LAURA K. GROSS

Curriculum Vitae

Departments of Mathematics and Computer Science
Bridgewater State University
Bridgewater MA 02325
(508) 531-2391
laura.gross@bridgew.edu
http://webhost.bridgew.edu/L1Gross

EDUCATION

Ph.D. in Mathematics, 1997
Rensselaer Polytechnic Institute, Troy, NY
Advisors: V. Roytburd and G. Kovačič
Thesis: Weakly nonlinear dynamics of interface propagation

M.S. in Mathematics, 1993
Rensselaer Polytechnic Institute, Troy, NY

B.S. cum laude in Applied Mathematics, 1991
Yale University, New Haven, CT
Concentration: Computer Science
Senior Project: Bootstrapping in principal component analysis
Unofficial Minor: Chinese Language and Literature

EMPLOYMENT

Professor, 2018–present
Bridgewater State University, Departments of Mathematics and Computer Science

Associate Professor, 2012–2018
Bridgewater State University, Departments of Mathematics and Computer Science

Assistant Professor, 2009–2012
Bridgewater State University, Department of Mathematics and Computer Science

Associate Professor, 2004–2009
The University of Akron, Department of Theoretical and Applied Mathematics

Assistant Professor, 1997–2004
The University of Akron, Department of Theoretical and Applied Mathematics

Consultant to Albrecht Inc., 2004–2006
Planned mathematical design elements in a commercial development in Akron, OH

RESEARCH EXPERIENCE

Visiting Scholar, 2008–2009
Center for BioDynamics, Boston University

Visiting Scholar, 2001–2002
Northwestern University, Department of Engineering Sciences and Applied Mathematics

Visiting Assistant Professor, 2000–2001
The University of Vermont, Department of Mathematics and Statistics

Visiting Scientist, Summer 2000
National Aeronautics and Space Administration, Goddard Space Flight Center

Graduate Research Assistant, Summer 1996
Los Alamos National Laboratory, Center for Nonlinear Studies

Undergraduate Statistics Researcher, Summer 1990
Research Experience for Undergraduates, Mount Holyoke College

ADMINISTRATIVE EXPERIENCE

Acting Assistant Director, Honors Program, Fall 2013
Bridgewater State University

Worked with students, faculty and administrators to develop policy, curriculum and community for the Honors Program. Taught a colloquium Honors in Action, which helped build an Honors community, particularly among commuter students. Worked with Residence Life and Housing on programming to support community building in the Honors Residential Learning Community. Advised Honors students. Facilitated the offering of well-balanced Honors courses and colloquia. Served on the Honors Advisory Board.

Honors Advisory Board Member, 2011–2013
Bridgewater State University

Served as a founding member of the five-member Honors Advisory Board. Reviewed Honors course proposals from faculty, vetted student proposals for Honors theses, reviewed student essays and applications for admission to the Honors Program, served as a liaison between the Honors Program and Departmental-Honors Chairs in the sciences, and helped document and oversee the policies and procedures of the Honors Program.

Departmental-Honors Chair, 2009–2013, 2017–present
Bridgewater State University, Department of Mathematics

Promoted, administered, and advised Departmental Honors in Mathematics.

Advisory Board Member for Student Retention and Enhancement Across Mathematics and the Sciences (STREAMS), 2011–2015
Bridgewater State University, Bartlett College of Science and Mathematics

Helped administer program supported by a five-year National Science Foundation grant to increase the graduation rate of mathematics and science majors at Bridgewater State University. A major component of the plan involved revamping courses that effectively serve as gateways to mathematics and science majors at Bridgewater State University.

Course Coordinator, Applied Calculus for Business, 2014–2015
Bridgewater State University

Implemented active, project-based, team-based learning in applied calculus for business. Provided paid professional development accordingly for part-time instructors with a grant I obtained from the Dean's Office. By leading two half days of pre-semester training and six term-time meetings, I recast the course into one in which business applications drive the students' need for calculus, rather than taking a traditional calculus perspective applicable to any major and injecting business problems.

Member of Peer Evaluation Committees in Computer Science, 2013, 2018
Bridgewater State University, Department of Computer Science

Served on committees for reappointment, promotion to Associate Professor, and promotion to Professor.

Member of Peer Evaluation Committees in Mathematics, 2018
Bridgewater State University, Department of Mathematics

Served on committees for reappointment, tenure, promotion to Associate Professor, and Chair review.

