

Joshua P. Bowman

- CONTACT INFORMATION Institute for Mathematical Sciences 607-339-7870 (cell)
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- EDUCATION **Cornell University**, Ithaca, NY
Ph.D., Mathematics, August 2009
Cornell University, Ithaca, NY
M.S., Mathematics, August 2006
St. Olaf College, Northfield, MN
B.A. *summa cum laude*, Mathematics and music, May 1999
- RESEARCH AREAS Teichmüller theory, geometric topology, complex dynamics
- PUBLICATIONS “Wild singularities of flat surfaces” (with F. Valdez)
To appear in the Israel Journal of Mathematics.
“The complete family of Arnoux–Yoccoz surfaces”
To appear in *Geometriae Dedicata*.
“Finiteness conditions on translation surfaces”
To appear in *Quasiconformal Mappings, Riemann Surfaces, and Teichmüller Spaces (in honor of Clifford Earle’s 75th birthday)*, Contemporary Mathematics.
“Orientation-reversing involutions of the genus 3 Arnoux–Yoccoz surface and related surfaces”
In the tradition of Ahlfors–Bers V, Contemporary Mathematics 510 (2010), pp. 13–23.
“Teichmüller geodesics, Delaunay triangulations, and Veech groups”
Teichmüller Theory and Moduli Problems, Ramanujan Math Society Lecture Notes Series Vol. 10 (2010), pp. 113–129.
The Scientific Legacy of Poincaré (translator), History of Mathematics Vol. 36, AMS and London Mathematical Society, 2010.
- OTHER PAPERS “The deltoid map on \mathbb{P}^2 ”, available at www.math.sunysb.edu/~bowman.
“Homology of basins of infinity for rock-paper-scissors maps” (with M. Lyubich), in preparation
“Flat structures and complex structures in Teichmüller theory”, *Ph.D. thesis*
- CONFERENCE PRESENTATIONS *Dynamical deltoids*
Joint Mathematics Meetings, Boston, MA, 5 January 2012
Rock-paper-scissors in the complex world
at the special session on “Connections to Complex Dynamics”
MAA MathFest, Lexington, KY, 4 August 2011
Wild singularities of flat surfaces
at the Fifth Ahlfors–Bers Colloquium
Rice University, Houston, TX, 25 March 2011
The complete family of Arnoux–Yoccoz surfaces
at “Dynamics and Geometry of Teichmüller space” (pre-conference school)
Centre International de Rencontres Mathématiques, Luminy, France, 19 June 2009

Delaunay triangulations of flat surfaces
at the Graduate Conference in Algebra and Topology
Binghamton University, Binghamton, NY, 8 November 2008

Applications of Delaunay triangulations to Teichmüller theory
at “Dynamics in Teichmüller space”
Station Biologique, Roscoff, France, 2 June 2008

Applications of Delaunay triangulations to Teichmüller theory
at the Fourth Ahlfors–Bers Colloquium
Rutgers University, Newark, NJ, 8 May 2008

Teichmüller geodesics and Veech groups
at the International Workshop on Teichmüller Theory and Moduli Problems
Harish-Chandra Research Institute, Allahabad, India, 7 January 2006

A computational search for stabilizers of Teichmüller geodesics
at “Conformal Dynamics, Hyperbolic Geometry, and Continued Fractions”
Centre International de Rencontres Mathématiques, Luminy, France, 13 June 2005

SEMINAR
PRESENTATIONS

Rock-paper-scissors in the complex world
Harvard Dynamics and Geometry Seminar, 30 November 2011

Rock-paper-scissors in the complex world
Stony Brook Dynamical Systems Seminar, 28 October 2011

Rock-paper-scissors in the complex world
Cornell Dynamical Systems Seminar, 30 September 2011

Wild singularities of flat surfaces
CUNY Geometry and Topology Seminar, 5 April 2011

All I really need to know I learned from polygons
Stony Brook Math Club, 28 October 2010

Singularities of non-compact translation surfaces
Oberseminar Differentialgeometrie, Hausdorff Institute for Mathematics, 17 July 2010

Invariant sets and orbit closures for the $SL(2, \mathbb{R})$ action on moduli spaces of translation surfaces
Stony Brook Mini-Course/Dynamics Learning Seminar, March 2010

Affine invariants of compact and non-compact translation surfaces
Yale Dynamics of Group Actions Seminar, 22 March 2010

Flat surfaces: triangulations, tessellations, and limits
CUNY Graduate Center Complex Analysis and Dynamics Seminar, 6 November 2009

Flat surfaces: triangulations, tessellations, and limits
Stony Brook Dynamical Systems Seminar, 2 October 2009

From the golden ratio to the geometric series
Cornell Dynamical Systems Seminar, 6 March 2009

Some variational and asymptotic methods in the study of complex structures
Stony Brook Dynamics Systems Seminar, 30 January 2009

Flat surfaces, Teichmüller disks, and hyperbolic tessellations
Indiana University Dynamics Systems Seminar, 15 January 2009

Flat surfaces, Teichmüller disks, and hyperbolic tessellations
University of Chicago Dynamics Systems Seminar, 14 January 2009

Some variational and asymptotic methods in the study of complex structures
Cornell Lie Groups Seminar, 24 October 2008

Preparing teaching and research statements
Cornell Teaching Seminar, 17 September 2008

The cocycle of life
Olivetti Club, 22 April 2008

Visualizing Veech groups
Cornell Dynamical Systems Seminar, 30 November 2007

Klein's quartic, 'tis of thee, sweet curve of genus 3, of thee I sing
Olivetti Club, 6 November 2007

