CURRICULUM VITAE

Gerhard H. Dangelmayr

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Degrees

1987	Habilitation (Dr. rer. nat. habil.) in Mathematical Physics	University of Tübingen, Germany
1979	D. Sc. (Dr. rer. nat.) in Physics	University of Tübingen, Germany
1975	Diploma in Physics	University of Tübingen, Germany

Positions held

2021 -	Professor Emeritus	Colorado State University
1998 - 2021	Professor	Department of Mathematics
2017 - 2021	Transitional Appointment	
2011 - 2016	Department Chair	
Fall 2008 & Spring 2010	Acting Department Chair	
2007 - 2011	Undergraduate Director	
1995 - 1998	Associate Professor	
1987 - 1998	Dozent and apl. Professor (special faculty position)	University of Tübingen Department of Physics
1986 - 1993	Deputy Director	Institute for Information Sciences
1979 - 1987	Postdoc and Lecturer	

Research Visits and Temporary Positions

February - March 2003	Visitor	University of Exeter, UK
September - December 1994	Visiting Professor	Colorado State University
July 1989	Visitor	University of Warwick, UK
July 1985	Visitor	University of California, Berkeley
September 1985	Visitor	Cornell University
January - March 1985	Visiting Professor	University of California, Santa Cruz
November 1983	Visitor	University of Houston
April - May 1980	Research Associate	University of Bristol, UK

POSTDOCS and GRADUATE STUDENTS

Postdocs Supervised

Jan - Apr 2007	Dr. Adrian Murza	Colorado State University (supported by CIMS, joint with I. Oprea)
1993 - 1995	Dr. Christoph Geiger	University of Tübingen
1991 - 1995	Dr. David Rodriguez	University of Tübingen

Ph.D.-Theses at Colorado State University

- Chuan Zhang (Ph.D. 2014): *Storing Cycles in Hopfield-type Neural Networks*
- William Christopher Strickland (Ph.D. 2013): *The Mathematical Modelling and Analysis of Nonlocal Invasions and Savanna Population Dynamics*
- Jennifer Maple (Ph.D. 2013, Co-adviser): *Steady State Hopf Mode Interaction in Anisotropic Systems*
- Yang Zou (Ph.D. 2012, Co-adviser): *Intermittency and Chaos near Hopf Bifurcation with* $O(2) \times O(2)$ *Symmetry*
- Blake Rutherford (Ph.D. 2010): *Lagrangian Mixing and Transport in Hurricanes*
- Travis Olson (Ph.D. 2010): *Hopf Bifurcation in Anisotropic Reaction Diffusion Systems Posed in Large Rectangles*
- William Sea (Ph.D. 2008): *Moving Beyond Aggregated Models: Woody Plant Size Influences on Savanna Function and Dynamics* (degree from NREL, I acted as inofficial Math co-advisor)
- Sabino Gadaleta (Ph.D. 2000): *Optimal Chaos Control Through Reinforcement Learning*

D.Sc-Theses at University of Tübingen (thesis-titles translated from German)

- Christoph Spandl (D.Sc. 1998): *Reliable Classification of Spatiotemporal Signals*
- Jörg Hettel (D.Sc. 1996): *Organizing Centers and Parity Breaking Instabilities: Application of Bifurcation Theory to Physical and Biological Model Equations*
- Christoph Geiger (D.Sc. 1993): *Bifurcations in O(3)-equivariant Systems and their Application to Spherical Benard Convection*
- Michael Wegelin (D.Sc. 1993): *Nonlinear Dynamics of Spatiotemporal Patterns in Hierarchical Systems*
- Dieter Lang (D.Sc. 1988): *Information Processing in Artifical Neural Networks*
- Martin Neveling (D.Sc. 1988): *Bifurcations in Systems with Competing Instabilities*
- Peter Haug (D.Sc. 1988): *Cellular Patterns in Crystal Growth: Bifurcation Analysis and Simulation*

Master-Theses at Colorado State University

- Ashley Johnson (2008): *Asynchronous Oscillations in an N-Patch Diffusively Coupled Predator-Prey Model*
- Tim Wildey (2004): *Spatiotemporal Dynamics of a System of Globally Coupled Ginzburg Landau Equations*
- Joshua Ladd (2004): *Heteroclinic Cycles in a Symmetric System Derived from the Partial Differential Equations for Electroconvection in Nematic Liquid Crystals*

- Cang Tsang Wang (2003): *Equivariant Bifurcation Theory and its Application to Visual Halluzination and Pattern Formation in Liquid Crystals*

Diploma-Theses Completed at Colorado State University
(Degrees from University of Tübingen, thesis-titles translated from German)

- Sabino Gadaleta (1997): *Time Series Analysis of Stochastic and Deterministic-Chaotic Systems Through Topology Preserving Maps*
- Markus Anderle (1997): *Application of Statistical Methods of Data Analysis to the Reconstruction of Dynamical Systems from Time Series*

Diploma-Theses at University of Tübingen (thesis-titles translated from German)

