

# Jim Fowler

Curriculum Vitae

The Ohio State University ▪ Department of Mathematics  
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## Education

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University of Chicago 2003–2009  
Chicago, Illinois

M.S. in Mathematics, June 2005.

Ph.D. in Mathematics, June 2009.

Harvard University 1999–2003  
Cambridge, Massachusetts

A.B. in Mathematics, *summa cum laude*, June 2003.

Junior Phi Beta Kappa.

## Employment

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The Ohio State University, Assistant Professor 2014–

Mathematics 2162.02: Accelerated Calculus II for Honors Engineers

Mathematics 5801: General Topology and Knot Theory

The Ohio State University, Program Manager 2013–2014

Mathematics 2568: Linear Algebra.

Calculus Two MOOC on Coursera (23k student enrollments).

Multivariable calculus MOOC on Coursera (11k student enrollments).

The Ohio State University, Lecturer 2012–2013

Calculus One MOOC on Coursera (87k student enrollments).

iTunesU Calculus One (ranked #1 in Summer 2013; 37k subscribers).

Mathematics 1151: Calculus I.

Mathematics 1161: Accelerated Calculus I.

Mathematics 1181: Honors Calculus I.

The Ohio State University, Ross Mathematics Program Summer 2010–

Taught the number theory course; ran a number theory recitation for high school students; taught a piecewise-linear topology course for undergraduate and high school students.

The Ohio State University, Zassenhaus Assistant Professor 2009–2012

Mathematics 151: Calculus and Analytic Geometry I.  
 Mathematics 153: Calculus and Analytic Geometry III.  
 Mathematics 254 and 254.02: Calculus and Analytic Geometry IV.  
 Mathematics 660: Introductory Complex Analysis.  
 Mathematics 953: Topics in Topology  
 Mathematics 345: Foundations of Higher Mathematics  
 Mathematics 758: Algebraic Topology: Cohomology  
 Mathematics 765: Smooth Manifolds

University of Chicago, Directed Reading Program, Mentor 2004–2009  
 Mentored undergraduate projects on automatic groups, geometric group theory, combinatorial game theory, piecewise-linear topology, knot theory, stochastic processes.

University of Chicago, Polk Brothers Program 2005–2009  
 Taught middle school students in small groups and whole-classroom settings; assisted Chicago public school teachers with pedagogy and their study of mathematics.

University of Chicago, Graduate Student Lecturer 2005–2006  
2008–2009  
 Mathematics 131–133: Elementary Functions and Calculus.  
 Mathematics 153: Calculus.  
 Mathematics 204–205: Inquiry-based learning (Moore method); analysis in  $\mathbb{R}^n$ .

University of Chicago, College Fellow 2004–2005  
 Mathematics 203–205: Analysis in  $\mathbb{R}^n$ .

University of Chicago, Research Experience for Undergraduates, Mentor Summer 2004  
Summer 2006  
Summer 2007

University of Chicago, Undergraduate Lie Theory Seminar Fall 2006

Canada/USA Mathcamp, Mentor Summer 2004  
Summer 2005  
 Taught and mentored high school students in topics including piecewise-linear topology, quaternions, knots and links, game theory, projective geometry,  $p$ -adic numbers.

University of Chicago, Warm Up Program, Lecturer September 2005  
 Lectured in a mini-course reviewing point-set topology for incoming graduate students.

Harvard University, Course Assistant 2000–2003  
 Graded homework and ran weekly recitation sessions for multivariable calculus and linear algebra, representation theory, algebraic topology.

## Awards, Fellowships, Grants

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NSF Grant DUE–1505246 2015–2018  
 \$248k for creating and curating linear algebra materials.