Hiring Committee Chair, 2011–2012, 2017–2018
Bridgewater State University, Department of Mathematics and Computer Science

Hired and subsequently mentored three tenure-stream faculty in mathematics.

HONORS AND AWARDS

Chairs' Award, 2002
Buchtel College of Arts and Sciences, The University of Akron
For outstanding achievements in early career

Alpha Delta Pi Faculty and Staff Recognition Award, 1999
The University of Akron
For outstanding efforts in teaching and support of students

Certificates of Recognition for Service in Faculty Development, 2013, 2014
Bridgewater State University
For contributions to the Honors Program

Trainer of Master Teaching Fellows, 1996–1997
Rensselaer Polytechnic Institute
Sole student selected institute-wide to train Master Teaching Fellows

Master Teaching Fellow, 1995–1996
Rensselaer Polytechnic Institute
One of six fellows selected institute-wide to orient all new teaching assistants

The Rensselaer Union Volunteerism Award, 1995
Rensselaer Polytechnic Institute
For developing programs to recruit and mentor women students

Award for Excellence in Student Leadership, Rensselaer Polytechnic Institute, 1994
For founding and serving as chair of the Women Students Association

GRANTS

National Science Foundation, 2000–2002
Grant from Professional Opportunities for Women in Research and Education (POWRE)

Mathematical Association of America/The Tensor Foundation, 1998, 1999
Grant to found an organization to make careers in mathematics more appealing and accessible to female students at The University of Akron

Internal research grants, 1998 and 1999, 2011
Research support from The University of Akron and Bridgewater State University

PUBLICATIONS IN APPLIED MATHEMATICS

1. **Comparison study of dynamics in one-sided and two-sided solid-combustion models**

   Y. Yang, **L. K. Gross**, and J. Yu

   SIAM Journal on Applied Mathematics, **70** (8), pp. 3086–3104 (2010)

2. **Frontal reaction in a layered polymerizing medium**

   D. Golovaty, **L. K. Gross**, and J. T. Joyner

   SIAM Journal on Applied Mathematics, **70** (8), pp. 3022–3038 (2010)

3. **Complex dynamic behavior during transition in a solid combustion model**
   Jun Yu, **L. K. Gross**, Christopher M. Danforth

   Complexity, **14** (6), pp. 9–14 (2009)

4. **Snell's Law of Refraction observed in thermal frontal polymerization**

   John A. Pojman, V. Viner, B. Binici, S. Lavergne, M. Winsper, D. Golovaty, and **L. K. Gross**

   Chaos, **17**, p. 033125 (2007)

5. **The enhancement of weakly exothermic polymerization fronts**

   D. M. G. Comissiong, **L. K. Gross**, and V. A. Volpert

   Journal of Engineering Mathematics, **57** (4), pp. 423–435 (2007)

6. **On a completely residual-based method for computer code verification**

   L. Brubaker, **L. K. Gross**, and J. Zhu

   Journal of Neural, Parallel, and Scientific Computing, **14** (4), pp. 337–344 (2006)

7. **Frontal polymerization in the presence of an inert material**

   D. M. G. Comissiong, **L. K. Gross**, and V. A. Volpert

   Journal of Engineering Mathematics, **54** (4), pp. 389–402 (2006)

8. **Nonlinear dynamics of frontal polymerization with autoacceleration**

   D. M. G. Comissiong, **L. K. Gross**, and V. A. Volpert

   Journal of Engineering Mathematics, **53**, pp. 59–78 (2005)

9. **Weakly nonlinear and numerical analyses of dynamics in a solid combustion model**

   L. K. Gross and J. Yu

   SIAM Journal on Applied Mathematics, **65** (5), pp. 1708–1725 (2005)

10. **A numerical study of one-step models of polymerization: Frontal vs. bulk mode**

    Stephen A. Cardarelli, Dmitry Golovaty, **L. K. Gross**, Vitaliy T. Gyrya, and Jianping Zhu

    Physica D, **206** (3–4), pp. 145–165 (2005)

11. **Bifurcation analysis of polymerization fronts**

    D. M. G. Comissiong, **L. K. Gross**, and V. A. Volpert

    Nonlinear Dynamics in Polymeric Systems, ACS Symposium Series No. 869, J. A. Pojman, Q. Tran-Cong-Miyata, Eds., American Chemical Society, Oxford University Press, pp. 147–159 (2004)

