Oct. 2003

Selected Invited Talks:

Definability and Randomness	
University of Connecticut Logic Group Seminar	04/2012
Degree-invariant functions and uniform Borel reductions	
AMS 2012 Spring Eastern Sectional Meeting, George Washington University	03/2012
Dualities and Dichotomies in Algorithmic Information Theory	
Logic Colloquium 2011, Barcelona, Spain	07/2011
The Strength of the Besicovitch-Davies Theorem	
2010 AMS Fall Central Section Meeting, University of Notre Dame	11/2010
Colloquium Logicum 2010, Münster, Germany	09/2010
Computability in Europe 2010, Ponta Delgada, Azores	07/2010
Old and New Results on Algorithmic Equivalence Relations	
Workshop on Recursion Theory 2011, IMS Singapore, Singapore	08/2011
Workshop on Computability Theory 2010, Ponta Delgada, Azores	07/2010
Logic Seminar, Caltech/UCLA	02/2010
Definability and Randomness	
5th Conference on Logic, Computability and Randomness, University of Notre Dame	05/2010
14th South Eastern Logic Symposium (SEALS), Gainesville, Florida	02/2010
MIT Logic Seminar	01/2010
The Structure of NCR inside Δ^0_2	
ASL Annual Meeting, Notre Dame	05/2009
Logic Colloquium, University of Wisconsin, Madison	04/2009
Effective Geometric Measure Theory	
Department of Mathematics, National University of Singapore	07/2008
Computability, Complexity, and Randomness, Nanjing	05/2008
Joint Meeting AMS and NZMS, Wellington	12/2007
Mutual Theories of Algorithmic Information	
VIG 2008, UCLA, Los Angeles	01/2008

Selected Invited Talks (continued):

Measures and Their Random Reals
Department of Mathematics, University of Hawaii, Manoa 04/2008
ASL Winter Meeting, San Diego 01/2008

The Metamathematics of Randomness
UCLA Logic Colloquium, Los Angeles 01/2007

Effectively Closed Sets of Measures and Randomness
Logic, Randomness, and Computability, Buenos Aires 01/2007
TAMC 2007, Shanghai 05/2007

Randomness – Beyond Lebesgue Measure
Department of Mathematics, University of Chicago 11/2006
Department of Mathematics, University of Notre Dame 11/2006

The Metamathematics of Randomness
Logic Colloquium 06, Nijmegen 07/2006

Trees of Non-Trivial Hausdorff Measure in Computability Theory
Theory and Applications of Models of Computation, Beijing 05/2006

Fractal Dimensions in Recursion Theory
Logic Colloquium, Department of Mathematics, Berkeley 04/2006

Measures and Their Random Reals
Workshop on Computational Prospects of Infinity, IMS Singapore 08/2005

Kolmogorov-Loveland Randomness and Stochasticity
Department of Mathematics, National University of Singapore 09/2005
ASL meeting, Stanford 03/2005

Random Functions
Logic, Randomness, and Computability, Cordoba, Argentina 09/2004

Kolmogorov Complexity and Diophantine Approximation
School of Math. and Comp. Sc., Victoria University of Wellington, NZ 03/2004
Max-Planck-Institut für Mathematik, Bonn, Germany 03/2004

Publications:

J. Reimann and T. A. Slaman. Measures and their random reals. To appear in *Transactions of the AMS*.

A. Day and J. Reimann, Independence, relative randomness and PA degrees. To appear in *Notre Dame Journal of Formal Logic*.

B. Kjos-Hanssen and J. Reimann. The strength of the Besicovitch-Davies Theorem. *Computability in Europe 2010*, Lecture Notes in Comput. Sci., pages 229–238, Berlin, 2010. Springer.

J. Reimann. Randomness beyond Lebesgue measure. *Logic Colloquium 2006*, Cambridge University Press, 2009.

J. Reimann. Effectively closed classes of measures and randomness. *Annals of Pure and Applied Logic* 156(1), pp 170–182, 2008.