Crestron Summum Bonum Award for Excellence in Teaching	March 2014
NSF Grant DUE-1245433 \$180k for building online textbooks.	2013–2016
ODEE, eLearning Professional Development Grant	September 5, 2013
The STEAM Factory, OSU Outreach and Engagement Impact Grant	2013
“Steal My Idea” Presentation Winner	March 27, 2013
NSF Graduate Research Fellowship	2003–2008
McCormick Fellowship, University of Chicago	2003–2005
Palfrey Exhibition, Harvard University Awarded to the most distinguished scholar in the senior class holding a stipendiary scholarship.	May 2003
Wister Prize, Harvard University Awarded to the student with the highest record in mathematics.	May 2003
Robert Fletcher Rogers Prize, Harvard University Awarded to the two students who gave the best talks at the undergraduate mathematics table.	May 2003
Certificate of Distinction in Teaching, Derek Bok Center for Teaching and Learning	Fall 2000

## Publications

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- Jim Fowler and Zhixu Su. Smooth manifolds with prescribed rational cohomology ring. *Geometriae Dedicata*, pages 1–18, 2016.
- Michael W. Davis, Jim Fowler, and Jean-François Lafont. Aspherical manifolds that cannot be triangulated. *Algebr. Geom. Topol.*, 14(2):795–803, 2014.
- J. Fowler. Finiteness properties for some rational Poincaré duality groups. *Illinois J. Math.*, 56(2), 2012.
- J. Fowler and C. Ogle. Bounded homotopy theory and the  $K$ -theory of weighted complexes. *Proc. Steklov Inst. Math.*, 275(Classical and Contemporary Mathematics in honor of Boris Delone):210–226, 2011.
- C. Adams, A. Colestock, J. Fowler, W. Gillam, and E. Katerman. Cusp size bounds from singular surfaces in hyperbolic 3-manifolds. *Trans. Amer. Math. Soc.*, 358(2):727–741 (electronic), 2006.
- C. Adams, A. Colestock, J. Fowler, W. Gillam, and E. Katerman. Cleanliness of geodesics in hyperbolic 3-manifolds. *Pacific J. Math.*, 213(2):201–211, 2004.

Jeremy Brandman, James Fowler, Brian Lins, Ilya Spitkovsky, and Nahum Zobin. Convex hulls of Coxeter groups. In *Function spaces, interpolation theory and related topics (Lund, 2000)*, pages 213–240. de Gruyter, Berlin, 2002.

## Other Papers

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J. Fowler, A. Groot, D. Pandya, and B. Snapp. The no-three-in-line problem on a torus. *ArXiv 1203.6604*, March 2012.

James A. Fowler. *Poincare duality groups and homology manifolds*. ProQuest LLC, Ann Arbor, MI, 2009. Thesis (Ph.D.)—The University of Chicago.

## Talks

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Open and active calculus interventions at Ohio State  
Gateway to Mathematical Sciences: Lectures on Instruction  
Michigan State University February 23, 2016

Discussion of Active Learning in Calculus Courses  
Ohio Mathematics Chairs/Leads Network Meeting  
Ohio State University January 22, 2016

An Introduction to Ximera  
Precalculus and Calculus Innovation Workshop  
Northwestern University November 13–14, 2015

Ximera: Collaboratively Develop Interactive Online Content  
Ohio MAA Section CONSACT Workshop  
Capital University October 23–24, 2015

Use Ximera to collaborate on open and interactive texts  
Unizin Innovation Summit  
Grapevine, Texas October 8–9 2015

Projective Planes  
Minnesota State University, Mankato October 2, 2015

What's in it for the Professor? A discussion on instructor impact.  
Coursera Partners Conference  
Newport Beach, California March 2015

High-dimensional unknotting, Part 1  
Invitations to Mathematics December 3, 2014

High-dimensional unknotting, Part 2  
Invitations to Mathematics December 8, 2014

Shor's algorithm  
OSU Quantum Topology Group November 18, 2014

Rational projective planes  
IUPUI Modern Analysis and Geometry Seminar  
Indianapolis, Indiana November 11, 2014

