

**LIST OF PARTICIPANTS
PATTERN FORMATION IN CONTINUOUS
AND COUPLED SYSTEMS
May 11–15, 1998**

Guenther Ahlers	Univ. of California-Santa Barbara (Physics)
Rutherford Aris	University of Minnesota (Chemical Engineering)
Dieter Armbruster	Arizona State University (Mathematics)
Don Aronson	University of Minnesota (Mathematics)
Peter Ashwin	University of Surrey (Mathematics and Statistics)
Dwight Barkley	University of Warwick (Mathematics Institute)
Kurt Berger	University of Wisconsin, Madison (Mathematics)
Eberhard Bodenschatz	Cornell University (Physics)
Jared Bronski	Stanford University (Mathematics)
Pietro-Luciano Buono	University of Houston (Mathematics)
F.H. Busse	Universität Bayreuth (Physikalisches Institut)
David Chillingworth	University of Southampton (Mathematics)
Pascal Chossat	University of California (Mathematics)
Stella Maria Costa de Abreu	University of Porto (Applied Mathematics)
John David Crawford	University of Pittsburgh (Physics)
Shangbin Cui	Lanzhou University (Mathematics)
Ana Paula da Silva Dias	University of Warwick (Mathematics)
Gerhard Dangelmayr	Colorado State University (Mathematics)
Benoit Dionne	University of Ottawa (Mathematics)

Jinqiao Duan	Clemson University (Mathematical Sciences)
Matthew Earl	Cornell University
Michael J. Field	University of Houston (Mathematics)
Jerry Gollub	Haverford College (Physics)
Martin Golubitsky	University of Houston (Mathematics)
M. Gabriela M. Gomes	University do Porto (Centro de Matematica Aplicada)
Michael Gorman	University of Houston (Physics)
Hans Peter Grimm	Northwestern University (Applied Mathematics)
John Guckenheimer	Cornell University (Mathematics)
Gemunu Gunaratne	University of Houston (Physics)
Aric Hagberg	Los Alamos National Laboratory (Center for Nonlinear Studies)
J Woods Halley	University of Minnesota (Physics and Astronomy)
John L. Hudson	University of Virginia (Engineering-Chemical)
Ronald Imbihl	Universitaet Hannover (Institut fur Physikalische Chemie)
Miaohua Jiang	Wake Forest University (Mathematics and Computer Science)
Mark Johnson	Entelos, Inc. (Biological Systems Modeling)
Mike Jolly	Indiana University (Mathematics)
Eric W. Justh	University of Maryland, College Park (Electrical Engineering)
Yannis Kevrekidis	Princeton University (Chemical Engineering)
Gregory P. King	University of Warwick (Fluid Dynamics Research Center)
Edgar Knobloch	University of California-Berkeley (Physics)
Bernd Krauskopf	University of Bristol (Engineering Mathematics)
Katharina Krischer	Fritz-Haber Institut (Max-Planck-Gesellschaft)
Martin (Maciej) Krupa	Technical Institute Vienna (Applied Mathematics)

Jeroen Lamb	University of Warwick (Mathematics Institute)
William Langford	The Fields Institute for Research in Mathematical Sciences
Ali Lari-Lavassani	University of Calgary (Mathematics and Statistics)
Reiner Lauterbach	Universität Hamburg (Institut für Angewandte Mathematik)
Victor LeBlanc	University of Ottawa (Mathematics and Statistics)
Chjan Lim	Rensselaer Polytechnic Institute (RPI) (Mathematical Sciences)
Dan Luss	University of Houston (Chemical Engineering)
Kurt Lust	Cornell University (Applied Mathematics)
John Mallet-Paret	Brown University (Applied Mathematics)
Rolf-Martin Mantel	University of Minnesota (Institute for Mathematics and its Applications)
Bernie Matkowsky	Northwestern University (Engineering Sciences and Applied Mathematics)
Ian Melbourne	University of Houston (Mathematics)
Ehud Meron	Ben-Gurion University (Physics)
Alexandra Milik	Technische Universität Wien (Institut für angewandte und numerische Mathematik)
Rennie Mirolo	Boston College (Mathematics)
Cyrill Muratov	Courant Institute
Wayne Nagata	University of British Columbia (Mathematics)
Mahesh Nerurkar	Rutgers University (Mathematics)
Ricardo Oliva	Cornell University
Hinke Osinga	California Institute of Technology
H.G. Purwins	Universität Münster (Institut für Angewandte Physik)
Sridhar Raghavachari	University of Notre Dame (Physics)

