



Nicholas G. Vlamis

Employment & Education

- 2015–Present **RTG Postdoctoral Assistant Professor**, *University of Michigan*, Ann Arbor, MI.
2010–2015 **Mathematics, MS 2012, Ph.D 2015**, *Boston College*, Chestnut Hill, MA.
Advisors: Martin Bridgeman and Ian Biringer
2009–2010 **High School Math Teacher**, *Mystic Valley Regional Charter School*, Malden, MA.
Taught Grades 9-12.
Fall 2008 **Semester Abroad**, *Budapest Semesters in Mathematics*, Budapest, Hungary.
2004–2008 **Mathematics and Physics, BS 2008**, *Northeastern University*, Boston, MA.

Research Interests

- low-dimensional topology
- Riemann surfaces
- Teichmüller theory
- mapping class groups
- hyperbolic geometry
- geometric and topological group theory

Papers

- The first integral cohomology of pure mapping class groups.
Submitted. Joint with Javier Aramayona and Priyam Patel.
- Algebraic and topological properties of big mapping class groups.
Submitted. Joint with Priyam Patel.
- Coloring curves on surfaces.
Submitted. Joint with Jonah Gaster and Joshua Evan Greene.
- Graphs of curves on infinite-type surfaces with mapping class group actions.
Ann. Inst. Fourier (Grenoble), to appear. Joint with Matthew Gentry Durham and Federica Fanoni.
- The Bridgeman-Kahn identity for hyperbolic manifolds with cusped boundary.
Geom. Dedicata (2017). Joint with Andrew Yarmola.
- *Automorphisms of the compression body graph*.
J. London Math. Soc. (2) 95 (2017) 94–114. Joint with Ian Biringer.
- *Basmajian's identity in higher Teichmüller-Thurston theory*.
J. Topology 10 (2017), no. 3, 744–764. Joint with Andrew Yarmola.
- *Moments of a length function on the boundary of a hyperbolic manifold*.
Algebr. Geom. Topol. 15 (2015), no. 4, 1909–1929.
- *Quasiconformal homogeneity and subgroups of the mapping class group*.
Michigan Math. J. 64 (2015), no. 1, 53–75.

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Articles in preparation*

- Possible Thurston norm balls. Joint with Natalia Pacheco-Tallaj[†] and Kevin Schreve.
- Quasiconformal homogeneity of ladder surfaces. Joint with Ara Basmajian.

*An article is considered in preparation if either it is in the process of being written or there are main theorems forming the core of an article with (drafts of) proofs written.

[†]Undergraduate author.

Awards & Grants

- 2017 Outstanding Postdoctoral Fellow Award
Awarded by University of Michigan Postdoctoral Association.
- 2017-2019 AMS-Simons Travel Grant
- 2017 Juha Heinonen Award for Excellence in Teaching, Mentoring, and Research
Awarded by the University of Michigan Department of Mathematics.
- 2016/17 GEAR Short Term Visit Grants:
 - Prof. Ara Basmajian, City University of New York (18 April 2017 - 2 May 2017)
 - Prof. Hugo Parlier, University of Luxembourg (19 March 2017 - 26 March 2017)
 - Prof. Javier Aramayona, Universidad Autónoma de Madrid (12 March 2017 - 18 March 2017)
 - Prof. Ser Peow Tan, National University of Singapore (9 Aug. 2016 - 20 Aug. 2016)
 - Prof. Hugo Parlier, University of Fribourg (15 May 2016 - 22 May 2016)
- 2014 Donal J. White Teaching Excellence Award
Awarded by the Boston College Department of Mathematics.
- 2013 GEAR Summer REGS
Title: Identities and moments on hyperbolic manifolds.
A grant to work with Prof. Ser Peow Tan at the National University of Singapore.

Talks

Conference Talks

- Aug. 2018 (Upcoming) Geodesics on hyperbolic manifolds and related topics
- April 2018 (Upcoming) Interaction between geometry, group theory and dynamics, AMS Special Session
- Sept. 2017 Geometric Group Theory, AMS Special Session
- Aug. 2017 13th William Rowan Hamilton Geometry & Topology Workshop
- Dec. 2016 Geometric Group Theory and Topology in Low Dimensions, CMS Special Session
- Sept. 2016 Convex Cocompactness, AMS Special Session
- March 2016 Workshop on Surface Group Representations
- June 2015 Moduli Crossroads Retreat
- May 2015 Graduate Student Conference in Algebra, Geometry, and Topology
- May 2014 GEAR Junior Retreat

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Seminar Talks

- Jan. 2018 Caltech: *Geometry & Topology Seminar*
Jan. 2018 University of California, Santa Barbara: *Topology Seminar*
Oct. 2017 University of Toronto: *Geometry & Topology Seminar*
July 2017 Georgia Institute of Technology: *Geometry Topology Seminar*
April 2017 Graduate Center, City University of New York: *Geometry and Topology Seminar*
March 2017 Université du Luxembourg: *Geometry and Topology Seminar*
March 2017 Universidad Autónoma de Madrid: *Group Theory Seminar*
Jan. 2017 University of Illinois Urbana-Champaign: *Geometry, Groups, and Dynamics Seminar*
April 2016 Graduate Center, City University of New York: *Hyperbolic Geometry Seminar*
March 2016 Tufts University: *Geometric Group Theory and Topology Seminar*
Nov. 2015 Purdue University: *Geometry Seminar*
Sept. 2015 Michigan State University: *Geometry and Topology Seminar*
Sept. 2015 University of Michigan: *Topology Seminar*
Nov. 2014 Cornell University: *Topology and Geometric Group Theory Seminar*
July 2013 National University of Singapore: *Topology Seminar*

Teaching

University of Michigan

- Fall 2015/16/17 Math 385: Mathematics for Elementary School Teachers
This is an inquiry-based learning (IBL) course.
Winter 2016 Math 590: Topology
Cross-listed undergraduate/graduate course.