Aspherical manifolds that cannot be triangulated Midwest Topology Seminar Indianapolis, Indiana	April 19, 2014
Reaching Online Learners: Being Smart Isn't Enough SXSWedu Austin, Texas	March 3–6, 2014
Computing in topology and student learning Job Talk	January 28, 2014
Turbocharging Our MOOCs with Mooculus EDUCAUSE Anaheim, California	October 15–18, 2013
Plenary lecture on Desargues' theorem Undergraduate Mathematics Symposium University of Illinois at Chicago	October 5, 2013
E-Learning and the MOOCs at OSU OSURA Columbus, Ohio	September 26, 2013
Hyperbolic knots and their volumes OSU Quantum Topology Group	September 10, 2013
Numeric methods in topology OSU Topology Seminar	November 13, 2012
Manifolds realizing rational homotopy types AMS Special Session on Interactions Between Geometry and Topology AMS Fall Central Sectional Meeting	October 20–21, 2012
Rational projective planes Spring Topology and Dynamics Conference Universidad Nacional Autonoma de México	March 22–24, 2012
Poincaré duality groups Stratified Spaces: Joining Analysis, Topology and Geometry Mathematisches Forschungsinstitut Oberwolfach	December 11–17, 2011
Remarks on rational homology manifolds Conference in Geometric Group Theory and related topics The Ohio State University	May 30–June 3, 2011
Weighted algebraic topology Geometrical methods in high-dimensional topology The Ohio State University	May 16–21, 2011
Projective Planes OSU Radical Pi	April 20, 2011
CAT(0) square complexes OSU Math Circle	April 17, 2011
$\mathcal{B}$ -bounded finiteness Spring Topology and Dynamics Conference The University of Texas at Tyler	March 17–19, 2011

$\mathcal{B}$ -bounded finiteness University of Michigan	March 31, 2011
$\mathcal{B}$ -bounded finiteness OSU Topology Seminar	February 15, 2011
A first talk on surgery OSU Topology Seminar	October 5, 2010
Rational Poincaré duality groups and controlled symmetric signature Workshop in Geometric Topology Colorado College	June 10–12, 2010
Rational Poincaré duality groups and controlled symmetric signature Spring Topology and Dynamics Conference Mississippi State University	March 18–20, 2010
Rational Poincaré duality and controlled symmetric signature University of Notre Dame	March 4, 2010
Rational Poincaré duality and controlled symmetric signature OSU Topology Seminar	March 2, 2010
Dividing a square into triangles of equal-area OSU Radical Pi	January 13, 2010
Rational Poincaré duality groups OSU Topology Seminar	November 24, 2009
Rational Poincaré duality groups Ferryfest University of Chicago	March 22–24, 2009
Lattices with torsion and rational homology manifolds Topology of Stratified Spaces Mathematical Sciences Research Institute	September 8–12, 2008
Double suspensions of homology spheres Farb and Friends Student Seminar	May 20, 2008
The $\alpha$ -approximation theorem Farb and Friends Student Seminar	November 4, 2008
Quaternionic toric varieties Farb and Friends Student Seminar	April 4, 2008
Hyperbolization of polyhedra Farb and Friends Student Seminar	March 7, 2008
Classifying high-dimensional manifolds Farb and Friends Student Seminar	October 12, 2007
Wall's finiteness obstruction Algebraic Topology Proseminar	September 27, 2007
Introduction to Surgery Algebraic Topology Proseminar	May 29, 2007

PL-unknotting of codimension $\geq 3$ knots Farb and Friends Student Seminar	May 11, 2007
Building Aspherical Manifolds via Davis' Construction Farb and Friends Student Seminar	January 25, 2007
Approximating $L^2$ invariants by finite-dimensional analogues $L^2$ Seminar	November 22, 2006
Algebraic topology and distributed computing Applied algebraic topology seminar	November 2, 2006
The $h$ -cobordism theorem Shmuel's Student Seminar	March 7, 2005
Wall's finiteness obstruction Algebraic Topology Proseminar	November 23, 2004
2-adics and equidissections of squares Pizza Seminar	November 16, 2004
Introduction to characteristic classes Algebraic Topology Proseminar	October 19, 2004
Dissecting squares into equal-area triangles Harvard Mathematics Table	October 15, 2002
Bounding the volume of hyperbolic 3-manifolds Harvard Mathematics Table	October 23, 2001
Clean geodesic journeys through hyperbolic manifolds MAA MathFest Madison, Wisconsin	August 3, 2001
Functions growing faster than any computable function Harvard Mathematics Table	December 12, 2000

