

Daniel A. Visscher

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Education

Northwestern University Ph.D., Mathematics Advisors: Amie Wilkinson, Keith Burns	June 2012
St. Olaf College B.A., Mathematics <i>Summa Cum Laude, Distinction in Mathematics</i>	May 2006

Academic Appointments

Ithaca College <i>Assistant Professor</i>	2017 – present
University of Michigan <i>Lecturer I</i>	2015 – 2017
<i>RTG Postdoctoral Assistant Professor</i>	2012 – 2015

Publications

8. Explorations in analysis, topology, and dynamics: an introduction to abstract mathematics, with A. Uribe. *AMS Pure and Applied Undergraduate Texts* **44** (2020), 180 pages.
7. Measuring mathematics engagement anxiety: new dimensions of math anxiety in an RMARS-addendum, with N. White. *International Journal of Research in Undergraduate Mathematics Education* **6** (2020), 113–144.
6. A new proof of the existence of embedded surfaces with Anosov geodesic flow, with V. Donnay. *Regular and Chaotic Dynamics* **23** (2018), 685–694.
5. Equilibrium measures for certain isometric extensions of Anosov systems, with R. Spatzier. *Ergodic Theory & Dynamical Systems* **38** (2018), 1154–67.
4. A Franks' lemma for convex planar billiards. *Dynamical Systems* **30** (2015), 333–340.
3. A new proof of Franks' lemma for geodesic flows. *Discrete & Continuous Dynamical Systems - Series A* **34** (2014), 4875–95.
2. A case study of student and instructor reactions to a calculus e-book, with M. Bode, M. Khorami. *PRIMUS* **24** (2014), 160–174.
1. Minimal free resolutions of complete bipartite graph ideals. *Communications in Algebra* **34** (2006), 3761–66.

Grants, Fellowships, and Awards

- 2020–2024 **Research Experience for Undergraduates (REU) Site Award (co-PI)**
National Science Foundation
Title: *Ithaca College REU in Dynamical Systems*
Amount: \$287,672
- 2019–2024 **Robert Noyce Teacher Scholarship Program Grant (co-PI)**
National Science Foundation
Title: *Preparation of STEM Teachers for Professional Growth and Effectiveness*
Amount: \$752,331
- 2020 **Instructional Development Fund Award**
Ithaca College Center for Faculty Excellence
Title: *Rethinking the first undergraduate mathematics experience: linear algebra*
Notes: *For developing a 100-level linear algebra course; taught for the first time in Fall 2021.*
- 2019 **Center for Faculty Research and Development (CFRD) Released Time**
Ithaca College Center for Faculty Excellence
Title: *Explorations in Topology and Analysis Textbook*
Notes: *Competitively awarded by a faculty review committee for the purpose of finishing an Inquiry-Based Learning textbook. For three semester hours of course release. Led to publication of a book.*
- 2018 **Summer Grant for Faculty Research**
Ithaca College Center for Faculty Excellence
Title: *Dynamics of geodesic flows on embedded surfaces*
Notes: *Competitively awarded by a faculty review committee, recognizing the quality and significance of scholarly activities. For eight weeks of summer research. Resulted in publication of a research article.*
- 2018 **Early Career Excellence Institute**
Ithaca College Center for Faculty Excellence
Notes: *A yearlong interdisciplinary faculty learning community to problem solve, design, and reflect on inclusive classroom practices. Resulted in redesign of Math 105: Mathematics for Decision Making into an Inquiry-Based Learning course.*
- 2015–2016 **Project NExT Fellow (Red15)**
Mathematical Association of America
Notes: *A year-long, national professional development program for beginning mathematics faculty addressing all aspects of an academic career.*
- 2014–2015 **Investigating Student Learning (ISL) Grant**
University of Michigan Center for Research on Learning and Teaching (CRLT)
Title: *Comparing Oral and Traditional Assessments in Math Content Courses for Pre-Service Teachers*
Notes: *Competitive grant for instructors with a plan to investigate engaged student learning in their courses or programs. Resulted in a publication and multiple posters and talks.*
- 2011–2012 **Graduate Teaching Fellowship**
Northwestern University Searle Center for Teaching Excellence
Notes: *A selected group of advanced graduate students university-wide who lead workshops and conduct teaching observations for fellow graduate students.*

2005–2006 **Goldwater Scholar in Mathematics**

Notes: *A nationally competitive scholarship for undergraduates who show exceptional promise of becoming research leaders in the natural sciences, engineering and mathematics.*

