From the nonlinear dynamical systems theory to observational chaos

Toulouse, October 9-11, 2023

Tentative program

Monday October 9, 2023

Nonlinear dynamical systems theory I

9:10 *From Hamiltonian to dissipative chaos and back: A primer of active particles*
      Arkady Pikovsky
9:50 *Statistics of Attractor Embeddings in Reservoir Computing*
      <u>**Louis M. Pecora**</u> **& Thomas L. Carroll**
10:30 *Coffee break at Hall San Subra*
10:50 *From the Rössler attractor to the templex*
      Gisela D. Charó, Christophe Letellier & <u>**Denisse Sciamarella**</u>
11:20 *The templex approach in Lagrangian analysis*
      <u>**Gisela D. Charó**</u>**, Christophe Letellier & Denisse Sciamarella**
11:50 *Topological description of the Lorenz-84 chaotic attractor*
      <u>**Martin Rosalie**</u> **& Sylvain Mangiarotti**

12:10 *Lunch at Hall San Subra*

Nonlinear dynamical systems theory II

13:45 *Probing the homoclinic connection in β-FPUT problem*
      <u>**Andrea Armaroli**</u> **& Stefano Trillo**
14:15 *Numerical approaches for investigating the chaotic behavior of multidimensional Hamiltonian systems*
      Haris Skokos
14:45 *Hopf-like bifurcation in mixed mode oscillation in a fractional-order FitzHugh-Nagumo model*
      <u>**René Lozi**</u> **& Mohammed Salah Abdelouahab**
15:40 *Application of fractional chaotic system to explore human gait dynamics*
      <u>**Devasmito Das**</u>**, Jean Jacques Loiseau, Ina Taralova & Manoj Pandey**

15:45 *Coffee break at Hall San Subra*

16:15 *Similarities and differences between the control theory of discrete and continuous time chaotic systems*
      <u>**Jean-Pierre Barbot**</u>**, Christophe Letellier & Gilles Millerioux**
16:45 *On topological synchronization of Rössler systems*
      <u>**Théophile Caby**</u> **& Michele Gianfelice**
17:15 *Taxonomy of generalized synchronization based on flat coupling*
      <u>**Christophe Letellier**</u>**, Ludovico Minati, Jean-Pierre Barbot, Irene Sendiña Nadal & I. Leyva**

Applications

9:00 *Predicting and controlling complex cardiac excitation waves in the heart*
> **Ulrich Parlitz**

9:40 *Using Auxiliary Information in Model Building for Nonlinear Dynamics: An Application in Robotics*
> **Luis Antonio Aguirre**

10:20 *An NMR spectroscopist's view of nonlinear magnetization dynamics: in liquid and frozen solutions, at high and low temperatures, at low and high polarizations*
> <u>**Daniel Abergel**</u>**, Vineeth Thalakottoor & Alain Louis-Joseph**

10:50 *Coffee break at Hall San Subra*

11:20 *An open cavity flow control in the age of artificial intelligence*
> <u>**François Lusseyran**</u>**, Guy Y. Cornejo Maceda, Eliott Varon & Bernd R. Noack**

11:50 *Multistability in the spin-orbit dynamics of celestial bodies*
> **Vitor M. de Oliveira**

12:10 *The new field of network physiology: mapping the human physiolome*
> **Plamen Ivanov**

12:30 *Lunch at Hall San Subra*

History of chaos

14:00 *From Lattes' results to the notion of focal point*
> **Christian Mira**

14:40 *Would chaotic dynamical systems be more beautiful if they were useless?*
> **René Lozi**

15:20 *Coffee break at Hall San Subra*

15:40 *A biochemical reaction with a plethora of non-linear behaviors*
> **Lars Folke Olsen**

16:20 *A tentative history of conservative chaos*
> **Christophe Letellier**

16:50 *Otto E. Rössler's contribution to chaos*
> **Christophe Letellier**

Environmental dynamics

9:30 *Different routes to large-intensity pulses in Zeeman laser model*
Tomasz Kapitaniak

~~**10:10** *Intermittent rarity: Chaotic population dynamics on the edge of extinction*~~
~~**Bernard Cazelles**~~ Cancelled

10:10 *Epidemiological models with delay and fluctuations*
<u>Michael Bestehorn</u> **& Thomas Michelitsch**

10:40 *Coffee break at Hall San Subra*

11:10 *Compartment model with retarded transition rates*
<u>Téo Granger</u>, **Thomas Michelitsch, Bernard Collet, Michael Bestehorn & Alejandro Riascos**

11:40 *Governing equations and their topological dynamics extracted from observational time series in hydrology, ecology, epidemiology, and other environmental sciences*
Sylvain Mangiarotti

12:10 *A new class of Ansatz models for non-autonomous systems*
<u>Myrtille Tabone</u>, **Yàn Zhang & Sylvain Mangiarotti**

12:40 *Lunch at Hall San Subra*

Data analysis

14:30 *Unveiling the connectivity of complex networks using ordinal transition methods*
Juan A. Almendral, I. Leyva & <u>Irene Sendiña-Nadal</u>

15:00 *Predicting chromosomal compartments directly from the nucleotide sequence with DNA-DDA*
<u>Xenia Lainscsek</u> **& Leila Taher**

15:30 *Exploring universality and individuality inherent in human EEG: A reservoir computing approach*
Hiromichi Suetani

16:00 *Coffee and cake-to-go at Hall San Subra*