Yuriko Renardy	Virginia Polytechnic Institute and State University (Mathematics)
Hermann Riecke	Northwestern University (Applied Mathematics)
H.H. Rotermund	Fritz-Haber-Institut Abt. (Physikalische Chemie)
Rajarshi Roy	Georgia Tech (Physics)
Alastair Rucklidge	University of Cambridge (Applied Mathematics and Theoretical Physics)
Dumitru Dan Rusu	CMS-University of Guelph (Mathematics and Statistics)
Bjorn Sandstede	Ohio State University (Mathematics)
Tony Shardlow	University of Minnesota (Institute for Mathematics and its Applications)
Moshe Sheintuch	Technion (Chemical Engineering)
Mary Silber	Northwestern University (Eng Sci and Appl Math)
Ian Stewart	University of Warwick (Mathematics)
Steven H. Strogatz	Cornell University (Theoretical and Applied Mechanics)
Jim Swift	Northern Arizona University (Mathematics and Statistics)
Harry L. Swinney	University of Texas (Physics)
Laurette Tuckerman	IMA
Paul Umbanhowar	University of Pennsylvania (Physics and Astronomy)
H.S.J. van der Zant	Delft University of Technology (Applied Physics)
Stephan Van Gils	Universiteit Twente (Applied Mathematics)
Andre Vanderbauwhede	University of Gent (Pure Mathematics and Computer Science)
Shinya Watanabe	Ibaraki University (Mathematical Sciences)
Warren Weckesser	University of Minnesota (Institute for Mathematics and its Applications)
Hans Weinberger	University of Minnesota (Mathematics)

Kurt Wiesenfeld	Georgia Tech (Physics)
Ralf Wittenberg	Princeton University (Program in Applied and Computational Mathematics)
Claudia Wulff	Freie Universität Berlin (Institut für Mathematik I)
Stephen Yeung	Cornell University
William Zimmerman Jr.	University of Minnesota (Physics and Astronomy)

IMA SUMMER PROGRAMS

- 1987 Robotics
- 1988 Signal Processing
- 1989 Robust Statistics and Diagnostics
- 1990 Radar and Sonar (June 18 - June 29)
New Directions in Time Series Analysis (July 2 - July 27)
- 1991 Semiconductors
- 1992 Environmental Studies: Mathematical, Computational, and
Statistical Analysis
- 1993 Modeling, Mesh Generation, and Adaptive Numerical Methods
for Partial Differential Equations
- 1994 Molecular Biology
- 1995 Large Scale Optimizations with Applications to Inverse Problems,
Optimal Control and Design, and Molecular and Structural
Optimization
- 1996 Emerging Applications of Number Theory (July 15 - July 26)
Theory of Random Sets (August 22 - August 24)
- 1997 Statistics in the Health Sciences
- 1998 Coding and Cryptography (July 6 - July 18)
Mathematical Modeling in Industry (July 22 - July 31)
- 1999 Decision Making under Uncertainty: Energy and Environmental Models
(July 20-24, 1999)
Codes, Systems and Graphical Models (August 2-13, 1999)

SPRINGER LECTURE NOTES FROM THE IMA:

The Mathematics and Physics of Disordered Media

Editors: Barry Hughes and Barry Ninham
(Lecture Notes in Math., Volume 1035, 1983)

Orienting Polymers

Editor: J.L. Ericksen
(Lecture Notes in Math., Volume 1063, 1984)

New Perspectives in Thermodynamics

Editor: James Serrin
(Springer-Verlag, 1986)

Models of Economic Dynamics

Editor: Hugo Sonnenschein
(Lecture Notes in Econ., Volume 264, 1986)

The IMA Volumes in Mathematics and its Applications

Current Volumes:

