

XXV Dynamics Days Europe 2005
Berlin, Germany, July 25 - 28, 2005

Organizer: Eckehard Schöll

Scientific Program

Technische Universität Berlin



<http://wwwnlds.physik.tu-berlin.de/ddays05>

European Dynamics Days is a series of major international conferences for Nonlinear Science with a long tradition aimed at covering the entire field of dynamics and non-linearity. It provides a European forum for developments in theory and applications of nonlinear dynamics. Over 25 years, it has been bringing together researchers from a wide range of backgrounds including physics, chemistry, biology, engineering and mathematics for interdisciplinary research in nonlinear science.

In 2005 the XXV European Dynamics Days is hosted by the Technische Universität of Berlin, Germany. The conference will take place from Monday 25 July to Thursday 28 July.

Dynamics Days 2005 has been listed as a Europhysics Conference by the European Physical Society.

Local Organizing Committee:

Eckehard Schöll, Chair

Markus Bär, Harald Engel, Bernold Fiedler, Siegfried Hess, Andreas Knorr, Jürgen Kurths, Kathy Lüdge, Alexander Mikhailov, Volkhard Nordmeier

Conference Secretary: Andrea Schulze

Webmaster: Michael Block

Poster design: Frank Elsholz, Florian Koppelow

Computer facilities and audiovisual equipment: Grischa Stegemann, Jan Schlesner, Philipp Hövel

Organizational assistance: Johanne Hizanidis, Philipp Hövel

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Dynamics Days Europe 2005

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Program Overview
XXV Dynamics Days Europe, Berlin July 25 - 28, 2005

time	room	Monday 25 th	Tuesday 26 th	Wednesday 27 th	Thursday 28 th
9:00 – 10:30	PN 201	Opening I1 Peter Tass (Jülich)	I3 Peter Ashwin (Exeter) I4 Daniel Gauthier (Duke)	I6 Karin Dahmen (U of Illinois) I7 Takao Ohta (Kyoto)	I8 Josef Käs (Leipzig) I9 Mark Fromhold (Nottingham)
coffee break					
11:00 – 12:30	PN 201 PN 202	M1 Neurodynamics M2 Nonlinear Quantum Dynamics	M5 Noise-induced Phenomena M6 Complex Growth Phenomena	M 9 Stability of Nonlinear Waves M10 Nonlinear Optical Systems	M11 Nonlinear Dynamics of Nanosystems M12 Dynamical Networks
lunch break					
14:00 – 16:00	PN 201 PN 202 PN 203	C1 Nonlinearity and Dynamics in Biology C2 Quantum Chaos C3 Pattern Formation I	C4 Chaos Control C5 Non-equilibrium Statistical Physics and Stochastic Processes C6 Complex Growth / Time Series Analysis		C7 Applications in Engineering and Nanoscience C8 Dynamical Networks C9 Pattern Formation II
coffee break					
16:30 – 18:00	PN 201 PN 202	M3 Dynamics in Cell Biology M4 Patterns and Control	M7 Chaos Control M8 Turbulence	Conference Excursion	
18:00 – 18:45	PN 201	I2 John Hudson (U of Virginia)	I5 Wolfram Just (London)	Conference Dinner	
18:45 – 21:00	Area A / B	Poster Session I Welcome Reception	Poster Session II Concert	Closing I10 Robert Behringer (Duke)	

Program Schedule

Monday, 25 July 2005

Opening Session (PN 201)

9:00 Opening address

Plenary Invited Talk (PN 201)

Session chair: Eckehard Schöll

9:30 Development of novel brain stimulation techniques with methods from
I 1 nonlinear physics
Peter A. Tass (Jülich, Germany)

10:15 Coffee break

M1 Minisymposium: Neurodynamics (PN 201)

Organizer and session chair: Theo Geisel (Göttingen)

11:00 Mesoscopic spatial activity patterns in sensory neocortex: from the
M 1.1 physiology of perception to the construction of cortex-machine-interfaces
M. Deliano (Magdeburg, Germany)

