

## Simplified version of the program

Time	Monday (04/08)	Tuesday (05/08)	Wednesday (06/08)	Thursday (07/08)	Friday (08/08)
8:00	Registration	Registration	Registration	Registration	Registration
8:40	Opening Ceremony <b>Chair:</b> Prof. Edson Denis Leonel				
9:00	<b>Zaslavsky Award Lecture</b> Prof. Rajarshi Roy <b>Chair:</b> Prof. Elbert Macau	<b>Zaslavsky Award Lecture</b> Prof. Igor Aronson <b>Chair:</b> Prof. Mark Edelman	<b>Zaslavsky Award Lecture</b> Prof. Iberê Luiz Caldas <b>Chair:</b> Prof. Edson Denis Leonel	<b>Lagrange Award Lecture</b> Prof. Boris Malomed <b>Chair:</b> Prof. José R. C. Piqueira	<b>Invited talk</b> Prof. José R. C. Piqueira <b>Chair:</b> Prof. Ricardo L. Viana
9:50	<b>Invited talk</b> Prof. Suani T. R. de Pinho <b>Chair:</b> Prof. Elbert Macau	<b>Invited talk</b> Prof. Alexander Solynin <b>Chair:</b> Prof. Mark Edelman	<b>Invited talk</b> Prof. Arturo C. Marti <b>Chair:</b> Prof. Edson Denis Leonel	<b>Invited talk</b> Prof. Dimitri Volchenkov <b>Chair:</b> Prof. José R. C. Piqueira	<b>Invited talk</b> Prof. Carla Pinto <b>Chair:</b> Prof. Ricardo L. Viana  <b>Invited talk</b> Prof. Marcus W. Beims <b>Chair:</b> Prof. Ricardo L. Viana
10:15	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break
10:45	<b>Afraimovich Award Lecture</b> Prof. Cristian Bonatto <b>Chair:</b> Prof. Edson Denis Leonel	<b>Afraimovich Award Lecture</b> Prof. Johanne Hizanidis <b>Chair:</b> Prof. Ulrike Feudel	<b>Hsu Award Lecture</b> Prof. Ricardo Luiz Viana <b>Chair:</b> Miguel A. F. Sanjuán	<b>Hsu Award Lecture</b> Prof. G. Ambika <b>Chair:</b> Prof. Marcus W. Beims	<b>MS9</b>
11:35	<b>Invited talk</b> Prof. Hilda Cerdeira <b>Chair:</b> Prof. Edson Denis Leonel	<b>Invited talk</b> Prof. Norma Valencio <b>Chair:</b> Prof. Ulrike Feudel	<b>Invited talk</b> Prof. Marcelo Ramírez-Avila <b>Chair:</b> Prof. Miguel A. F. Sanjuán	<b>Invited talk</b> Prof. Marcus A. M. de Aguiar <b>Chair:</b> Prof. Marcus W. Beims	Closing
12:00	Lunch Break	Lunch Break	Lunch Break	Lunch Break	Lunch Break
14:00	<b>MS1</b> <b>MS2</b> <b>MS3</b> <b>MSonline</b>	<b>MS4</b> <b>MS5</b> <b>MS6</b> <b>MSonline</b>	<b>CT1</b> <b>CT2</b> <b>MS7</b>	<b>CT3</b> <b>CT4</b> <b>MS8</b>	Free time
16:00	coffee Break	coffee Break	coffee Break	coffee Break	
16:45	<b>Hsu Award Lecture</b> Prof. Keqin Gu <b>Chair:</b> Prof. Alexander Solynin	<b>Invited talk</b> Prof. André L P Livorati <b>Chair:</b> Prof. Dimitri Volchenkov  <b>Invited talk</b> Prof. Everton S Medeiros <b>Chair:</b> Prof. Dimitri Volchenkov	Poster section	<b>Invited talk</b> Prof. Mark Edelman <b>Chair:</b> Prof. Yeliz Karaca  <b>Invited talk</b> Prof. Sabrina Camargo <b>Chair:</b> Prof. Yeliz Karaca	
17:35	<b>Invited talk</b> Prof. Miguel A. F. Sanjuán <b>Chair:</b> Prof. Alexander Solynin	<b>Invited talk</b> Prof. Ulrike Feudel <b>Chair:</b> Prof. Dimitri Volchenkov		<b>Invited talk</b> Prof. Haris Skokos <b>Chair:</b> Prof. Yeliz Karaca	
18:00	Closing	Closing	Conference Dinner	Closing	





Physics Department  
Rooms 1, 2 & 3.