Delaunay triangulations of flat surfaces
Section de Mathématiques, Ecole Polytechnique Fédérale de Lausanne, 20 March 2007

Delaunay triangulations and bicuspid surfaces (following work of Veech)
Teichmüller Theory Seminar, Université de Provence, 2 February 2007

Pseudo-Anosov maps of a surface-ally docious (If you say it loud enough you'll always sound precocious)
Olivetti Club, 4 April 2006

All I really need to know I learned from polygons
St. Olaf College Mathematics Department Colloquium, 21 March 2006

Veech groups of flat surfaces
Cornell Dynamical Systems Seminar, 5 December 2005

Translation with a capital T, and that rhymes with B, and that stands for billiards!
Olivetti Club, 20 September 2005

Project calculus: incorporating long-term projects in your calculus classroom
(co-presented with Jonathan Needleman)
Cornell Teaching Seminar, 27 April 2005

Here a ball, there a ball, everywhere a unit ball: Royden's theorem on isometries of Teichmüller space
Olivetti Club, 29 March 2005

Enlivening the classroom: reducing teachers' and students' stress with humor
Cornell Teaching Seminar, 2 February 2005

The plants go marching n by n: garden variety affine and projective planes
Olivetti Club, 24 February 2004

CONFERENCES
RECENTLY
ATTENDED

Midwest Dynamical Systems Seminar
IUPUI, Indianapolis, IN, 14–16 October 2011

William Rowan Hamilton Geometry & Topology Workshop
Trinity College, Dublin, Ireland, 30 August–3 September 2011

MAA MathFest
Lexington, KY, 4–6 August 2011

Geometric and Algebraic Structures in Mathematics (as an organizer),
celebrating Dennis Sullivan's 70th birthday
Stony Brook University, Stony Brook, NY, 26 May–4 June 2011

Billiards, Flat Surfaces, and Dynamics on Moduli Space
Mathematisches Forschungsinstitut Oberwolfach, 8–15 May 2011

Ahlfors–Bers Colloquium
Rice University, 24–27 March 2011

Frontiers in Complex Dynamics, celebrating John Milnor's 80th birthday
Banff Center, Alberta, Canada, 21–25 February 2011

TEACHING
EXPERIENCE

Stony Brook University, Stony Brook, NY

Lecturer

Fall 2009–present

Courses:

- MAT 125, MAT 131 Calculus
- MAT 141–142 Honors Calculus
- MAT 362 Differential geometry
- MAT 698 Independent study in dynamical systems

Cornell University, Ithaca, NY

Teaching Assistant and Instructional Teaching Assistant

Fall 2004 to Spring 2009

Courses:

- Math 1004, Pre-calculus (for Pre-freshman Summer Program), *instructor*
- Math 1910, Calculus for Engineers, *instructor*
- Math 1920, Calculus for Engineers, *teaching assistant*
- Math 2230, Theoretical Linear Algebra and Calculus, *teaching assistant*
- Math 3560, Groups and Geometry, *teaching assistant*

Peace Corps, Guinea, West Africa

Volunteer Teacher

September 2000 to June 2002

- Taught 9th and 10th grade mathematics, including algebra and geometry, to over 200 students, as well as 12th grade differential calculus
- Founded a club for exploring and reviewing science and mathematics

OUTREACH

MoMath-BNL Gifted Mathematics Program

April 2012

Greater Metropolitan New York Math Fair

April 2010

- This event is hosted by the Brooklyn Technical High School.
- I was on a panel of judges for high school students' papers and presentations.

4H Career Explorations

June 2007, July 2008

- This program is designed to expose teens in 4H to a variety of career opportunities.
- I co-developed and co-led sessions on mathematical thinking and game theory.

Expanding Your Horizons

April 2008

- This program is designed to nurture girls' interest in math and science.
- I co-developed and co-led a session on understanding patterns in quipus.

DEPARTMENTAL
ACTIVITIES

Organizer

"Geometric and Algebraic Structures in Mathematics",
Conference to celebrate Dennis Sullivan's 70th birthday (2011)

Stony Brook IMS Preprint Series (2009–present)

Cornell Dynamical systems seminar (2008–2009)

Olivetti Club at Cornell (2005)

Cornell Math Department Fall Picnic (2003, 2004, 2007, 2008)

Cornell Math Department Spring Concert (2008, 2009)

Participant

Stony Brook Dynamical systems seminar (2009–present)

Cornell Dynamical systems seminar (2005–2009)

Cornell Teaching seminar (2004–present)

Cornell Math Department Spring Concert (2004–2008)

AWARDS **Hutchinson Fellowship**, Cornell University, Spring 2008
 VIGRE Fellowship, Cornell University, Fall 2003 to Spring 2006
 Buntrock Scholar, St. Olaf College, September 1995 to May 1999

PROFESSIONAL American Mathematical Society
ORGANIZATIONS Mathematical Association of America

OTHER SKILLS Computing: \LaTeX , MetaPost, word processing, MATLAB, Maple
 French: speak, read, and write fluently
 Other languages studied: German, Arabic, Maninkakan

REFERENCES **Dr. John Hubbard**, Cornell University (Ph.D. advisor)
 Dr. Mikhail Lyubich, Stony Brook University
 Dr. Howard Masur, University of Chicago
 Dr. Barak Weiss, Ben-Gurion University of the Negev
 Dr. Jason Starr, Stony Brook University (teaching reference)
 Nancy Wozniak, M.A., Stony Brook Teaching, Learning + Technology