11:30 Contour integration – from probabilistic models to non-linear neural
M 1.2 dynamics
U. Ernst (Bremen, Germany)

12:00 Spatiotemporal dynamics of networks with spatially decaying connectivity
M 1.3 Nicolas Brunel (Paris, France)

12:30 Multi-stable pattern formation in the visual cortex
M 1.4 F. Wolf (Göttingen, Germany)

M2 Minisymposium: Nonlinear Quantum Dynamics (PN 202)

Organizer and session chair: Fritz Haake (Essen)

11:00 Focusing light with unstable manifolds
M 2.1 Harald G. L. Schwefel (New Haven, USA)

11:30 Ehrenfest time dependence of electrical conduction through a chaotic
M 2.2 quantum dot.
J. Tworzydło (Warsaw, Poland)

12:00 Fidelity recovery in chaotic systems and the Debye-Waller factor
M 2.3 H.-J. Stöckmann (Marburg, Germany)

12:30 Semiclassical Foundation of Universality in Quantum Chaos
M 2.4 Sebastian Müller (Essen, Germany)

13:00 Lunch break

C1 Nonlinearity and Dynamics in Biology (PN 201)

Session chair: Markus Bär

14:00 Chemotactic collapse and mesenchymal morphogenesis
C 1.1 C. Escudero (Madrid, Spain)

14:20 Fractional transport of tumor cells
C 1.2 A. Iomin (Haifa, Israel)

- 14:40** Hydrodynamic Interactions Support Bundling of Helical Flagella
C 1.3 H. Stark (Konstanz, Germany)
- 15:00** Spatiotemporal pattern formation through molecular-level self-organization
C 1.4 in an array of molecular machines
V. Casagrande (Berlin, Germany)
- 15:20** Parameter estimation in self-organized critical epidemics
C 1.5 N. Stollenwerk (Jülich, Germany)
- 15:40** Epidemic outbreaks in a network of cities with distributed sizes
C 1.6 B. Blasius (Potsdam, Germany)
- C2 Quantum Chaos (PN 202)**
Session chair: Mark Fromhold
- 14:00** Semiclassical theory of weak antilocalization and spin relaxation in chaotic
C 2.1 and integrable billiards
Oleg Zaitsev (Regensburg, Germany)
- 14:20** Flooding of regular islands by chaotic states
C 2.2 A. Bäcker (Dresden, Germany)
- 14:40** Quasiscattered and scarred resonances in chaotic microcavities
C 2.3 Soo-Young Lee (Daejeon, Korea)
- 15:00** General Approach to the Quantum Kicked Particle in a Magnetic Field:
C 2.4 Quantum-Antiresonance Transition
Itzhack Dana (Ramat-Gan, Israel)
- 15:20** Chaotic-to-regular crossover of shot noise
C 2.5 in mesoscopic conductors
Florian Aigner (Vienna, Austria)
- 15:40** The classical dynamics near the triple collision in two-electron atoms
C 2.6 Gregor Tanner (Nottingham, UK)
- C3 Pattern Formation I (PN 203)**
Session chair: Takao Ohta
- 14:00** Theory of traveling filaments in bistable semiconductors
C 3.1 Pavel Rodin (St.-Petersburg, Russia)
- 14:20** The effect of diffusion and external electric field on the formation of patterns
C 3.2 in electric discharges
M. A. Fontelos (Madrid, Spain)
- 14:40** Oscillatory and chaotic shape evolution of electromigration-driven islands
C 3.3 Philipp Kuhn (Köln, Germany)
- 15:00** Quasi regular target waves in disordered oscillatory media
C 3.4 R. Tönjes (Potsdam, Germany)
- 15:20** Topological interactions and self-organization in anisotropic quasi
C 3.5 two-dimensional emulsions
Ralf Stannarius (Magdeburg, Germany)
- 15:40** Instabilities of pulses close to the transition between trigger and phase waves
C 3.6 G. Bordiougov (Berlin, Germany)
- 16:00** **Coffee break**

