

**LAURA K. GROSS**  
Curriculum Vitae

Mathematics and Computer Science  
Hart Hall, Room 228  
Bridgewater State University  
Bridgewater MA 02325  
(508) 531-2391 (voice)  
(508) 531-1361 (fax)  
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

**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  
Minor: Chinese Language and Literature

**EMPLOYMENT**

**Assistant Professor**, 2009–present  
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  
Planning of mathematical design elements in a commercial development in Akron, OH

**RESEARCH EXPERIENCE**

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

**Minisymposium Organizer, 2007**

Frontal Phenomena

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

**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

**TEACHING EXPERIENCE**

**University Courses, 1997–present (except during leaves of absence)**

Taught Calculus I, II, and III, differential equations, linear algebra, Advanced Engineering Mathematics I and II, mathematics for liberal arts, algebra with business applications, and precalculus at Bridgewater State University and The University of Akron.

**Summer Experience in Engineering (SEE), 2005–2007**

Developed and taught calculus overviews to, as well as mentored, top high-school girls from Ohio and Pennsylvania in SEE, a recruitment program at The University of Akron.

**Northeast 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, 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 related hands-on activities for in-service elementary and middle-school teachers. By teaching active teachers in subjects up to and including calculus, the VMI promotes high quality mathematics instruction and high levels of mathematics learning in elementary schools across Vermont. It now serves as a template for a variety of programs around the country.

## PUBLICATIONS

**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)**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)**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)**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)**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)**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)**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)**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)**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)**Review: *Essential Mathematical Methods for Physicists* by Weber and Arfken****L. K. Gross***SIAM Review*, **47** (3), pp. 606–608 (2005)**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)**Featured review: Selected books on advanced engineering mathematics****L. K. Gross***SIAM Review*, **46** (3), pp. 549–561 (2004)

**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)**Weakly nonlinear stability analysis of frontal polymerization****L. K. Gross** and V. A. Volpert*Studies in Applied Mathematics*, **110** (4), pp. 351–375 (2003)**Weakly nonlinear dynamics of interface propagation****L. K. Gross***Studies in Applied Mathematics*, **108** (4), pp. 323–350 (2002)**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)**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)**Thermo-kinetically controlled pattern selection**M. Frankel, **L. K. Gross**, and V. Roytburd, *Interfaces and Free Boundaries*, **2** (3), pp. 313–330 (2000)**GRANTS****Travel Grant**, Spring 2010

Grant to attend Society of Industrial and Applied Mathematics (SIAM) Conference on Mathematical Aspects of Materials Science (Philadelphia, PA) from the Center for the Advancement of Research and Teaching (CART), Bridgewater State University. Received additional support from the Department of Mathematics and Computer Science, Bridgewater State University.

**National Science Foundation**, 2000–2002

Grant from Professional Opportunities for Women in Research and Education (POWRE).

**Travel grants**, 1999, 2003

Grants from conference organizers to attend Women of Applied Mathematics Research and Leadership Conference at the University of Maryland (2003), a workshop at the Institute for Mathematics and its Applications in Minnesota (1999), and International Conference on Industrial and Applied Mathematics in Scotland (1999).

**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.

## HONORS

### **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

### **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

## SELECT PRESENTATIONS

### **Pattern formation in combustion, 2010**

Celebrating the Teacher-Scholar: Making the Most of Our Resources, Center for the Advancement of Research and Teaching (CART) May Celebration XIV, Bridgewater State University

### **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

### **Complex dynamic behavior on transition in a solid combustion model, 2006**

International Conference on Complex Systems, Quincy, MA

### **Weakly nonlinear and numerical analyses of dynamics in solid combustion, 2004**

Symposium on Transient Behavior and Stability in Fluid and Combustion Models, SIAM Conference on Nonlinear Waves, University of Central Florida

### **Pattern prediction in frontal polymerization, 2003**

Invited presentation, Women of Applied Mathematics Research and Leadership Conference, University of Maryland

### **Mathematical Description of Crystal Growth, 2003**

Mathematics-Club Colloquium, Case Western Reserve University

### **Women in Science and Engineering Roundtable, 2003**

Led discussion (“Form From Fire”), Case Western Reserve University.

**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

**Career Talk**, 2001

Sonia Kovalevsky Day, University at Albany, State University of New York

## **MEMBERSHIPS**

**Society of Industrial and Applied Mathematics**

**Pi Mu Epsilon**, National Mathematics Honor Society

**Sigma Xi**, Scientific Research Society