- Jürgen Schwarz (1996): *Degenerate Bifurcations in Spherical Dynamical Systems*
- Sybille Geiger (1996): *Efficient Simulation and Modeling of Spherically Symmetric Systems of Partial Differrential Equations*
- Tilmann Steck (1996): *Mode Couplings in Spherical Convection Systems*
- Roland Rzehak (1996): *Detection and Continuation of Coherent Structures*
- Alexander Sieck (1996): *Dynamics of Networks of Nonlinear Oscillators under Periodic Forcing*
- Jens-Ole Wund (1995): *Methods for Determining Motion Fields with Discontinuities from Time-Varying Image Sequences*
- Roland Bosch (1995): *Dynamics of Recurrent Neural Networks*
- Fritz-Günter Helf-Bayhorst (1995): *A Variational Approach to the Description of Fluid Systems*
- Jörg Tomes (1994): *Nonlinear Dynamics of an Electronic Analog-Network of Artificial Neuronal Oscillators*
- Matthias Franz (1994): *Generation and Suppression of Chaos in a Periodically Perturbed Lorenz System*
- Christoph Stelzer (1993): *Classical-Mechanical Dynamics of Ring Conductors in the Presence of an External Magnetic Field*
- Frieder Ackermann (1993): *Dynamics and Function of large Systems of Oscillating Neurons*
- H. Möller (1993): *Feature Recognition Using a Hierarchical Oscillator Network*
- Jörg Hettel (1993): *Resonance Phenomena Through Symmetry Breaking and Normal Form Studies for a Laser with Saturable Absorber*
- Jörg Oppenländer (1992): *On the Dynamics of Hierarchical Oscillator Networks*
- Reinhardt Schmid (1992): *Data Analysis and Pattern Recognition for a Facial Play Analysis Device*
- Frank Weisser (1992): *Signal Analysis and Pattern Recognition using the Karhunen-Loeve-Method*
- Axel Hoff (1991): *Dynamics of a Coherently Excited Model Neuron: Synchronisation and Chaos*
- Markus Lappe (1989): *Storage of Patterns and Pattern Sequences in Artificial Neural Networks*

- Michael Wegelin (1989): *Interaction of Hysteresis and Degenerate Hopf Bifurcation in Optical Bistable Systems*

Graduate Student Committee Memberships (since 2003)

2019: D. Handwerk (PhD, Mathematics)

2013: B. Springer (PhD, Mathematics), N. Salvi (PhD, Mathematics)

2011: A. von Hermann (PhD, Mathematics), J. Hidalgo (PhD, Atmospherical Sciences), G. Williams (PhD, Atmospherical Sciences)

2010: A. Jamshidi (PhD, Mathematics), J.-M. Chang (PhD, Mathematics)

2009: G. Buccini (PhD, NREL), E. Holt (PhD, Mathematics), B. Springer (MS, Mathematics), Y. Zou (MS, Mathematics)

2008: Y. Quiao (PhD, Mathematics), F. Emdad (PhD, Mathematics)

2006: V. Madhok (MS, Physics)

2005: P. Horman (MS, Mathematics)

2004: A. Saunders (MS, Atmospherical Sciences), J. Hidalgo MS, Atmospherical Sciences)

2003: I. Alolyan (PhD, Mathematics), D. Dreisigmeyer (PhD, Electrical Engineering)

CURRICULUM DEVELOPMENT

- **Math 281: Introduction to Mathematical Reasoning** (Experimental Course)

  This course was initiated by a group of faculty in 2007 in order to provide a bridge course intermediating between our calculus sequence and the mathematically more rigorous 300- and 400-level courses such as MATH 301, MATH 317 and MATH 366. As Chair of the MATH 281 subcommittee of the Undergraduate Committee in Spring 2007 I coordinated the development of this course. The course was taught three times (Fall 2007-2009) by two instructors (Professors Betten and Cavalieri) emphasizing different (but overlapping) mathematical concepts and using different textbooks. The mode of delivery consisted of a combination of classroom instruction and student group presentations. This course has become a regular course of our undergraduate curriculum that is used to introduce our majors to rigorous proof techniques.

- **Math 331: Introduction to Mathematical Modeling**

  Within our NSF-funded project *A Mathematical Modelling Programme for Undergraduates* (2002-2004), Michael Kirby and I developed lecture notes and computing projects for the newly introduced course MATH 331. The overall strategy of our approach to teaching mathematical modeling was to emphasize the top down and bottom up approaches as dual principles. The top refers to the model of a real world situation and the bottom refers to observed data. By top down approach we understand the process of choosing a particular mathematical model, whereas bottom up means fitting usually noisy and non-ideal data to the model. The full modeling process requires an interaction between the two approaches. Accordingly, the main focus of the course was on the one hand a qualitative understanding of the mathematical methods, and on the other hand numerical computations with Matlab.

  Michael Kirby taught this course in Fall 2002 and I taught it in Fall 2003 and 2004. Thereafter it was taught out of our lecture notes until Fall 2008 by other instructors.

- **MATH 340: Introduction to Ordinary Differential Equations**

  In Spring 2005 I developed online Class Notes for MATH 340 in which the course material is summarized and supplemented by practice problems, with particular emphasis laid on using Matlab for solving "hard" problems numerically or symbolically. The notes have been used by MATH 340 instructors until Spring 2010.