12. **Weakly nonlinear stability analysis of frontal polymerization**

    L. K. Gross and V. A. Volpert

    Studies in Applied Mathematics, **110** (4), pp. 351–375 (2003)

13. **Weakly nonlinear dynamics of interface propagation**

    L. K. Gross

    Studies in Applied Mathematics, **108** (4), pp. 323–350 (2002)

14. **The onset of linear instability in a solid combustion model**

    J. Yu and **L. K. Gross**

    Studies in Applied Mathematics, **107** (1), pp. 81–101 (2001)

15. **On instability of a bend Fréedericksz configuration in nematic liquid crystals**

    D. Golovaty, **L. K. Gross**, S. I. Hariharan, and E. C. Gartland, Jr.

    Journal of Mathematical Analysis and Applications, **255** (2), pp. 391–403 (2001)

16. **Thermo-kinetically controlled pattern selection**

    M. Frankel, **L. K. Gross**, and V. Roytburd

    Interfaces and Free Boundaries, **2** (3), pp. 313–330 (2000)

PUBLICATIONS IN TEACHING AND LEARNING

1. **Strengthening information literacy in a writing designated course in the mathematics major**

   Laura K. Gross, Sheau-Hwang Chang, and Marcia Dinneen, *College & Undergraduate Libraries*, 23 (1), pp. 56–78 (2016)

2. **Improving proof-writing skills through weekly student presentations**

   Laura K. Gross, "Beyond Lecture: Resources and Pedagogical Techniques for Enhancing the Teaching of Proof-Writing Across the Curriculum," Rachel Schwell, Aliza Steurer, and Jennifer F. Vasquez (Editors), Notes, **85**, MAA Press, Washington, DC, pp. 83–90 (2016)

BOOK REVIEWS

1. **Review:** *Advanced Mathematics for Applications* **by Andrea Prosperetti**

   L. K. Gross

   SIAM Review, **55** (2), pp. 403–405 (2013)

2. **Review:** *Essential Mathematical Methods for Physicists* **by Weber and Arfken**

   L. K. Gross

   SIAM Review, **47** (3), pp. 606–608 (2005)

3. **Featured review: Selected books on advanced engineering mathematics**
   L. K. Gross
   SIAM Review, **46** (3), pp. 549-561 (2004)

SELECT PRESENTATIONS

Programming and computer algebra: A 100-level course, 2018
SIAM Conference on Applied Mathematics Education, Portland, OR

Using math software to enhance students' learning in an upper level physical chemistry course, 2017
Saritha Nellutla (presenter), Laura K. Gross, and Marjorie Partridge (undergraduate)
Chemistry Education Research & Practice, Gordon Research Conference, Lewiston, ME

Why I showed up: Students advise faculty on how to increase attendance at office hours, 2016
Poster Presentation with undergraduates Carla Acosta (Sociology), Chris Laguerre (Biology), and Emma Lantieri (Communication)
Teaching and Learning Conference, Bridgewater State University

Teaching mathematical writing in an upper-level elective, 2016
MathFest, Columbus, OH

On a generalized free-interface model of solid combustion, 2016
Joint Mathematics Meetings, Seattle, WA

Convincing your colleagues to adopt a common intra-departmental peer cooperative learning program, 2015
With T. Kling (Physics), S. Waratuke (Chemistry), M. Salomone (Mathematics), and J. Williams (Physics), all of Bridgewater State University
Crossing Boundaries: Transforming STEM Education, Association of American Colleges & Universities, Seattle, WA

Frontal polymerization in a heterogeneous medium, 2008
Seminar on Dynamical Systems, Boston University

Frontal polymerization in a medium with periodic monomer distribution, 2007
Symposium on Frontal Phenomena, U. S. National Congress on Computational Mechanics, San Francisco, CA

Pattern prediction in frontal polymerization, 2003
Invited presentation, Women of Applied Mathematics Research and Leadership Conference, University of Maryland

Weakly nonlinear stability analysis of self-propagating polymerization fronts, 2002

Symposium on Nonlinear Dynamics of Polymeric Systems, Division of Polymer Chemistry and Division of Physical Chemistry, American Chemical Society annual meeting, Boston, MA

Homoclinic orbits in second harmonic generation, 2001
Applied Mathematics Seminar, The University of Vermont

OTHER PROFESSIONAL ACTIVITIES

Chair, Deborah and Franklin Tepper Haimo Awards Committee, 2019–2021
Member, Deborah and Franklin Tepper Haimo Awards Committee, 2017–2018
Council on Prizes and Awards, Mathematical Association of America
Recommend to the Board of Governors for confirmation up to three winners of the Deborah and Franklin Tepper Haimo Award given annually to recognize college or university teachers who have been widely recognized as extraordinarily successful and whose teaching effectiveness has been shown to have had influence beyond their own institutions.

