

Emily Gamber Burkhead

CONTACT INFORMATION

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RESEARCH INTERESTS

Dynamical Systems, Ergodic Theory

EDUCATION

University of North Carolina, Chapel Hill, North Carolina

Ph.D., Mathematics, May 2006

- Dissertation Title: “A Topological Classification of D -dimensional Cellular Automata”
- Advisor: Dr. Jane M. Hawkins

University of North Carolina, Chapel Hill, North Carolina

M.S., Mathematics, May 2004

College of Wooster, Wooster, Ohio

B.A., Mathematics, May, 2001

- Magna Cum Laude, Departmental Honors
- Computer Science Minor

EXPERIENCE

Postdoctoral Fellow, Santa Fe Institute

August 2006 - present

Teaching Fellow, Department of Mathematics, University of North Carolina, Chapel Hill

August 2002 - June 2006

Full instructional responsibility for three semester courses: Pre-Calculus, Calculus I, Multivariable Calculus. Full course responsibility, including course development, for Selected Topics in Mathematics (for non-science majors) during two semesters.

Mathematician, National Security Agency, Ft. Meade, Maryland

June 2004 - August 2004

Researched various cellular infrastructures, analyzed signals and protocols, characterized radio frequency (RF) signals, and integrated and tested devices for a project dealing with a sensor array which provides in-building RF monitoring. Also utilized interior propagation modeling software with blueprints of government buildings to analyze RF propagation.

Applied Research Mathematician, National Security Agency, Ft. Meade, Maryland

May 2003 - August 2003

Part of a research group in the Director's Summer Program focused on antennas; utilized modeling, statistical methods, complex variables, data analysis, and wrote programs in Perl in the effort to model a phased array.

Teaching Assistant, Department of Mathematics, University of North Carolina, Chapel Hill

January 2003 - May 2003, August 2005 - December 2005

Graded homework for a graduate topology course and an undergraduate combinatorics course.

Grader, Mathematical Sciences Department, College of Wooster, Wooster, Ohio

January 1998- May 2001

Graded homework for seven undergraduate math courses.

Math Center Tutor, Mathematical Sciences Department, College of Wooster, Wooster, Ohio

August 1998 - December 2000

Tutored undergraduates enrolled in mathematics courses.

Cryptologic Mathematician, National Security Agency, Ft. Meade, Maryland

May 2000 - August 2000

Utilized linear algebra and aspects of higher mathematics, wrote programs in C to manipulate data and test theories in an attempt to solve a particular cryptologic problem.

HONORS AND
AWARDS

Project NExt Fellow

Mathematical Association of America, 2007-2008

J. Burton Linker Award for Excellence in Teaching recipient

Department of Mathematics, University of North Carolina, Chapel Hill, 2005-2006

National Physical Science Consortium Fellowship recipient

August 2002-May 2006

Future Faculty Fellowship participant

Center for Teaching and Learning, University of North Carolina, Chapel Hill, May 2005

J. Burton Linker Award for Excellence in Teaching nominee

Department of Mathematics, University of North Carolina, Chapel Hill, 2004-2005

U.S. Department of Education Graduate Assistance in Areas of National Need (GAANN) Grant recipient

University of North Carolina, Chapel Hill, August 2001- July 2002

COLLEGE OF
WOOSTER HONORS
AND AWARDS

Dan F. Lockhart Outstanding Senior Award

Elizabeth Sidwell Wagner Prize in Mathematics

William H. Wilson Prize in Mathematics

Math and Science Scholarship, August 1997 - May 2001

Jean "Bunny" Bogner Endowed Scholarship

George F. Deuble Foundation Scholarship, Ohio Foundation of Independent Colleges, Inc.
Faculty Scholarship

Albert Gordon McGaw Memorial Scholarship

Melcher P. Fobes Endowed Scholarship

Phi Beta Kappa, elected May 2000

Dean's List, named all eight semesters

National Fastpitch Coaches Association All-America Scholar-Athlete

PAPERS

Burkhead, E.G., J. Hawkins, and D. Molinek. *A Dynamical Study of a Cellular Automata Model of the Spread of HIV in a Lymph Node*. In preparation.

Burkhead, E.G. *A Topological Classification of D-Dimensional Cellular Automata*. Submitted 2007.

Gamber, E. *Equicontinuity Properties of D-Dimensional Cellular Automata*. *Topology Proceedings* **30** (2006), no. 1, 197-222.

Gamber, E. *A Topological Classification of D-Dimensional Cellular Automata*. Ph.D. Thesis, University of North Carolina at Chapel Hill, 2006.

