
CATHERINE RAY

rin.io/about-me 703-622-7252 rinray1@gmail.com

EDUCATION

2017-Present **Northwestern**; PhD Student in Maths

2015-2017 **UChicago**; Divisional Masters Program in Maths; advised by Peter May

2012-2013 **George Mason University**; B.S. in Computational Physics (graduated winter 2013); advised by Dimitrios Papaconstantopoulos

2010-2012 **Mary Baldwin College**: Program for the Exceptionally Gifted: Mathematics, Computer Science, and Physics; advised by John Ong

EXPERIENCE

2016-Present **Math Circles Teacher**; Chicago, IL

2016 **REU Mentor**; University of Chicago, Chicago, IL

2014-2016 **2014 Thiel Fellow (Mathematics and Assitive Tech)**; Thiel Foundation; Berkeley, CA

2015 **Visiting Researcher**; Max-Planck-Institut für Mathematik; Bonn, Germany

2015 **Visiting Researcher**; Santa Fe Institute of Complex Systems; Santa Fe, NM

2013-2014 **Mouse Vocalization Specialist & Audio Processing Engineer**; Mouser; Belmont, CA

2013 **Software Engineering Intern**; Cloudera; Palo Alto, CA

2013 **Computational Chemistry Research**; George Mason University, VA

2013 **Automated Computational Semantics (& Machine Learning) Research**; George Mason University; Fairfax, VA

2012 **Human-Computer Interaction Intern (Autonomous Robotics)**; George Washington University; Washington D.C.

2012 **Teaching Assistant for College Algebra**; Mary Baldwin College

2011 **Research Assistant in Materials Science Lab**; Mary Baldwin College; Staunton, VA

PUBLICATIONS/TITLES OF CREATIVE WORK

2017 **On Techniques Used in Calculating the Homotopy Groups of tmf at the prime 2**, UChicago Master's Thesis

2016 **Filling a Gap in Gromov's Proof of the Polynomial Ham Sandwich Theorem**

2015 **A Geometric Model of Morava E-theory**

2015 **Simplifying Multiscale Modeling**, Santa Fe Institute of Complex Systems

2014 **A New Female-Female Mouse Vocalization Discovered via Unlabeled Machine Learning**, Mousera

2014 **On the Detection and Prevention of Aggression in Lab Mice via Quasi-Real Time Analysis**, Mousera

2013 **Contextual Machine Learning through the Analysis and Chunking of Partially Translated Grade 2 Braille**, George Mason Computational Semantics

NONPROVISIONAL PATENT [PENDING]

2013 **Robotic Mobility Assistive Wheelchairs**, 90776.0001USP1

FELLOWSHIPS

2017 Awarded **NSF GRFP Fellowship (102K + 36K)**

2014-2016 Awarded **Thiel Fellowship (100K)**

AWARDS AND HONORS

2013 **Outstanding Rising Senior Award** in Computational and Data Sciences, SPACS 2013

2012-2013 **Dean's List**, George Mason University

2010-2012 **Dean's List**, Mary Baldwin College

INVITED TALKS

- Simplifying Multiscale Modeling**, Santa Fe Institute of Complex Systems – 2015
Elliptic cohomology, Geometric Langlands Seminar, Berkeley – 2015
Introduction to formal group laws in homotopy theory, UChicago – 2015
Forms of K-theory, UChicago – 2015
Polynomial Ham Sandwich theorem, Young Topologists Meeting, Københavns Universitet – 2016
A Partition-based Proof of the Jacobi Triple Product formula, UChicago – 2016

ATTENDED CONFERENCES

- Introduction to Geometric Langlands**, MSRI – 2014
Homotopy theory, manifolds, and field theories, Bonn, Germany – 2015
p-adic methods in Number Theory, Berkeley – 2015
Midwest Topology Seminar, UChicago – 2015
Midwest Topology Seminar, Northwestern – 2016
Midwest Topology Seminar, Wayne State – 2016
2016 Talbot: Kervaire Invariant One problem, Salt Lake City, Utah – 2016
Young Topologists Meeting, Copenhagen – 2016
Homotopy Theory and Number Theory: WCATSS, Eugene, Oregon – 2016
European 2016 Autumn School in Topology, Utrecht, Netherlands – 2016
Conference on invertible objects and duality in derived algebraic geometry and homotopy theory, Regensburg, Germany – 2017
Midwest Topology Seminar, UChicago – 2017
2016 Talbot: Obstruction theory for Structured Ring Spectra, Boise, Idaho – 2017

REFERENCES

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|---|---|------------------------------------|
| EDWARD FRENKEL
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| AGNES BEAUDRY
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zakh@math.cornell.edu | |