Teaching

Ithaca College

2017–present

105 Math for Decision Making (F17, Sp18, F18, F19, Sp22)
111 Calculus I (Sp18, F18, Sp20, F20, Sp21, F21)
112 Calculus II (F19)
187 Introduction to Applied Linear Algebra (F21)
211 Calculus III (F17, F19)
231 Linear Algebra (Sp19)
305 Introduction to Analysis (Sp20, Sp22)
362 Modern Geometry (F20)
397 Junior Seminar (F17, F20)
398 Research Experience in Mathematics (Sp18, Sp21)
480 Connections in Advanced Mathematics: Billiards, Dynamics, and Geometry (F21)
570 Connections between Secondary and Advanced Algebra (Su20, Su21)

Independent Studies:

—Differential Geometry of Curves and Surfaces (Antara Sen, Sp20),
Text: doCarmo *Differential Geometry of Curves and Surfaces*
—Explorations in Analysis, Topology, and Dynamics (Jacob Brown, F19),
Text: Uribe & Visscher *Explorations in Analysis, Topology, and Dynamics*

Senior Capstone Projects:

—Geodesics on Surfaces of Revolution (Jamie Woodworth, F21)
—Information Theory: Understanding Data and Randomness (Damion Lance, F20)
—Determinism, Randomness, and Chaos (Carl Fortna, F20)

University of Michigan

2012–2017

116 Calculus II (F15, W16, F16, W17)
176 Explorations in Topology and Analysis (W13, W14)
217 Linear Algebra (Sp16, Sp17)
385 Mathematics for Elementary School Teachers (F12, F13, F14)
431 Topics in Geometry for Teachers (F16)
MMSS Discrete Dynamical Systems (Su16, Su17)

* *MMSS is the Michigan Math and Science Scholars program, a summer enrichment program for high school students.*

Northwestern University

2009–2011

220 Differential Calculus of One Variable Functions
234 Multiple Integration and Vector Calculus
EXCEL Integral Calculus of One Variable Functions

* *The EXCEL Program is a pre-college summer program for diverse and underrepresented students for the McCormick School of Engineering and Applied Sciences.*

Undergraduate Research Supervision

Questions in billiard dynamics on surfaces of revolution

2022 Summer REU, *Ithaca College*.

Students: Tommy Angel (IC), Bjorn Cattell-Ravdal (MSU Denver), Ian Robinson (Murray State)

Periodic billiard orbits on surfaces of revolution

2021 Summer REU, *Ithaca College*.

Students: Jack Klawitter (Middlebury), Kevin Manogue (Lafayette), Shanshan Cao (Boston U.)

Distribution of rational squares: real and complex

2018-2019 Mathematics Department Honors Project, *Ithaca College*.

Student: Danny Akimchuck (IC)

Billiards on surfaces of revolution

Summer 2016 Mathematics Department REU, *University of Michigan*.

Student: Isaac Garfinkle (Carleton College)

Oral assessments and learning opportunities

2015-2016 Undergraduate Research Opportunity Program, *University of Michigan*.

Co-mentor: Nina White

Student: Cooper Agar (UM)

Coding geodesics in hyperbolic spaces

Summer 2013 Mathematics Department REU, *University of Michigan*.

Students: Sean Douglass (UM), Caleb Springer (UM)

Selected Talks

Constructing embedded surfaces with Anosov geodesic flows.

Eastern Sectional Meeting of the AMS Special Session on Geometric Dynamics and Billiards.

Tufts University, March 2022.

Ithaca College Mathematics Research Experience for Undergraduates (REU).

Ithaca College Provost's Colloquium, October 2021.

Dimension 9 3/4.

Ithaca College World of Mathematics, February 2020.

The Dynamics of Continued Fractions.

Bucknell University Math Department Student Colloquium, April 2019.

Approximating Pi with Billiards.

Ithaca College World of Mathematics, April 2018.

Cue the math: a dynamicist talks billiards.

Ithaca College Department of Mathematics Colloquium, January 2018.

Anosov geodesic flows on surfaces embedded in R^3 .

Ohio State University Topology Seminar, April 2017.

The Dynamics of Continued Fractions.

Ithaca College Department of Mathematics Colloquium, December 2016.

Constructing embedded surfaces with Anosov geodesic flows.

Joint Mathematics Meetings AMS Session on Dyn. Syst. and Erg. Th.. Seattle, WA, January 2016.

The teetotaler's tour: a simple strategy for the aspiring globetrotter.

University of Michigan Undergraduate Math Club, December 2015.

Why does it work? A study of the progression of student thought on how to justify an algorithm.

University of Michigan Teaching Mathematics Content Courses Conference, October 2015.

Whatever You Might Call It: questions and answers about interactive, student-centered teaching.

