



**6th Ph.D. School "Mathematical Modeling of Complex Systems"  
University "G. d'Annunzio", Italy, 03-11 July, 2019**

**<https://www.sci.unich.it/mmcs2019>**

**LECTURE PROGRAM**

**Campus of Pescara**

**Wednesday, July 3: Fundamental Concepts of Complexity (Aula Rossa)**

**Morning Session 09:00 – 13:30**

*Chairman: A. De Sanctis*

**9:30-9:45: Greetings and opening remarks**

**9:45-10:45, Tassos Bountis (Patras and Astana): COMPLEX DYNAMICS AND STATISTICS OF 1-DIMENSIONAL HAMILTONIAN LATTICES I**

*Coffee Break Aula Rossa*

**11:15-12:45, Vasileios Basios (Brussels): FOUNDING COMPLEXITY SCIENCE: THE WORK OF GREGOIRE NICOLIS**

**13:00-13:30, Aglaia Athanassiadou (Patras): THE GENETIC COMPLEXITY OF THE HUMAN GENOME IN HEALTH AND DISEASE**

**Afternoon Session 15:00 – 18:00**

*Chairman: D. Ghikas*

**15:00-15:45, Peter Veerman (Portland): DIFFUSION AND CONSENSUS ON WEAKLY CONNECTED DIRECTED GRAPHS**

*Coffee Break*

**16:00-18:00, Tassos Bezerianos (Patras and Singapore):** GRAPH THEORY MODELS REPRESENT COGNITIVE PROCESSES IN THE BRAIN I

## **Thursday, July 4: Complexity in Biomedicine (Aula Rossa)**

### **Special session**

“FROM THE TREATMENT OF SMALL DEFECTS TO THE TREATMENT OF THE EXTREME ATROPHY OF THE JAWS”

## **Friday, July 5: Complexity in Physical and Biological Sciences (Classroom 4)**

### **Morning Session 09:30 – 13:30**

*Chairman: M. Robnik*

**9:30-11:30, Tassos Bountis (Patras and Astana):** COMPLEX DYNAMICS AND STATISTICS OF 1-DIMENSIONAL HAMILTONIAN LATTICES II

*Coffee Break 1<sup>st</sup> floor up the yellow stairs*

**12:00-13:30, Aikaterini Mandilara (Astana):** ENTROPY AND COMPLEXITY IN QUANTUM INFORMATION: BASIC PARADIGMS

### **Afternoon Session 15:00 – 17:00**

*Chairman: V. Basios*

**15:00-17:00, Tassos Bezerianos (Patras and Singapore):** GRAPH THEORY MODELS REPRESENT COGNITIVE PROCESSES IN THE BRAIN II

*Coffee Break 1<sup>st</sup> floor up the yellow stairs*

### **Short Presentation Session 17:30 – 19:30**

**17:30-18:00, Jordan McKittrick (University of Cambridge):** WHEN IS ENTROPY FINITE? INFERENCE IN THE ABSENCE OF INFORMATION.

**18:00-18:30, Bootan Rahman (University of Kurdistan Hewlêr):** SOME APPLICATIONS OF TIME DELAY SYSTEMS (slides)

**18:30-19:00, Konstantinos Tsampourakis (Washington State University):** PATTERN FORMATION IN A MULTI AGENT SYSTEM.

**19:00-19:30, Houtalonis Joannis (National Kapodistrian university of Athens):** A STEP FURTHER IN INVESTIGATING EARTHQUAKE CODA WAVES IN TERMS OF NON EXTENSIVE STATISTICAL PHYSICS.

