ANDREW J. BERNOFF

PROFESSOR OF MATHEMATICS
HARVEY MUDD COLLEGE
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MISSION

I am a mathematician who specializes in applying dynamical systems to understanding experiments in physics, chemistry and biology. I'm passionate about undergraduate education, mentoring research, and helping students find careers and pursue graduate studies in applied mathematics and the natural sciences.

EDUCATION

PhD in Applied Mathematics (1988)
Department of Applied Mathematics & Theoretical Physics (DAMTP)
University of Cambridge (Trinity College)

BS in Mathematics, BS in Physics (1982)
Massachusetts Institute of Technology (MIT)

EMPLOYMENT

HARVEY MUDD COLLEGE (1998-PRESENT)
DEPARTMENT OF MATHEMATICS
Diana & Kenneth Jonsson Professor of Mathematics (2009-2019)
Chair of the Mathematics Department (2009-2014)
Full Professor (2001-Present)
Associate Professor (1998-2001)

NORTHWESTERN UNIVERSITY (1990-1997)
DEPARTMENT OF ENGINEERING SCIENCE & APPLIED MATHEMATICS
Assistant Professor

UNIVERSITY OF CALIFORNIA, BERKELEY (1989-1990)
NSF Mathematical Sciences Postdoctoral Research Fellow

UNIVERSITY OF ARIZONA (1986-1989)
DEPARTMENT OF MATHEMATICS
Postdoctoral Research Associate

I have also held visiting appointments at Duke University, New York University (CIMS), University of California, Berkeley (MSRI, Department of Mechanical Engineering), University of Minnesota (IMA), and the University of British Columbia.

PROFESSIONAL APPOINTMENTS (SELECTED)

WILLIAM LOWELL PUTNAM COMPETITION PROBLEMS COMMITTEE (2019-21)

VICE CHAIR, SIAM ACTIVITY GROUP ON DYNAMICAL SYSTEMS (2020-2021)
CHAIR, SIAM ACTIVITY GROUP ON DYNAMICAL SYSTEMS (2018-2019)

ORGANIZING COMMITTEE, SIAM CONFERENCE ON APPLIED DYNAMICAL SYSTEMS (2019)

DIRECTOR, CLAREMONT CENTER FOR MATHEMATICAL SCIENCES (2018-20)
Coordinate mathematical activities across the Claremont colleges consortium.

MEMBER, NSF COMMITTEE OF VISITORS (2007, 2010, 2013)
Invited to assess and critique the Directorate of Mathematical Sciences at NSF.

SECTION EDITOR, SIAM REVIEW EDUCATION SECTION (2005-2010)
Director of editorial board for the Education Section of SIAM Review.

ASSOCIATE EDITOR, SIAM REVIEW EDUCATION SECTION (2001-2004, 2011)

SECTION PRESIDENT, SOUTHERN CALIFORNIA SECTION OF SIAM (2004-2011)

EDITOR, MINNESOTA JOURNAL OF UNDERGRADUATE MATHEMATICS (MJUM) - (2015- 2023)
Member of inaugural editorial board for this undergraduate research journal.

ASSOCIATE EDITOR, SIAM UNDERGRADUATE RESEARCH ONLINE (SIURO) - (2007-2012)
Member of inaugural editorial board for SIAM's undergraduate research publication.

COMMITTEE OF ACADEMIC SPONSORS, MATHEMATICAL SCIENCES RESEARCH INSTITUTE (2013-2015)

STEERING COMMITTEE, PARK CITY MATHEMATICS INSTITUTE (2008-2011)
Recruit and select lecturers, researchers and students for three-week summer school.

DIRECTOR, HARVEY MUDD COLLEGE MATHEMATICS CLINIC (2007-2008)
Recruited, staffed and directed industry-sponsored student research teams.

HONORS AND AWARDS

2013 SIAM OUTSTANDING PAPER PRIZE (SHARED WITH CHAD M. TOPAZ)
For "A Primer of Swarm Equilibria," **SIAM J. Appl. Dyn. Sys.** 1 (2011).

2013 SIGEST PAPER AWARD (SHARED WITH CHAD M. TOPAZ)
An enhanced version of our 2011 paper, "A Primer of Swarm Equilibria," was chosen to be republished in **SIAM Review** 55 (2013).