- **Algebra, Analysis and Linear Algebra Sequences**

  In Fall 2007 (in my role as Undergraduate Director) I initiated and supervised the development of our new sequences in Analysis (MATH 417 - MATH 418), Algebra (Math 466 - MATH 467) and Linear Algebra (MATH 369 - MATH 469). The goal of this undergraduate curriculum reform was to introduce advanced courses in these key mathematical areas preparing our majors for graduate school, and conversely offer incoming graduate students the possibility to get prepared for our graduate courses. The development of these courses was a joint effort of a consortium of faculty members. The existing courses (MATH 369, MATH 417, MATH 466) have been revised and new courses (MATH 418, MATH 467, MATH 469) have been introduced to complete the sequences.

- **Math 430/ECE 430: Fourier/Wavelet Analysis with Applications**

  Together with Professor Scharf (ECE) I initiated in Fall 2009 a subcommittee of the Undergraduate Committee charged with the development of a new joint listed course on Fourier/ Wavelet Analysis. Chair of the committee was Professor Liu. I was active member of this committee and strongly involved in the course development. The course is intended as a key course for ECE Honors Track 2 students and Math majors following the Mathematics of Information Concentration. In Fall 2010 the course application has been submitted to the College Curriculum Committee. This course has become a regular senior-level course of our applied math undergraduate curriculum.

- **Syllabi for MATH 540 and MATH 640**

  As part of the reform of our Ph.D. Qualifier Examination in Spring 2009, I chaired the subcommittee of the Graduate Committee charged with the development of standardized course material for MATH 540 (Dynamical Systems) and MATH 640 (Ordinary Differential Equations I). Together with the committee members (Professors Oprea, Rudolph and Shipman) I developed syllabi and identified topics that form the subject of the qualifier exams for these courses.

- **Reform of the General Mathematics Concentration**

  In Spring 2008 I started a major reform of our General Mathematics Concentration. The changes serve to provide a strong education in Algebra, Analysis and Linear Algebra that prepares our majors for graduate school. The key courses of the revised program are the new sequences MATH 417 - MATH 418, MATH 466 - MATH 467 and the second Linear Algebra course MATH 469. The revised program was approved by faculty in Spring 2008. It was finalized and passed to the CCC in Fall 2008 by Interim Undergraduate Director James Thomas and approved by the UCC in the same semester.

- **Mathematics Honors Track 2 Program**

  I developed the first version of this program in Spring 2008, where it was approved by faculty. The program was finalized in Fall 2008 by Interim Undergraduate Director James Thomas and approved by the UCC in the same semester. Key courses of the program are MATH 417/418, MATH 466/467 and MATH 469.

- **Reform of the Mathematics of Information Concentration**

  The intention of this program was to provide students with a strong background in ECE and advanced programming skills. However, the original version from 2003 includes ECE and CS courses that have additional courses in these areas as prerequisites which are not listed in the program. As a result, there were effectively no free electives. Together with Professor Betten I reformed the program such that "hidden prerequisites" are eliminated and 22 credits of free electives are available within the 120-credits university requirement. Recently this concentration and the computational math concentration have been merged with the applied math concentration.

MAIN ACTIVITIES AS DEPARTMENT CHAIR AND ACTING CHAIR

- Five tenure track Assistant Professors received tenure and were promoted to Associate Professors and five Associate Professors were promoted to Professors.
- Hired eleven new tenure track faculty including an endowed Yates Chair.
- Introduced the position of Academic Support Coordinator.
- Supervised and contributed essentially in writing to our eight-year Department review 2000 - 2008 and our six-year review 2008 - 2014.
- Supervised and wrote several revisions and extensions of our Department code.
- Initiated and contributed to various curriculum reforms.
- Established the Calculus center with support from the Dean.
- Introduced regular undergraduate poster sessions with prizes.

COURSES TAUGHT

At University of Tübingen

- Graduate Courses (after Pre-Diploma) on
  - Methods of Mathematical Physics
  - Systems Theory I/II: Deterministic/Stochastic Systems
  - Dynamical Systems and Chaos
  - Neural Networks
  - Singularity and Bifurcation Theory
- Organization of Seminars on Nonlinear Dynamics and Bifurcation, Pattern Formation in Condensed Matter, Neural Networks and Pattern Recognition, for Graduate Students and Postdocs

At Colorado State University

- MATH 317: Advanced Calculus of One Variable (Spring 2017, Fall 2018, 2020-online)
- M331: Methods of Applied Mathematics I (Fall 1998)
- MATH 331: Introduction to Mathematical Modeling (Fall 2003, 2004, 2016 - 2019, 2020-online)
- M332: Methods of Applied Mathematics II (Spring 1996-1999, 2001)
- MATH 332: Partial Differential Equations (Spring 2007)

- MATH 340: Introduction to Ordinary Differential Equations (Spring-Fall 1996 & 1999, Spring 2000 & 2001, Fall 2002, Spring-Fall 2005 & 2006, Spring 2007, Fall 2009)
- MATH 345: Differential Equations (Spring-Fall 2000, Fall 2001, 2010 - 2013, 2015)
- MATH 369: Linear Algebra (Spring 1997)
- MATH 417: Advanced Calculus II (Fall 2017, 2019)
- MATH 435: Projects in Applied Mathematics (Spring 2002)
- MATH 519: Complex Variables I (Spring 2006)
- M531: Discrete Models of Physical Systems (Fall 1995)
- M532: Continuous Models of Physical Systems (Spring 1996)
- MATH 540: Dynamical Systems (Fall 1995, 1997, 1999, 2001, 2003, 2005, 2006, 2016)
- MATH 560: Linear Algebra (Fall 1998)
- MATH 640: Ordinary Differential Equations I (Spring 1997, Fall 2002 & 2004)
- MATH 641: Ordinary Differential Equations II (Spring 2005 & 2004)
- M675J: Advanced Dynamical Systems (Spring 1998)
- M775: Introduction to Equivariant Bifurcation Theory (Fall 1996)