M3 Minisymposium: Dynamics in Cell Biology (PN 201)

Organizer and session chair: Lev Tsimring (San Diego)

16:30 Modeling and identification of complex cellular networks: Cell cycle regulation
 M 3.1 Jörg Stelling (Zürich, Switzerland)

17:00 Intracellular Ca^{2+} : A stochastic medium
 M 3.2 Rüdiger Thul (Berlin, Germany)

17:30 Delay-Induced Stochastic Oscillations in Gene Regulation
 M 3.3 L.S. Tsimring (San Diego, USA)

M4 Minisymposium: Patterns and Control (PN 202)

Organizer and session chair: Stefania Residori (Nice)

16:30 Universal Behaviour of Pattern Formation in Planar Gas-Discharge Systems
 M 4.1 Hans-Georg Purwins (Münster, Germany)

17:00 Control of Optical Localized Structures in a Liquid-Crystal-Light-Valve with Optical Feedback
 M 4.2 U. Bortolozzo (Nice, France)

17:30 Characterization and control of transverse patterns in nonlinear optics
 M 4.3 Ph. Jander (Münster, Germany)

Plenary Invited Talk (PN 201)

Session chair: Harald Engel

18:00 Sudden Onset of Corrosion as a Cooperative Critical Phenomenon
 I 2 J.L. Hudson (Charlottesville, USA)

Poster Session I and Welcome Reception (Poster Area A + B)**18:45-21:00** Posters P1.1 – P1.126

Area A: Pattern Formation, Turbulence and Fluid Dynamics, Space Time Chaos

Area B: Dynamical Systems, Time Series Analysis

Tuesday, 26 July 2005**Plenary Invited Talks (PN 201)**

Session chair: Roberto Artuso

9:00 Some Milnor attractors for dynamical systems with symmetries
 I 3 Peter Ashwin (Exeter, UK)

9:45 Using dissipative spatial structures to achieve ultra-low-light-level optical switching
 I 4 Daniel J. Gauthier (Duke University, USA)

10:30 Coffee break**M5 Minisymposium: Noise-induced Phenomena (PN 201)**

Organizer and session chair: Alexander Neiman (Athens/Ohio)

11:00 Stochastic resonance in non-Markovian systems
 M 5.1 I. Goychuk (Augsburg, Germany)

11:30 Signal processing in coupled stochastic systems

M 5.2 Jordi Garcia-Ojalvo (Terrassa, Spain)

12:00 Control of noise-induced oscillations

M 5.3 N.B. Janson (Loughborough, UK)

M6 Minisymposium: Complex Growth Phenomena (PN 202)

Organizer and session chair: Joachim Krug (Köln)

11:00 Pattern formation during solidification: Insights from phase-field modelling

M 6.1 Mathis Plapp (Palaiseau, France)

11:30 The Morphometry and Coarsening Dynamics of Faceted Crystal Surfaces

M 6.2 Stephen J. Watson (Evanston, USA)

12:00 Long time scale atomistic simulations of crystal growth

M 6.3 G. Henkelman (Austin, USA)

12:30 Lunch break

C4 Chaos Control (PN 201)

Session chair: Wolfram Just

14:00 Secret encryption keys by synchronization of chaotic systems

C 4.1 W. Kinzel (Würzburg, Germany)

14:20 Synchronization in complex networks with age ordering

C 4.2 Dong-Uk Hwang (Firenze, Italy)

14:40 Control of Spatio-temporal Chaos in Parametrically Excited Surface Waves

C 4.3 T. Epstein (Jerusalem, Israel)

15:00 Oscillation Suppression in Coupled Oscillators with Topologically Different

C 4.4 Attractors and Its Application to a Chaotic Nd:YAG Laser

Chil-Min Kim (Daejeon, Korea)

