

**Heidi Burgiel**  
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## EDUCATION

*Master of Education*, Technology, Innovation, and Education May 2017  
Harvard Graduate School of Education, Cambridge, MA  
Topics of study: Constructivist pedagogy, educational technology.

*Doctor of Philosophy*, Mathematics August 1995  
University of Washington, Seattle, WA  
Thesis title: Realizations of Regular Maps  
Topics of study: Classical geometry, discrete geometry, combinatorics.

*Bachelor of Science*, Mathematics May 1990  
Massachusetts Institute of Technology  
Topics of study: Pure mathematics, computer science, writing.

## SKILLS

Artificial Languages: Python, HTML, CSS, LaTeX, Logo, Scratch  
Tools: Microsoft Office, Google Office Suite, Slack, Maple  
Learning Management Platforms: Canvas, Blackboard, Moodle, MyMathLab

## PROFESSIONAL EXPERIENCE

*Lasell University* July 2018-Present  
Netwon, MA Instructional Designer  
Instructional Designers in the RoseMary B. Fuss Teaching and Learning Center at Lasell College provide faculty with expertise, leadership, and support in teaching across all platforms (face-to-face, blended, and online). General topics include developing, teaching, and evaluating instructional resources and strategies, as well as designing course sites and related materials.

*HarvardX* May 2017-December 2018  
Cambridge, MA Content Developer and Online TA  
Draft final assessments, illustrate and edit written materials, and respond to student questions for “Calculus Applied!” MOOC. Quality assurance, student support, and writing distractors for “Fat Chance”.

*Lasell College* March 2018-June 2018  
Netwon, MA Instructional Technologist  
Support faculty in adoption and use of educational technology, best practices in face-to-face and online learning, and in transition from Moodle to Canvas.

*University of Massachusetts, Lowell* September 2017-December 2017  
Mathematical Sciences Department, Lowell, MA Adjunct Faculty  
Teach two sections of Calculus 1A, a hybrid calculus/precalculus course.

*Harvard-Smithsonian Center for Astrophysics* September 2016-May 2017  
Cambridge, MA Intern  
Complete literature review and conduct statistical analysis using Stata of how factors in high school computer science education affect success in introductory college computer science courses. Prepare and submit an article for publication.

*Bridgewater State University* Full Professor, September 2014 - August 2016  
Mathematics Department Associate Professor, September 2009-2014  
Bridgewater, MA Assistant Professor, September 2003-2009  
Taught “Programming and Computer Algebra” course using Logo, Python, and Maple. Collaborated on development and delivery of Mathematics for Elementary Teachers courses. Published illustrated reference text *The Symmetries of Things* with John H. Conway and Chaim Goodman-Strauss. Conducted and published mathematics research. Chaired learning management system selection committee, served as faculty liaison to university technology committee, LMS deployment committee, and IT staff. Collaborated to develop and support department web site using HTML, Forefront, and SharePoint. Developed projects for and coordinated Precalculus and Quantitative Methods for Management courses. Co-chaired 5-year departmental review and served on departmental and university-wide assessment committees. Chaired two hiring committees and served on three others. Directed Mathematics Services tutoring center. Academic advising.

*Massachusetts Institute of Technology* Summer 2012, 2013  
Cambridge, MA Temporary employment  
Quality assurance of MIT OCW Scholar courses.

*Massachusetts Institute of Technology* June 2010-July 2011  
Cambridge, MA Research Scientist  
Collaborated with faculty, staff, and students to produce, design and edit written materials, video, problem sets, and solutions for four OCW Scholar mathematics courses. Designed and developed materials for calculus “mathlets” in collaboration with Professor Haynes Miller and instructional technologist Hu Hohn. Collaborated with mathematics and aeronautics faculty on design of “Crossroads” wiki highlighting interdisciplinary connections.

*Museum of Science* June 2003 - September 2003  
Boston, MA Program Presenter  
Supervise and present for Cahners Computer Place museum exhibit.

*Boston University* January 2003 - May 2003  
 Boston, MA Lecturer  
 Taught probability and statistics and multivariable calculus courses.

*Museum of Science* November 2002 - May 2003  
 Boston, MA Intern  
 Evaluated and recommended educational games for inclusion in Cahners Computer Place exhibit.

*The Otter Group* November 2002 - December 2002  
 Cambridge, MA Temporary employment  
 Quality assurance of MIT OpenCourseWare class sites.

*Classwell Learning Group* July 2002-December 2002  
 Boston, MA Temporary employment  
 Quality assurance of K - 8 online mathematics materials.