DIANA & KENNETH JONSSON PROFESSOR OF MATHEMATICS (2009-2019)
I was appointed to this Endowed Chair at Harvey Mudd College in 2009.

AMS AWARD FOR EXEMPLARY PROGRAM OR ACHIEVEMENT (2006)
Awarded to the Harvey Mudd College Mathematics Department.

NSF MATHEMATICAL SCIENCES POSTDOCTORAL FELLOWSHIP (1989-1991)
For postgraduate study in mathematics at the University of California, Berkeley.

MARSHALL SCHOLARSHIP (1982–1985)
For graduate study at the University of Cambridge.

INTERNATIONAL MATHEMATICS OLYMPIAD (1978) - Competed as a member of Team USA.

GRADUATE & POSTDOCTORAL MENTORING

POSTDOCTORAL SUPERVISON

HMC Teaching & Research Postdoctoral Fellows:
These postdoctoral fellows were supported at Harvey Mudd College via an NSF DMS Workforce Grant on which I was the Principal Investigator.

- Dr. Nora Youngs (July 2015-June 2016). Joined the faculty at Colby College.
- Dr. Robert Thompson (July 2014-June 2015). Joined the faculty at Carleton College.
- Dr. Amanda Ruiz (July 2013-June 2014). Joined the faculty at University of San Diego.
- Dr. Jacqueline Dresch (July 2012-June 2013). Joined the Faculty at Amherst College.
- Dr. Erin Byrne (July 2011-December 2012). Joined the Faculty at Olin College.
- Dr. Matt Davis (July 2010-June 2012). Joined the Faculty at Muskingum University.
- Dr. Ursula Whitcher (July 2009-June 2011). Joined the Faculty at the UW, Eau Claire.

NSF Mathematical Sciences Postdoctoral Research Fellowships

- Dr. Louis Rossi (July 1994-August 1996)
  Present Position: Dean of the Graduate College and Vice Provost, University of Delaware.
- Dr. Jasper Weinburd (July 2019-June 2022)
  Present Position: Assistant Professor, Hamline University

GRADUATE SUPERVISION

- David Sarocka, PhD Northwestern University 1996
  Present Position: Professor, Madison Area Technical College
- Joseph Lingevitch, PhD Northwestern University 1995
  Present Position: Research Scientist, Naval Research Laboratory
- J. H. M. van Dongen, MS in Mechanical Engineering, Northwestern University 1994
  Supervised jointly with Prof. Seth Lichter
  Present Position: Reservoir Engineer, ARA Petroleum, The Netherlands

UNDERGRADUATE MENTORING

SENIOR THESIS STUDENTS

Harvey Mudd College is an undergraduate institution and while I have no opportunity to supervise graduate students I have supervised 26 undergraduate Senior Theses. Among these students thirteen have received PhD's (from CalTech, Cambridge, University of Chicago, University of Colorado, Boulder, Cornell (3), Duke, MIT, Princeton, Rand, UCSC and UCSD).

