

Nitsan Ben-Gal

Address: Institut für Mathematik I, Freie Universität Berlin, Arnimallee 3, 14195 Berlin, Germany
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Personal Data: Dual Citizen: United States of America, Israel

Education:

May 2010: **Ph.D.** in Applied Mathematics, Brown University, all requirements completed January 2010. Advisor: Prof. Bernold Fiedler.
Thesis: "Grow-Up Solutions and Heteroclinics to Infinity for Scalar Parabolic PDEs"

May 2005: **Sc. M.** in Applied Mathematics, Brown University. Advisor: Prof. Bernold Fiedler

May 2004: **B.S.** in Honors Mathematics, University of Michigan, Ann Arbor.
Diploma **with Highest Honors**, Honors Mathematics, Physics minor.
Advisor: Prof. Kristen S. Moore

Research Interests:

Dynamical Systems, Partial Differential Equations, and Nonlinear Analysis: In particular - global attractors and grow-up solutions for scalar parabolic partial differential equations; Inertial manifolds; Fučík Spectra for ODEs and PDEs; nonlinear spring-mass system modeling; finite-time blow-up.

Fellowships and Awards:

US Junior Oberwolfach Fellow, 2009

National Science Foundation Graduate Research Fellowship Honorable Mention, 2006

NSF VIGRE Fellowships, 2005, 2006

Brown University Fellowship, 2004-2005

Arthur H. Copeland Mathematics Scholarship, 2003

Evelyn O. Bychinsky Mathematics Award, 2003

Phi Beta Kappa National Honors Society Induction, 2003

Research Experience:

1/10 – present: Grow-Up solutions, inertial manifolds, global attractors and Fučík Spectra for parabolic partial differential equations
Postdoctoral researcher in the Collaborative Research Center for Space-Time Matter, advisor – Prof. Dr. Bernold Fiedler
Freie Universität Berlin, Germany

Research Experience, Continued:

- 5/09 – 12/09: Global attractors, Grow-Up and Fučík Spectra for scalar parabolic differential equations
Research Assistant in the Collaborative Research Center for Space-Time-Matter, advisor – Prof. Dr. Bernold Fiedler
Freie Universität Berlin, Germany, (Traveling Scholar from Brown University)
- 5/08 – 1/09:
5/07 – 1/08: Global attractors, Grow-Up and Fučík Spectra for scalar parabolic partial differential equations
Research Assistant in the Collaborative Research Center for Complex Nonlinear Processes, advisor – Prof. Dr. Bernold Fiedler
Freie Universität Berlin, Germany (Traveling Scholar from Brown University)
- 5/05 – 12/09: Global attractors, Grow-Up and Fučík Spectra for scalar parabolic partial differential equations
Graduate student, advisor – Prof. Bernold Fiedler
Brown University, Providence, Rhode Island, USA
- 11/02 – 8/04: Nonlinear spring-mass system modeling and suspension bridge dynamics
Undergraduate Research Assistant, advisor – Prof. Kristen S. Moore
University of Michigan, Ann Arbor, Michigan, USA
- 6/03 – 8/03: Calculus on the Sierpinski Gasket, point singularities and normal derivatives of the heat kernel
Visiting Undergraduate Researcher (REU), advisor – Prof. Robert S. Strichartz
Cornell University, Ithaca, New York, USA

Publications: **Conference Proceedings**

Asymptotics of Grow-Up Solutions and Global Attractors of Non-Dissipative PDEs, Nitsan Ben-Gal, Oberwolfach Reports, 6 (2009), no. 2, 1434-1436.

Journal Articles

Inertial manifolds for slowly non-dissipative evolutionary equations, Nitsan Ben-Gal. In preparation.

On the asymptotics of grow-up solutions for a class of slowly non-dissipative reaction-diffusion equations, Nitsan Ben-Gal. In preparation.

The connecting orbit structure of the non-compact global attractor for slowly non-dissipative scalar parabolic PDEs, Nitsan Ben-Gal. In preparation.

Calculus on the Sierpinski gasket II: Point singularities, eigenfunctions, and normal derivatives of the heat kernel, Nitsan Ben-Gal, Abby Shaw-Krauss, Robert S. Strichartz, Clint Young, Transactions of the American Mathematical Society, 358 (2006), no. 9, 3883-3936.

Bifurcation and stability properties of periodic solutions to two nonlinear spring-mass systems, N. Ben-Gal, K. S. Moore, Nonlinear Analysis: Theory, Methods & Applications, 61 (2005), no. 6, 1015-1030.