- 1 **Homogenization and Effective Moduli of Materials and Media**
J. Ericksen, D. Kinderlehrer, R. Kohn, and J.-L. Lions (eds.)
- 2 **Oscillation Theory, Computation, and Methods of Compensated Compactness** C. Dafermos, J. Ericksen, D. Kinderlehrer, and M. Slemrod (eds.)
- 3 **Metastability and Incompletely Posed Problems**
S. Antman, J. Ericksen, D. Kinderlehrer, and I. Muller (eds.)
- 4 **Dynamical Problems in Continuum Physics**
J. Bona, C. Dafermos, J. Ericksen, and D. Kinderlehrer (eds.)
- 5 **Theory and Applications of Liquid Crystals**
J. Ericksen and D. Kinderlehrer (eds.)
- 6 **Amorphous Polymers and Non-Newtonian Fluids**
C. Dafermos, J. Ericksen, and D. Kinderlehrer (eds.)
- 7 **Random Media** G. Papanicolaou (ed.)
- 8 **Percolation Theory and Ergodic Theory of Infinite Particle Systems** H. Kesten (ed.)
- 9 **Hydrodynamic Behavior and Interacting Particle Systems**
G. Papanicolaou (ed.)
- 10 **Stochastic Differential Systems, Stochastic Control Theory, and Applications** W. Fleming and P.-L. Lions (eds.)
- 11 **Numerical Simulation in Oil Recovery** M.F. Wheeler (ed.)
- 12 **Computational Fluid Dynamics and Reacting Gas Flows**
B. Engquist, M. Luskin, and A. Majda (eds.)
- 13 **Numerical Algorithms for Parallel Computer Architectures**
M.H. Schultz (ed.)
- 14 **Mathematical Aspects of Scientific Software** J.R. Rice (ed.)
- 15 **Mathematical Frontiers in Computational Chemical Physics**
D. Truhlar (ed.)
- 16 **Mathematics in Industrial Problems** A. Friedman
- 17 **Applications of Combinatorics and Graph Theory to the Biological and Social Sciences** F. Roberts (ed.)
- 18 **q -Series and Partitions** D. Stanton (ed.)
- 19 **Invariant Theory and Tableaux** D. Stanton (ed.)
- 20 **Coding Theory and Design Theory Part I: Coding Theory**
D. Ray-Chaudhuri (ed.)
- 21 **Coding Theory and Design Theory Part II: Design Theory**
D. Ray-Chaudhuri (ed.)
- 22 **Signal Processing Part I: Signal Processing Theory**
L. Auslander, F.A. Grünbaum, J.W. Helton, T. Kailath, P. Khargonekar, and S. Mitter (eds.)

- 23 **Signal Processing Part II: Control Theory and Applications
of Signal Processing** L. Auslander, F.A. Grünbaum, J.W. Helton,
T. Kailath, P. Khargonekar, and S. Mitter (eds.)
- 24 **Mathematics in Industrial Problems, Part 2** A. Friedman
25 **Solitons in Physics, Mathematics, and Nonlinear Optics**
P.J. Olver and D.H. Sattinger (eds.)
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32 **Radar and Sonar, Part I**
R. Blahut, W. Miller, Jr., and C. Wilcox
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W.A. Stahel and S. Weisberg (eds.)
- 34 **Directions in Robust Statistics and Diagnostics: Part II**
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- 42 **Partial Differential Equations with Minimal Smoothness
and Applications** B. Dahlberg, E. Fabes, R. Fefferman, D. Jerison,
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M.E. Gurtin and G.B. McFadden
- 44 **Twist Mappings and Their Applications**
R. McGehee and K.R. Meyer (eds.)
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and M.S. Taqqu (eds.)