- Miguel Velez, HMC 2021, *Modelling the transition from homogeneous to columnar states in locust hopper bands.*
- Hannah Larson, HMC 2020, *Agent Based Models of Locust Foraging & Social Behavior.* Presently a PhD student in Ecology & Evolutionary Biology at UCLA
- Quentin Barth, HMC 2019, *Hysteresis of Clumping in Swarming Models.*
- Daniel Schmidt, HMC 2017, *Kinetic Monte Carlo Methods for Computing First Capture Time Distributions in Models of Diffusive Absorption.*
  Presently a Financial Engineer at Citadel Financial.
- Gavin (Jialun) Zhang, HMC 2017, *Dynamics and Clustering in Locust Hopper Bands*
  Presently a Mathematics PhD student at Stanford.
- Alec Dunton, HMC 2016, *Topological Data Analysis for Systems of Coupled Oscillators.*
  PhD in Applied Mathematics (2021) from the University of Colorado, Boulder
- Ryan Jones, HMC 2016, *Hopper Bands: Locust Aggregation*
  Presently an Applied Math PhD student at the University of Colorado, Boulder
- Weerapat Pittayakanchit, HMC 2016, *Global Stability of Equilibria in a Model of Swarming*
  PhD in Physics (2022) from the University of Chicago.
- Ksenia Zakirova, HMC 2015, *Wave Dynamics in Moving Chains.*
  Presently a software engineer at Epic Systems.
- Jaron Kent-Dobias, HMC 2014, *Labyrinthian Foams in Langmuir Layers.*
  Finalist for the LeRoy Apker Award for Undergraduate Physics Research
  PhD in Physics (2020) from Cornell University.
- Louis Ryan, HMC 2012, *Analysis of Swarm Behavior in Two Dimensions*
  Formerly a PhD student at Harvard University, NSF Graduate Fellow.
  Presently a software engineer at Google.
- Andrew Ronan, HMC 2011, *Dynamics of Attractive-Repulsive Swarms*
  MS in Finance (2013) from NYU,
  Presently an Investment Analytics Associate at AIG Global Asset Management.
- Cecily Taylor (Keppel), HMC 2011, *Analysis of Mixing in a 2D Drop due to Time-Dependent Boundary Stresses*
  PhD (2016) in Engineering Science from the University of California, San Diego.
  Presently a Transportation Engineer at AECOM, Los Angeles.
- Andrew Leverentz, HMC 2008, An *Integrodifferential Equation Modeling 1-D Swarming Behavior*
  Formerly a software engineer at Google and FICO.
  Presently a CS PhD student at the University of California, San Diego.
- George Tucker, HMC 2008, *Domain Relaxation in Langmuir Films with Dipole-Dipole Repulsion*
  PhD from MIT (2014), NDSEG Fellow.
  Presently a Research Software Engineer with Google Brain.
- Kazh Brito, HMC 2007, *Hole Closure in Langmuir Fluid Monolayers*
  MSc from UC, Merced (2010).

- Joseph Majkut, HMC 2006, *Foraging Fruit Flies: Lagrangian and Eulerian Descriptions*
  MSc University of Delft (2008), PhD from Princeton University (2014).
  AAAS Congressional Science Fellow (2014-2015).
  Presently Director of Climate Science at the Niskanen Center, Washington DC.
- Jacob Pugh, HMC 2006, *Dynamics of Tethers in Langmuir Layers*
  Deceased.
- Adrian (Robin) Baur, HMC 2006, *Rupture in Thin Fluid Films*
  PhD from Cornell University (2012),
  Presently a Product Development Scientist at Olympus IMS.
- Dan Beutel, HMC 2003, *Modeling Advection and Diffusion in Microchannels*
- Benjamin Bryant, HMC 2003, *Modeling Moving Droplets: A Precursor Film Approach*
  PhD from Rand Graduate School (2013).
  Postdoctoral Scholar - The Natural Capital Project at Stanford University.
- Michael Gratton, HMC 2002, *The Effects of Torsion on Anomalous Diffusion in Helical Pipes*
  PhD from Duke University (2008). Presently at Metron Scientific Solutions.
- Bradley Forrest, HMC 2002, *Modeling Faraday Excitation of a Viscous Fluid*
  PhD from Cornell University (2009).
  Presently an Associate Professor at Stockton College.
- Marco Latini, HMC 2001, *Mixing in Curved Pipes*
  PhD from Caltech (2006), NDSEG Fellow.
  Presently a Systems Engineer at Northrop Grumman.
- Anand Patil, HMC 2001, *Modeling Van-der-Waals Driven Droplet Formation in Thin Films*
  PhD from UC, Santa Cruz (2008).
  Presently Software Engineer at Cloudera.
- Joel Miller, HMC 2000, *Self-Similar Decay of Localized Diffusive Waves*
  PhD from University of Cambridge (2005). Churchill Scholar
  Presently Larkins Fellow and Senior Lecturer at Monash University.

MATHEMATICS CLINIC PROJECTS

The Harvey Mudd College Mathematics Clinic engages teams of 4 to 6 students in a year-long research experience working with an industrial sponsor on challenging real-world problems. I have both directed this program (recruiting projects and facilitating the student, faculty and industrial liaison interactions) and supervised eight Clinic teams over the past 17 years.

