

Jonathan Dahl

CONTACT INFORMATION

Department of Mathematics
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RESEARCH INTERESTS

I am interested in the optimal transport problem and its applications, as well as metric geometry and the extension of results in Riemannian geometry to more general classes of metric spaces. Additionally, I am studying the integration of pedagogical content knowledge into mathematical education computer programs.

EDUCATION

Johns Hopkins University, Baltimore, Maryland USA

Ph.D., 2010 Mathematics

- Thesis topic: *Existence and structure of solutions of Steiner problems in optimal transport*
- Advisor: Prof. Chikako Mese

M.A., 2006 Mathematics

University of Maryland, College Park, Maryland USA

B.S., 2004 Mathematics with High Honors

TEACHING EXPERIENCE

Lafayette College, Easton, Pennsylvania USA

Visiting Assistant Professor, Fall 2013 to present,
Taught a variety of courses across all levels of Mathematics and Computer Science, including a new self-designed special topics course in Cyber Security. Served as a member on several thesis committees as well as supervising independent study courses and student research under the EXCEL Scholar funding program.
Independent study courses supervised:

- Theories of Integrals and Set Theory, Fall 2015.
- Computer Graphics and VR, Spring 2018.
- Combinatorial Optimization, Fall 2018.
- Advanced Topics in Complexity Theory, Fall 2018.
- Post-Quantum Cryptography, Fall 2018.

EXCEL Scholar projects supervised:

- Augmented Reality Tools for Geometry and Topology Visualization, Summer 2018.
- 3D Modeling of Dam and Levee Rock Assemblage, Fall 2018 (in coordination with a parallel EXCEL Scholar supervised by Michael McGuire, Civil and Environmental Engineering at Lafayette).

Specific courses taught:

- CM 151 Introduction to Computational Science, Spring 2019.
- CM 160 Games as Models of the Natural World, Fall 2017.
- CS 105 Digital Media, Spring 2018, Fall 2018.
- CS 150L Data Structures and Algorithms Lab, Fall 2019.
- CS 200 Computers and Society, Spring 2017, Spring 2018, Spring 2019.
- CS 202 Analysis of Algorithms, Fall 2016, Fall 2017, Fall 2018.
- CS 303 Theory of Computation, Spring 2017, Spring 2019.
- CS 410 Cyber Security, Spring 2018.
- MATH 125 Modeling and Differential Calculus, Fall 2013, Spring 2015.
- MATH 141 Differential Calculus and Economic Modeling, Fall 2014.
- MATH 161 Calculus I, Fall 2013, Summer 2014, Fall 2015, Spring 2016, Fall 2016, Fall 2019.
- MATH 162 Calculus II, Fall 2014, Fall 2016.
- MATH 186 Applied Statistics, Spring 2014, Spring 2015.
- MATH 263 Calculus III, Spring 2014, Fall 2019.
- MATH 264 Differential Equations with Linear Algebra, Spring 2016.
- MATH 343 Advanced Multivariable Calculus, Fall 2015.

University of California, Berkeley, California USA

RTG Postdoctoral Fellow, Fall 2010 to Spring 2013,
Specific courses taught:

- MATH 1B Calculus, Summer 2012.
- MATH 104 Introduction to Analysis, Spring 2011, Spring 2013.
- MATH 141 Elementary Differential Topology, Spring 2012, Fall 2012.
- MATH 199 Supervised Independent Study (Homotopy Theory), Fall 2012.
- MATH 199 Supervised Independent Study (Minimal Networks), Spring 2013.
- MATH 214 Differential Manifolds, Fall 2010, Fall 2011.

Johns Hopkins University, Baltimore, Maryland USA

Teaching Assistant, Fall 2004 to Spring 2010,
Taught recitation sections. Graded homework, quizzes, and exams. Held office hours, and participated in weekly Math Help Room open tutoring sessions. Specific courses taught:

- MATH 106 Calculus I (Biological and Social Sciences), Fall 2004, Fall 2005, Spring 2007.
- MATH 109 Calculus II (Physical Sciences and Engineering), Fall 2007, Spring 2010.
- MATH 201 Linear Algebra, Fall 2009.
- MATH 202 Calculus III, Spring 2005, Spring 2006, Fall 2006, Fall 2008.
- MATH 302 Differential Equations with Applications, Spring 2008.

