Dynamics Days 2001

Dresden, June 5 - 8, 2001

Scientific Organisers:
Holger Kantz, Klaus Richter, Thomas Schreiber

Program

MAX-PLANCK-INSTITUT FÜR PHYSIK KOMPLEXER SYSTEME
DRESDEN, GERMANY

Tuesday Morning 5 June

8:00 - 9:00
Registration

9:00 - 10:00
Henry D.I. Abarbanel: Nonlinear Dynamics of Small Networks of Neurons

Coffee Break

10:30 - 12:30 *Minisymposia*		
Room A: MS TUE 1 **T. Dittrich** **Quantum Chaos**	**Room B: MS TUE 2** **P. Grassberger** **Soft Matter**	**Room C: MS TUE 3** **R. Mantegna** **Econophysics**
H. Schanz *Classical and Quantum Hamiltonian Ratchets* K. Hornberger *Spectral cross correlations of magnetic edge states* T. Prosen *Mixing and Dynamical Localization in Systems without Classical Chaos* M. Sieber *Correlations between trajectories in chaotic systems and their connection to random matrix theory*	J. Vollmer *Phase Separation in Amphiphilic Mixtures: Local Equilibrium, Instabilities and Cascade Nucleation* W. Zimmermann *Action and Reaction of Polymers in Flows* L. Schäfer *Reptation in entangled polymer systems: can we observe asymptotic behavior?* G. Schütz *Nonequilibrium dynamics in dense polymer solutions*	H. Takayasu *Macroscopic price dynamics derived from microscopic market fluctuations* M. Marsili *Statistical mechanics of complex adaptive systems* P. Bak *(to be announced)*

Lunch Break

Tuesday Afternoon 5 June

14:00 - 15:00 **Bernold Fiedler: Dynamics of spirals and scroll waves**

15:00 - 16:00 **Carlo W.J. Beenakker: Chaotic wave dynamics**

Coffee Break

16:30 - 18:30 *Minisymposia*		
Room A: MS TUE 4 **I. Procaccia** **Turbulence**	**Room B: MS TUE 5** **P. Reimann** **Stochastic Processes**	**Room C: MS TUE 6** **E. Frey** **Biophysics**
A. Tilgner *The Dynamo experiment* A. Celani *Statistically Preserved Structures in Turbulence* E. Bodenschatz *Fluid Particle Accelerations in Fully Developed Turbulence* Y. Cohen *Statistically preserved structures*	C. Van den Broeck *The adiabatic piston: and yet it moves* L. Schimansky-Geier *Stochastic Resonance and Synchronization* J. Lehmann *Surmounting oscillating Barriers* W. Just *Sochastic modeling: Replacing fast degrees of freedom by noise*	U. Seifert *Non-equilibrium dynamics of membranes and molecules* C. Wiggins *Nonlinear Dynamics of Semiflexible Polymers* F. Jülicher *Modeling Molecular Motors* R. Metzler *The knot problem: From Alexander the Great to topological enzymes*

Buffet & Poster Session

Wednesday Morning 6 June

9:00 - 10:00
Eshel Ben-Jacob: The scaling and chaotic behavior of in vitro neural networks

Coffee Break

10:30 - 12:30 *Minisymposia*		
Room A: MS WED 1 **D. Helbing** **Traffic and Granular Flow**	**Room B: MS WED 2** **B. Mehlig** **Semiclassics**	**Room C: MS WED 3** **J. Kurths** **Neural and Medical Dynamics**
H. Herrmann *Motion and shape of dunes* P. Hänggi *Brownian and molecular engines* M. Treiber *Microscopic modelling of freeway traffic* M. Schreckenberg *Analysis and modelling of microscopic traffic dynamics*	M. Wilkinson *Absorption of radiation in small metal particles: a semi-classical RPA approach* S.L. Tomsovic *Deviations from universality in the spectra of complex quantum systems* T. Guhr *Acoustic resonances in thin chaotic plates*	J. Kurths *Phase Synchronization in Coupled Complex Systems: from Neuroscience to Solar Systems* M. Rosenblum *Detecting directionality of coupling of noisy oscillators* A. Stefanovska *Oscillators of the cardiovascular system and their synchronization* P. Tass *3D-localization of synchronization in the human brain by means of the synchronization tomography*

Lunch Break

Wednesday Afternoon 6 June

14:00 - 16:00

Poster Session

Coffee Break

16:30 - 17:30
Detlef Lohse: On the sound of snapping shrimp

17:30 - 18:30
Ingo Rehberg: Pattern formation in complex fluids

Thursday Morning 7 June

9:00 - 10:00
Stefan Rahmstorf: Abrupt climate change – a non-linear response of the climate system?

