

# Mona Merling

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## BASIC INFORMATION

University of Pennsylvania  
Department of Mathematics  
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*Webpage:* math.upenn.edu/~mmerling  
*Citizenship:* Romania  
*Date of birth:* 5 January 1986

## RESEARCH INTERESTS

Algebraic topology. In particular, algebraic K-theory and equivariant stable homotopy theory.

## ACADEMIC APPOINTMENTS

**University of Pennsylvania**, Philadelphia, PA

Assistant Professor, July 2018 - present

**Johns Hopkins University**, Baltimore, MD

J.J. Sylvester Assistant Professor, July 2014 - June 2018

## EDUCATION

**University of Chicago**, Chicago, IL

Ph.D. in Mathematics, June 2014

Advisor: Peter May

M.S. in Mathematics, June 2010

**Bard College**, Annandale, NY

B.A. in Mathematics, May 2009

## INVITED ACADEMIC VISITS

**Mathematics Sciences Research Institute**, Berkeley

Summer Stay, July 2020 (postponed to 2021)

**Isaac Newton Institute**, Cambridge, UK

K-theory, Algebraic Cycles and Motivic Homotopy Theory Program Guest, June 2020 (cancelled)

**Max Planck Institute for Mathematics**, Bonn, Germany

Research Guest, July-November 2018

**Isaac Newton Institute**, Cambridge, UK

Homotopy Harnessing Higher Structures Program Guest, July 2018 (2 weeks)

**Hausdorff Institute for Mathematics**, Bonn, Germany

Junior Trimester Program Guest, September-October 2016

**University of Copenhagen**, Denmark

Invited Visitor, August 2013 (2 weeks)

GRANTS AND AWARDS	Principal Investigator, NSF CAREER grant DMS-1943925 “Applications of equivariant homotopy theory to manifolds”	2020-25
	Principal Investigator, NSF grant DMS-1709461/1850644 “Groups, manifolds, and stable homotopy theory”	2017-20
	AMS-Simons Travel Grant	2015-17
	Distinguished Scientist Scholarship (full tuition scholarship), Bard College	2004-09
	M. Susan Richman Senior Project Award in Mathematics, Bard College	2009
	7 additional awards from Bard College for academic achievements in mathematics, scholarship, and community service	2007-09
CONFERENCE GRANTS	Principal Investigator, NSF grant DMS-2017119 “Mid-Atlantic Topology Conference”	2020-21
	School of Arts and Sciences Conference Grant, University of Pennsylvania	2020
	University Research Fund Conference Grant, University of Pennsylvania	2020
	Co-Principal Investigator, NSF grant DMS-1619569 “Mid-Atlantic Topology Symposium: New Directions”	2016
TEACHING AWARDS AND GRANTS	Departmental Good Teaching Award, University of Pennsylvania, math 730	2020
	Departmental Good Teaching Award, University of Pennsylvania, math 410	2020
	Departmental Good Teaching Award, University of Pennsylvania, math 619	2019
	NV Grant, Center for Educational Resources, Johns Hopkins University <i>Grant for designing and implementing a narrative visual component for two mathematics classes in the form of video final presentations</i>	2016
	Lawrence and Josephine Graves Prize for Excellence in Undergraduate Teaching, University of Chicago	2013
VOLUMES EDITED	New directions in homotopy theory, (co-edited with N. Kitchloo, J. Morava, E. Riehl, W. S. Wilson), <i>Contemporary Mathematics</i> , Volume 707, (2018).	
PUBLICATIONS & PREPRINTS	The equivariant parametrized $h$ -cobordism theorem, the non-manifold part, (with C. Malkiewich), <a href="https://arxiv.org/abs/2001.05563">arXiv:2001.05563</a> , submitted.	
	Cut and paste invariants of manifolds via algebraic K-theory, (with R. Hoekzema, L. Murray, C. Rovi, J. Semikina), <a href="https://arxiv.org/abs/2001.00176">arXiv:2001.00176</a> , submitted.	
	Equivariant infinite loop space theory. The space level story, (with J.P. May and A. Osorno), <a href="https://arxiv.org/abs/1704.03413">arXiv:1704.03413</a> , submitted.	
	Coassembly is a homotopy limit map, (with C. Malkiewich), <i>Annals of K-Theory</i> Volume 5 Issue 3 (2020), pages 373–394, <a href="https://arxiv.org/abs/1904.05858">arXiv:1904.05858</a> .	