Boston College

- Fall 2014 MATH1004: Finite Probability and Applications
Spring 2012/13/14 MT101: Calculus II
Fall 2011/12/13 MT100: Calculus I

Mystic Valley Regional Charter School

- 2009-10 Alebra I, Advanced Math, IB Math Studies, and Technology

Pedagogical Training

- 2016 **IBL Workshop**, *University of Michigan*, Ann Arbor, MI.
A three day workshop focused on observing an IBL classroom.
2015 **TeMaCC**, *University of Michigan*, Ann Arbor, MI.
A one day workshop and conference on teaching content courses for future teachers.

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- 2015 **Teacher Training**, *University of Michigan*, Ann Arbor, MI.
The training consisted of a week long orientation on implementing active-learning techniques in the classroom and continues throughout the year with weekly seminars and monthly lunches discussing inquiry-based learning.
- 2015 **IBL Workshop**, *Cal Poly San Luis Obispo*, San Luis Obispo, CA.
A week long workshop developing the skill and practice necessary for successful implementation of inquiry-based learning.
- 2015 **Apprenticeship in College Teaching**, *Boston College*, Chestnut Hill, MA.
The ACT program combines teaching seminars with independent work conducting class observations and developing teaching materials.

Undergraduate Research

University of Michigan REU

- Summer 2017 **Thurston norm of 2-generator, 1-relator groups**, *Natalia M. Pacheco-Tallaj*, Harvard University, Co-advised with Kevin Schreve.
- Summer 2016 **Curve complexes of non-orientable surfaces**, *Alex Pieloch*, Duke University, Co-advised with Matt Durham.
- Summer 2016 **Rigidity of representations of free groups in $PSL(2, \mathbb{C})$** , *Ben Lowe*, University of Chicago, Co-advised with Richard Canary.

Laboratory of Geometry at Michigan, LOG(M)

LOG(M) is a vertically integrated research experience for undergraduates. Each project is proposed and supervised by a faculty mentor and the undergraduates are advised by the faculty mentor and a graduate student. This program was started by Anton Lukyanenko, Caleb Ashley, and myself.

- Winter 2018 **Chromatic numbers of flip graphs**
Faculty Mentor: Nicholas Vlamis (me)
Graduate Mentor: Francesca Gandini
Students: John Paul Koenig, Sanjana Kolisetty, Zihui Qi
- Winter 2017 **Visualizing the Birman-Series set on the punctured torus**
Faculty Mentor: Nicholas Vlamis (me)
Graduate Mentor: Mark Greenfield
Students: Connor Davis, Ben Gould, Luke Kiernan
(The students produced the image – of the Farey tessalation – in the left corner of the first page while learning about Möbius transformations.)

Outreach

- 2015–Present **Wayne County Math Teachers' Circle**
This is a professional development program for teachers in the Detroit area to work on interesting math problems and gain ideas for their own classroom.

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Fall 2016/17 *Wolverine Pathways*

This is a program for underserved middle and high students in the Ypsilanti and Southfield school districts. The goal of the program is to offer a pathway to college. Students who complete the rigorous program and are accepted to UM receive a full-tuition scholarship. The math department runs math circles for the students to introduce them to fun and interesting math.

Fall 2016/17 *FEMMES Capstone*

This is a program dedicated to closing gender and racial divides in STEM fields. FEMMES hosts a capstone once a semester for girls between 4th and 6th grade from diverse, underserved communities where the students partake in various STEM activities led by volunteers.

2014–15 Taught a high-functioning autistic 9th grader group theory.

Service

2015–Present Organizer of the Topology seminar at the University of Michigan

2016–Present Co-organizer of IBL Lunch at the University of Michigan

2011–15 Mathematics Graduate Association, Boston College
Vice President 2014–2015, Treasurer 2011–2014

2013–15 *Actuary Exam 1/P Review Session*

At Boston College, I co-organized, with Prof. Dan Chambers, weekly sessions consisting of introducing necessary material and solving problems.

2013–15 AMS Graduate Student Chapter, Boston College
Co-founder and Treasurer 2013–2014

2007–08 Math Club, Northeastern University
Co-founder, President

References

Research

- Martin Bridgeman (Boston College)
- Ian Biringer (Boston College)
- Richard Canary (University of Michigan)
- Ara Basmajian (City University of New York)
- Christopher Leininger (University of Illinois Urbana-Champaign)

Teaching

- Alejandro Uribe (University of Michigan)

Miscellaneous

- Member of the AMS
- Citizen of the United States of America
- Passed the Society of Actuaries Exams P/1 and FM/2.

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