Coffee Break

10:30 - 12:30 *Contributed Talks*		
Room A: CS THU 1	**Room B: CS THU 2**	**Room C: CS THU 3**
D. van der Meer *Granular Gas Dynamics: Hysteretic Clustering, Anomalous Diffusion, and Biased Flow*	M. Stich *Pattern formation near the onset of birhythmicity*	M. Brack *Bifurcation cascades and self-similarity with analytical scaling properties in Hamiltonian Systems*
P.M. Reis *Coarsening of self-organised clusters due to segregation in a two-component monolayer of particles*	D. Topaj *Transition to coherent state in globally coupled maps: linear response approach*	M.A.F. Sanjuan *Wada basin boundaries in the Henon-Heiles System*
M. Ragwitz *Nonlinear determinism in time series measurements of 2-dimensional turbulence*	A. Yochelis *Labyrinths and phase locking in a spatially extended oscillatory systems*	R. Hilfer *Large Fractional Dynamics*
Y. Zarmi *From the Burgers Equation to a linear delay-differential equation*	T. John *On-off Intermittency in a Stochastically Driven Spatially Extended Dissipative System*	R. Friedrichs *Stretched patterns on ferrofluids*
O. Dauchot *Spiral Turbulence in shear flows: a long wave modulation of the turbulent state*	M. Timme *Unstable attractors in networks of biological oscillators*	J. Wiersig *Devil's Staircase in Magnetoresistance of a Periodic Array of Scatterers*
C. Beck *Generalized statistical mechanics approach to fully developed turbulence*	A.M. Albano *Mutual information in the scalp eeg during the initial sleep cycle*	P. Rodin *Superfast ionization fronts in semiconductors: pattern formation in power electronics*

Lunch Break

Thursday Afternoon 7 June

14:00 - 15:00
Haye Hinrichsen: Wetting under non-equilibrium conditions

15:00 - 16:00
Jon Keating: Periodic orbit bifurcations and quantum fluctuation statistics

Coffee Break

16:30 - 18:30 *Minisymposia*		
Room A: MS THU 1 **H. Chaté** **Space-time Chaos, Synchronisation**	**Room B: MS THU 2** **R. Klages** **Nonequilibrium Statistical Mechanics**	**Room C: MS THU 3** **L. Smith** **Time Series Analysis**
A. Pikovsky *Synchronization in complex systems* A. Goryachev *Synchronization defects: Novel type of structure in media with complex dynamics* M. van Hecke *Building Blocks of Spacetime-Chaos: dynamics of phase gradient blobs in the CGLE* A. Torcini *Linear and nonlinear information flow in spatially extended systems*	P. Gaspard *Fractals, chaos, and transport properties* H. van Beijeren *Chaotic properties of dilute random Lorentz gases* R. Dorfman *Entropy production in the relaxation to equilibrium for simple systems* H. Spohn *The Gallavotti-Cohen fluctuation theorem in driven nonequilibrium systems*	L.A. Smith *Uncertainty from a Time Series: The roles of ignorance and error in empirical models* D. Kaplan *A Bayesian Perspective on Chaotic Models* O. Talagrand *Realtime time series analysis in operational weather forecasts*

Buffet & Poster Session

Friday Morning 8 June

<table>
<tr><td colspan="3">9:00 - 11:00
Minisymposia</td></tr>
<tr><td>Room A: MS FRI 1
H. Emmerich
Complex Growth</td><td>Room B: MS FRI 2
C. Grebogi
Chaotic advection</td><td>Room C: MS FRI 3
E. Govekar
Applications in Engineering</td></tr>
<tr><td>G. Gompper
Lattice-Boltzmann study of spontaneous emulsification in ternary amphiphilic systems

M. Biehl
Growth and sublimation in the presence of competing surface reconstructions

S. Linz
Stochastic field equations for amorphous film growth

M. Schreiber
Application of the Hartree-Fock based diagonalization algorithm to the quantum Coulomb glass and to quantum dots</td><td>C. Grebogi
Dynamics in open flows

T. Tél
Active processes in open flows

W. Losert
Experiments with granular flows

G. Grégoire
Active and passive particles: Modelling beads in a bacterial bath</td><td>I. Grabec
Experimental characterisation of state and dynamics of manufacturing processes

R. Friedrich
Nonlinear modeling of water jet cutting

G. Stepan
Nonlinear regenerative machine tool vibrations

T. Lehn-Schiøler
Stochastic modeling of transonic flutter</td></tr>
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Coffee Break

11:30 - 12:30 *Contributed Talks*		
Room A: CS FRI 1	**Room B: CS FRI 2**	**Room C: CS FRI 3**
M. Palus *Beyond cycles: Nonlinearity and prediction of air pollution*	C. P. Dettmann *The Burnett expansion of the periodic Lorentz gas*	A. Kittel *Control of a intracavity frequency doubled solid state laser*
H. Lange *Synchronicity of long-term phenomena in hydrological and meteorological data*	F. Grossmann *Towards a time-dependent semiclassical theory for hard quantum effects*	M. Bertram *Controlling turbulence in the catalytic CO oxidation by global delayed feedback*
H. Yizhaq *Urban Segregation as a Nonlinear Phenomenon*	H. Waalkens *Quantum Monodromy in the* H_2^+ *and the* HHe^{2+} *system*	A. Handel *New Approaches for Controlling Spiral Defect Chaos in Rayleigh-Benard Experiments*

12:30 - 13:30
F. Varela (Title to be announced)

Lunch

The End

A meeting of the working group WG4 “Common methods of data processing” of the EU funded COST P4 action “Nonlinear Dynamics in Mechanical Processing” will take place from 15:00 to 18:00 at the Max Planck Institut für Physik komplexer Systeme, Nöthnitzer Straße 38. The meeting is organised by Arkady Pikovsky.