Gamber, E. *Gilman's Classification of One-Dimensional Cellular Automata*. Master's Project, University of North Carolina at Chapel Hill, 2004.

Branson, J., and E. Gamber. *<Title Classified>*. Summer Network Evaluation Intern Program, National Security Agency. Ft. Meade, MD, 2004.

Barnes, R., L. DeKeukelaere, E. Gamber, D. Mellis, G. Olson, and E. Reisner. *<Title Classified>*. Director's Summer Program, National Security Agency. Ft. Meade, MD, 2003.

Gamber, E., M. Korn, L. Jackson, and C. McCullough. *<Title Classified>*. Z2 Summer Program, National Security Agency. Ft. Meade, MD, 2000.

PRESENTATIONS

Complex Systems Summer School Lecture Series, Institute of Theoretical Physics, Beijing, China, July 2007.

Researcher Meeting, Santa Fe Institute, March 2007.

Ergodic Theory and Probability Seminar, The Ohio State University, October 2006.

Colloquium, College of Wooster, Ohio, October 2006.

Ergodic Theory Session, AMS Central Section Meeting, University of Cincinnati, Ohio, October 2006.

Carolinas Dynamics Symposium, Davidson College, North Carolina, April 2006.

Spring Topology and Dynamics Conference, University of North Carolina at Greensboro, March 2006.

Ergodic Theory Session, Winter Meeting of the Canadian Mathematical Society, Victoria, British Columbia, December 2005

Ergodic Theory and Dynamical Systems Seminar, University of North Carolina at Chapel Hill,

October 2005.

Summer Conference on Topology and its Applications, Denison University, Ohio, July 2005.
Carolinas Dynamics Symposium, University of North Carolina at Chapel Hill, April 2005.
Spring Topology and Dynamics Conference, Berry College, Georgia, March 2005.
Summer Network Evaluation Intern Program National Security Agency, August 2004. Joint with J. Branson.
Carolina Dynamics Group Conference, College of Charleston, South Carolina, April 2004.
First Year Seminar Guest Lecture, University of North Carolina at Chapel Hill, March 2004.
Ergodic Theory and Dynamical Systems Seminar, University of North Carolina at Chapel Hill, October 2003.
Graduate Mathematics Association Seminar, University of North Carolina at Chapel Hill, October 2003.
Z2 Summer Program, National Security Agency, August 2000. Joint with M. Korn, L. Jackson, and C. McCullough.

ADDITIONAL
CONFERENCES
ATTENDED

Abandoning Dead Ends: Presenting The Heart of Mathematics to All Students, University of Texas, Austin, May 2007.
AMS Southeast Section Meeting, Davidson College, North Carolina, March 2007.
MSRI Introduction to Dynamical Systems with Emphasis on Extended Systems Workshop, Berkeley, CA, January 2007. (*Short research presentation given.*)
Joint Meetings of the AMS and MAA, San Antonio, TX, January 2006.
PIMS Northwest Dynamics Symposium, University of Victoria, BC, August 2005.
PIMS Summer School in Aperiodic Order, University of Victoria, BC, August 2005.
Spring Workshop on Dynamics and Related Topics, University of Maryland, College Park, March 2005.
Ergodic Theory Workshop, University of North Carolina at Chapel Hill, February 2005.
Ergodic Theory Workshop, University of North Carolina at Chapel Hill, February 2004.
AMS Southeast Section Meeting, University of North Carolina at Chapel Hill, October 2003.
Joint Meetings of the AMS and MAA, Baltimore, MD, January 2003.
Carleton and St. Olaf Colleges Summer Mathematics Program for Women, Northfield, MN, June 1999 - July 1999.
Carolina and Ohio Science and Education Network Research Experiences in Science and Mathematics, Duke University, Durham, NC, June 1998.
Women in Science and Mathematics Conference, The College of Mt. St. Joseph, Cincinnati, OH, July 1996.

COMMITTEE
MEMBERSHIP

Co-Organizer, Special Session on Dynamical Systems, AMS Southeast Section Meeting Davidson College, North Carolina, *March 2007*

President, Graduate Mathematics Association
University of North Carolina at Chapel Hill, *August 2003 - May 2004*

Vice President, Graduate Mathematics Association
University of North Carolina at Chapel Hill, *August 2002 - May 2003*

Seminar Coordinator, Graduate Mathematics Association
University of North Carolina at Chapel Hill, *January 2002 - May 2003*

MEMBERSHIP IN
PROFESSIONAL
SOCIETIES

American Mathematical Society
Association for Women in Mathematics
Phi Beta Kappa