*University of Illinois, Chicago* July 1997-October 2001  
 Chicago, IL Staff  
 Developed Logo course Microcomputers in Elementary School Mathematics and Java course Methods of Structured Programming. Wrote and edited Maple worksheets for multivariable calculus. Administered computer lab and supervised student assistants. Unix systems administration, Windows and MacOS user support.

*The Geometry Center* September 1995-June 1997  
 Minneapolis, MN Post-doctoral fellow  
 Teaching assistant for initial deployment of The University of Minnesota Calculus Initiative course. Teaching assistant for Technology in the Geometry Classroom course and summer professional development program. Designed and edited modules for Technology in the Geometry Classroom course and summer professional development program.

*IAS/Park City Math Institute* Summer 1993, 1994, 1995  
 Park City, UT Teaching assistant  
 Teaching assistant for computer-assisted geometry course. Administrative support for Seattle-area cohort of master high school math teachers.

*University of Washington* September 1990-June 1995  
 Seattle, WA Graduate assistant  
 Administrative support of teacher professional development programs, computer lab assistant, teaching assistant.

*MIT Media Lab* June 1989-August 1990  
 Cambridge, MA Undergraduate Research Opportunity  
 C programming for Walter Bender's Newspapers of the Future group.

## TEACHING

Online Teaching and Learning at Lasell, Lasell College, Summer 2018 – Fall 2021

Calculus 1A, University of Massachusetts Lowell, Fall 2017

Mathematics for Elementary Teachers III, Bridgewater State University, Fall 2012.

Attended Future of Learning professional education program, Summer 2012, Harvard Graduate School of Education.

Mathematics for Elementary Teachers II, Bridgewater State University, Spring 2012-2016, Fall 2013, 2014.

Mathematics for Elementary Teachers I, Bridgewater State University, Fall 2011, 2013.

Attended Critical Issues in Mathematics Education 2011: Mathematical Education of Teachers workshop at the Mathematical Sciences Research Institute in Berkeley, CA, Spring 2011.

Foundations of Modern Geometry, Bridgewater State University, Spring 2010, 2015, 2016, Fall 2014, 2015.

Abstract Algebra, Bridgewater State University, Spring 2008.

Discrete Mathematics I, Bridgewater State University, Fall 2007.

Programming and Computer Algebra, Bridgewater State University, Fall 2007-2009, 2011-2013, 2015, Spring 2009-2010, 2012-2014.

Attended MAA PREP Revitalizing your Developmental Mathematics Courses, Summer 2006, U.C. Berkeley.

Quantitative Methods for Management, Bridgewater State University, Spring 2006, 2008, 2009, 2012, 2013 Summer 2008, 2009, Fall 2011, 2012.

Elements of Calculus II, Bridgewater State University, Summer 2005.

Topics in Geometry, Bridgewater State University, Fall 2004.

Selected Topics in Mathematics, Bridgewater State University, Spring 2004, 2005, 2007.

Strategies for Teaching Mathematics, Bridgewater State University, Fall 2003-2006.

Precalculus, Bridgewater State University, Fall 2003, 2005, 2006, 2008, Summer 2004, 2006, Spring 2006, 2007.

Intern/Program Presenter, Cahners ComputerPlace, Boston Museum of Science, Winter 2002 - Summer 2003, Summer 2004.

Probability and Statistics, Boston University, Spring 2003.

Multivarialbe Calculus, Boston University, Spring 2003.

Computer lab director for Math/Science Projects for High School Students, University of Illinois Chicago, Summer 2001.

Methods of Structured Programming, University of Illinois Chicago, Spring 1999, 2001.

Microcomputers in Elementary School Mathematics, University of Illinois Chicago, Fall 1998.

Computer lab director for Calculus III, University of Illinois Chicago, Summer 1998 - Spring 2000.

Computer lab director for Projective Geometry, University of Illinois Chicago, Spring 2000, Spring 1998.

Teaching assistant for University of Minnesota Calculus Initiative, 1995–1996.

Technology in the Geometry Classroom, University of Minnesota, Summer 1996, Spring 1997.

## PUBLICATIONS

### BOOKS AND CHAPTERS

H. Burgiel, C. Lieberman, H.R. Miller, K. Willcox. “Interactive Applets in Calculus and Engineering Courses”, *Enhancing Mathematics Understanding through Visualization: The Role of Dynamical Software*, edited by S. Habre. IGI Global, 2013.

H. Burgiel, J.H. Conway and C. Goodman-Strauss. *The Symmetries of Things*. A.K. Peters, 2008.

### REFEREED ARTICLES

H. Burgiel, P. Sadler, and G. Sonnert. “The association of high school computer science content and pedagogy with students’ success in college computer science”. *ACM Transactions on Computing Education* 20 (2020), no. 2, 1-21.

