Dr. Cameron Donnay Hill

Contact Information

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Academic Work History

Assistant Professor of Mathematics July 2013 to the present
Department of Mathematics and Computer Science,
Wesleyan University.

Postdoctoral Fellow January-May 2014
Mathematical Sciences Research Institute,
Program in Model Theory, Arithmetic Geometry and Number Theory.

Postdoctoral Research Associate August 2010 to July 2013
Department of Mathematics, University of Notre Dame.
– Mentors: Professors Sergei Starchenko and Peter Cholak.

Education

University of California, Berkeley

Ph.D., Department of Mathematics, December 2010.

- Thesis: *Geometric Model Theory in Efficient Computability*, August 2010.
(Results are collected in the papers [5],[1] below with much improved exposition.)
- Adviser: Professor Leo Harrington,
with additional supervision from Professor Thomas Scanlon.
- Area of Study: Mathematical Logic, Model Theory, Discrete Mathematics.

Yale University, New Haven, CT

B.A., *Russian and East European Studies*, June 2002.

Fellowships, Grants, and Awards

Fellow, Woodrow Wilson Foundation *Career Enhancement Fellowship for Junior Faculty*, 2016.

Silver medalist, *Kurt Gödel Research Prize Fellowships Program*, 2014.

Ford Fellow (Ford Foundation Dissertation-year Fellowship), Fall 2009 - Spring 2010.

Berkeley-Pembroke Exchange Scholar, University of Cambridge, Fall 2009 - Spring 2010.

Graduate Student Researcher, Cyberinfrastructure for Phylogenetic Research (CIPRES), NSF EF 03-31494, Summer 2005 and Spring 2006.

Honorable Mention, Ford Foundation Pre-Doctoral Fellowship, 2005.

Graduate Assistance in Areas of National Need (GAANN) grant recipient, Fall 2003 - Summer 2004.

Publications

[1] *On (uniform) hierarchical decompositions of finite structures and model-theoretic geometry.*
To appear in *Annals of Pure and Applied Logic (APAL).*

[2] with V. Guingona. *On a Common Generalization of Shelah's 2-Rank, dp-Rank, and o-Minimal Dimension.*
Annals of Pure and Applied Logic (APAL) , 166(4): 502–525, April 2015.

[3] with U. Andrews, D. Dushenin, J. Knight, A. Melnikov. *Comparing classes of finite sums.*
Algebra and Logic, Vol. 54, No. 6, January, 2016. (Russian Original: Vol. 54, No. 6, November-December, 2015)

[4] with V. Guingona. *On Vapnik-Chervonenkis density over indiscernible sequences.* *Mathematical Logic Quarterly.* 60(1-2): 59–65, February 2014.

[5] *Super/rosy L^k-theories and classes of finite structures.*
Annals of Pure and Applied Logic, 164(10): 907–927, October 2013.

[6] with R. Mihaescu and S. Rao. *Fast phylogeny reconstruction through learning of ancestral sequences.*
Algorithmica, 66(2): 419–449, June 2013.

[7] *Efficiently inverting the L^2-invariant through stability theory* (extended abstract). In the proceedings of "Logical Approaches to Barriers in Computing and Complexity," February 2010, Ernst-Moritz-Arndt-Universität Preprint Series, *ed.* A. Beckman, C. Grassner, B. Löwe.

[8] with C. Daskalakis, A. Jaffe, R. Mihaescu, E. Mossel, and S. Rao. *Maximal accurate forests from distance matrices.*
In *Research in Computational Molecular Biology, 10th Annual International Conference, RECOMB 2006, Venice, Italy, April 2-5, 2006, Proceedings.* Lecture Notes in Computer Science 3909, 281–295, *ed.* A. Apostolico *et al.*

Submitted papers

[9] *An observation regarding 0,1-laws and asymptotics of definable sets in geometric Fraïssé classes.*
(Submitted to *Fundamenta Mathematicae.*)

[10] with V. Guingona and L. Scow. *Characterizating model-theoretic dividing lines via collapse of generalized indiscernibles*
Submitted (APAL).

[11] *On constrained generic expansions and structural Ramsey theory.*
Submitted (Discrete Mathematics).

[12] *Well-quasi-orders, quasi-finite axiomatizability and AZ-enumerability.*
Submitted (J. of Symbolic Logic (JSL)) and returned for revision.

[13] *Remarks on extreme amenability, ultrafilters, and Stone spaces.*
Submitted (Notre Dame J. of Formal Logic (NDJFL)).

[14] with D. Lowengrub. *Dimension in a class of theories generalizing o-minimal theories.*
Submitted (NDJFL).

[15] *On semi/tame classes of finite structures.*
Submitted (JSL) and returned for revision.

Papers in preparation

[16] *Characterization of super-robust of classes of finite groups.*

[17] *Totally categorical theories as generics of tame classes.*

[18] *A general context for Ramsey-theoretic dividing lines in model theory.*

[19] *Structural sufficient conditions for certain kinds of 0,1-laws*

Invited Talks and Presentations

2015 Fall Central Sectional Meeting of the American Mathematical Society, Special Session on Model Theory, 03-04 October 2015:
Sufficient conditions for tight control of the asymptotics of definable sets.