Selected Presentations:

- April 10:* Talk: "Grow-Up Solutions, Inertial Manifolds, and Global Attractors for Slowly Non-Dissipative PDEs"
Lefschetz Center for Dynamical Systems Seminar, Brown University, Division of Applied Mathematics
- Jan 10:* Talk: "Asymptotics of Grow-Up Solutions and Global Attractors for Slowly Non-Dissipative PDEs"
Joint Mathematics Meetings 2010
- Jan 10:* Poster: "Asymptotics of Grow-Up Solutions and Global Attractors of Slowly Non-Dissipative PDEs"
Dynamics Days US 2010
- Sept 09:* Talk: "Asymptotics of Grow-Up Solutions and Global Attractors of Slowly Non-Dissipative PDEs"
Workshop in Nonlinear Elliptic PDEs, Université Libre de Bruxelles
- July 09:* Talk: "Asymptotics of Grow-Up Solutions and the Connection Problem for Slowly Non-Dissipative Parabolic PDEs"
Nonlinear Dynamics Seminar, Institut für Mathematik, Freie Universität Berlin
- May 09:* Talk: "Asymptotics of Grow-Up Solutions and Global Attractors of Non-Dissipative PDEs"
Workshop on Topological and Variation Methods for Partial Differential Equations
Oberwolfach Research Institute, Germany
- April 09:* Talk: "Asymptotics of Grow-Up Solutions and Global Attractors of Non-Dissipative PDEs"
Dynamical Systems Seminar, University of Minnesota, School of Mathematics
- Nov 08:* Talk: "Asymptotics of Grow-Up Solutions and Global Attractors of Non-Dissipative PDEs"
Oberseminar Nonlinear Dynamics, Weierstrass Institute for Applied Analysis and Stochastics, Berlin
- Jan 08:* Talk: "Global Attractors for Non-dissipative Scalar Parabolic PDEs"
Nonlinear Dynamics Seminar, Institut für Mathematik, Freie Universität Berlin
- Jun 07:* Talk: "Global Attractors and Fucik Spectra for Scalar Parabolic Differential Equations with Jump Nonlinearities"
Mathematical Tools for Complex Systems Science and Technology Ph.D-Course, Danish Center for Applied Mathematics and Mechanics, Copenhagen
- Mar 07:* Talk: "Spectral Theory of the Laplacian, a Tutorial"
Transatlantic Seminar, Brown University, Division of Applied Mathematics
- Jan 07:* Poster: "Bifurcation and Stability Properties of Two Nonlinear Spring-Mass Systems"
Connections For Women: Dynamical Systems, MSRI
- Jan 07:* Poster: "Bifurcation and Stability Properties of Two Nonlinear Spring-Mass Systems"
Dynamics Days US 2007
- Mar 06:* Talk: "Characterizing the Fučik Spectrum Through Early Theory and New Results"
Transatlantic Seminar, Brown University, Division of Applied Mathematics
- Dec 05:* Talk: "Bifurcation and Stability Properties of Two Nonlinear Spring-Mass Systems"
Transatlantic Seminar, Brown University, Division of Applied Mathematics
- Feb 04:* Talk: "Large Amplitude Oscillations in Suspension Bridges: Multiple Periodic Solutions to a Nonlinear Spring-Mass System"
Nebraska Conference for Undergraduate Women in Mathematics

Teaching Experience:

Spring 2009: Teaching Assistant, Guest Lecturer
Brown University, Division of Applied Mathematics
Methods of Applied Mathematics I (APMA 0330)

Teaching Experience, Continued:

Spring 2008: Teaching Assistant, Guest Lecturer
Brown University, Division of Applied Mathematics
Methods of Applied Mathematics II, Honors (APMA0360)

Summer 2007: Guest Lecturer
Danish Center for Applied Mathematics and Mechanics, Copenhagen
Mathematical Tools for Complex Systems in Science and Technology Ph.D-
Course

Spring 2007: Teaching Assistant, Guest Lecturer
Brown University, Division of Applied Mathematics
Nonlinear Dynamical Systems: Theory and Applications II (APMA2200)

Fall 2006: Teaching Assistant,
Brown University, Division of Applied Mathematics
Nonlinear Dynamical Systems: Theory and Applications (APMA2190)

Spring 2006: Teaching Assistant, Guest Lecturer,
Brown University, Division of Applied Mathematics
Methods of Applied Mathematics I (APMA0330)

Fall 2005: Teaching Assistant,
Brown University, Division of Applied Mathematics
Methods of Applied Mathematics II (APMA0340)

Spring 2004: Instructor
University of Michigan, Science Learning Center
Introductory Mechanics (Physics 140)

Professional Affiliations:

Rose Whelan Society for Women in Mathematics; co-chair 2004-2007
Association for Women in Mathematics (AWM) Mentor Network; mentor
Society for Industrial and Applied Mathematics (SIAM); member
American Mathematical Society (AMS); member

Languages: English - fluent
Hebrew – proficient
German – proficient
Japanese – reading and conversational proficiency

References: **Almut Burchard**, University of Toronto, almut@math.toronto.edu
Constantine Dafermos, Brown University, dafermos@dam.brown.edu
Bernold Fiedler, Freie Universität Berlin, bernard_f@web.de
Carlos Rocha, Instituto Superior Técnico, crocha@math.ist.utl.pt
Björn Sandstede, Brown University, Bjorn_Sandstede@brown.edu
Arnd Scheel, University of Minnesota, scheel@ima.umn.edu
Suzanne Sindi, Brown University, Suzanne_Sindi@brown.edu