H. Burgiel and V. Oussa. “Strictly Convex Deltahedra”. Submitted to *The College Mathematics Journal* on 11/3/17.

H. Burgiel and V. Oussa. “Gabor orthonormal bases generated by indicator functions of parallelepiped-shaped sets.” *Advances in Pure and Applied Mathematics* 9 (2018), no. 2, 93–107. 52C22

H. Burgiel and M. El-Hashash. “Open questions on Tantrix graphs.” *The Mathematical Gazette* 101, no. 550 (2017): 83-89.

M. Person et. al. “Constraint on the Size of KBO (50000) Quaoar from a Single Chord Occultation”, *Icarus*, re-submitted after revision on 2/8/13.

H. Burgiel and M. Salomone. “Logarithmic Spirals and Projective Geometry in M.C. Escher’s “Path of Life III””, *Journal of Humanistic Mathematics*, Vol 2, no. 1, January 2012.

H. Burgiel, W. Heilman. “Why Teach Transformations of Graphs?” *MathAMATYC Educator*, August 2010.

H. Burgiel, M. El-Hashash. “The permutahedron  $\pi_n$  is Hamiltonian.” *Int. J. Contemp. Math. Sciences*, Vol. 4, 2009, no. 1, pp. 31 - 39.

H. Burgiel, M. El-Hashash, A. Hassan. “On the Hamiltonicity of the Permutahedron.” *Congr. Numerantium* 189, 145-160 (2008).

D. AuCoin, E. Bukowiecki, S. Miskelly, et. al. “A Center for Academic Achievement: How Innovative Collaborations Between Faculty and Learning Center Administrators Built Model, Credit-Bearing, First-Year Courses with Embedded Support for At-Risk Students.” *International Journal of Learning*, 15(11), 65-77 (2009).

H. Burgiel, D. Franzblau, and K. R. Gutschera. “The Mystery of the Linked Triangles.” *Mathematics Magazine*, April 1996.

H. Burgiel. “Toroidal Skew Polyhedra.” *Symmetry: Culture and Science*, Volume 6, Number 1, 1995.

H. Burgiel and D. Stanton. “Realizations of Regular Abstract Polyhedra of Types  $\{3,6\}$  and  $\{6,3\}$ .” Special issue of *Discrete and Computational Geometry*, 2000.

H. Burgiel and V. Reiner. “Two Signed Associahedra.” *New York Journal of Mathematics*, volume 4, 1998.

H. Burgiel. “How to Lose at Tetris.” *Mathematical Gazette*, July 1997.

#### OTHER PUBLICATIONS

H. Burgiel. Review of *Creating Symmetry: The Artful Mathematics of Wallpaper Patterns*. *The College Mathematics Journal*, Volume 46, Issue 3. May 2016.

H. Burgiel. “Hyperbolic Afghan, 3, 7”. *Ravelry.com*, November 2015.

H. Burgiel. Review of *Crafting Conundrums: Puzzles and Patterns for the Bead Crochet Artist*. *Association of Women in Mathematics Newsletter*, Summer 2015.

H. Burgiel. “Unit Origami: Star-Building on Deltahedra”, *Proceedings of Bridges Baltimore 2015: Mathematics, Music, Art, Architecture, Culture*, edited by K. Delp, C.

Kaplan, D. McKenna, R. Sarhangi. Tessellations Publishing, Phoenix, Arizona, 2015.

H. Burgiel, “A Question on Graphs Formed by ‘Stitching’”, Pi Mu Epsilon journal, Fall 2013.

H. Burgiel. Review of *Crafting by Concepts: Fiber Arts and Mathematics*. Association of Women in Mathematics Newsletter, Vol 43, no. 1, Jan-Feb 2013.

A. Mattuck et. al. OCW Scholar Differential Equations. MIT OpenCourseWare, February 2012.

G. Strang et. al. OCW Scholar Linear Algebra. MIT OpenCourseWare, January 2012.

D. Jerison et. al. OCW Scholar Single Variable Calculus. MIT OpenCourseWare, January 2011.

D. Auroux et. al. OCW Scholar Multivariable Calculus. MIT OpenCourseWare, January 2011.

J. Bowen, H. Burgiel. “Notation for Symmetric Images”, Bridgewater Review, Vol. 29, no. 1, June 2010.

H. Burgiel. Review of *Origami Tessellations: Awe-Inspiring Geometric Designs*. Mathematics Teacher magazine, October 2009.