Symmetric monoidal  $G$ -categories and their strictification, (with B. Guillou, J.P. May and A. Osorno), *Quarterly Journal of Mathematics*, Volume 71, Issue 1 (2020), pages 207–246, [arXiv:1809.03017](#).

Equivariant  $A$ -theory, (with C. Malkiewich), *Documenta Mathematica*, 24 (2019), pages 815–85, [arXiv:1609.03429](#).

A symmetric monoidal and equivariant Segal machine, (with B. Guillou, J.P. May and A. Osorno), *Journal of Pure and Applied Algebra*, Volume 226 (6) (2019), pages 2425–2454, [arXiv:1711.09183](#).

Motivic homotopical Galois extensions, (with A. Beaudry, K. Hess, M. Kedziorek, and V. Stojanoska), *Topology and its Applications*, Volume 235 (2018), pages 290–338, [arXiv:1611.00382](#).

Equivariant algebraic  $K$ -theory of  $G$ -rings, *Mathematische Zeitschrift*, 285(3), (2017), pages 1205–1248, [arXiv:1505.07562](#).

Categorical models for equivariant classifying spaces, (with B. Guillou and J.P. May), *Algebraic and Geometric Topology*, 17-5 (2017), pages 2565–2602, [arXiv:1201.5178](#).

Unbased calculus for functors to chain complexes, (with M. Basterra, K. Bauer, A. Beaudry, R. Eldred, B. Johnson and S. Yeakel), *Contemporary Mathematics*, Vol. 641 (2015), pages 29–48, [arXiv:1409.1553v2](#).

Function fields with class number indivisible by a prime  $l$ , (with M. Daub, J. Lang, A. Pacelli, N. Pitiwan, M. Rosen), *Acta Arithmetica*, 150 (2011), pages 339–359, [arXiv:0906.3728](#).

Gassmann equivalent dessins, (with R. Perlis), *Communications in Algebra*, Vol. 38, Issue 6 (2010), pages 2129–2137.

CONFERENCE  
PROCEEDINGS

$G$ -manifolds and algebraic  $K$ -theory, *Oberwolfach reports*, Report No. 31, (2018), pages 37–40.

OTHER  
PUBLICATIONS

Widening the Pipeline (with J. Hartmann), *Notices of the AMS (Early Career section)*, Volume 67, Number 11, (2020).

The User’s Guide Project: Giving Experiential Context to Research Papers, (with C. Malkiewich, D. White, L. Wolcott, and C. Yarnall), *Journal of Humanistic Mathematics*, Volume 5 Issue 2 (2015), pages 186–188.

GRADUATE  
STUDENT  
SUPERVISION

Thomas Brazelton, third year PhD student, University of Pennsylvania  
(co-advised with Kirsten Wickelgren)

Elijah Gunther, third year PhD student, University of Pennsylvania

Andres Mejia, second year PhD student, University of Pennsylvania

Maxine Calle, first year PhD student, University of Pennsylvania

Saad Slaoui, masters thesis, University of Pennsylvania, spring 2019.

POSTDOC  
MENTORSHIP

Maximilien Peroux, University of Pennsylvania

Ningchuan Zhang, University of Pennsylvania

TEACHING  
EXPERIENCE

**University of Pennsylvania**, Instructor

Fall 2020 math 123 Community Math Teaching Project (ABCS class)  
Spring 2020 math 730 Algebraic  $K$ -theory (graduate, Kan seminar style)  
Fall 2019 math 410 Complex Analysis  
Spring 2019 math 619 Algebraic Topology III (graduate)  
Spring 2019 math 370 Abstract Algebra

**Johns Hopkins University**, Instructor

Spring 2018 math 106 Calculus I for biology  
Fall 2017 math 727 Topics in Algebraic Topology (graduate)  
Fall 2017 math 615 Algebraic Topology I (graduate)  
Spring 2017 math 422 Representation Theory  
Spring 2017 math 616 Algebraic Topology II (graduate)  
Spring 2016 math 422 Representation Theory  
Spring 2016 math 401 Advanced Algebra  
Fall 2015 math 401 Advanced Algebra  
Fall 2015 math 328 Non-Euclidean geometry (inquiry based learning style)  
Spring 2015 math 107 Calculus II for biology  
Fall 2014 math 328 Non-Euclidean geometry (inquiry based learning style)

