# CHRISTOPHER P. GRANT

**Contact Information**

- **Mail:** 241 TMCB
    Department of Mathematics
    Brigham Young University
    Provo, UT 84602
- **Email:** chrisgrant5@icloud.com

**Professional Studies**

- **B.S.**: Brigham Young University, 1986, Mathematics, Summa Cum Laude. Spencer W. Kimball Scholar: 1980–81, 1983–86.
- **M.S.**: Brigham Young University, 1988, Mathematics. Advisor: Peter Bates. National Science Foundation Graduate Research Fellowship: 1987–1988.
- **Ph.D.**: University of Utah, 1991, Mathematics. Advisor: Paul Fife. National Science Foundation Graduate Research Fellowship: 1988–1990. University of Utah Graduate Research Fellowship: 1990–1991.

**Professional Experience**

- **Associate Chair**: Brigham Young University, Department of Mathematics, August 2000–July 2006.
- **Assistant Chair**: Brigham Young University, Department of Mathematics, March 2000–July 2000.
- **Acting Assistant Chair**: Brigham Young University, Department of Mathematics, February 1999–March 2000.
- **Associate Professor**: Brigham Young University, Department of Mathematics, August 1998–Present.
- **Assistant Professor**: Brigham Young University, Department of Mathematics, August 1993–August 1998.
- **Postdoctoral Research Fellow**: Georgia Institute of Technology, Center for Dynamical Systems and Nonlinear Studies, September 1991–July 1993.
- **Teaching Fellow**: University of Utah, Department of Mathematics, August 1988–August 1991.
- **Research Technician**: Eyring Research Institute, May 1984–August 1987.

**Scholarly Publications**

- *Using Fluorescence Recovery After Photobleaching data to Uncover Filament Dynamics*, PLoS Computational Biology, **18** (2022), e1010573, with J. C. Dallon, Cécile Leduc, Emily J. Evans, Sandrine Etienne-Manneville, and Stéphanie Portet.

- *Mean Square Displacement for a Discrete Centroid Model of Cell Motion*, PLoS One. **16** (2021), e0261021, with Mary Ellen Rosen and J. C. Dallon.

- *A Continuous-Time Stochastic Model of Cell Motion in the Presence of a Chemoattractant*, Discrete and Continuous Dynamical Systems. Series B, **25** (2020), 4839–4852, with J. C. Dallon, Lynnae C. Despain, and Emily J. Evans.

- *Results from a Differential Equation Model for Cell Motion with Random Switching Show that the Model Cell Velocity is Asymptotically Independent of Force*, Journal of Differential Equations, **268** (2019), 301–317, with J. C. Dallon, Emily J. Evans, and W. V. Smith.

- *A Continuous-time Model of Centrally Coordinated Motion with Random Switching*, Journal of Mathematical Biology, **74** (2017), 727–753, with J. C. Dallon, Lynnae C. Despain, Emily J. Evans, and W. V. Smith.

- *Cell Speed is Independent of Force in a Mathematical Model of Amoeboidal Cell Motion with Random Switching Terms*, Mathematical Biosciences, **246** (2013), 1–7, with J. C. Dallon, E. J. Evans, and W. V. Smith.

- *A Sharkovsky Theorem for Non-Locally Connected Spaces*, Discrete and Continuous Dynamical Systems - Series A, **32** (2012), 3485–3499, with Gregory R. Conner and Mark H. Meilstrup.

- *Resistance and Conductance in Structured Zermelo Tournaments*, Advances in Applied Mathematics, **44** (2010), 37–52, with Gregory R. Conner and Benjamin Z. Webb.

- *Neighborhood Monotonicity, the Extended Zermelo Model, and Symmetric Knockout Tournaments*, Discrete Mathematics, **309** (2009), 3998–4010, with Gregory R. Conner.

- *The Rasch Model and Additive Conjoint Measurement*, Journal of Applied Measurement, **10** (2009), 348–354, with Van A. Newby, Gregory R. Conner, and C. Victor Bunderson.

- *Blowup in a Mass-Conserving Convection-Diffusion Equation with Superquadratic Nonlinearity*, Proceedings of the American Mathematical Society, **129** (2001), 3353–3362, with Todd L. Fisher .

- *Grain Sizes in the Discrete Allen-Cahn and Cahn-Hilliard Equations*, Discrete and Continuous Dynamical Systems, **7** (2001) 127-146.