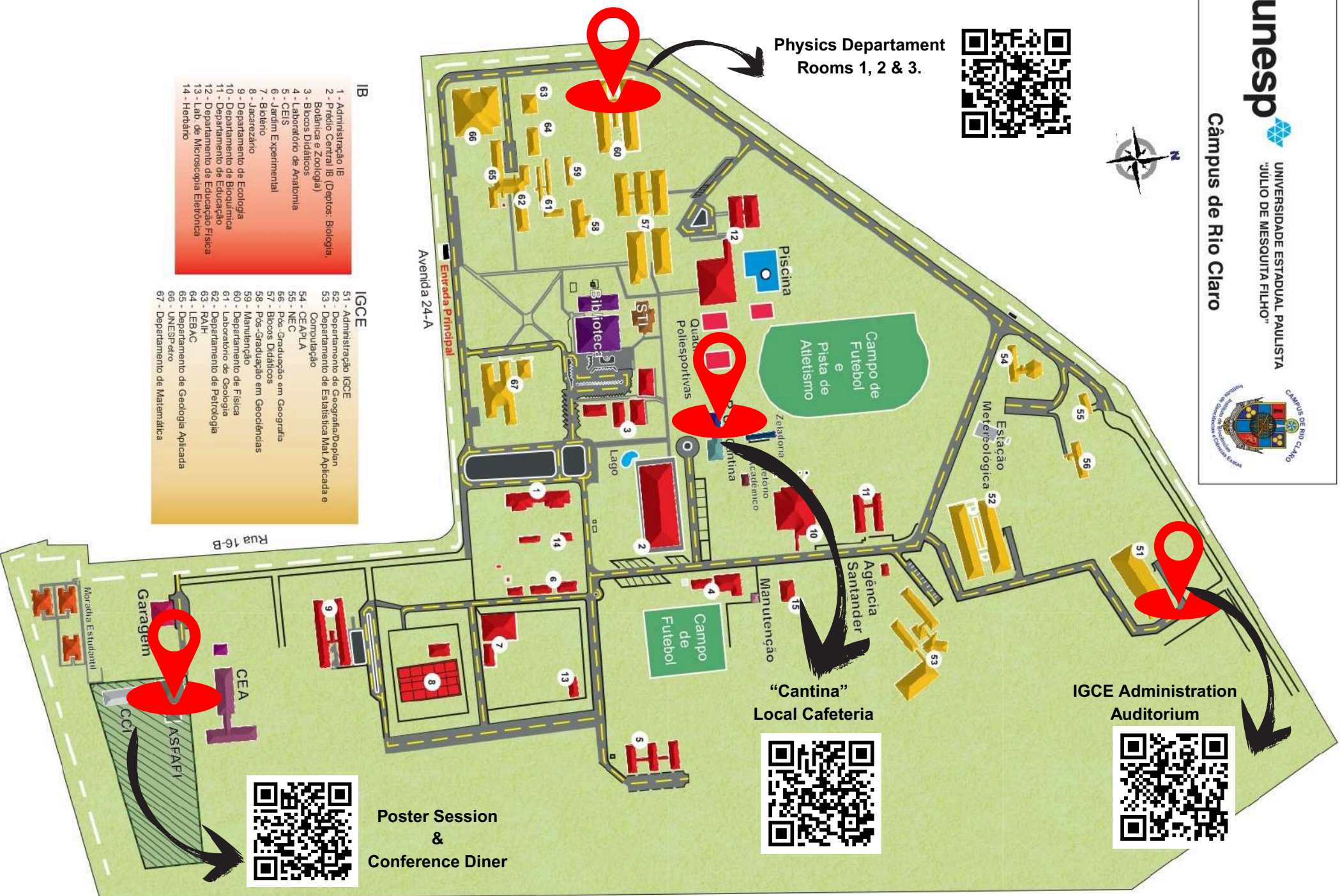
IGCE Administration  
Auditorium



"Cantina"  
Local Cafeteria



Poster Session  
&  
Conference Diner



IB

- 1 - Administração IB
- 2 - Prédio Central IB (Deptos: Biologia, Botânica e Zoologia)
- 3 - Blocos Didáticos
- 4 - Laboratório de Anatomia
- 5 - CEIS
- 6 - Jardim Experimental
- 7 - Biótipo
- 8 - Jaceiraário
- 9 - Departamento de Ecologia
- 10 - Departamento de Bioquímica
- 11 - Departamento de Educação Física
- 13 - Lab. de Microscopia Eletrônica
- 14 - Herbario

IGCE

- 51 - Administração IGCE
- 52 - Departamento de Geografia/Depen
- 53 - Departamento de Estatística Mat. Aplicada e Computação
- 54 - CEN-PLA
- 55 - NEC
- 56 - Pós-Graduação em Geografia
- 57 - Blocos Didáticos
- 58 - Pós-Graduação em Geociências
- 59 - Manutenção
- 60 - Departamento de Física
- 61 - Laboratório de Geologia
- 62 - Departamento de Petrologia
- 63 - RAIH
- 64 - LEBAC
- 65 - Departamento de Geologia Aplicada
- 66 - UNESP-eiro
- 67 - Departamento de Matemática