**University of Chicago**, Instructor

Winter 2014 math 176 Geometry IBL (co-taught with John Boller)  
Spring 2013 math 112 Studies in mathematics  
Winter 2013 math 153 Calculus III  
Fall 2012 math 152 Calculus II  
Spring 2012 math 112 Studies in mathematics  
Winter 2012 math 106 Precalculus II  
Fall 2011 math 105 Precalculus I

**University of Chicago**, College Fellow

Spring 2011 math 256 Basic Algebra III (mentor: Liang Xiao)  
Winter 2011 math 255 Basic Algebra II (mentor: Rina Anno)  
Fall 2010 math 254 Basic Algebra I (mentor: David Constantine)

**Bard College**, mathematics tutor

TALKS

**Conference and Colloquium Talks**

New perspectives on  $K$ - and  $L$ -theory, Münster, September 2020, postponed.

International Workshop on Algebraic Topology, Beijing International Center for Mathematical Research, Peking University, August 2020, postponed.

Follow-up Workshop to JTP “Topology,” Hausdorff Institute for Mathematics, Bonn, August 2020, postponed.

$(\infty, n)$ -categories, factorization homology, and algebraic K-theory, MSRI, Berkeley, March 2020 (moved online)

Equivariant stable homotopy theory and  $p$ -adic Hodge theory, Banff International Research Station, Canada, March 2020

Colloquium, Bryn Mawr, November, 2019

Mid-Atlantic Topology Conference, University of Virginia, Charlottesville, October 2019

International Workshop on Algebraic Topology, Shanghai Center for Mathematical Sciences, Fudan University, August 2019

Four manifolds: Confluence of high and low dimensions, Fields Institute, Toronto, July 2019

Graduate Student Conference in Algebra, Geometry, and Topology (Keynote speaker), Temple University, June 2019

Cornell Topology Festival, Ithaca, May 2019

AMS Sectional Meeting, Special Session on Equivariant Homotopy and Trace Methods, University of Hawaii, March 2019

Equivariant and Motivic Homotopy Conference (Homotopy Harnessing Higher Structures Program), Isaac Newton Institute, Cambridge, August 2018

Topologie, Oberwolfach, July 2018

Equivariant Homotopy Theory and K-theory, FU Berlin, June 2018

AMS Sectional Meeting, Special Session on Homotopy Theory, Vanderbilt University, Nashville, April 2018

Tetrahedral Geometry and Topology Seminar, Lancaster, April 2018

AMS Sectional Meeting, Special Session on Homotopy Theory, Ohio State University, Columbus, March 2018

Midwest Topology Seminar, Northwestern, Evanston, March 2018

Colloquium, Florida State University, December 2017

Colloquium, University of Pennsylvania, December 2017

Colloquium, Notre Dame University, December 2017

Colloquium, University of Melbourne, November 2017

Lloyd Roeling Conference, University of Louisiana, Lafayette, November 2017

AMS Sectional Meeting, Special Session on Algebraic Topology, Buffalo, September 2017

Cascade Topology Conference, University of British Columbia, Vancouver, May 2017  
Colloquium, Reed, Portland, November 2016  
Operations in Highly Structured Homology Theories, Banff, Canada, May 2016  
Equivariant Derived Algebraic Geometry, Banff, Canada, February 2016  
Trace Methods Summer School, Regensburg, August 2015  
Equivariant and Motivic Homotopy Theory, Reed, Portland, May 2015  
AMW Workshop at AMS Joint Meetings, San Antonio, January 2015  
Young Topologists Meeting, Copenhagen, June 2014 (contributed talk)  
MSRI Connections for Women Workshop, MSRI, Berkeley, January 2014  
AMS Joint Meetings, Special Session on Homotopy Theory, Baltimore, January 2014  
AMS Special Session on Homotopy Theory and Algebraic K-theory, Riverside, November 2013  
Graduate Student Topology Conference, Notre Dame, April 2013 (contributed talk)  
AMS Joint meetings, Washington DC, January 2009 (contributed talk)  
AMS Joint meetings, San Diego, January 2008 (contributed talk)  
AMS Joint meetings, New Orleans, January 2007 (contributed talk)