15:20 Control of unstable filaments in 3D excitable media

C 4.5 Sergio Alonso (Berlin, Germany)

15:40 Influence of measurement delay and impulse length in Poincaré based chaos

C 4.6 control

Jens Christian Claussen (Kiel, Germany)

C5 Non-equilibrium Statistical Physics and Stochastic Processes (PN 202)

Session chair: Siegfried Hess

14:00 The Fluctuation Theorem

C 5.1 Denis J. Evans (Canberra Australia)

14:20 Phase space transition state theory and conduits for reaction in

C 5.2 multidimensional systems

H. Waalkens (Bristol, UK)

14:40 Modeling fast Hamiltonian chaos by suitable stochastic processes

C 5.3 Anja Riegert (Dresden, Germany)

15:00 Rectifying thermal fluctuations in colloidal suspensions of magnetic particles

C 5.4 Andreas Engel (Oldenburg, Germany)

15:20 Nonequilibrium potential: its role in stochastic resonance in excited systems
 C 5.5 Horacio S. Wio (Santander, Spain)

15:40 Noise-induced bursting in electroreceptors
 C 5.6 Alexander Neiman (Ohio, USA)

C6 Complex Growth / Time Series Analysis (PN 203)

Session chair: Peter Ashwin

14:00 Nonlinear dynamics of step bunches
 C 6.1 Joachim Krug (Köln, Germany)

14:20 Spatial dynamics and formation of solidification fronts in a phase-field
 C 6.2 model with phase-dependent heat absorption
 K.B. Blyuss (Exeter, UK)

14:40 A Growth Process with Oblique Incidence
 C 6.3 G. Pruessner (Blacksburg, USA)

15:00 Revealing Non-linearities in Data Sets via the Analysis of Fourier Phase
 C 6.4 Coupling.
 R. Monetti (Garching, Germany)

15:20 Coupled Langevin equations for the North Atlantic Oscillation
 C 6.5 P.G. Lind (Stuttgart, Germany)

15:40 Brownian Motion of Migrating Cells?
 C 6.6 R. Klages (London, UK)

16:00 **Coffee break**

M7 Minisymposium: Chaos Control (PN 201)

Organizer and session chair: Stefano Boccaletti (Firenze)

16:30 Analytical treatment of delayed feedback control method for weakly
 M 7.1 nonlinear dynamical systems
 K. Pyragas (Vilnius, Lithuania)

17:00 Probing global properties of time-delayed feedback control in electronic
 M 7.2 circuits
 Hartmut Benner (Darmstadt, Germany)

17:30 Experimental targeting and control of spatiotemporal chaos in non linear
 M 7.3 optics
 S. Boccaletti (Firenze, Italy)

M8 Minisymposium: Turbulence (PN 202)

Organizer and session chair: Rudolf Friedrich (Münster)

16:30 Statistics of the Lagrangian acceleration in a turbulent flow
 M 8.1 N. Mordant (Paris, France)

17:00 On different cascade-speeds for longitudinal and transverse structures of
 M 8.2 turbulence
 Joachim Peinke (Oldenburg, Germany)

- 17:30** Large scale structures in Rayleigh-Bénard convection at high Rayleigh numbers
M 8.3 A. Tilgner (Göttingen, Germany)

Plenary Invited Talk (PN 201)

Session chair: Jürgen Kurths

- 18:00** Time-delayed feedback control of chaos: towards a global perspective
I 5 Wolfram Just (London, UK)

Poster Session II and Buffet (Poster Area A + B)

18:45-21:00 Posters P2.1 – P2.130

Area A: Chaos Control, Patterns and Noise, Stochastic Processes, Classical Hamiltonian Chaos, Quantum Chaos, Non-equilibrium Statistical Physics, Nonlinear Dynamics in Optical Systems, Applications in Engineering and Nanoscience, Control and Optimization