Focus Group Member, Joint Mathematics Meetings, 2016
Provided input on the MAA's Instructional Practices Guide, Seattle, WA

Minisymposium Organizer, U. S. National Congress on Computational Mechanics, 2007
Frontal Phenomena
With Stephen B. Margolis (Sandia National Laboratory)
And D. Golovaty (The University of Akron)
U. S. National Congress on Computational Mechanics, San Francisco, CA

Proposal Reviewer, National Science Foundation, 2009
Served on a panel reviewing research proposals in applied mathematics.

Proposal Reviewer, Association for Women in Mathematics, 2010
Reviewed research travel-grant proposals in three funding cycles in 2010.

Member, Discussion Group on Power and Privilege, 2011
Explored issues of diversity, inclusion and social justice with fellow employees in the "Race, Ethnicity, Racism and White Privilege: Lunchtime Discussion Series," sponsored by the Office of Institutional Diversity at Bridgewater State University.

Organizer, Student Poster Sessions, 2003–2006
Organized a poster session for mathematics students at all levels at Celebration of Excellence in Teaching and Learning (**CELT**) at The University of Akron.

TEACHING EXPERIENCE

University Courses, 1997–present
Taught Computer Science II (COMP 152), Programming and Computer Algebra (COMP 150), and an interdisciplinary Honors colloquium (INTD 151) at Bridgewater State Uni-

versity. Mathematics courses taught include Calculus I, II, and III, applied calculus for business, differential equations, linear algebra, Introduction to Analysis I, Advanced Engineering Mathematics I and II, applied mathematics, mathematics for liberal arts, algebra with business applications, precalculus, and Elementary Statistics I at Bridgewater State University and The University of Akron.

Inaugural BSU International Summer Session II Program in Shanghai, 2017
Taught Elementary Statistics I in China to students who had come home to China for the summer from their universities in North America. The students transferred the credits from Bridgewater State University to their home institutions.

Online Teaching Institute, 2016
Participated in a ten-week fully online Online Teaching Institute at Bridgewater State University offered by the Teaching Technology Center. Learned to teach in a hybrid or fully online modality and created Blackboard course sites that align with Quality Matters online course development guidelines.

Science of Learning, 2016
Organized and participated in a summer book group at Bridgewater State University. We discussed *Make It Stick: The Science of Successful Learning*. The group included Mathematics Faculty and the Director of the Office and Teaching and Learning.

Coach, Crazy 8s Math Club, 2015–2016
Led a recreational after-school math club for Grades 3–5 in Cambridgeport School in the Cambridge Public Schools. Used lesson plans and materials from Bedtime Math to help kids enjoy the mathematics behind a wide variety of fun activities. Piloted new Season-4 lessons during Season 3.

Summer Experience in Engineering (SEE), 2005–2007
Developed and taught calculus overviews to top high-school girls from Ohio and Pennsylvania in SEE, a recruitment program at The University of Akron.

NE Ohio Center of Excellence for Science and Math Education, 2005, 2006
Collaborated with faculty at regional universities and K-12 schools to promote the effective teaching and learning of mathematics. In particular, wrote algebra modules with a middle-school teacher and with professors of mathematics and of education. The team taught the algebra modules to middle-school teachers at Cleveland State University.

Kids' Career Day, 2005, 2003
Designed and led hands-on mathematical activities at The University of Akron for girls of elementary school age.

Vermont Mathematics, Science, and Technology High School Summer Institute (now Governor's Institute on Mathematical Sciences), 2003
Designed and delivered a mini-course to top high-school students from Vermont on "Fair Division: The Mathematics of Sharing" at the University of Vermont at what is now the Governor's Institute in Mathematics.