University of Michigan Teaching Seminar (panelist), October 2015.

Comparing oral and traditional assessment in a content course for pre-service elementary school teachers.

MAA MathFest Washington, DC, August 2015.

Equilibrium measures for frame flows.

University of Toledo Dynamical Systems Seminar, March 2015.

Comparing oral and traditional assessment in a content course for pre-service elementary school teachers.

University of Michigan Teaching Mathematics Seminar, January 2015.

Comparing oral and traditional assessment in a content course for pre-service elementary school teachers.

Joint Mathematics Meetings Session on Res. in Undergr. Math Ed. San Antonio, TX, January 2015.

Equilibrium states for certain partially hyperbolic systems.

AIMS Session on Entropy and Stat. Prop. for Smooth Dynamics. Madrid, Spain, July 2014.

Promoting inquiry on day one.

University of Michigan Teaching Mathematics Content Courses Conference, October 2014.

A Franks' lemma for geodesic flows.

Michigan State University Geometry Seminar, May 2013.

Technology in the Classroom: Using an eBook in a Calculus Class.

Northwestern University Mathematics Department Panel Discussion, May 2012.

Stability and sustainability in geometric dynamics.

Bryn Mawr College Mathematics Colloquium, November 2011.

Franks' lemma in geometric contexts.

Penn State University Dynamical Systems and Related Topics Workshop, October 2011.

The teetotaler's tour: a simple strategy for the aspiring globetrotter.

Hope College Department of Mathematics Colloquium, January 2011.

Selected Conferences Attended

Problem Session in honor of Charles Pugh's 80th Birthday, Zoom, September 2021.

Seaway Section Meeting, Ithaca College, November 2019.

Seaway Section Meeting, St. John Fisher College, April 2019.

Joint Mathematics Meetings, Baltimore, MD, January 2019.

Workshop in Dynamical Systems and Related Topics, Penn State University, October 2018.

Workshop in Dynamical Systems and Related Topics, Penn State University, October 2017.

Joint Mathematics Meetings, Atlanta, GA, January 2017.

MAA MathFest, Columbus, OH, August 2016.

Joint Mathematics Meetings, Seattle, WA, January 2016.

MAA MathFest, Washington, D.C., August 2015.

RL Moore – IBL Conference, Austin, TX, June 2015.

AIMS Conference on Dynamical Systems, Diff. Eqs. and Appl., Madrid, SPAIN, July 2014.
Inquiry-Based Learning Workshop, Kenyon College, June 2014.
School on Geometry and Dynamics, Luminy, FRANCE, April 2014.
Midwest Dynamical Systems Meeting, University of Illinois, Urbana-Champaign, Nov. 2013.
Workshop in Dynamical Systems and Related Topics, Penn State University, October 2013.
Beyond Uniform Hyperbolicity Conference, Będlewo, POLAND, May 2013.
RTG Workshop on Random Walks on Groups, University of Michigan, March 2013.
Mathematicians in Mathematics Education, University of Arizona, March 2013.
Ann Arbor Elementary Mathematics Laboratory and Workshop, U. of Michigan, August 2012.

Professional Service

Departmental Committees

- Assessment Committee, Dept. of Mathematics, Ithaca College (2021–2022)
- Chair of the Teaching Effectiveness Committee, Dept. of Mathematics, Ithaca College (2018–2021)
- Activities Committee, Dept. of Mathematics, Ithaca College (2019–2020)
- Diversity and Inclusion Committee, Dept. of Mathematics, Ithaca College (2017–2018)

School Committees

- Curriculum Committee, Ithaca College School of Humanities and Sciences (2020–2022)

MAA Committees

- Nominations Committee, MAA Seaway Section (2018–2020)
- Seaway NExT Advisory Committee, MAA Seaway Section (2018–2022)

Outreach

- Editor-in-Chief, Mathematics Department Newsletter, Ithaca College (2020–)
- Coach, 5th Grade math group at Fall Creek Elementary School, Ithaca, NY (2019)
- Judge, MAA Undergraduate Poster Session, Joint Mathematics Meetings (2016, 2017, 2019)

Reviewing and Refereeing

- Annales de l'Institut Henri Poincaré
- Discrete and Continuous Dynamical Systems - A
- Ergodic Theory and Dynamical Systems
- Journal of Modern Dynamics
- Journal of Nonlinear Analysis
- Mathematical Physics, Analysis, and Geometry
- Mathematical Reviews
- PRIMUS
- Systems & Control Letters

Professional Memberships

American Mathematical Society
Mathematical Association of America
Phi Beta Kappa