- *Superabundance of Stationary Solutions for the Discrete Allen-Cahn Equation*, Dynamics of Continuous, Discrete, & Impulsive Systems, **8B** (2001) 71-92.

- *An Extension of Zermelo's Model for Ranking by Paired Comparisons*, with Gregory R. Conner, European Journal of Applied Mathematics, **11** (2000) 225-247, with Gregory R. Conner.

- *Interior Blowup in a Convection-Diffusion Equation*, SIAM Journal on Mathematical Analysis, **29** (1998) 1447–1458.

- *Asymptotics of Blowup for a Convection-Diffusion Equation with Conservation*, Differential and Integral Equations **9** (1996) 719–728, with Gregory R. Conner.

- *Slowly-Migrating Transition Layers for the Discrete Allen-Cahn and Cahn-Hilliard Equations*, Nonlinearity **8** (1995) 861–876, with Erik Van Vleck.

- *Slow Motion in One-Dimensional Cahn-Morral Systems*, SIAM Journal on Mathematical Analysis **26** (1995) 21–34.
- *Spinodal Decomposition for the Cahn-Hilliard Equation*, Communications in Partial Differential Equations **18** (1993) 453–490.
- *The Dynamics of Pattern Selection for the Cahn-Hilliard Equation*, Ph.D. Dissertation, University of Utah, August 1991.
- *A Property of Two Dimensions, Solution to Advanced Problem 6593*, American Mathematical Monthly **98** (1991) 65-67, with Michel Balazard.
- *Blow Up for a Diffusion-Advection Equation*, Proceedings of the Royal Society of Edinburgh **113A** (1989) 181–190, with Nicholas Alikakos and Peter Bates.
- *Stabilization and Blow-up of Solutions of a Nonlinear Parabolic Equation*, M.S. Thesis, BYU, December 1988.

## Conference Talks and Invited Presentations

- *Ernst Zermelo and the Ranking of Tournaments*, Brigham Young University Mathematics Colloquium, November 2007.
- *Equilibria of the Discrete Allen-Cahn and Cahn-Hilliard Equations*, Year 2000 International Conference on Dynamical Systems and Differential Equations (Kennesaw, Georgia), May 2000.
- *One-Dimensional Discrete Allen-Cahn and Cahn-Hilliard Equations*, NIST Workshop on Lattice Differential Equations (Gaithersburg, Maryland), July 1999.
- *Pattern Evolution in the Discrete Cahn-Hilliard Equation*, SIAM Conference on Applications of Dynamical Systems (Snowbird, Utah), May 1999.
- *Computational Issues in the Extended Zermelo Model*, SIAM Annual Meeting (Atlanta), May 1999.
- *Stability, Instability, and Dormant Instability in Lattice Differential Equations*, Third Americas Conference on Differential Equations and Nonlinear Analysis (Atlanta), September 1998.
- *Grain Sizes in the Discrete Allen-Cahn and Cahn-Hilliard Equations*, SIAM Annual Meeting (Toronto), July 1998.
- *Materials Science and Slow Evolution*, Utah State University Research Experience for Undergraduates, June 1998.
- *An Extension of the Bradley-Terry Model for Incomplete Tournaments without Strong Connectedness*, SIAM Annual Meeting (Stanford, California), July 1997.
- *The Attractor of the Discrete Allen-Cahn Equation*, Lookout Mountain Workshop on Phase Transitions in Allen-Cahn and Cahn-Hilliard Equations (Golden, Colorado), June 1997.
- *Transition from Slow Motion to Pinning in Lattice Equations*, SIAM Conference on Applications of Dynamical Systems (Snowbird, Utah), May 1997.
- *Slow Motion and Pinning in Lattice Differential Equations*, International Conference on Dynamical Systems and Differential Equations (Springfield, Missouri), May 1996.
- *Asymptotic Behavior of a Flux-Conservative Convection-Diffusion Equation*, SIAM Annual Meeting (Charlotte), October 1995.
- *Asymptotic Behavior of a Flux-Conservative Convection-Diffusion Equation*, Nonlinear Analysis and Differential Equations Workshop (Salt Lake City, Utah), May 1995.