Various articles in The Newsletter of the BSC Mathematics and Computer Science Department, 2008-2016.

Various articles in the Digital Bridges Newsletter, Bridgewater State College, 2008-2009.

H. Burgiel. Review of *The interactive Geometry Software Cinderella*. The American Mathematical Monthly, volume 107, 2000.

H. Burgiel and E. Sander. *Technology in the Geometry Classroom*. The Geometry Center, August 1996.

### **HONORS, CERTIFICATES, AND AWARDS**

MITx “Becoming a More Equitable Educator: Mindsets and Practices”, July 2021.

CSS.0x “CSS Basics”, February 2018.

MITx-11.154x “Launching Innovation in Schools”, November 2017.

MITx-6.00.1x “Introduction to Computer Science and Programming using Python”, August 2015.

Faculty Librarian Research Grant supporting two semesters work on “Negative Curvature in Crochet and Clay”, Fall 2014.

Invited to attend “The Mathematics of Klee & Grünbaum” conference, Seattle, WA, July 2010.

CART Summer Grant supporting “A Mathematical Study of M.C. Escher’s Path of Life III”. August 2010.

E. Bukowiecki, H. Burgiel, K. Evans, R. Farrar, S. Miskelly and J. Stakhnevich. Presidential Award for Excellence in Collaboration to Improve Teaching. For support for First-Year Students submitted by the faculty directors of learning assistance in the Academic Achievement Center. April, 2008.

2006 Faculty-Librarian Presidential Grant supporting precalculus course development.

## **SERVICE**

### *Lasell University*

“Speed of Change” Idea Creation Group 12, Spring 2021.

Web Accessibility Committee, 2019.

Starfish Implementation Team, 2018-2019.

### *Bridgewater State University*

Department of Mathematics 5-year Program Review, joint work with Shannon Lockard, Spring 2016.

Center for the Advancement of Research and Scholarship Advisory Board member, 2014-2016.

BSU Quantitative Reasoning Student Learning Outcomes Working Group, Fall 2015.

BSU Blackboard 9 Project Pedagogy Team, Fall 2014.

BSU MSCA LMS Selection Committee, Chair, Spring 2014.

BSU Education Technology Committee, 2013-2014.

MATH 105 Learning Outcomes Working Group, 2013-2014.

GLBTA Pride Center Camp Pride Scholarship Committee, Spring 2013.

Differentiated Math Major Working Group, 2012-2013.



Math Program Assessment Committee, 2011-2013, 2015-2016. Chair: 2011-2012.

Math Faculty Mentorship Coordinator, 2011-2013, 2015-2016.

Department Website Committee, 2012-2014, 2015-2016.

Developmental Math Committee, Spring 2012-Fall 2012.

Principle Investigator, NSF MSP Proposal, Spring 2012.

Peer Evaluation Committee, Fall 2011, 2012. Chair: Fall 2012.

Math and Computer Science Core Curriculum Committee, 2009-2010.

Committee on Mission/Vision Statements for the School of Science and Mathematics, 2009.

Supported Software Working Group, 2009.

Math/CompSci Newsletter 2008-2010, 2011-2016. Editor: 2011-2012, 2013-2014.

Intellectual Property Rights group, 2008-2010.

Technology Fellow, 2008-2010.

Faculty Development Leadership Group, 2008-2010.

Assessment Council, 2008-2010, 2013-2016.

Assessment Guidebook Update subcommittee, 2008-2009.

ADVANCE grant proposal, 2007-2009.

Title III grant proposal, 2008-2009.

Diversity Council, 2006-2008.

Hiring Committee, Department of Mathematics and Computer Science, 2005-2010. Chair: 2006-2007, 2009-2010.

Cahners Computer Place Advisory Board, Boston Museum of Science, 2005-2008.

NCATE Technology Committee, 2004-2007.

Director of Mathematics Services, 2003-2008.

Educational Technology Advisory Committee, 2003-2005.

*University of Illinois, Chicago*

Department of Mathematics Technology Committee, 1997-2001.

### **SELECTED PRESENTATIONS**

New England Educational Assessment Network 2020 Fall Forum, online, November 2021. “Low-Cost Assessment for Career Readiness”. Joint with Matthew Boyle, Dennis Frey, Deborah Baldizar, and Halliday Piel.

New England Educational Assessment Network 2020 Fall Forum, online, November 2020. “What Worked? What Didn’t?” Joint with Matt Boyle.

Bard College Mathematics Seminar, Annandale-On-Hudson, NY, November 2017. “Stellating Deltahedra”

Harvard-Smithsonian Center for Astrophysics Science Education Department Seminar, Cambridge, MA, April 2017. “Supporting Success in College Computer Science: A Factor Analysis of Secondary School Activities”.