Vermont Mathematics Initiative (VMI), 2000–2001
Taught algebra and trigonometry and supervised hands-on activities for in-service elementary and middle-school teachers. By teaching active teachers subjects up to and including calculus, the VMI promotes high quality instruction and high levels of learning in mathematics in schools across Vermont. It serves as a template for programs around the country.

Ohio Project NExT (New Experiences in Teaching), 1998–2000
As a new Ph.D., gave a talk and attended workshops at the Mathematical Association of America semi-annual Ohio Section meetings with NExT, a program to develop skills in teaching, research, communication, and service in new faculty in the mathematical sciences.

ADVISING

Faculty Advisor
Academic Advising, Academic Achievement Center
Bridgewater State University, 2016–2017
Advised a total of approximately 300 first-year students over three semesters. Held office hours; conducted exit interviews. Advised at Transfer Advising Workshops and New Student Orientations.

Academic advisor for approximately twenty computer-science and mathematics majors every semester
Bridgewater State University, 2010–present

Honors Thesis Advisor for Terry Mullen
BS in Mathematics, Bridgewater State University, 2015

Honors Thesis Advisor with Dr. Kling for Kassaundra Przelomski
BS in Physics, Bridgewater State University, 2015

Master's Thesis Advisor with Dr. Golovaty for James T. Joyner
MS in Applied Mathematics, The University of Akron, 2006

Master's Thesis Advisor with Dr. Zhu for Lauren Brubaker
MS in Applied Mathematics, The University of Akron, 2005

Master's Thesis Advisor with Drs. Golovaty and Zhu for Stephen Cardarelli
MS in Applied Mathematics, The University of Akron, 2003

Honors Thesis Advisor for Mary Knust
BS in Mathematics, The University of Akron, 2003

Advisor for numerous undergraduate poster presentations, expository research papers, and "math-chat" presentations
Bridgewater State University and The University of Akron, 2002–present

Reader for undergraduate Honors theses in mathematics (10), physics (1), and computer science (2)
Bridgewater State University, 2011–present

MENTORING

Office hours at the Center for Multicultural Affairs, 2016–present
Hold a weekly office hour at the Center for Multicultural Affairs at Bridgewater State University.

Consultant, Project NExT (New Experiences in Teaching), 2011–present
Mentor a NExT Fellow (recent mathematics Ph.D.) at another university to share perspectives on a wide variety of issues confronting junior faculty, including improving teaching, furthering scholarship, and serving the mathematical and academic communities.

Program on Mentoring Women in Mathematics (WIM), 1998-2000, 2002-2007
Co-founded and co-organized WIM to foster communication among women math students at the University of Akron. Hosted alumnae and distinguished external visitors. Arranged tours of area laboratories. Sponsored women students to give conferences talks.

English Conversation Sessions, 1998-1999
Founded and organized lunchtime conversations for international studenhen ts to practice their English at the then Department of Mathematics and Computer Science at The University of Akron.

Invited Colloquium Speaker for Mathematics Club, 2003
Gave invited colloquium to the Mathematics Club at Case Western Reserve University on Mathematical Description of Crystal Growth.

Leader of Women in Science and Engineering Roundtable, 2003
Led discussion on scientific article Form From Fire, Case Western Reserve University.

Career Panelist, 2003
Addressed career-related questions at Vermont Mathematics, Science, and Technology High School Summer Institute, Burlington, VT.

Invited Career Speaker, 2001
Sonia Kovalevsky Day, University at Albany, State University of New York

Pi Mu Epsilon (PME) Advisor, 2004-2008, 2010–2015
Advised chapters of PME mathematics honor society at The University of Akron and Bridgewater State University.

Math Club Advisor, 2010–2015
Advise the Math Club at Bridgewater State University.

LANGUAGES

Native speaker of English with proficiency in French, German, and Mandarin Chinese and a basic working knowledge of Spanish

DATA TRAINING

Data Analysis and Statistical Inference, 2015
Coursera (Duke University)

Identified a research question and created a fully reproducible project in R/RStudio and RMarkdown using statistical methods for confidence intervals and hypothesis testing on real data. Obtained Statement of Accomplishment with Distinction for this online non-credit course.

PROGRAMMING AND COMPUTER SKILLS

Python, Java, R, Scratch, Matlab, Maple, RMarkdown, Learning Management Systems, LaTeX, Emacs, Microsoft Office