# Monday (04/08)

## 08:00 - 12:00 - Auditorium Administration Building (IGCE)

08:00 - 08:40: Registration

### 08:40 - 09:00: Opening Ceremony

Prof. Eliris Cristina Rizzioli (Dean of the Institute of Geosciences and Exact Sciences)

Prof. Lucas Fugikawa Santos (Head of the Physics Department)

Prof. Dimitri Volchenkov (Conference Steering Committee)

Prof. Edson Denis Leonel (Chair of the Conference)

### 09:00 - 09:50: Zaslavsky Award Lecture

#### Optoelectronic oscillators in the single photon regime

Awardee: Prof. Rajarshi Roy

Chair: Prof. Elbert Macau

### 09:50 - 10:15: Highlighting nonlinear effect of data-based models of infectious diseases

Speaker: Prof. Suani Tavares R. de Pinho

Chair: Prof. Elbert Macau

### 10:15 - 10:45: Coffee Break

### 10:45 - 11:35: Afraimovich Award Lecture

#### Chaotic and Hyperchaotic Dynamics in Nonlinear Systems: Structure, Statistics, and Extreme Events

Awardee: Prof. Cristian Bonatto

Chair: Prof. Edson Denis Leonel

### 11:35 - 12:00: Phase Transitions in Mobile Systems

Speaker: Prof. Hilda Cerdeira

Chair: Prof. Edson Denis Leonel

### 12:00 - 14:00: Lunch Break

## 14:00 - 16:00 - Parallel Sessions - Physics Department

### MS1. Synchronization in Neural Networks: Nonlinear Dynamics, Complex Networks, and Cognitive Implications

#### Physics Department - Room 1

14:00-14:20: The effect of time delay for synchronisation suppression in neuronal networks

14:20-14:40: Noise-Induced Extreme Events in Hodgkin-Huxley Networks

14:40-15:00: Synchronization in neuronal network with external pulsed perturbations

15:00-15:20: Intermittent synchronization in neural networks

15:20-15:40: Exploring Long-Range Cortical Communication: Remote Synchronization and Node Influence in Neuronal Dynamics

15:40-16:00: Influence of Synchronized Firing Patterns on Neuronal Connectivity

### MS2. Nontwist and Hamiltonian dynamical systems

#### Physics Department - Room 2

14:00-14:20: Avoiding transport even in the absence of total barriers in nontwist maps

14:20-14:40: Nonlinear dynamics analysis of the effects of the repulsive barrier in strong-field atomic ionization.

14:40-15:00: Shearless barriers in the conservative Ikeda map

15:00-15:20: Transient motion in Hamiltonian systems

15:20-15:40: Tiling symmetries and myriad bifurcations in Hamiltonian systems

15:40-16:00: Transport barriers for two modes drift wave map

### MS3. Fractional Calculus in Complex and Nonlinear Systems

#### Physics Department - Room 3

14:00-14:10: Opening session (pre-recorded)

14:10-14:55: On fractional calculus with modified Mittag-Leffler Kernel (pre-recorded)

14:55-15:15: Fractional-order Chaotic Systems, GL-ABM -based Lorenz-Inspired Systems by Ensemble AI and Explainable AI (in-person)

15:15-15:35: A Novel Examination of Fractal, Fractional and Conformable Derivatives as well as Integral Transforms (pre-recorded)

15:35-15:55: Caputo fractional operator with Proportional-Integral-Derivative controller (pre-recorded)

### MSOnline (Day 1). Solitons and other localized structures in physical and mathematical sciences

#### online

14:00-14:08: Opening Session

14:08-14:36: Symmetry approach to the problem of the gas expansion into a vacuum

14:36-15:04: Strongly nonlinear solitary waves and their action on particles, plankton, and turbulence

15:04-15:32: Numerical simulations of interacting internal solitary waves of opposite polarity and breather generation by flow over an obstacle in a continuously stratified three-layer fluid

15:32-16:00: Beyond mean-field effects in dynamics of quantum droplets in two-core trap

## 16:00 - 18:00 - Auditorium Administration Building (IGCE)

16:00 - 16:45: Coffee Break

**16:45 - 17:35: Hsu Award Lecture**

**Coupled differential-difference equations: Generality, stability region, sensitivity to small delays, and computational efficiency**