Joint Mathematics Meetings, Seattle, WA, January 2016. “Hyperbolic Afghan  $\{3, 7\}$ ”.

Joint Mathematics Meetings, Seattle, WA, January 2016. “Application of Doily Design to Hyperbolic Crochet”.

Bridges, Baltimore, MD, July 2015. “Unit Origami: Star Building on Deltahedra” (Workshop).

Joint Mathematics Meetings, San Antonio, TX, January 2015. “Motivating Math with Unit Origami”.

Joint Mathematics Meetings, Baltimore, MD, January 2014. “Shapes (and Rates) of Vases”.

CARS Celebration XVII, Bridgewater State University, May 2013. “A Scholarship of Teaching and Learning Faculty and Professional Learning Community (SoTL FPLC): Insights, Outcomes and Future Directions”, panel presentation.

CARS Celebration XVII, Bridgewater State University, May 2013. “Shapes of Vases”, poster. Joint with Polina Sabinin.

Northeastern Section/Mathematics Association of America Fall 2012 Section Meeting. Bridgewater, MA, 2012. “Open Problems for (Undergraduate?) Research”.

Invited panelist, Path of Professorship workshop. Massachusetts Institute of Technology, October 26, 2012.

CARS Celebration XVI, Bridgewater State University, May 2012. “The Mathematics of M.C. Escher’s Path of Life III”. Joint with Matthew Salomone.

Fields Institute, Toronto, Canada, October 2011. “A Family of Unsatisfying Graphs”.

Smith College Lunch Time Lecture Series, Northampton, MA, November 2010. “Tantrix and the Permutahedron”.

MAA Mathfest, August 2010. “Tantrix and the Permutahedron”.

CART Celebration XIV, Bridgewater State College, May 2010. Panel moderator: “Adding Assessment to Your Portfolio”.

CART Celebration XIII, Bridgewater State College, May 2009. Panel member and organizer: “Symmetry at BSC”.

Math for America, New York, NY, August 2008. “Seeing Symmetries”.

CART Celebration XII, Bridgewater State College, May 2008. Panel moderator: “Adventures in Online Assessment”.

CART Celebration XII, Bridgewater State College, May 2008. Co-organized panel: “Assessment: What are We Doing and Does it Work?”

Joint Mathematics Meetings, San Diego, CA, January 2008. “Why Teach Transformations of Graphs?”

National Association for Developmental Education, Boston, MA, February 2008. Poster presentation: “Intentionally Structured Support for Students in Entry Level Courses” with Elaine Bukowiecki and Ruth Farrar.

CART Celebration X, Bridgewater State College, May 2006. Poster presentation: “Writing in Math, Assessment”.

National Academic Advising Association Northeast Regional Conference, Providence, RI, March 2006. Panel presentation: “Faculty Collaboration to ‘Insure’ Success in a First-Year Program”.

Conference on Teaching for Transformation, Boston, MA, January 2006. Panel presentation: “Faculty Collaboration in the Incremental Transformation of a First-Year Program.”

Polytopes Day in Calgary, University of Calgary, May 2005. “Signed Associahedra”.

Bridgewater State, Stonehill and Wheaton Colleges’ Mathematics Colloquim, October 2003. “Naming Patterns”.

AMS Special Session on Discrete and Applied Geometry, Toronto, Canada, September

2000. “Colored Frieze Patterns”.

Symmetry in Graphs, Maps and Complexes, Washington, DC, July 1998. “Realizations of Regular Abstract Polyhedra of Types  $\{3,6\}$  and  $\{6,3\}$ ”.

Formal Power Series and Algebraic Combinatorics, Toronto, Canada, June 1998. “Realizations of Regular Abstract Polyhedra of Types  $\{3,6\}$  and  $\{6,3\}$ ”.

Joint Mathematics Meetings, San Diego, CA, January 1997. “Using Technology to Teach Geometry”.

Joint Mathematics Meetings, San Diego, CA, January 1997. “Combinatorial Algebraic Methods for Symmetric Embedding of Triangulated Tori”.

Exploring Undergraduate Algebra and Geometry with Technology, June 1996, “Web Publishing for Teachers”.

Meeting of the Intermountain Section of the MAA, Portland, OR, April 1995. Panel Discussion: “The IAS/Park City Mathematics Institute”.

AMS/MAA Mathfest, Minneapolis, MN, August 1994. “How to Lose at Tetris”.

Five Colleges Regional Geometry Institute, Northampton, MA, July 1993. “How to Lose at Tetris”.