



20th International Conference/Summer School

NONLINEAR SCIENCE AND COMPLEXITY

Patras, July 19 – 29, 2007

LECTURE PROGRAM

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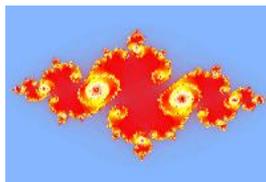
Ministry of Education (Department of Conferences), Ministry of Foreign Affairs
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UNIVERSITY OF PATRAS

AND

CENTER FOR RESEARCH AND APPLICATIONS OF NONLINEAR SYSTEMS

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**THE FIRST WEEK OF THE SCHOOL – CONFERENCE WILL TAKE PLACE AT THE
CONFERENCE CENTER OF THE UNIVERSITY OF PATRAS**

THURSDAY, 19 JULY

Morning Session: 09:30 – 13:45

Chairman: T. Bountis

- 09:30 – 10:45** ***Greetings – Introductory Remarks***
T. Bountis (Patras), S. Pnevmatikos (Patras), S. Koubias (Rector, University of Patras)
- 10:45 – 12:00** ***The Three-Body Problem: Application to the Extrasolar Planetary Systems***
J. Hadjidemetriou (Thessaloniki)
- 12:00 – 12:30** *Coffee Break*
- 12:30 – 13:45** ***Are There Habitable Zones in the Known Extrasolar Planetary Systems?***
R. Dvorak (Vienna)

Afternoon Session: 18:00 – 21:00

Chairman: J. Hadjidemtrion

- 18:00 – 18:45** ***The Flow of Material Through the Arms in Normal and Barred Galaxies***
P. Patsis (Athens)
- 18:45 – 19:30** ***Beam Stability in Modern Light Sources via Frequency Map Analysis***
Ch. Skokos (Paris)
- 20:00 – 21:00** ***Coffee – Posters – Discussion: Complexity in Physics and Astronomy***

FRIDAY, 20 JULY

Morning Session: 09:30 – 13:45

Chairman: S. Farantos

- 09:30 – 10:30** ***Crystallization and Self-organization in Complex Matter***
V. Basios (Brussels)
- 10:30 – 11:30** ***Nonlinear Localization in Biomolecules and Metamaterials***
G. P. Tsironis (Heraclion)
- 11:30 – 12:00** ***Nonlinear Base Opening Dynamics in DNA***
G. Kalosakas (Patras)
- 12:00 – 12:30** *Coffee Break*
- 12:30 – 13:45** ***Controlling Spatiotemporal Dynamics in Chemical Systems***
K. Showalter (Morgantown)

Afternoon Session: 18:00 – 21:00

Chairman: R. Dvorak

- 18:00 – 18:45** ***The Transition to Chaos in the Pilot Wave Approach to Quantum Mechanics***
C. Efthymiopoulos (Athens)
- 18:45 – 20:00** ***Nonlinear Vibrational Normal Modes of Biomolecules***
S. Farantos (Heraclion)
- 20:00 – 21:00** ***Coffee – Posters – Discussion: Complexity in Chemistry and Biology***

SATURDAY, 21 JULY

Morning Session: 09:30 – 13:45

Chairman: K. Showalter

- 09:30 – 10:45 ***Molecular Vibrations: From the Spectrum to the Motion of the Atoms***
C. Jung (Cuernavaca)
- 10:45 – 11:15 *Coffee Break*
- 11:15 – 12:30 ***Phase Transitions in Vibrated Granular Matter***
J. P. van der Weele (Patras)
- 12:30 – 13:45 ***Gradient Theory, Instabilities and Pattern Formation: From Terrascales to Nanoscales***
E. Aifantis (Thessaloniki)
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SUNDAY, 22 JULY

EXCURSION TO OLYMPIA

MONDAY, 23 JULY

Morning Session: 09:30 – 14:00

Chairman: E. Aifantis

- 09:30 – 10:45 ***Modelling Tip Growth in Cells***
B. Mulder (Amsterdam)
- 10:45 – 11:15 *Coffee Break*
- 11:15 – 12:30 ***Theory and Applications of Regular and Anomalous Diffusion***
L. Vlahos (Thessaloniki)
- 12:30 – 14:00 ***Extensivity vs. Additivity of the Entropy and Generalized Central Limit Theorems in the Presence of Strong Interactions***
C. Tsallis (Rio de Janeiro)

Afternoon Session: 18:00 – 21:00

Chairman: I. Vlachos

- 18:00 – 19:20 ***Hamiltonian and Lagrangian Methods for Space-Time Transformations in Photonics, Bose-Einstein Condensates and Liquid Crystals***
K. Hizanidis (Athens)
- 19:20 – 19:25 *Coffee Break*
- 19:25 – 20:25 ***Optical Lattice Solitons***
N. Efremidis (Heraklion)
- 20:15 – 21:00 ***Coffee – Posters – Discussion: Nonlinear Phenomena in Complex Materials***

TUESDAY, 24 JULY

Morning Session: 09:30 – 13:45

Chairman: A. Raub

- 09:30 – 10:30** *Canonical Perturbation Theory and Lie Transforms: Application to Nonlinear Resonant Wave-Particle Interaction*
Yannis Kominis (Athens)
- 10:30 – 11:30** *The Fermi Pasta Ulam Paradox: Problems, Myths and Solutions*
S. Flach (Dresden)
- 11:30 – 12:00** *Coffee Break*
- 12:00 – 12:30** *Modeling and Hedging Electricity Price Risk in Competitive Markets*
Carlo Mari (Pescara)
- 12:30 – 13:30** *Nonlinear Phenomena in Josephson Junction Devices*
N. Flytzanis (Heraclion)