J. Reimann and T. A. Slaman. Probability measures and effective randomness. To appear in: *13th International Congress of Logic Methodology and Philosophy of Science*, Beijing, 2007.

Publications (continued):

A. Nies and J. Reimann. A lower cone in the wtt degrees of non-integral effective dimension. Computational prospects of infinity, Part II. Institute for Mathematical Sciences, National University of Singapore, 15. World Scientific Publishing, 2008.

R. G. Downey, W. Merkle, and J. Reimann. Schnorr dimension. *Mathematical Structures in Computer Science* 16(5), pp 789-811, 2006.
(An earlier version appeared in: S. B. Cooper, B. Löwe, and L. Torenvliet, editors, *New Computational Paradigms, First Conference on Computability in Europe*, number 3526 in Lecture Notes in Comput. Sci., pages 96–105, Berlin, 2005. Springer.)

J. Reimann and F. Stephan. On hierarchies of randomness tests. In *Mathematical Logic in Asia*, Proceedings of the 9th Asian Logic Conference, Novosibirsk, World Scientific Publishing, 2006.

W. Merkle, J. Reimann. On selection functions that do not preserve normality. *Theory of Computing Systems*, 39(5):685-697, 2006.
(An earlier version appeared in: *Mathematical foundations of computer science 2003*, volume 2747 of *Lecture Notes in Comput. Sci.*, pages 602–611. Springer, Berlin, 2003.)

W. Merkle, J. Miller, A. Nies, J. Reimann, and F. Stephan. Kolmogorov-Loveland randomness and stochasticity. *Annals of Pure and Applied Logic*, 138(1–3):183–210, 2005.
(An earlier version appeared in: *STACS 2005*, volume 3404 of *Lecture Notes in Comput. Sci.*, pages 422–433. Springer, Berlin, 2005.)

J. Reimann. Computability and fractal dimension. Doctoral dissertation, Universität Heidelberg, 2005.

K. Ambos-Spies, W. Merkle, J. Reimann, and S. A. Terwijn. Almost complete sets. *Theoret. Comput. Sci.*, 306(1-3):177–194, 2003.
(An earlier version appeared in: *STACS 2000 (Lille)*, volume 1770 of *Lecture Notes in Comput. Sci.*, pages 419–430, Berlin, 2000. Springer.)

J. Reimann and F. Stephan. Effective Hausdorff dimension. In *Logic Colloquium '01*, volume 20 of *Lect. Notes Log.*, pages 369–385. Assoc. Symbol. Logic, Urbana, IL, 2005.

K. Ambos-Spies, W. Merkle, J. Reimann, and F. Stephan. Hausdorff dimension in exponential time. In *Proceedings of the 16th Annual IEEE Conference on Computational Complexity*, pages 210–217. IEEE Computer Society, 2001.

K. Ambos-Spies and J. Reimann. Effective Baire category concepts. In *Proceedings of the Sixth Asian Logic Conference (Beijing, 1996)*, pages 13–29, River Edge, NJ, 1998. World Sci. Publishing.

J. Reimann. Topologische Spiele und resourcenbeschränkte Baire-Kategorie. Diploma Thesis, Universität Heidelberg, 1997.

Articles submitted or in preparation:

Measures and their random reals. *Submitted*.

J. Reimann and T. A. Slaman. Effective Randomness for continuous measures. *In preparation*.

J. Reimann and T. A. Slaman. The structure of NCR_1. *In preparation*.

J. Reimann, Algorithmic randomness – the view from ergodic theory. *In preparation*.

A. Montalban, J. Reimann and T. A. Slaman. Degree invariant functions and uniform Borel reducibility. *In preparation*.

M. Katz and J. Reimann, An Introduction to Ramsey Theory. Book, *in preparation*.

Other publications:

R. Downey and J. Reimann. *Algorithmic Randomness*. Scholarpedia, 2(10):2574.

Teaching:

Pennsylvania State University, University Park

Fall 2012	Math 441 – Matrix Algebra Math 558 – Foundations of Mathematics
Spring 2012	Math 561 – Set Theory
Fall 2011	MASS Course – Introduction to Ramsey Theory The *Mathematics Advanced Study Semesters* (MASS) program at Penn State brings together talented and motivated undergraduate students from the US and beyond to provide advanced learning combined with research initiation. See also `massramsey2011.wordpress.com`
Spring 2011	Math 574 – Topics in Logic
Fall 2010	Math 435 – Basic Abstract Algebra

University of California, Berkeley

Spring 2010	Math 135 – Incompleteness and Undecidability
Fall 2009	Math 227A – Theory of Recursive Functions Math 125A – Mathematical Logic
Spring 2009	Math 225B – Metamathematics
Fall 2008	Math 104 – Introduction to Analysis Math 125A – Mathematical Logic
Spring 2008	Math 104 – Introduction to Analysis
Fall 2007	Math 104 – Introduction to Analysis Math 110 – Linear Algebra
Spring 2007	Math 185 – Introduction to Complex Analysis
Fall 2006	Math 104 – Introduction to Analysis

Individual Supervision and Mentoring:

At Penn State, I currently supervise graduate student John Pardo and co-supervise graduate students Phil Hudelson and Noopur Pathak.
Moreover, I supervised several undergraduate research and studies projects, as listed below.

Fall 2011	Math 496 – Independent Studies (Undergraduate) Topic: *Fractal Geometry and Algorithmic Information Theory* (The course serves as a preparation for an honor's thesis project by Qiyuan Li.)
	MASS course – Introduction to Ramsey Theory (The course comprises the supervision of small research projects on Ramsey Theory – 17 students.)
Spring 2011	Math 496 – Independent Studies (Undergraduate) Topic: *Geometric Measure Theory* – Qiyuan Li

At the University of California, Berkeley, I supervised the following independent studies and seminars.

Fall 2009	Math 299 – Reading Course for Graduate Students Topic: *Recent papers on algorithmic randomness*
Spring 2009	Math 196 – Honors Thesis (Alexander Kudlick) Topic: *Maharam's Problem* Math 199 – Supervised Independent Study and Research (Sarah Brodsky) Topic: *Measure Theory*
Fall 2008	Math 199 – Supervised Independent Study and Research (Alexander Kudlick) Topic: *Compactness and Ultrafilters*
Spring 2007	Math 24 – Freshmen Seminar Topic: *Randomness*

At the University of Heidelberg, I supervised two Diploma theses (comparable to a master's thesis)

Theresa Fahrenberger	(completed 2004)
Heiner Violet	(completed 2005)

Professional Activities:

Referee for the following journals:

Advances in Mathematics

Annals of Pure and Applied Logic

Bulletin of Symbolic Logic

Information and Computation

Journal of Logic and Analysis

Journal of Symbolic Logic

Mathematical Logic Quaterly

Proceedings of the London Mathematical Society

Theoretical Computer Science

Theory of Computing Systems

Transactions on Computation Theory

Professional Activities: (continued)

Scientific Program Committee for the following conferences:

Annual meeting of the Association for Symbolic Logic, Waterloo, Canada, 2013

Annual meeting of the Association for Symbolic Logic, Madison, WI, 2012

Computability, Complexity, and Randomness 2011, Cape Town, South Africa

Organizing Committee for the following conferences:

Colloquium Logicum, Heidelberg, 2004

Computability and Logic, Heidelberg, 2003

Computability and Randomness, Heidelberg, 2003

Computability and Models, Heidelberg, 2001

Co-organizer of a special session on Computability, Annual meeting of the Association for Symbolic Logic, Madison, WI, 2012

References:

Prof. Theodore A. Slaman

University of California, Berkeley, `slaman@math.berkeley.edu` (also regarding teaching)

Prof. Alexander Kechris

California Institute of Technology, `kechris@caltech.edu`

Prof. Klaus Ambos-Spies

Universität Heidelberg, `ambos@math.uni-heidelberg.de` (also regarding teaching)

Prof. Denis Hirschfeldt

University of Chicago, `drh@math.uchicago.edu`

Prof. Rod Downey

Victoria University of Wellington, `Rod.Downey@ecs.vuw.ac.nz`