### **Seminar Talks**

CORONA Geometry Seminar, online, October 2020  
UCLA Topology Seminar, May 2020  
Temple Topology Seminar, September 2019  
Michigan State University Topology Seminar, April 2019  
Princeton Topology Seminar, March 2019  
MIT Topology Seminar, March 2019  
University of Pennsylvania Topology Seminar, February 2019  
Johns Hopkins Topology Seminar, February 2019  
University of Münster Topology Seminar, November 2018  
University of Wuppertal Topology Seminar, November 2018

École Polytechnique Federale de Lausanne Topology Seminar, October 2018

University of Bochum Topology Seminar, October 2018

University of Copenhagen Topology Seminar, September 2018

University of Regensburg Topology Seminar, July 2018

Penn State Altoona Topology Seminar, October 2017

Notre Dame Topology Seminar, March 2017

Maryland University Topology Seminar, January 2017

Wayne State Topology Seminar, November 2016

Rochester Topology Seminar, October 2016

Hausdorff Institute for Mathematics Seminar, Bonn, September 2016

University of Virginia Topology Seminar, October 2015

UIUC Topology Seminar, May 2015

UCSD Number Theory/Topology Seminar, March 2015

Johns Hopkins Topology Seminar, March 2015

MIT Topology Seminar, December 2014

Penn State Altoona Topology Seminar, May 2014

Northwestern Topology Seminar, December 2013

UIUC Topology Seminar, February 2013

### **Talks for undergraduates**

Penn Undergraduate Mathematics Society, September 2020 (online)

University of Chicago summer REU, June 2020 (online)

University of Chicago summer REU, July 2016

Undergraduate Conference on Geometry and Topology (faculty talk), University of Texas, Austin, February 2016

### SERVICE

Co-organizer (with Herman Gluck and Davi Maximo), Geometry-Topology Seminar, University of Pennsylvania, Spring 2019-present

Co-organizer (with Herman Gluck), Summer Bridge Workshop in Algebraic Topology, University of Pennsylvania, Summer 2020

Co-organizer (with Jonathan Block, Rob Ghrist, Ben Knudsen, and Tony Pantev), Mid-Atlantic Topology Conference, April 2019

Co-organizer (with Andrew Blumberg, Anna Marie Bohmann, Akhil Mathew, Emily Riehl, and Dylan Wilson), Midwest Topology Seminar/ May Day 2019, University of Chicago, October 2019

Co-organizer (with Julia Hartmann), Workshop on Math Advice and Networking at the University of Pennsylvania (WOMAN UP), September 2019

Team Leader (with C. Rovi) for the Women in Topology III Workshop (proposed a research project and collaborated on a resulting publication with our group), 2019-20

NSF panelist, Topology Panel, twice

Co-organizer (with Thomas Brazelton), Directed Reading Program, PILOT University of Pennsylvania chapter, fall 2019

Organizer, Directed Reading Program, PILOT Johns Hopkins chapter, 2017-2018

Future Scholars Program (wrote yearly exam and selected the Baltimore high schoolers for math classes at JHU), Johns Hopkins, 2016&2017

Volunteer, John Rurah Middle School Math Lab, Baltimore, Spring 2017

Co-organizer (with Nitu Kitchloo, Jack Morava, Emily Riehl, and Steve Wilson), Second Mid-Atlantic Topology Conference, Johns Hopkins, March 2016

Organizer, Johns Hopkins Algebraic Topology Seminar, Johns Hopkins, 2015-2018

Co-organizer (with Carl McTague), Johns Hopkins Algebraic Topology Seminar, Johns Hopkins, 2014-2015

Author and co-editor in *The User's Guide Project: Giving Experiential Context to Research Papers*

Committee member and mentor for the Directed Reading Program, University of Chicago, 2012-2014

Co-organizer (with Evangelia Gazaki, Chris Skalit, and Preston Wake), Algebraic K-theory Student Seminar, University of Chicago, spring 2013

PROFESSIONAL  
DEVELOPMENT

Inclusive Teaching Seminar, member fall 2019 and spring 2020  
*Yearlong monthly seminar offered by the Center for Teaching and Learning, University of Pennsylvania*

DEPARTMENT  
SERVICE

Graduate Admissions Committee 2018-19, 2019-20, 2020-21  
Prize Committee 2018-19  
Prize Committee, Chair 2019-20, 2020-21

SERVICE TO THE  
UNIVERSITY

House Fellow, Harrison House August 2020-present

LANGUAGES

English, Spanish, German (Abitur 2005), French (proficient in reading), and Romanian



(native language).