- 1998–1999: Optimal Design of a Racing Shell (Owen Racing Shells)
- 1999–2000: Preemptive Offers for Portfolio Defense (Fair, Isaac, and Company, Inc.)
- 2000–2001: Optimization of Orbit-Raising Using Ion Propulsion (Space Systems/Loral)
- 2005–2006: Control Algorithm for an IV System (Cardinal Health)
- 2007–2008: Investigating Pairs Trading Strategies (Citadel Investment Group)
- 2013–2014: Cluster-Based Graph Algorithms for Biological Ontologies (LBNL))
- 2014–2015: Scalable Distributed Encrypted Search (Proofpoint, Inc.)
- 2018-2019: Building Intelligence into Credit Bond Pricing (Tradeweb Markets)
- 2019-2020: Visualizing Climate Restoration's Impact in California (Ice911 Research)
- 2020-2021: Efficient Algorithms for Fairer Finance (Greensill Capital)

SUMMER RESEARCH EXPERIENCES

I have directly supervised over 70 undergraduate summer research experiences. Through summer research programs I have helped set up at UCLA and Macalester College and the various grants I supervise and I have facilitated hundreds of students finding research projects in the last 20 years.

GRANTS (SELECTED)

SIMONS FOUNDATION COLLABORATION GRANT FOR MATHEMATICIANS

Discrete & Continuous Models of Non-local Chemical and Biological Systems

This collaborative grant supports my work with various theorists and experimentalist on problems in swarming and energy-driven pattern formation in physical systems. September 2014–August 2019.

NSF DIVISION OF MATHEMATICAL SCIENCES (WORKFORCE PROGRAM)

Optimizing the Mathematics Postdoctoral Experience: A Teaching and Research Postdoctoral Fellowship at Harvey Mudd College

I was the Principal Investigator on this $800,000 grant that supported a six postdoctoral fellows and ten undergraduate summer researchers at Harvey Mudd College. July 2009 – September 2015.

NSF DIVISION OF CHEMICAL, BIOENGINEERING, ENVIRONMENTAL & TRANSPORT SYSTEMS

Dynamics of interfacial domains

This collaborative grant supported work with an experimental group in the Physics Department at Kent State University and theorists in Mathematics and Chemical Engineering at Case Western Reserve University. September 2007–August 2010.

NSF DIVISION OF MATHEMATICAL SCIENCES, APPLIED MATHEMATICS PROGRAM

Research Training Group in Applied Differential Equations and Scientific Computing

I was a Senior Scientist on this UCLA grant that supported over thirty summer research experiences for Harvey Mudd College Undergraduates. The program continues to support HMC students through a second and third five-year NSF grants to UCLA. July 2006–June 2011.

NSF DIVISION OF MATHEMATICAL SCIENCES, APPLIED MATHEMATICS PROGRAM

Stability and Dynamics of Self-similarity in Evolution Equations

This single investigator grant supported my research on stability of self-similar solutions that arise naturally in physical problems such as thin-film rupture. July 1999–June 2002.

I've also received numerous internal grants from Harvey Mudd College..

CONFERENCES WORKSHOPS INVITED TALKS LECTURE SERIES (SELECTED)

AMS MRC – AGENT-BASED MODELS IN BIOLOGICAL AND SOCIAL SYSTEMS (2018)

I was the lead organizer for this week-long workshop for forty early career mathematicians. This AMS sponsored Mathematical Research Communities (MRCs) is a professional development program in which the participants develop collaboration skills, build a network focused in an active research domain, and receive mentoring from leaders in that area.

MOODY LECTURE SERIES

I co-founded, co-organize and raise money for this endowed lecture series at Harvey Mudd College. The Moody Lecture Series brings speakers to the college who illuminate the joy, mystery and applicability of mathematics. Since 2010 we have brought nine speakers to the college and turned out roughly 300 students to each lecture.

PARK CITY MATHEMATICS INSTITUTE

Harmonic Analysis & Partial Differential Equations in the Undergraduate Curriculum (2003)
I was the workshop leader and organizer of this three-week long workshop for faculty at undergraduate colleges sponsored by the Institute for Advanced Study.

Pizza and Problem Solving Seminars (2003-2011,2017-2019); Estimathons (2017-2019)
I was an invited speaker presenting a workshop on mathematical problem solving for over 200 secondary school teachers, undergraduates, graduate students and college faculty. I also run Estimathons, a team competition based on estimation and Fermi problems.

INVITED UNDERGRADUATE COLLOQUIA

An Introduction to Surface Tension (or Why Raindrops are Spherical)
This is a lecture I have developed to explain to undergraduates how mathematics allows us to understand the fluid dynamics of drops, jets and thin fluid layers and which incorporates students doing experiments during the lecture. I have given this talk several dozen times at small schools (Bowdoin, Macalester) and large (USF, UBC).