- 46 **New Directions in Time Series Analysis, Part II**
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and M.S. Taqqu (eds.)
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W.-M. Ni, L.A. Peletier, and J.-L. Vazquez (eds.)
- 48 **Linear Algebra, Markov Chains, and Queueing Models**
C.D. Meyer and R.J. Plemmons (eds.)
- 49 **Mathematics in Industrial Problems, Part 5** A. Friedman
50 **Combinatorial and Graph-Theoretic Problems in Linear Algebra**
R.A. Brualdi, S. Friedland, and V. Klee (eds.)
- 51 **Statistical Thermodynamics and Differential Geometry
of Microstructured Materials**
H.T. Davis and J.C.C. Nitsche (eds.)
- 52 **Shock Induced Transitions and Phase Structures in General
Media** J.E. Dunn, R. Fosdick, and M. Slemrod (eds.)
- 53 **Variational and Free Boundary Problems**
A. Friedman and J. Spruck (eds.)
- 54 **Microstructure and Phase Transitions**
D. Kinderlehrer, R. James, M. Luskin, and J.L. Ericksen (eds.)
- 55 **Turbulence in Fluid Flows: A Dynamical Systems Approach**
G.R. Sell, C. Foias, and R. Temam (eds.)
- 56 **Graph Theory and Sparse Matrix Computation**
A. George, J.R. Gilbert, and J.W.H. Liu (eds.)
- 57 **Mathematics in Industrial Problems, Part 6** A. Friedman
58 **Semiconductors, Part I**
W.M. Coughran, Jr., J. Cole, P. Lloyd, and J. White (eds.)
- 59 **Semiconductors, Part II**
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- 60 **Recent Advances in Iterative Methods**
G. Golub, A. Greenbaum, and M. Luskin (eds.)
- 61 **Free Boundaries in Viscous Flows**
R.A. Brown and S.H. Davis (eds.)
- 62 **Linear Algebra for Control Theory**
P. Van Dooren and B. Wyman (eds.)
- 63 **Hamiltonian Dynamical Systems: History, Theory,
and Applications**
H.S. Dumas, K.R. Meyer, and D.S. Schmidt (eds.)
- 64 **Systems and Control Theory for Power Systems**
J.H. Chow, P.V. Kokotovic, R.J. Thomas (eds.)
- 65 **Mathematical Finance**
M.H.A. Davis, D. Duffie, W.H. Fleming, and S.E. Shreve (eds.)
- 66 **Robust Control Theory** B.A. Francis and P.P. Khargonekar (eds.)
- 67 **Mathematics in Industrial Problems, Part 7** A. Friedman
68 **Flow Control** M.D. Gunzburger (ed.)

- 69 **Linear Algebra for Signal Processing**
A. Bojanczyk and G. Cybenko (eds.)
- 70 **Control and Optimal Design of Distributed Parameter Systems**
J.E. Lagnese, D.L. Russell, and L.W. White (eds.)
- 71 **Stochastic Networks** F.P. Kelly and R.J. Williams (eds.)
- 72 **Discrete Probability and Algorithms**
D. Aldous, P. Diaconis, J. Spencer, and J.M. Steele (eds.)
- 73 **Discrete Event Systems, Manufacturing Systems,
and Communication Networks**
P.R. Kumar and P.P. Varaiya (eds.)
- 74 **Adaptive Control, Filtering, and Signal Processing**
K.J. Åström, G.C. Goodwin, and P.R. Kumar (eds.)
- 75 **Modeling, Mesh Generation, and Adaptive Numerical Methods
for Partial Differential Equations** I. Babuska, J.E. Flaherty,
W.D. Henshaw, J.E. Hopcroft, J.E. Oliger, and T. Tezduyar (eds.)
- 76 **Random Discrete Structures** D. Aldous and R. Pemantle (eds.)
- 77 **Nonlinear Stochastic PDEs: Hydrodynamic Limit and Burgers'
Turbulence** T. Funaki and W.A. Woyczynski (eds.)
- 78 **Nonsmooth Analysis and Geometric Methods in Deterministic
Optimal Control** B.S. Mordukhovich and H.J. Sussmann (eds.)
- 79 **Environmental Studies: Mathematical, Computational,
and Statistical Analysis** M.F. Wheeler (ed.)
- 80 **Image Models (and their Speech Model Cousins)**
S.E. Levinson and L. Shepp (eds.)
- 81 **Genetic Mapping and DNA Sequencing**
T. Speed and M.S. Waterman (eds.)
- 82 **Mathematical Approaches to Biomolecular Structure and Dynamics**
J.P. Mesirov, K. Schulten, and D. Sumners (eds.)
- 83 **Mathematics in Industrial Problems, Part 8** A. Friedman
- 84 **Classical and Modern Branching Processes**
K.B. Athreya and P. Jagers (eds.)
- 85 **Stochastic Models in Geosystems**
S.A. Molchanov and W.A. Woyczynski (eds.)
- 86 **Computational Wave Propagation**
B. Engquist and G.A. Kriegsmann (eds.)
- 87 **Progress in Population Genetics and Human Evolution**
P. Donnelly and S. Tavaré (eds.)
- 88 **Mathematics in Industrial Problems, Part 9** A. Friedman
- 89 **Multiparticle Quantum Scattering With Applications to Nuclear,
Atomic and Molecular Physics** D.G. Truhlar and B. Simon (eds.)
- 90 **Inverse Problems in Wave Propagation** G. Chavent, G. Papanicolau,
P. Sacks, and W.W. Symes (eds.)
- 91 **Singularities and Oscillations** J. Rauch and M. Taylor (eds.)