Course Coordination: MATH 340, Introduction to Ordinary Differential Equations, Fall 1996 - Spring 2002 and Fall 2005 - Spring 2010

SERVICE

Department, College and University Committee Service

- Department Promotion Committee for Patrick Shipman, Chair, 2019
- Department Undergraduate Committee, Chair (Fall 2007 - Spring 2011)
- Department Executive Committee (Fall 2011 - Spring 2016 as Chair, Fall 2010 - Spring 2011, Spring 2010 (Chair), Fall 2008 (Chair) - Spring 2009)
- Department 8-Years Review Committee, Chair (Fall 2008 - Spring 2009)
- Department 6-Years Review Committee, Chair (Fall 2014 - Spring 2015)
- Department Search Committee (Fall 2006 - Spring 2007)
- Department Promotion and Tenure Committee (Fall 2010: Chair, Fall 2005, Fall 2001)
- Department Graduate Committee (Fall 2003 - Spring 2006, Fall 1998 - Spring 2000)
- Grade Appeal Committees for two student appeals, Chair of one committee (Spring 2007)
- Calculus Redesign Task Force (Math faculty and TILT personnel, Fall 2008 - Spring 2009)
- MATH 281 (experimental course on Mathematical Reasoning) subcommittee of the Department Undergraduate Committee (Fall 2007: Chair, Spring 2010, Fall 2010)
- MATH 540/640 (Dynamical Systems/Ordinary Differential Equations) syllabus subcommittee of the Graduate Committee, Chair (Fall 2009 - Spring 2010)
- Fourier/Wavelet course subcommittee of the Undergraduate Committee (Fall 2009)
- College Executive Committee (June 2011 - June 2016, December 2010, Spring 2010, Fall 2008)
- College Teaching Awards Committee (Spring 2007 - Spring 2009)
- University Faculty Council (Fall 2016 - Spring 2017)

Departmental Seminar/Colloquium Organization

- Applied Dynamics Lab (Fall 2009 - Fall 2019, with I. Oprea and P. Shipman)
- Applied Math Seminar (Fall 2004 - Spring 2005, Fall 1996 - Spring 2000)
- Symmetry Seminar (Spring and Fall 1998)

Math Day: Regular annual, varied assignments 1995 - 2019

Service for the Profession

- *Proposal Reviews:* NSF (Comparative Review, 2002), EPSRC (2003), DOE (2005), ACS Petroleum Funds (2006, 2007)
- *Paper Reviews:* Since 1995 Referee for Chaos, Dynamical Systems, Europhysics Letters, J. Appl. Math. and Comp., J. Nonlinear Sci., J. Physics A, J. Physics D, J. Sound and Vibration, Nonlinearity, Pattern Recognition Letters, Physica D, Physics Letters A, Proc. Roy. Soc. Lond., SIAM J. on Applied Dynamical Systems, Z. Angew. Math. und Mech., J. Math. Anal. and Appl., Int. J. Nonlin. Scie. and Num. Sim. About 2-8 papers per year.
- *Editorial Board:* Associate Editor for Ordinary Differential Equations and Dynamical Systems, Rocky Mountain Journal of Mathematics, August 2007 - October 2008

EXTERNAL FUNDING

At Colorado State University

- NSF-DMS-1615909. Pattern Formation and Spatiotemporal Complex Dynamics in Extended Anisotropic Systems, 9/1/2016-8/31/2020, $409,978. PI: I. Oprea, CoPIs: G. Dangelmayr, P. Shipman.
- NSF-EEC-1519438. Revolutionizing Roles to Reimagine Integrated Systems of Engineering Formation, 7/1/2015-6/30/2020, $1,988,663. PI: A. Maciejewski, CoPIs: Z.S. Byrne, T.W. Chen, G. Dangelmayr, L.B. Sample McMeeking, T.J. Siller.
- NSF-ATM-0530884. CMG Research: Analysis of Transport, Mixing and Coherent Structures in Hurricane Intensity, 10/1/2005-5/15/2010, $1,573,078. PI: M. Montgomery, CoPI: M. Kirby, Collaborators: G. Dangelmayr, W. Schubert.
- NSF-DMS-0407418. Collaborative Research: Pattern Formation and Dynamics in Nematic Electroconvection, 9/1/2004-8/31/2008, $139,000. PI: I. Oprea, CoPI: G. Dangelmayr.
- NSF-228181. *Workshops on Dynamics and Bifurcation of Patterns in Dissipative Systems*, 2/1/2003-1/31/2004, $17,400. PI: I. Oprea, CoPI: G. Dangelmayr.
- NSF-DUE-0126650. *A Mathematical Modeling Program for Undergraduates in Science, Mathematics, Engineering and Technology*, 1/1/2002-12/31/2004, $74,935. PI: M. Kirby, CoPI: G. Dangelmayr.
- NSF-EAR-0120630. *Biocomplexity in African Savannas*, 9/1/2001-8/31/2005, $1,424,965 PI: N. Hanan, CoPIs: P. Omi, M. Coughenour, Collaborator: G. Dangelmayr.