I've also organized many small conferences, workshops and minisymposia.

RESEARCH PUBLICATIONS

A. J. Bernoff, A. Jilkine, A. Navarro Hernández & A. E. Lindsay, “Single cell directional sensing from just a few receptor binding events.” Biophysical Journal 122 (2023), 3108-3116.

A. E. Lindsay, A. J. Bernoff, & A. Navarro Hernández, “Short-time diffusive fluxes over membrane receptors yields the direction of a signalling source.” R. Soc. Open Sci. 10 (2023) #221619.

A. J. Bernoff, M. Culshaw-Maurer, R. Everett, M. E. Hohn, C. Strickland, & J. Weinburd, “Agent-based and continuous models of hopper bands for the Australian plague locust: How resource consumption can mediate pulse formation and geometry.” PLoS Comput. Biol. 16 (2020) #1007820.

A. J. Bernoff, A. E. Lindsay & D. Schmidt*, “Asymptotic and Numerical Approximation of Diffusive Capture by a Patterned Partially Absorbing Plane.” **SIAM Multiscale Model. Simul.** 3 (2018) 1411-1447.

A. J. Bernoff & A. E. Lindsay, “Numerical approximation of diffusive capture rates by planar and spherical surfaces with absorbing pores.” **SIAM J. Appl. Math.** 78 (2018) 266-290.

A. E. Lindsay, A. J. Bernoff & M. J. Ward, “First Passage Statistics for the Capture of a Brownian Particle by a Structured Spherical Target with Multiple Surface Traps." **SIAM Multiscale Model. Simul.** 15 (2017) 74-109.

A. J. Bernoff & C. M. Topaz, “Biological aggregation driven by social and environmental factors: A nonlocal model and its degenerate Cahn-Hilliard approximation,” **SIAM J. Appl. Dyn. Sys.** 15 (2016) 1528-1562.

J. Kent-Dobias* & A. J. Bernoff, “Energy Driven Pattern Formation in Planar Dipole-Dipole Systems in the Presence of Weak Noise,” **Phys. Rev. E**. 91 (2015) #032919.

A. J. Bernoff & C. M. Topaz, “Nonlocal aggregation models: A primer of swarm equilibria.” **SIAM Review** 55 (2013) 709-747. *A SIGEST Prize Paper - an enhanced version of our 2011 paper.*

C. Nilsen*, J. Paige*, O. Warner*, B. Mayhew*, R. Sutley*, M. Lam*, A. J. Bernoff & C. M. Topaz “Social aggregation in pea aphids: Experiment and random walk modeling,” **PLoS ONE** 8 (2013) #0083343.

C. M. Topaz, M. R. D’Orsogna, L. Edelstein-Keshet, & A. J. Bernoff, “Locust dynamics: Behavioral phase change and swarming,” **PLoS Comput Biol** 8 (2012) #e1002642.

A. P. Higginbotham*, A. Guillen*, N. Jones*, T. D. Donnelly & A. J. Bernoff. “Evidence of the harmonic Faraday instability in ultrasonic atomization experiments with a deep, inviscid fluid,” **J. Acoust. Soc. Am.** 130 (2011) 2694-2699.

A. J. Bernoff & C. M. Topaz, “A primer of swarm equilibria,” **SIAM J. Appl. Dyn. Sys.** 1 (2011) 212-250. *Winner of the 2013 SIAM Outstanding Paper Prize.*

A. J. Bernoff & T. P. Witelski, “Stability and dynamics of self-similarity in evolution equations**,” J. Eng. Math.** 66 (2010) 11-31.

L. Zou, A. J. Bernoff, J. A. Mann, Jr., J. C. Alexander & E.K. Mann. “Gaseous hole closing in a polymer Langmuir monolayer,” **Langmuir** 26 (2010) 3232-3236.

A. J. Leverentz*, C. M. Topaz & A. J. Bernoff. “Asymptotic Dynamics of Attractive-Repulsive Swarms,” **SIAM J. Appl. Dyn. Sys.** 8 (2009) 880-908.

C. M. Topaz, A. J. Bernoff, S. Logan*, & W. Toolson*, “Aggregations, Interactions, and Boundaries: A Minimal Model for Rolling Swarms of Locusts,” **Eur. Phys. J. - Spec. Top**. 157 (2008) 93-109.