- 92 **Large-Scale Optimization with Applications, Part I:
Optimization in Inverse Problems and Design**
L.T. Biegler, T.F. Coleman, A.R. Conn, and F. Santosa (eds.)
- 93 **Large-Scale Optimization with Applications, Part II:
Optimal Design and Control**
L.T. Biegler, T.F. Coleman, A.R. Conn, and F. Santosa (eds.)
- 94 **Large-Scale Optimization with Applications, Part III:
Molecular Structure and Optimization**
L.T. Biegler, T.F. Coleman, A.R. Conn, and F. Santosa (eds.)
- 95 **Quasiclassical Methods**
J. Rauch and B. Simon (eds.)
- 96 **Wave Propagation in Complex Media**
G. Papanicolaou (ed.)
- 97 **Random Sets: Theory and Applications**
J. Goutsias, R.P.S. Mahler, and H.T. Nguyen (eds.)
- 98 **Particulate Flows: Processing and Rheology**
D.A. Drew, D.D. Joseph, and S.L. Passman (eds.)
- 99 **Mathematics of Multiscale Materials** K.M. Golden, G.R. Grimmett,
R.D. James, G.W. Milton, and P.N. Sen (eds.)
- 100 **Mathematics in Industrial Problems, Part 10** A. Friedman
- 101 **Nonlinear Optical Materials** J.V. Moloney (ed.)
- 102 **Numerical Methods for Polymeric Systems** S.G. Whittington (ed.)
- 103 **Topology and Geometry in Polymer Science** S.G. Whittington,
D. Summers, and T. Lodge (eds.)
- 104 **Essays on Mathematical Robotics** J. Baillieul, S.S. Sastry,
and H.J. Sussmann (eds.)
- 105 **Algorithms For Parallel Processing** M.T. Heath, A. Ranade,
and R.S. Schreiber (eds.)
- 106 **Parallel Processing of Discrete Problems** P.M. Pardalos (ed.)
- 107 **The Mathematics of Information Coding, Extraction, and
Distribution** G. Cybenko, D.P. O'Leary, and J. Rissanen (eds.)
- 108 **Rational Drug Design** D.G. Truhlar, W. Howe, A.J. Hopfinger,
J. Blaney, and R.A. Dammkoehler (eds.)
- 109 **Emerging Applications of Number Theory** D.A. Hejhal, J. Friedman,
M.C. Gutzwiller, and A.M. Odlyzko (eds.)
- 110 **Computational Radiology and Imaging: Therapy and Diagnostics**
C. Börgers and F. Natterer (eds.)
- 111 **Evolutionary Algorithms** L.D. Davis, K. De Jong, M.D. Vose,
and L.D. Whitley (eds.)
- 112 **Statistics in Genetics** M.E. Halloran and S. Geisser (eds.)
- 113 **Grid Generation and Adaptive Algorithms** M.W. Bern, J.E. Flaherty,
M. Luskin (eds.)
- 114 **Diagnosis and Prediction** S. Geisser (ed.)
- 115 **Pattern Formation in Continuous and Coupled Systems: A Survey Volume**
M. Golubitsky, D. Luss, S.H. Strogatz (eds.)

FORTHCOMING VOLUMES

1992–1992: *Control Theory*
Robotics

1996 Summer Program: *Emerging Applications of Number Theory*

1996–1997: *Mathematics in High Performance Computing*
Algorithms for Parallel Processing
Evolutionary Algorithms
The Mathematics of Information Coding, Extraction and Distribution
Structured Adaptive Mesh Refinement Grid Methods
Computational Radiology and Imaging: Therapy and Diagnostics
Mathematical and Computational Issues in Drug Design
Rational Drug Design
Grid Generation and Adaptive Algorithms
Parallel Solution of Partial Differential Equations

1997 Summer Program: *Statistics in the Health Sciences*
Week 1: Genetics
Week 2: Imaging
Week 3: Diagnosis and Prediction
Weeks 4 and 5: Design and Analysis of Clinical Trials
Week 6: Statistics and Epidemiology: Environment and Health

1997–1998: *Emerging Applications for Dynamical Systems*
Numerical Methods for Bifurcation Problems
Multiple-time-scale Dynamical Systems
Dynamics of Algorithms