At University of Tübingen (German titles translated)

- 1995 - 1997: *Analysis of the Model Equations for Earth Mantle Convection Using Methods of Nonlinear Dynamics and Bifurcation Theory.* German National Science Foundation (DFG).

- 1994 - 1997: *Optimal Bases for the Efficient Solution of Symmetric Evolution Equations* (with W. Güttinger). German National Science Foundation (DFG): Program on Ergodic Theory, Analysis and Efficient Simulation of Dynamical Systems.
- 1993 - 1997: *Spherical Convection Systems* (with W. Güttinger). German National Science Foundation (DFG): Program on Structure Formation in Dissipative Continuous Systems.
- Sep - Dec 1993: *Structure Formation, Dynamics and Information Processing in Nonlinear Networks* (with T. Doderer, W. Güttinger, P. Hübener, W. Rosenstiel, H. Speckmann). Special Support by the State of Baden Württemberg and the University of Tübingen.
- 1993 - 1996: *Dynamics of Coupled Oscillators* (with P. Ashwin, W. Güttinger, I. Stewart). British Council and German Academic Exchange Service (DAAD).
- 1992 - 1995: *Dynamics of Traveling Waves* (with E. Knobloch). NATO Special Programme Panel on Chaos, Order and Patterns.
- 1991 - 1994: *Bifurcation Theory and Applications*. Tübingen Representative of the European Bifurcation Theory Group, European Stimulation Program (ESP).
- 1991 - 1993: *Nonlinear Dynamics of Continuous Systems* (with B. Fiedler, W. Güttinger, K. Kirchgässner, A. Mielke). Research Program of the State of Baden Württemberg.
- 1989 - 1990: *Pattern Formation and Pattern Recognition Through Self-Organization* (with W. Güttinger, H. Haken, A. Wunderlin). Research Program of the State of Baden Württemberg.
- 1982 - 1987: *Structural Stability in Physics* (with W. Güttinger). Volkswagen Foundation.

CONFERENCE ORGANIZATION AND LECTURES

Conference Organization

- Minisymposium on Applied Dynamical Systems. SIAM Central States Section Conference, September 2017, Fort Collins, Colorado (with I. Oprea, P. Shipman)
- Minisymposium on Spatiotemporally Complex Patterns. SIAM Conference on Applications of Dynamical Systems, May 2017, Snowbird, Utah (with I. Oprea, P. Shipman)
- Minisymposium on Spatiotemporal Complexity: Modelling, Theory and Analysis. SIAM Conference on Applications of Dynamical Systems, May 2007, Snowbird, Utah (with I. Oprea)
- Rocky Mountain Workshop on Dynamics and Bifurcation of Patterns in Dissipative Systems. NSF-Workshop, May 19-22, 2003, Fort Collins, CO (with I. Oprea)
- Workshop on Dynamics, Bifurcations and Patterns. May 3-4, 2000, Colorado State University, Fort Collins, CO (with I. Oprea)
- Empirical and Analytical Reduction of Nonlinear Symmetric Systems. March 10-15, 1997, University of Tübingen, Tübingen, FRG (with C. Geiger and M. Kirby)
- DFG-Workshop on Reduction of PDE's. November 19-22, 1995, Tübingen, FRG (with K. Böhmer and K-P. Hadeler)
- Workshop on Dynamics of Coupled Oscillators. August 24 - 25, 1994, University of Tübingen, Tübingen, FRG (with P. Ashwin)
- Workshop on Synergetics. December 1 - 3, 1989, University of Tübingen, Tübingen, FRG (with D. Armbruster and W. Güttinger)
- International Symposium on the Physics of Structure Formation: Theory and Simulation. October 27 - 31, 1986, Tübingen, FRG (with W. Güttinger)