Afternoon Session: 18:00 – 21:00

Chairman: V. Papageorgiou

- 18:00 – 19:00** *Navier-Stokes Equations with Application to Wind Energy Problems*
A. Rauh (Oldenburg)
- 19:00 – 19:15** *Coffee Break*
- 19:15 – 20:00** *Amplitude Equations for Stochastic PDEs*
G. Pavliotis (London)
- 20:15 – 21:00** *Coffee – Posters – Discussion: Nonlinear Waves in Continuous and Discrete Media*

WEDNESDAY, 25 JULY

Morning Session: 09:30 – 13:45

Chairman: C. Jung

- 09:30 – 10:30** *Second-order, Third-order and nth-order Ordinary Differential Equations: How the Exceptional Became Unexceptional*
P. G. L. Leach (Durban)
- 10:30 – 11:30** *Integrability of Nonlinear Partial Difference Equations and Yang-Baxter Maps*
V. Papageorgiou (Patras)
- 11:30 – 12:00** *Coffee Break*
- 12:00 – 12:30** *Recursion Operators for Ordinary Differential Equations*
A. Maharaj (Durban)
- 12:30 – 13:00** *Two Cases of Continuation of Periodic Orbits: The Magnetization Problem and the Coupling of Two Oscillators*
E. Meletlidou (Thessaloniki)
- 13:00 – 13:45** *Travelling Waves in 1 and 2- Dimensional Lattices*
V. Rothos (Thessaloniki)

WEDNESDAY EVENING, 20:00 – 23:00

CULTURAL EVENT

- 20:00 – 21:00 *Concert by the Music Group “Polytropon”: “Music and Songs for the Movies by M. Hadzidakis and M. Theodorakis”, at the University of Patras Conference Center*
- 21:00 – 23:00 *Dinner at the Restaurant “Agnantema”, Paralia Aktaiou, Rion*
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THURSDAY, 26 JULY

Morning Session: 09:30 – 13:45

Chairman: L. Vlahos

- 09:30 – 10:30 *Genomic, Proteomic and Electrical Brain Signals Integration in Multiscale Functional Monitoring and CNS Complexity*
A. Bezerianos (Patras)
- 10:30 – 11:30 *Computational Intelligence: Theory and Applications*
M. Vrahatis (Patras)
- 11:30 – 12:00 *Coffee Break*
- 12 :00 – 12 :30 *Phase Models of Coupled Oscillators From Experimental Data*
L Cimponeriu (Potsdam)
- 12:30 – 13:45 *Nonlinear Dynamics, Fluctuations and Non-Equilibrium Statistical Mechanics*
P. Gaspard (Brussels)

Afternoon Session: 18:00 – 21:00

Chairman: P. Gaspard

- 18:00 – 18:30 *Fractal Statistics of Non-Equilibrium Billiards*
T. Gilbert (Brussels)
- 18:30- 19:00 *Ergodic Properties of Relaxation Phase in Non-Chaotic Unimodal Maps*
K. Karamanos (Brussels)
- 19:00 – 19:15 *Coffee Break*
- 19:15 – 20:00 *Complexity and Organization in the Primary Structure of DNA*
A. Provata (Athens)
- 20:15 – 21:00 *Coffee – Discussion – Posters*

***THE REMAINDER OF THE SCHOOL – CONFERENCE WILL TAKE PLACE
AT THE PREMISES OF THE “ACHAIA BEACH” HOTEL***

FRIDAY, 27 JULY

Morning Session: 09:30 – 13:45

Chairman: M. Vrahatis

- 9:30 – 10:30 *Ordered and Chaotic Orbits in Spiral Galaxies*
G. Contopoulos (Athens)
- 10:30 – 11:30 *On the Stability of the Lagrange Points: Analytical and Numerical Results*
R. Dvorak (Vienna)
- 11:30 – 12:00 *Coffee Break*
- 12:00 – 12:30 *Complexity in Skeletonization on a Discrete Lattice*
Y. Bakopoulos (Athens)
- 12:30 – 13:00 *A Nonlinear Classical Model for the Study of the Decay Widths of Isoscalar Giant*

Monopole Resonances in Nuclei.

P. Papachristou (Athens)

Afternoon Session: 18:00 – 21:00

Chairman: J. P. van der Weele

18:00 – 19:00 *The Complexity of Nonlinear Time Series Analysis*

D. Kougioumtzis (Thessaloniki)

19:00 – 19:15 *Coffee Break*

19:15 – 19:45 *Applications of Recurrence Quantification in Nonlinear Time Series Analysis*

T. Karakasidis (Volos)

19:45 – 20:15 *Spatiotemporal Distributed Systems: SOC or/ and Chaos*

G. Pavlos (Xanthi)

20:15 – 21:00 *Coffee – Posters – Discussion: Nonlinear Time Series Analysis*

SATURDAY, 28 JULY

Morning Session: 09:30 – 13:45

Chairman: T. Bountis

09:30 – 10:30 *Quantum Chaos in Generic Systems I*

M. Robnik (Maribor)

10:30 – 11:30 *Quantum Chaos in Generic Systems II*

M. Robnik (Maribor)

11:30 – 12:00 *Coffee Break*

12:00 – 12:30 *Classical and Quantum Chaos in the Dissociation of a Diatomic Molecule in a Laser Field: The Key Role of the Frequency of Maximum Dissociation*

V. Constandoudis (Athens)

12:30 – 13:30 *Classical Chaos and Quantum Information*

D. Ghikas (Patras)

Self-organized Afternoon Session: 18:30 – 21:00

SUNDAY, 29 JULY

Chairpersons: T. Bountis and A. Provata

09:30 – 12:30 *Discussion of the Results of the 20th Summer School and Preparation of the 21st Summer School, July 2008*

HAPPY SUMMER TO EVERYONE!