Area B: Granular Materials, Traffic Flow, Econophysics, Soft Matter, Dynamical Networks, Nonlinearity and Dynamics in Biology, Neuro-Dynamics, Complex Growth Phenomena

- 19:30** Concert and Exhibition “Music Complexes” (PN 115)

Wednesday, 27 July 2005

Plenary Invited Talks (PN 201)

Session chair: Daan Lenstra

- 9:00** Crackling Noise: From Magnets to Earthquakes
I 6 Karin Dahmen (Urbana Champaign, USA)
- 9:45** Dynamics of Traveling Patterns under Spatio-Temporal Forcing
I 7 Takao Ohta (Kyoto, Japan)
- 10:30** **Coffee break**

M9 Minisymposium: Stability of Nonlinear Waves (PN 201)

Organizer and session chair: Arnd Scheel (Minneapolis)

- 11:00** Exchange of stability in systems with marginally stable continuous spectrum
M 9.1 M. Kunze (Essen, Germany)
- 11:30** Asymptotic stability of solitary waves in models of water wave dynamics
M 9.2 Robert Pego (Pittsburgh, USA)
- 12:00** The structure of essential and absolute spectra, and their computation by continuation
M 9.3 Jens D.M. Rademacher (Vancouver, Canada)

M10 Minisymposium: Nonlinear Optical Systems (PN 202)

Organizer and session chair: Bernd Krauskopf (Bristol)

- 11:00** Semiconductor Lasers with Integrated Optical Delay: A Nonlinear Dynamics Laboratory
M 10.1 Hans-Jürgen Wünsche (Berlin, Germany)

- 11:30** Nonlinear Dynamics of Mutually Delay-Coupled Semiconductor Lasers
M 10.2 I. Fischer (Brussel, Belgium)
- 12:00** Coherent optical feedback with time delay in semiconductor lasers
M 10.3 Daan Lenstra (Amsterdam, Netherlands)
- 12:30** **Lunch break**
- 13:45** **Conference Excursion (buses leave in front of Physics Building)**
- 18:30** **Conference Dinner**

Thursday, 28 July 2005

Plenary Invited Talks (PN 201)

Session chair: Pierre Gaspard

- 9:00** Feeling and Influencing Active Intracellular Polymer Networks with Light –
I 8 From a Biological Cell's Polymer Physics to Early Cancer Diagnosis and
Nerve Regeneration
Josef A. Käs (Leipzig, Germany)
- 9:45** Quantum chaos in semiconductor superlattices
I 9 T.M. Fromhold (Nottingham, UK)
- 10:30** **Coffee break**

M11 Minisymposium: Nonlinear Dynamics of Nanosystems (PN 201)

Organizer and session chair: Heinz Georg Schuster (Kiel)

- 11:00** Nonlinear Dynamics in Nanosystems
M 11.1 P. Gaspard (Brussels, Belgium)
- 11:20** Dynamics of Nonlinear Coupled Nanomechanical Resonators
M 11.2 Ron Lifshitz (Tel Aviv, Israel)
- 11:40** Nonlinear dynamics in crystal growth
M 11.3 A. Voigt (Bonn, Germany)
- 12:00** Panel discussion

M12 Minisymposium: Dynamical Networks (PN 202)

Organizer: Shlomo Havlin (Ramat-Gan)

Session chair: Hernan Makse (New York)

- 11:00** Stability and topology of scale-free networks under attack and defense
M 12.1 strategies
Lazaros K. Gallos (Thessaloniki, Greece)
- 11:30** Anomalous distances and stability of complex networks
M 12.2 Reuven Cohen (Rehovot, Israel)
- 12:00** Self-similarity of complex networks
M 12.3 Hernán A. Makse (New York, USA)
- 12:30** **Lunch break**

C7 Applications in Engineering and Nanoscience (PN 201)