Lectures at Conferences and Workshops

- *Amplitude and Phase Equations in Anisotropic Systems*, SIAM Conference on Applications of Dynamical Systems, May 2019, Snowbird, Utah
- *Spatiotemporal Intermittency and Chaos in a Ginzburg Landau System for Oscillatory Instabilities in Nematic Electroconvection*, SIAM Conference on Applications of Dynamical Systems, May 2017, Snowbird, Utah
- *Near-onset Convective Wave Patterns in Nematic Liquid Crystals*, NSF Workshop on Mathematical Modeling and Computer Simulations for Soft Materials, September 13 - 17, 2010, Fort Collins, CO
- *Envelope Dynamics of Experimental and Simulated Nematic Electroconvection Patterns*, Dynamics Days Europe, July 2007, Loughborough, UK
- *Envelope Dynamics of Simulated and Experimental Electroconvection Patterns*, SIAM Conference on Applications of Dynamical Systems, May 2007, Snowbird, Utah
- *Globally Coupled Ginzburg Landau Equations for Electroconvection in Nematic Liquid Crystals*, Poster, 21st International Liquid Crystal Conference, July 2006, Keystone, CO,
- *Zig zag Analysis of a Spatiotemporal Pattern Recorded During Electroconvection of a Nematic Liquid Crystal*, CSU/LANL(DDMA) Workshop, September 2006, Fort Collins, CO
- *Globally Coupled Ginzburg Landau Equations for Electroconvection in Nematic Liquid Crystals*, Workshop on Pattern Formation in Fluids, 12-16 December 2005, Cambridge, UK,
- *Introduction to Symmetry and Manifolds*, Workshop on Geometry and Symmetry in Numerical Computation in honor of Eugene Allgower, 8-10 August 2005, Fort Collins, CO
- *Eckhaus Stability Boundaries for Waves in Anisotropic Systems*, International Conference on Industrial and Applied Mathematics, July 7 - 11, 2003, Sydney, Australia
- *Mathematical Approaches to Complexity*, Seminar lecture at the Spring 2003 Biocomplexity seminar, NREL, CSU, 4 Feb, 2003
- *Wave Patterns in Electroconvection of Nematic Liquid Crystals: A Ginzburg Landau Approach*, Poster with I. Oprea, Rocky Mountain Workshop on Dynamics and Bifurcation of Patterns in Dissipative Systems, May 19 - 22, 2003, Fort Collins, CO
- *Global Minimization of Hopf Surfaces with Application to Electroconvection in Nematic Liquid Crystals*, Poster with I. Alolyan, G. Allgower, I. Oprea, Rocky Mountain Workshop on Dynamics and Bifurcation of Patterns in Dissipative Systems, May 19 - 22, 2003, Fort Collins, CO
- *Event Statistics of Time Series Simulated using a Spatial Savanna Model and Simple Threshold Model*, Poster with W. Sea und N. Hanan, African Savanna Complexity Workshop, January 23 - 25, 2003, Luiperdskloof, South Africa
- *Effect of Spatial Heterogeneity and Scale on a Savanna Model*, Poster with W. Sea und N. Hanan, African Savanna Complexity Workshop, January 23 - 25, 2003, Luiperdskloof, South Africa
- *Biocomplexity in African Savannas*, Poster with N. Hanan, NSF Workshop on Integrating Education in Complexity Research, April 14 -16, 2002, Washington DC
- *Reinforcement Learning Chaos Control Using Value Sensitive Vectorquantization*, International Joint Conference on Neural Networks, July 15 - 19, 2001, Washington DC

- *Ginzburg Landau Study of Electroconvection in Nematic Liquid Crystals*, Poster with I. Oprea, 5'eme Colloque Franco-Roumain de Mathematiques Applicquees, August 28 - September 1, 2000, Constanta, Roumanie
- *Ginzburg Landau Study of Electroconvection in Nematic Liquid Crystals*, Workshop on Bifurcations: Numerical Methods, Software, Applications, June 29 - 30, 2000, Gent, Belgium
- *A Ginzburg Landau Study of Electroconvection in Nematic Liquid Crystals*, Workshop on Dynamics, Bifurcations and Patterns, May 3 - 4, 2000, Fort Collins, CO
- *Hopf Bifurcation in Anisotropic Systems*, Fifth SIAM Conference on Applications of Dynamical Systems, May 23 - 27, 1999, Snowbird, Utah
- *Optimal Chaos Control through Reinforcement Learning*, Poster with S. Gadaleta, Fifth SIAM Conference on Applications of Dynamical Systems, May 23 - 27, 1999, Snowbird, Utah
- *Parity Breaking Bifurcation in Inhomogenous Systems*, Workshop on Hybrid Methods for Bifurcation and Dynamics in Partial Differential Equations, June 9 - 11, 1997, Marburg, FRG
- *Imperfect Bifurcation of Traveling Waves*, DFG-Workshop on Empirical and Analytical Reduction of Nonlinear Symmetric Systems, March 10 - 15, 1997, Tübingen, FRG
- *Parity Breaking Instability in Inhomogenous Systems*, Dynamics Days, January 8 - 10, 1997, Tempe, Arizona
- *Compressible Convection in Spherical Shells*, Poster with C. Geiger and D. Rodriguez, 6th Colloquium of DFG-SSP on Structure Formation in Continuous Dissipative Systems, March 14 - 16, 1996, Goslar, FRG
- *Continuation and Detection of Coherent Structures*, Poster with R. Rzehak, DPG/AFK - Spring Meeting, March 25 - 29, 1996, Regensburg, FRG
- *Center Manifold-Reduction from an Applied Point of View*, DFG-SSP Workshop on Reduction of PDE's, November 19 - 22, 1995, Tübingen, FRG
- *Parity Breaking Bifurcation in Inhomogeneous Systems*, Poster with J. Hettel and E. Knobloch, Third SIAM Conference on Application of Dynamical Systems, May 21 - 24, 1995, Snowbird, Utah
- *Randomness or Determinism? Introduction to the World of Deterministic Chaos*, Introductory Lecture of the Studium Generale - Lecture Series on Complexity and Selforganization, April - July, 1995, University of Tübingen
- *Parity breaking instabilities in inhomogeneous systems*, Workshop on Bifurcation and Symmetry, June 25 - July 1, 1995, Mathematisches Forschungsinstitut Oberwolfach, FRG
- *Mathematical Foundations of Structure Formation*, DFG-SSP Workshop on Structure Formation in Continuous Dissipative Systems May 8 - 10, 1995, Schwerte, FRG
- *Bifurcation of Traveling Wave States in Extended Systems*, IUTAM/ISIMM Symposium on Structure and Dynamics of Nonlinear Waves in Fluids, August 17 - 20, 1994, Hannover, FRG.
- *Ginzburg-Landau Description of Waves in Extended systems*, NATO-ARW Workshop on Dynamical Systems, Bifurcations and Symmetry (organized by the European Bifurcation Theory Group), September 3 - 9, 1993, Cargese, France
- *Coupled oscillators with $D_3 \times D_3$-symmetry*, Workshop on Reactive and Diffusive Flows, ESF Study Center, November 22 - December 13, 1992, Heidelberg, FRG

