

CATHERINE RAY

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EDUCATION

Northwestern – *PhD Student; advised by Paul Goerss*

2017 – PRESENT

UChicago – *Divisional Masters; advised by Peter May*

2015 – 2017

- Thesis: *On Techniques Used in Calculating the Homotopy Groups of tmf at the prime 2*

George Mason University – *B.S. in Computational Physics; advised by Dimitrios Papaconstantopoulos*

2012 – 2013

- Thesis: *Contextual Machine Learning through the Analysis and Chunking of Partially Translated Grade 2 Braille*
- Thesis: *Predicting Superconductivity Transition Temperature via the Augmented Plane Wave Model*

Mary Baldwin University – *Mathematics, Computer Science, and Physics*

2010 – 2012 (transferred)

RESEARCH PREPRINTS

A Global Crystalline Period Map – *joint with M. Neaton and A. Pieper*

Nov 2019 – [arXiv:1911.08615](https://arxiv.org/abs/1911.08615) (collaboration from 2019 Arizona Winter School)

Automorphisms of Abelian Varieties and Principal Polarizations – *joint with D. Lee*

Dec 2019 – [arXiv:1811.07007](https://arxiv.org/abs/1811.07007) (submitted)

Towards Directed Collapsibility – *joint with R. Belton, R. Brooks, S. Ebli, L. Fajstrup, B. T. Fasy, N. Sanderson, E. Vidaurre*

Feb 2019 – [arXiv:1902.01039](https://arxiv.org/abs/1902.01039) (accepted to appear in *Advances in Mathematics: AWM Springer 2018 Symposium*)

FELLOWSHIPS

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

Awarded 2014 Thiel Fellowship (100K)

RECENT INVITED TALKS

Inverse Galois Theory in the Homotopy Groups of Spheres,
Princeton CCR Colloquium - 2019

Galois Theory and Galois Representations in Homotopy Theory,
Higher School of Economics, Moscow - 2019

An Introduction to the Classic Theory of p -Divisible Groups,
Oberwolfach Arbeitsgemeinschaft - 2019

ATTENDED CONFERENCES

Lunts' Dacha: Representations of Algebraic Groups: constructible, coherent, and categorical viewpoints, Grigorovska, Russia – 2019

AMS MRC: Explicit Arithmetic Geometry in Characteristic p , Rhode Island – 2019

Arbeitsgemeinschaft: Elliptic Cohomology According to Lurie, Oberwolfach – 2019

Arizona Winter School: Homotopy Theory and Arithmetic (Hopkins Project Group) -
2019

Homotopy Theory and Arithmetic Geometry: Motivic and Diophantine Aspects,
London, UK – 2018

Chromatic Homotopy Theory, Journey to the Frontier, Boulder, Colorado – 2018

Midwest Topology Seminar, Northwestern – 2018

Women In Topology Workshop at MSRI, Berkeley -- 2017

2017 Talbot: Obstruction theory for Structured Ring Spectra, Boise, Idaho – 2017

Midwest Topology Seminar, UChicago – 2017

Conference on invertible objects and duality in derived algebraic geometry and homotopy theory, Regensburg, Germany – 2017

European 2016 Autumn School in Topology, Utrecht, Netherlands – 2016

Homotopy Theory and Number Theory: WCATSS, Eugene, Oregon – 2016

Young Topologists Meeting, Copenhagen – 2016

2016 Talbot: Kervaire Invariant One problem, Salt Lake City, Utah – 2016

Midwest Topology Seminar, Wayne State – 2016

Midwest Topology Seminar, Northwestern – 2016

Midwest Topology Seminar, UChicago – 2015

p-adic methods in Number Theory, Berkeley – 2015

Homotopy theory, manifolds, and field theories, Bonn, Germany – 2015

Introduction to Geometric Langlands, MSRI – 2014

SEMINARS ORGANIZED

Moduli Spaces (Algebraic and Analytic) 2020 Winter

Applications of Topos Theory (Homotopy Working Seminar) 2019 Spring

TamagaWHAT (On the Proof of the Tamagawa Conjecture for Function Fields) 2019 Winter

Formal Moduli Problems (Homotopy Working Seminar) 2019 Winter

Geometry for Prime Addicts (p-adic geometry toward Scholze's proof of the Monodromy Weight Conjecture) 2018 Fall

Factorization Homology (Homotopy Working Seminar) 2018 Fall