- *Slowly-Migrating Transition Layers for the Discrete Allen-Cahn and Cahn-Hilliard Equations*, SIAM Annual Meeting (San Diego), July 1994.
- *Lattice Differential Equations Resulting from the Allen-Cahn and Cahn-Hilliard Equations*, Nonlinear Analysis and Differential Equations Workshop (Logan, Utah), September 1993.
- *Slow Motion in Lattice Systems of Differential Equations*, Georgia Tech Dynamical Systems Seminar, June 1993.
- *The Cahn-Hilliard Equation from a Dynamical Systems Perspective*, Brigham Young University Mathematics Colloquium, February 1993.
- *The Cahn-Hilliard Equation from a Dynamical Systems Perspective*, Vanderbilt University Mathematics Colloquium, February 1993.
- *Dynamical Systems Aspects of the Cahn-Hilliard Equation*, University of Tennessee Mathematics Colloquium, February 1993.
- *Slow Coarsening in Multicomponent Mixtures*, McMaster University Applied Analysis Seminar, January 1993.
- *Slow Coarsening in Multicomponent Mixtures*, Brigham Young University Differential Equations Seminar, December 1992.
- *Slow Coarsening in Multicomponent Mixtures*, University of Tennessee Differential Equations Seminar, November 1992.
- *Dynamical Metastability in Cahn-Hilliard-Morral Systems*, SIAM Conference on Applications of Dynamical Systems (Snowbird, Utah), October 1992.
- *The Dynamics of Pattern Formation for the Cahn-Hilliard Equation*, Cornell University Dynamics Seminar, February 1991.
- *The Dynamics of Pattern Formation for the Cahn-Hilliard Equation*, Georgia Tech CDSNS Seminar, February 1991.
- *Blow-up of Solutions to Certain Parabolic Equations*, Heriot-Watt University Conference on Reaction Diffusion Equations (Edinburgh, Scotland), June 1988.
- *Blowup and Stabilization of the Solutions to a Parabolic Equation with a Nonlinear Convection Term*, BYU Spring Research Conference, March 1988.

## Curricular Material

- *Applied Discrete Probability*, E-text, 123 pages, 2017.
- *Collective Choice for Mathematicians: Voting, Matching, Division, and More*, E-text, 136 pages, 2013.
- *Theory of Ordinary Differential Equations*, E-text for Math 634, 166 pages, revised 2008.
- *The History of Mathematics*, Lecture notes for Math 300, 48 pages, 2006.

## Awards

- Distinguished Citizenship Award, BYU Department of Mathematics, December 2018.
- Distinguished Citizenship Award, BYU Department of Mathematics, December 2014.
- Distinguished Teaching Award, BYU Department of Mathematics, 2009.

- Excellence in Teaching (10+ years), BYU College of Physical & Mathematical Sciences, 2008.
- Savage Distinguished Teaching Award, BYU Department of Mathematics, 2007.
- Distinguished Service Award, BYU Department of Mathematics, 2006.

**Grants**

- *Non-convex Energies and Dynamical Metastability*, Award No. 9501060, National Science Foundation, Division of Mathematical Sciences, Applied Mathematics Program, June 1995–May 1998.

**Courses Taught**

- Math 112 (Calculus 1)
- Math 113 (Calculus 2)
- Math 190 (Fundamentals of Mathematics)
- Math 290 (Fundamentals of Mathematics)
- Math 300 (History of Mathematics)
- Math 303 (Mathematics for Engineering 2)
- Math 311 (Numerical Methods)
- Math 313 (Elementary Linear Algebra)
- Math 315 (Theory of Analysis 1)
- Math 316 (Theory of Analysis 2)
- Math 334 (Ordinary Differential Equations)
- Math 341 (Theory of Analysis 1)
- Math 344 (Mathematical Analysis 1)
- Math 346 (Mathematical Analysis 2)
- Math 350 (Combinatorics)
- Math 413 (Advanced Linear Algebra)
- Math 431 (Probability Theory)
- Math 434 (Ordinary Differential Equations)
- Math 447 (Introduction to Partial Differential Equations)
- Math 460 (Topics in Geometry)
- Math 513 (Advanced Topics in Applied Mathematics)
- Math 521 (Methods of Applied Mathematics 1)
- Math 522 (Methods of Applied Mathematics 2)
- Math 541 (Real Analysis 1)
- Math 542 (Real Analysis 2)
- Math 543 (Advanced Probability 1)
- Math 544 (Advanced Probability 2)
- Math 634 (Theory of Ordinary Differential Equations 1)
- Math 635 (Theory of Ordinary Differential Equations 2)
- Math 636 (Advanced Probability 1)
- Math 637 (Advanced Probability 2)
- Math 640 (Nonlinear Analysis)
- Math 641 (Functions of a Real Variable)
- Math 642 (Functions of Real and Complex Variables 2)
- Math 647 (Theory of Partial Differential Equations 1)