- *Oscillatory Instabilities in Extended Systems*, 1992 AMS-SIAM Summer Seminar in Applied Mathematics: Exploiting Symmetry in Applied and Numerical Analysis, July 26 - August 1, 1992, Ft. Collins, Colorado, USA
- *Hopf Bifurcation with $D_m \times D_n$-Symmetry and Interacting Clusters of Oscillators*, International Conference on Bifurcations in Differentiable Dynamics, June 9 - 13, 1992, Hasselt, Belgium
- *Degenerate Bifurcation Involving the l=4 Representation of O(3)*, Workshop on Bifurcation with O(3) Symmetry, May 4 - 8, 1992, Nice, France
- *Degenerate Bifurcation Involving the l=4 Representation of O(3)*, Conference on Applied Dynamics and Bifurcation Theory (in honour of Klaus Kirchgässner), January 12 - 18, 1992, Oberwolfach, FRG
- *Explicit Symmetry Breaking of Equivariant bifurcations*, Int. Conference on Bifurcation and Symmetry: Cross Influences between Mathematics and Applications, June 2 - 7, 1991, Marburg, FRG
- *Traveling Wave Convection in Finite Containers*, IUTAM Symposium on Nonlinear Hydrodynamic Stability and Transition, September 3 - 7, 1990, Nice, France
- *Dynamical Symmetries and Bifurcations*, Conference on Bifurcation and Chaos: Analysis, Algorithms, Applications, August 10 - 24, 1990, Würzburg, FRG
- *Oscillatory States in Analog Neural Networks*, Poster, International Neural Network Conference, July 9 - 13, 1990, Paris, France
- *Synchronized States in Systems of Neural Oscillators*, Poster with T. Gencic, 1st Int. Workshop on Microelectronics for Neural Networks, June 25 - 26, 1990, Dortmund, FRG
- *Storing Cycles in Analog Neural Networks*, Int. Conference on Parallel Processing in Neural Systems and Computers (10th Cybernetics Congress of the DGK), March 19 - 21, 1990, Düsseldorf, FRG
- *Dynamics of Slowly Varying Wave Trains in Finite Geometry*, Workshop on Synergetics, December 1 - 3, 1989, Tübingen, FRG
- *Hopf Bifurcation with Broken Translation Symmetry*, NATO Workshop on Nonlinear Evolution of Spatio-Temporal Structures in Dissipative Systems, September 25 - 29, 1989, Streitberg, FRG
- *A Codimension-four Bifurcation Occurring in Optical Bistability*, NATO Advanced Research Workshop on Continuation and Bifurcations: Numerical Techniques and Applications, September 18 - 22, 1989, Leuven, Belgium
- *A Codimension-four Bifurcation Occurring in Optical Bistability*, ESP Workshop on Dynamics, Bifurcation and Singularity Theory, July 10 - 14, 1989, Warwick, GB
- *Effect of Sidewalls on the Hopf Bifurcation in Extended Systems*, Colloque Bifurcations et Attracteurs, September 5 - 9, 1988, Nice, France
- *O(2)-Equivariant Hopf Bifurcation with Symmetry Breaking Perturbation*, International Conference on Bifurcation Theory and Its Numerical Analysis, July 4 - 9, 1988, Xian, P.R. China
- *Hopf Bifurcation with Broken O(2)-Symmetry*, Workshop on Computation of Bifurcations in Mechanical Systems, April 17 - 23, 1988, Oberwolfach, FRG
- *Steady State-Steady State Interactions Between Isomorphic and Non-isomorphic Modes in the Presence of O(2)-symmetry*, Seminar on Symmetry and Dynamics, December 8 - 12, 1986, Heidelberg, FRG

- *Codimension-two Bifurcations with O(2)-Symmetry*, Workshop on Computational Aspects of Dynamical Systems, September 8 - 10, 1986, Ithaca, USA
- *Codimension-two Bifurcations with O(2)-Symmetry*, Conference on Bifurcation: Analysis, Algorithms, Applications, August 18 -22, 1986, Dortmund, FRG
- *Stationary Bifurcations in Non-flux Boundary Value Problems*, Arcata Conference on Multiparameter Bifurcation Theory, July 14 - 20, 1985, Arcata, USA
- *A Four-parameter Family of Planar Vector Fields*, Singularity Days II, July 1 - 2, 1985, Southampton, GB
- *Singularities in Quasi-geometrical Imaging*, NATO Advanced Research Workshop on Inverse Methods in Electromagnetic Imaging, September 18 - 24, 1984, Bad Windsheim, FRG
- *Nonlinear Phonon Focusing*, Fourth International Conference on Phonon Scattering in Condensed Matter, August 22 - 26, 1983, Stuttgart, FRG
- *Singularities in Phonon Focusing*, Poster with D. Armbruster, 23rd Discussion Meeting of the German Crystallographic Society, March 7 - 10, 1983, Tübingen, FRG