Instructor, Summer 2005 to Summer 2010,

	<ul style="list-style-type: none"> – MATH 105 Introduction to Calculus, Summer 2006. – MATH 108 Calculus I (Physical Sciences and Engineering), Summer 2005. – MATH 109 Online Calculus II, Summer 2010. – MATH 202 Online Calculus III, Summer 2008. – MATH 302 Online Differential Equations, Summer 2009.
PUBLICATIONS	<p><i>Steiner problems in optimal transport</i>, Transactions of the American Mathematical Society 363 (2011), no. 4, 1805-1819.</p> <p><i>Alexandrov curvature of convex hypersurfaces in Hilbert space</i>, Journal of Convex Analysis 25 (2018), no. 3. (Forthcoming)</p> <p><i>A maximum principle for pointwise energies of quadratic Wasserstein minimal networks</i>, preprint, arXiv:1011.0236.</p>
AWARDS	<p>William Kelso Morrill Award for Excellence in the Teaching of Mathematics, 2009.</p> <p>Spring Research Support, 2009.</p> <p>Summer Research Support, 2007.</p> <p>Abramowitz Award, 2004.</p> <p>Strauss Scholarship, 2003.</p>
TALKS	<p>MAA Session on The Advancement of Open Educational Resources, Joint Mathematics Meeting, Winter 2017.</p> <p>AMS Contributed Paper Session on Convex and Discrete Geometry, Joint Mathematics Meeting, Winter 2017.</p> <p>SAT Seminar, Lafayette College, Spring 2016.</p> <p>Geometry & Analysis Seminar, University of California, Santa Cruz, Spring 2015.</p> <p>SAT Seminar, Lafayette College, Spring 2015.</p> <p>MAAD Talk, Lafayette College, Fall 2014.</p> <p>SAT Seminar, Lafayette College, Fall 2013.</p> <p>Analysis Seminar, ETH Zurich, Fall 2012.</p> <p>Geometry Seminar, Stanford University, Spring 2012.</p> <p>Combined Applied Math & PDEs Seminar, University of California, Davis, Spring 2012.</p> <p>Differential Geometry Seminar, University of California, Berkeley, Spring 2011.</p> <p>CNA Summer School: New Vistas in Image Processing and PDEs, Carnegie Mellon University, Summer 2010.</p> <p>Graduate student and Post-doc workshop on Mean curvature flows and related topics, Johns Hopkins University, Spring 2010.</p> <p>Analysis Seminar, Johns Hopkins University, Fall 2008.</p>
CONFERENCES ATTENDED	<p>Joint Mathematics Meetings, San Diego, CA, January 8–13, 2018.</p> <p>Joint Mathematics Meetings, Atlanta, GA, January 4–7, 2017.</p> <p>Joint Mathematics Meetings, Seattle, WA, January 6–9, 2016.</p> <p>Metro Area Differential Geometry Seminar, Washington, DC, October 24, 2015.</p> <p>Joint Mathematics Meetings, San Antonio, MD, January 10–13, 2015.</p> <p>Joint Mathematics Meetings, Baltimore, MD, January 13–18, 2014.</p> <p>Infinite-Dimensional Geometry Workshop, MSRI, December 7–8, 2013.</p> <p>Southeast Geometry Seminar, Emory University, November 10, 2013.</p> <p>Joint Mathematics Meetings, San Diego, CA, January 9–12, 2013.</p> <p>Joint Mathematics Meetings, San Francisco, CA, January 13–16, 2010.</p> <p>Joint Mathematics Meetings, Washington, DC, January 5–8, 2009.</p>

Texas Geometry and Topology Conference, University of Texas at Austin, October 10–12, 2008.

Geometry Festival, Duke University, April 25–27, 2008.

PROFESSIONAL
DEVELOPMENT

AMS Short Course, Discrete Differential Geometry, January 2018.

AMS Short Course, Random Growth Models, January 2017.

MAA Minicourse, Algebraic Geometry: A Problem Based Course, January 2016.

MAA Minicourse, Humanistic Mathematics, January 2015.

MAA Minicourse, Doing the Scholarship of Teaching and Learning in Mathematics, January 2015.

AMS Short Course, Geometry and Topology in Statistical Inference, January 2014.

Undergraduate Faculty Program on Geometric Analysis and Undergraduate Research, Park City Mathematics Institute, July 2013.

MAA Minicourse, Problem-based courses for teachers, future teachers, and math majors, January 2013.

MAA Minicourse, Teaching introductory statistics (for instructors new to teaching intro stats), January 2013.