J. C. Alexander, A. J. Bernoff, E.K. Mann, J. A. Mann, Jr., J.R. Wintersmith* & L. Zou, “Domain Relaxation in Polymer Langmuir Layers,” **J. Fluid Mech.** 571 (2007) 191-219.

J.R. Wintersmith*, L. Zou, A. J. Bernoff, J. C. Alexander, J. A. Mann, Jr., E. E. Kooijman, & E.K. Mann, “Determination of Inter-Phase Line Tension in Langmuir Films,” **Phys. Rev. E.** 75 (2007) #061605.

J. C. Alexander, A. J. Bernoff, E.K. Mann, J. A. Mann, Jr. & L. Zou, “Hole Dynamics in Polymer Langmuir Layers,” **Phys. Fluids** 18 (2006) #062103.

T.D. Donnelly, J. Hogan*, A. Mugler*, M. Schubmehl*, N. Schommer*, A. J. Bernoff, S. Dasnurkar & T. Ditmire “Using Ultrasonic Atomization to Produce an Aerosol of Micron-scale Particles,” **Rev. Sci. Instr.** 76 (2005) #11330135.

A. E. Hosoi, D. Kogan*, C.E. Devereaux*, A. J. Bernoff & S. M. Baker, “Two-Dimensional Self-Assembly in Diblock Copolymers**,” Phys. Rev. Lett.** 95 (2005) #037801.

T. P. Witelski, A. J. Bernoff, & A. L. Bertozzi, "The Dynamics of Dissipation and Blow-up for a Critical-case Unstable Thin Film Equation," **Euro. J. Appl. Math.** 15 (2004) 223-256.

T.D. Donnelly, J. Hogan*, A. Mugler*, N. Schommer*, M. Schubmehl*, A. J. Bernoff, & B. Forrest*, "An Experimental Study of Micron-scale Droplet Aerosols Produced via Ultrasonic Atomization," **Phys. Fluids** 16 (2004) 2843-2851.

J. C. Miller* & A. J. Bernoff, "Rates of Convergence to Self-Similar Solutions of Burgers' Equation," **Stud. Appl. Math.** 111 (2003) 29-40.

A. J. Bernoff & T. P. Witelski, "Linear Stability of Source-type Similarity Solutions to the Lubrication Equations," **Appl. Math. Lett.** 15 (2002) 599-606.

S. Setayeshgar & A. J. Bernoff, "Scroll Waves in the Presence of Slowly Varying Anisotropy with Applications to the Heart," **Phys. Rev. Lett.** 88 (2002) #028101.

M. Latini* & A. J. Bernoff, "Transient Anomalous Diffusion in Shear Flows," **J. Fluid Mech.** 441 (2001) 399-411.

T.P. Witelski & A. J. Bernoff, "Dynamics of Three-dimensional Thin Film Rupture," **Physica D** 147 (2000) 155-176.

D. C. Sarocka, A. J. Bernoff & L. F. Rossi, "Large-amplitude Solutions to the Sivashinsky and Riley-Davis Equations for Directional Solidification," **Physica D** 127 (1999) 146-176.

T. P. Witelski & A. J. Bernoff, "Stability of Self-similar Solutions for Van der Waals Driven Thin Film Rupture," **Phys. Fluids** 9 (1999) 2443–2445.

A. J. Bernoff & P. Sternberg, "Onset of Superconductivity in Decreasing Fields for General Domains," **J. Math Phys.** 39 (1998) 1272-1284.

T. P. Witelski & A. J. Bernoff, "Self-similar Asymptotics and for Linear and Nonlinear Diffusion Equations," **Stud. Appl. Math.** 100 (1998) 153–193.

O. V. Atassi, A. J. Bernoff, & S. Lichter, "Interacting Vortex and Vortex Layer: How Length Scale Affects Entrainment and Ejection," **AIAA J.** 36 (1998) 924-928.

A. J. Bernoff, A. L. Bertozzi & T. P. Witelski, "Axisymmetric surface diffusion: dynamics and stability of self-similar pinchoff," **J. Stat. Phys.** 93 (1998) 725-776.

O. V. Atassi, A. J. Bernoff & S. Lichter, "The Interaction of a Point Vortex and a Wall-Bounded Vortex Layer," **J. Fluid Mech.** 343 (1997) 169-195.