Presentations of Graduate Students (since 2004)

- C. Strickland:
  - *Modelling non-local invasive spread on continuous domains coupled with a vector-based transportation network*, Annual Meeting of the Society of Mathematical Biology. June 2013, Tempe, AZ.
  - *Modelling the nonlocal spread of invasive plant species in heterogeneous landscapes*, Joint AMS-MAA meeting, January 2013, San Diego, Ca.
- C. Zhang:
  - *Learning cycles in Hopfield-type networks with delayed coupling*. Presented at:
    - 2013 Joint AMS-MAA meeting, January 2013, San Diego, Ca;
    - Dynamics Days 2013, January 2013, Denver, Co (poster);
    - SIAM Conference on Applications of Dynamics Systems, May 2013, Snowbird, Utah.
  - *Storing Cycles in Neural Networks with Delayed Couplings*, The 9th FRAM student conference, March 2013.
  - *Cyclic Patterns, Network Topology and Delay Induced Bifurcations in Neural Networks*, Annual Meeting of the Society of Mathematical Biology. June 2013, Tempe, AZ.
  - *Learning cyclic patterns in continuous Hopfield networks*, 2012 Workshop for Young Researchers in Mathematical Biology, August 2012, Columbus, Oh (poster).
  - *Simple cycles in continuous Hopfield networks: Admissability and bifurcation*, Dynamics Days 2012, Baltimore, Ma (poster).
- Y. Zou: *Modelling intermittency and chaos observed in a system of Ginzburg Landau equations for nematic electroconvection*, Joint AMS-MAA meeting, January 2012, Boston, Ma.
- B. Rutherford:
  - *The role of Lagrangian coherent structures in tropical cyclone formation*, 29th Conference on Hurricanes and Tropical Meteorology. May 10-14, 2010, Tuscon, Arizona
  - *Dynamical Systems Approach to Mixing in Hurricane Models*, SIAM Conference on Applications of Dynamical Systems, May 2007, Snowbird, Utah (poster).

- J. Ladd:
  - *Time Series Analysis of an Electroconvection Pattern*, Annual APS Meeting 2006, Baltimore
  - *Heteroclinic Cycles in a Symmetric System Derived from the Partial Differential Equations for Electroconvection in Nematic Liquid Crystals*, Conference on Industrial and Interdisciplinary Mathematics, 2004, Tempe, AZ (poster).
- T. Wildey: *Spatiotemporal Dynamics of a System of Globally Coupled Ginzburg Landau Equations*. Conference on Industrial and Interdisciplinary Mathematics, 2004, Tempe, AZ (poster).

PUBLICATIONS

Books

- G. Dangelmayr and I. Oprea (eds.): *Dynamics and Bifurcation of Patterns in Dissipative Systems.* World Scientific 2004. ISBN 981-238-946-6.
- G. Dangelmayr, B. Fiedler, K. Kirchgässner and A. Mielke: *Dynamics of Nonlinear Waves in Dissipative Systems: Reduction, Bifurcation and Stability.* Pitman Research Notes in Mathematics Series 352, Longman 1996. ISBN 058-222-929-4.
- W. Güttinger and G. Dangelmayr (eds.): *The Physics of Structure Formation.* Springer 1987. ISBN 038-718-383-3.

Articles in Journals and Proceedings

1. D. Handwerk, G. Dangelmayr, I. Oprea, and P. Shipman. *Phase-Diffusion Equations for the Anisotropic Complex Ginzburg-Landau Equation*, https://export.arxiv.org/abs/2009.12945.

2. D. Jonas, M. Kirby, A. R. Schenkel, G. Dangelmayr. *Modeling of adaptive immunity uncovers disease tolerance mechanisms.* J Theor Biol. 2023 Jul 7;568:111498. doi: 10.1016/j.jtbi.2023.111498. Epub 2023 Apr 24. PMID: 37100114.

3. G. Dangelmayr and I. Oprea. *InOut Intermittency with Nested Subspaces in a System of Globally Coupled, Complex GinzburgLandau Equations.* International Journal of Bifurcation and Chaos, 31(1), 2130001-1-21 (2021).
4. I. Oprea and G. Dangelmayr. *A period doubling route to spatiotemporal chaos in a system of Ginzburg-Landau equations for nematic electroconvection.* Discrete and Continuous Dynamical Systems Series B, 24:273-296 (2019), doi: 10.3934/dcdsb.2018095
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7. C. Strickland, G. Dangelmayr, and P.D. Shipman. *Modeling the presence probability of invasive plant species with nonlocal dispersal.* Journal of Mathematical Biology 69:267-294 (2014).
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10. Y. Zou, G. Dangelmayr, and I. Oprea. *Intermittency and chaos near Hopf bifurcation with broken $O(2) \times O(2)$ symmetry.* Int. J. Bifurcation and Chaos, 23, 1350139, 19 pages (2013).
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