## Other conferences attended

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Spring Topology and Dynamics Conference Bowling Green State University	May 14–16, 2015
Transforming Post-Secondary Education in Mathematics University of Chicago	September 19–20, 2015
Sage Education Days 5 University of Washington	June 19–21, 2013
Workshop on High Dimensional Topology University of Notre Dame	December 8–9, 2012
Singularities in Geometry and Topology Courant Institute of Mathematical Sciences	March 17–20, 2008

AMS Special Session on Geometric Topology Courant Institute of Mathematical Sciences	March 15–16, 2008
Topological and Geometric Rigidity Banff International Research Station	July 29–August 3, 2007
Problems in Geometric Group Theory American Institute of Mathematics	April 23–27, 2007
Nil Phenomena in Topology Vanderbilt University	April 14–15, 2007
Introductory Workshop on Computational Application of Algebraic Topology Mathematical Sciences Research Institute	September 5–8, 2006
Conference on Geometric Group Theory Centre de recherches mathématiques	July 3–14, 2006
Workshop on Group Actions and Rigidity University of Hawaii, Manoa	March 20–22, 2006
Ricci Flow, 3-manifolds, and Geometry Clay Mathematics Institute	June 20–July 15, 2005
Submanifolds, Singular Varieties and Stratified Spaces Courant Institute of Mathematical Sciences	March 13–16, 2005
Braids, Links, and Mapping Class Groups Columbia University	March 15–20, 2005
Conference on Low-dimensional topology University of Virginia	December 15–19, 2004

## Professional activities and service

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Spring Topology and Dynamics Conference, Geometric Topology special session organizer, Bowling Green	May 14–16, 2015
Ohio Mathematics Initiative, Subgroup 3: Communications Co-chair	2015–Present
Ohio Mathematics Initiative, Subgroup 3: Communications	2014–2015
The Ohio State University, Committee on Distance Education, Libraries, Information Technology	2014–Present
The Ohio State University, Distance Education Steering Committee	2014–Present
The Ohio State University, Innovate Conference Advisory Committee	Autumn 2014–Present
The Ohio State University, ODEE Impact Grant review committee	Autumn 2014



The Ohio State University, New Media in the Classroom	Autumn 2014
The Ohio State University, Intellectual Property, Patents, Copyright Senate Committee	2013–Present
The Ohio State University, Data Analysis Hiring Committee	2013
The Ohio State University, Special Year in Geometry and Topology, Proceedings Co-editor	2013–Present
The Ohio State University, STEAM Factory, Founding Director, Core Committee	2012–Present
The Ohio State University, eLearning Committee Organized technology enhanced lectures and built mooculus.osu.edu.	2012–Present
The Ohio State University, Topology Seminar Co-Coordinator	2010–Present
Ohio Board of Regents, Ohio Textbook Affordability Summit, Faculty Panelist	September 27, 2013
National Science Foundation, INGenIOuS, Faculty Panelist	May 30, 2013
The Ohio State University, Innovate Conference, MOOC Panelist	March 26, 2013
The Ohio State University, University Center for the Advancement of Teaching, Faculty Panelist	February 20, 2013
The Ohio State University, Special Year in Geometry and Topology, Graduate Student Seminar Organizer	2010–2011
University of Chicago, Directed Reading Program, Committee Member Paired undergraduates with graduate student mentors; organized undergraduate talks; designed database-driven website to monitor students' progress.	2006–2009
University of Chicago, Center for Teaching and Learning, Panelist	September 2007 September 2008
Moderated a large-group discussion of teaching issues, including initial course design, midquarter course changes, assessment techniques, lecturing styles.	