2014 Winter Meeting of the Association for Symbolic Logic, Special Session on Model Theory and Combinatorics, 27-30 December 2014:
Generic structures in Discrete Mathematics

2014 ASL North American Annual Meeting, 21 May 2014 (contributed talk):
Model-theoretic approaches to Ramsey Theory.

MSRI Model Theory Research Seminar, 08 April 2014:
The Finite Submodel Property and Definability in Classes of Finite Structures.

MSRI Postdoctoral Fellows Seminar, 24 March 2014:
Connections between Ramsey Theory and Model Theory.

Harvard/MIT Logic Colloquium, 22 October 2013:
On Filters in Fraïssé Classes.

The Ohio State University, Logic Seminar, 02 October 2012.

"Midwest Model Theory Day," 26 April 2012, University of Illinois, Chicago.

AMS Spring Western Sectional Meeting, Model theory special session, 03 March 2012. University of Hawaii, Honolulu.

"Neostability Theory" Workshop, 29 January to 03 February 2012, Banff International Research Station.

University of Paris 7, Complexity and Logic Seminar, 31 May 2011.

University of Maryland Logic Seminar, 05 April 2011.

ASL 2011 North American Annual Meeting, 26 March 2011.

McMaster University, Model Theory Working Seminar, 18 March 2011.

University of Illinois, Chicago, Logic Seminar, 23 November 2010.

Wesleyan University, Logic Seminar, 11 October 2010.

University of Cambridge, Computer Laboratory. February 2010.

University of Cambridge, Computer Laboratory. October 2009.

Teaching

Wesleyan University

Discrete Mathematics (228); *Multivariable Calculus (222)*	Spring 2016
Set Theory (241); *Analysis I, Part I (513)*	Fall 2015
Model Theory (509); *Multivariable Calculus (222)*	Spring 2015
Discrete Mathematics (228); *Calculus I, Part I (121)*	Fall 2014
Set Theory (241); *Calculus I, Part I (121)*	Fall 2013

University of Notre Dame

Topics in Logic: *Generic Constructions in Model Theory*	Spring 2013
Beginning Logic	Fall 2012
Calculus III, *Real Analysis*	Fall 2011, Spring 2012
Calculus A, Calculus B (for Life Sciences)	Fall 2010, Spring 2011

University of California, Berkeley

Graduate Student Instructor — Fall 2004 - Spring 2009

- Transition to Upper-division Mathematics (Math 74)
- Calculus for Engineering and Natural Science (Math 1A and 1B)
- Multivariable Calculus (Math 53)
- Linear Algebra and Differential Equations (Math 54)
- Discrete Mathematics (Math 55)
- Set Theory (Math 135)
- Category Theory and Universal Algebra (Math 245A)

Student Advising

Miriam Parnes
(Ph.D. thesis advisor)
Projected graduation: June 2018, Wesleyan University.

Undergraduate summer research supervisor for
Prayag Chatha (Wes. '16), Hanna Elszasz (Wes. '18), Oren Maximov (Wes. '17), and Sarah Xu (Wes. '18).
Project (Summer 2015): Inferential statistics for random graph models.

Donald Brower, Ph.D.
Co-advisor (with Professor Steven Buechler).
Thesis: *Aspects of Stability in Simple Theories*
Graduation: June 2012, University of Notre Dame.

Departmental Service

Departmental Advisory Committee (DADCOM) (Oversight for undergraduate education)	Fall 2015 - Spring 2016
Organizer for Wesleyan Mathematics Dept. Colloquium.	Fall 2014 - Spring 2015
Math Club Advisor.	Fall 2013

University Service

Steering committee member, College of Integrative Sciences. Fall 2015 - Spring 2016

Panelist for C3/LADO Visits to UCLA and UCSD (designed to cultivate interest in liberal arts colleges and to introduce liberal arts college teaching and scholarship opportunities to graduate students from underrepresented groups) May 2015

Hiring Committee for NSM-Academic Computing Manager. Fall 2013

Professional and Community Service

Organizer for 2016 ASL Spring Meeting, Model Theory special session. Spring 2016

Organizer for Logic Colloquium 2016, special session on Model Theory and Limit Structures. Summer 2016

Instructor for Intel® Math Program for Education Professionals Summer 2015

Organizer for MSRI Postdoctoral Fellows Seminar. Spring 2014

Refereed for:

- *Journal of Symbolic Logic*
- *Notre Dame Journal of Formal Logic.*
- *Archive for Mathematical Logic.*
- Conference on *Mathematical Foundations of Computer Science 2014 (MFCS 2014).*
- Conference on *Symposium on Theoretical Aspects of Computer Science (STACS 2015).*

Additional Service

Organizer for University of Notre Dame Logic Seminar. Fall 2012

Organizer for Student Model Theory Seminar, Univ. of Notre Dame. Fall 2011

Unbounded Representation, UC Berkeley. Founding member and co- organizer. Fall 2008 - Spring 2010

Mentorship Coordinator, UC Berkeley. Fall 2009 - Spring 2010

Professional Development Program, GSI. Fall 2006 - Spring 2007

Student Model Theory Seminar, UC Berkeley. Co-organizer. Fall 2007