Session chair: Günter Radons

- 14:00** Symmetry-breaking bifurcation, chaos and rectification in lateral
C 7.1 semiconductor superlattices
K. N. Alekseev (Oulu, Finland)
- 14:20** Improvement of transient response in non-contact atomic force microscopy
C 7.2 — an application of time delayed feedback control —
K. Yamasue (Kyoto, Japan)
- 14:40** Hierarchical self-organization in swarms of nano-robots
C 7.3 V. Avrutin (Stuttgart, Germany)
- 15:00** Selforganization in communication networks and beyond
C 7.4 Martin Greiner (Munich, Germany)
- 15:20** Dynamic Modeling of the Parallel Kinematic Machines
C 7.5 Li Zhang (Dortmund, Germany)
- 15:40** Moving flock: rotating states and charging flock
C 7.6 Hsuan-Yi Chen (Jhongli, Taiwan)

C8 Dynamical Networks (PN 202)

Session chair: Holger Kantz

- 14:00** A general framework for computing the vulnerability of complex networks
C 8.1 R. Criado (Madrid, Spain)
- 14:20** Evolution of Networks with Optimized Synchronization Properties
C 8.2 Markus Brede (Canberra, Australia)
- 14:40** Universality in the synchronization of complex weighted networks
C 8.3 Changsong Zhou (Potsdam, Germany)
- 15:00** Phase chaos
C 8.4 Yu.L. Maistrenko (Cologne, Germany)
- 15:20** Synchronization changes in the EEG dynamics:
C 8.5 Spatio-temporal and statistical assessment for epileptic seizure prediction
M. Winterhalder (Freiburg, Germany)
- 15:40** Entrainment of Complex Oscillator Networks and Design of Biological
C 8.6 clocks
Hiroshi Kori (Berlin, Germany)

C9 Pattern Formation II (PN 203)

Session chair: Robert Behringer

- 14:00** Temporal Chaos Versus Spatial Mixing in Reaction-Advection-Diffusion
C 9.1 Systems
M. Abel (Potsdam, Germany)
- 14:20** Bifurcations in a system of interacting fronts
C 9.2 A. Amann (Cork, Ireland)
- 14:40** Chaos of topological defects in parametrically excited waves: Properties of
C 9.3 defects and ways to control their motion
V.O. Afenchenko (Nizhny Novgorod, Russia)

- 15:00** Defect-mediated turbulence
C 9.4 in catalytic CO oxidation on Pt(110)
C. Beta (Berlin, Germany)
- 15:20** Noise induced wave nucleations in an excitable chemical reaction
C 9.5 I. Sendiña–Nadal (Móstoles, Spain)
- 15:40** Deformation and instability of a liquid interface under the effect of acoustic
C 9.6 radiation pressure
R. Wunenburger (Talence Cedex, France)

16:00 Coffee break

M13 Minisymposium: Applications in Technological Processes (PN 201)

Organizer and session chair: Jens Starke (Heidelberg)

- 16:30** Generation of Articulated Mechanisms by Optimization Techniques
M 13.1 A. Kawamoto (Nagakute Aichi, Japan)
- 17:00** Pattern formation in advanced manufacturing processes: beam cutting
M 13.2 techniques
Günter Radons (Chemnitz, Germany)
- 17:30** Constructive Nonlinear Dynamics in Process Systems Engineering
M 13.3 M. Mönnigmann (Aachen, Germany)

M14 Minisymposium: Granular Media (PN 202)

Organizer and session chair: Martin van Hecke (Leiden)

- 16:30** Jamming: from grains to glasses and back again
M 14.1 L. E. Silbert (Chicago, USA)
- 17:00** Slow compaction in granular media
M 14.2 Daniel Bideau (Rennes, France)
- 17:30** Shear band formation in granular materials
M 14.3 János Kertész (Budapest, Hungary)

Plenary Invited Talk (PN 201)

Session chair: Denis Evans

- 18:00** Fluctuations, Correlations, and Transitions in Granular Materials
I 10 R. P. Behringer (Duke University, USA)

18:45 Closing