L. F. Rossi, J. F. Lingevitch & A. J. Bernoff, "Quasi-steady Monopole and Tripole Attractors in Relaxing Vortices," **Phys. Fluids** 9 (1997) 2329-2338.

O. V. Atassi, S. Lichter & A. J. Bernoff, "The Interaction of a Point Vortex with a Boundary Layer Leading to Eruption," **AIAA** 96-2140 (1996).

A. J. Bernoff, H. J. H. M. van Dongen & S. Lichter, "The Steady Boundary Layer due to a Fast Vortex," **Phys. Fluids** (1996) 156-162.

A. J. Bernoff, R. Kuske, B. J. Matkowsky & V. Volpert, "Mean Field Effects for Counterpropagating Traveling Wave Solutions of Reaction-Diffusion Systems," **SIAM J. Appl. Math.** 55 (1995) 485-519.

J. F. Lingevitch & A. J. Bernoff, "Distortion and Evolution of a Localized Vortex in an Irrotational Flow," **Phys. Fluids** 7 (1995) 1015-1026.

D. C. Sarocka & A. J. Bernoff, "An Intrinsic Equation of Interfacial Motion for the Solidification of a Pure Hypercooled Melt," **Physica D** 85 (1995) 348-374.

A. J. Bernoff & A. L. Bertozzi, "Singularities in a Modified Kuramoto-Sivashinsky Equation Describing Interface Motion for Phase Transition," **Physica D** 85 (1995) 375-404.

A. J. Bernoff, "Finite Amplitude Convection Between Stress-free Boundaries: Ginzburg-Landau Equations and Modulation Theory," **Euro. J. Appl. Math.** 5 (1994) 267-282.

J. F. Lingevitch & A. J. Bernoff, "Advection of a Passive Scalar by a Vortex Couple in the Small-diffusion Limit," **J. Fluid Mech.** 270 (1994) 219-250.

A. J. Bernoff & J. F. Lingevitch, "Rapid Relaxation of an Axisymmetric Vortex," **Phys. Fluids** 6 (1994) 3717-3723.

A. J. Bernoff, "Spiral Waves Solutions for Reaction-Diffusion Equations in a Fast Reaction/Slow Diffusion Limit," **Physica D** 53 (1991) 125-150.

W. B. Underhill, S. Lichter & A. J. Bernoff, "Modulated, Frequency Locked and Chaotic Cross-waves," **J. Fluid Mech**. 225 (1991) 371-394.

H. Ayanle, A. J. Bernoff & S. Lichter, "Spanwise Modal Competition in Cross-waves," **Physica D** 43 (1990) 87-104.

A. J. Bernoff & S. Lichter, "A Continuum Model of Thin Film Deposition," **Phys. Rev. B** 39 (1989) 10560-10569.

A. J. Bernoff, L. P. Kwok & S. Lichter, "Viscous Cross-waves: An Analytical Treatment," **Phys. Fluids A** 1 (1989) 678-688.

A. J. Bernoff, "Slowly Varying Fully Nonlinear Wavetrains in the Ginzburg-Landau Equation," **Physica D** 30 (1988) 363-381.

S. Lichter & A. J. Bernoff, "Stability of Steady Cross-waves: Theory and Experiment," **Phys. Rev. A** 37 (1988) 1663-1667.

W. Arter, A. Bernoff & A. C. Newell, "Wavenumber Selection of Convection Rolls in a Box," **Phys. Fluids** 30 (1987) 3840-3842.

Undergraduate co-authors indicated by *.

MATHEMATICAL DIVERTIMENTI

A. J. Bernoff & U. Whitcher, "Measuring Gender Representation on Editorial Boards in the Mathematical Sciences," **SIAM News** (November 2016).

A. J. Bernoff, "The Thin Film Equation," Chapter III.30 in the **Princeton Companion to Applied Mathematics,** Princeton University Press (2015) 169-170.

A. J. Bernoff, "Mathematics in the Mountains: The Park City Math Institute," **Math Horizons** XVII (November 2008) 20-21.

A. J. Bernoff & F. E. Su, "Putnam, Pizza, & Problem Solving," **Math Horizons** XII (September 2004) 8-9.

DOCTORAL THESIS

A. J. Bernoff, Transitions from Order in Convection, PhD Thesis, University of Cambridge (1986).