**Saturday, Sunday July 6 and 7 free**

**Monday, July 8: Nonlinear Mathematical Science (Aula Rossa)**

**Morning Session 9:00 – 13:30**

*Chairman: T. Bountis*

**9:15-11:15, Marko Robnik (Maribor):** QUANTUM CHAOS OF GENERIC SYSTEMS

*Coffee Break 1<sup>st</sup> floor up the yellow stairs*

**11:30-13:30, Ko van der Weele (Patras):** NONLINEAR WAVES: THE DYNAMICAL SYSTEMS APPROACH 1. Waves in shallow water 2. Waves in flowing granular matter

**Afternoon Session 15:00 – 18:45**

*Chairman: P. Veerman*

**15:00-17:00, Manuel Velarde (Madrid):** NONLINEAR DYNAMICS AT THE MICRO AND NANO SCALES (FLUIDS, SOLIDS)

*Coffee Break 1<sup>st</sup> floor up the yellow stairs*

**17:15-18:45, Haris Skokos (Cape Town):** CHAOTIC BEHAVIOR OF MULTIDIMENSIONAL HAMILTONIAN SYSTEMS: Disordered lattices, Granular Chains and DNA models

**Tuesday, July 9: Complexity in Physical Systems (Classroom 4)**

**Morning Session 09:30 – 13:30**

*Chairman: T. Bezerianos*

**9:30-11:30, Athanassios Fokas (Cambridge):** MATHEMATICAL METHODS OF BRAIN IMAGING: NEW RESULTS ON THE ANALYSIS OF PET, SPECT, MEGG AND EEG TECHNIQUES

*Coffee Break 1<sup>st</sup> floor up the yellow stairs*

**12:00-13:00, George Livadiotis (Southwest USA):** THEORY OF KAPPA DISTRIBUTIONS AND NONEXTENSIVE STATISTICAL MECHANICS: APPLICATIONS IN ASTROPHYSICAL PLASMAS

**13:00-13:30, Maria Christina Van der Weele (Cambridge):** INTEGRABLE SYSTEMS IN 4+2 DIMENSIONS AND THEIR REDUCTION TO 3+1 DIMENSIONS

**Afternoon Session 15:00 – 18:30**

*Chairman: D. Ghikas*

**15:00-17:00, Athanassios Fokas (Cambridge) Plenary Talk:** ASSOCIATIONS: VISUAL PERCEPTION AND REDUCTION VERSUS UNIFICATION

*Coffee Break 1<sup>st</sup> floor up the yellow stairs*

**17:15-18:30, Poster Session**

**Wednesday, July 10: Entropy and Complexity (Classroom 4)**

**Morning Session 09:30 – 13:30**

*Chairman: T. Bezerianos*

**9:30-11:30, Costantino Tsallis (Rio de Janeiro):** BEYOND BOLTZMANN GIBBS IN PHYSICS, MATHEMATICS AND ELSEWHERE

*Coffee Break 1<sup>st</sup> floor up the yellow stairs*

**12:00-13:30, Chris G. Antonopoulos (Essex):** (to be defined)

**Afternoon Session 15:00 – 18:30**

*Chairman: P. Veerman*

**15:00-16:00, Demetris Ghikas (Patras):** FROM COMPLEXITY TO INFORMATION GEOMETRY

*Coffee Break 1<sup>st</sup> floor up the yellow stairs*

**16:30-18:30, Giovanni Pistone (Torino):** GEOMETRY OF THE PROBABILITY SIMPLEX I

**Thursday, July 11, 2019: Information Geometry (Aula Rossa)**

**Morning Session 09:30 – 13:00**

*Chairman: D. Ghikas*

**9:30-11:30, Giovanni Pistone:** GEOMETRY OF THE PROBABILITY SIMPLEX II

*Coffee Break 1<sup>st</sup> floor up the yellow stairs*

**12:00-12:45 Angela De Sanctis, Antonio Gattone (Pescara):** A SHAPE DISTANCE BASED ON THE FISHER-RAO METRIC AND ITS APPLICATION FOR SHAPE CLUSTERING

**13:00 – 13:30, School Closing**

## Rooms locations

“Aula Rossa” is on the 1st floor, up the red stairs (the ones far from the main entrance)

“Classroom 4” is on the ground floor, around ten meters after the main entrance, on the right

Coffee Break is on the 1st floor, up the yellow stairs