**Awardee:** Prof. Keqin Gu

**Chair:** Prof. Alexander Solynin

**17:35 - 18:00: Game Theory Meets Chaos: Two-Player Yorke's Game of Survival in Chaotic Transients**

**Speaker:** Prof. Miguel A. F. Sanjuán

**Chair:** Prof. Alexander Solynin

## Tuesday (05/08)

**08:00 - 12:00 - Auditorium Administration Building (IGCE)**

**08:00 - 09:00: Registration**

**09:00 - 09:50: Zaslavsky Award Lecture**

**Confined bacterial suspensions**

**Awardee:** Prof. Igor Aronson

**Chair:** Prof. Mark Edelman

**09:50 - 10:15: Steady-state distribution of heat and capacities**

**Speaker:** Prof. Alexander Solynin

**Chair:** Prof. Mark Edelman

**10:15 - 10:45: Coffee Break**

**10:45 - 11:35: Afraimovich Award Lecture**

**Superconducting oscillators: From collective dynamics to neuromorphic computing**

**Awardee:** Johanne Hizanidis

**Chair:** Prof. Ulrike Feudel

**11:35 - 12:00: Emergency Declaration in the Brazilian Context: Economic-Political**

**Addicted Networks Revealed by Bio-Inspired Models**

**Speaker:** Prof. Norma Valencio

**Chair:** Prof. Ulrike Feudel

**12:00 - 14:00: Lunch Break**

**14:00 - 16:00 - Parallel Sessions - Physics Department**

**MS4. Dynamical Systems Applied in Epidemiology**

**Physics Department - Room 1**

**14:00-14:20:** Individual Based approach to the SEIR Epidemic Model with Control Attenuation

**14:20-14:40:** Modeling vaccination campaigns in a lattice model

**14:40-15:00:** Impact of easing restrictions on the infection dynamics

**15:00-15:20:** Nonlinear dynamics tools applied to the characterization of Covid-19 multiple waves

**15:20-15:40:** Chaos and multistability in a SEIRS epidemic model with a periodically varying transmission rate

**15:40-16:00:** Complex dynamics in a time-dependent vaccination campaign

**MS5. Mathematical and Computational Modeling of Cancer Dynamics and Oncological Therapies**

**Physics Department - Room 2**

**14:00-14:20:** On hybrid modeling of cancer dynamics: integrating mechanistic and data-driven approaches

**14:20-14:40:** Fractional Calculus and Memory Effects in Mathematical Modeling of Cancer

**14:40-15:00:** Data-based generalized models of tumor growth using deformed functions

**15:00-15:20:** Coupling mathematical models of transcription regulation and bursting in Drosophila embryos

**15:20-15:40:** A Study of prostate cancer and treatments via mathematical modeling

**15:40-16:00:** In Vitro Population Growth of Patient-Derived Human Glioma Cells: Correlating Modeling and Clinics

**MS6. Nonlinear dynamics applied to engineering**

**Physics Department - Room 3**

**14:00-14:20:** Nonlinear dynamics applied to engineering

**14:20-14:40:** The Mechanics of Variable Mass Systems applied to the Added Mass Concept of a Moving Cylinder in Water

**14:40-15:00:** Dynamical Integrity of Nonlinear Modes of the Elastic Pendulum with Internal Resonance

**15:00-15:20:** Identifiability of a General Semi-Empirical Wake-Oscillator Model for Vortex-Induced Vibrations

**15:20-15:40:** Modelling aspects of elastic and immersed cables: the role of essentially nonlinear forces combined with time varying boundary conditions

**15:40-16:00:** Extreme Event Transition – Henon Map Case

**MSOnline (Day 2). Solitons and other localized structures in physical and mathematical sciences**

**online**



**14:00-14:25:** Interaction of plane solitons in the 2D Gardner equation  
**14:25-14:50:** Spontaneous symmetry breaking in a ring with two potential barriers  
**14:50-15:15:** Breathers of the nonlinear Schrödinger equation are coherent self-similar solutions  
**15:15-15:40:** Axially symmetric collapses in the 2-D Benjamin-Ono equation

## **16:00 - 18:00 - Auditorium Administration Building (IGCE)**

**16:00 - 16:45:** Coffee Break

**16:45 - 17:10: Transport and scaling analysis in the relativistic Standard map**

**Speaker:** Prof. André L. P. Livorati

**Chair:** Prof. Dimitri Volchenkov

**17:10 - 17:35: Local control for the collective dynamics of self-propelled particles**

**Speaker:** Prof. Everton S. Medeiros

**Chair:** Prof. Dimitri Volchenkov

**17:35 - 18:00: The constructive role of transient chaos in complex systems**

**Speaker:** Prof. Ulrike Feudel

**Chair:** Prof. Dimitri Volchenkov

## **Wednesday (06/08)**

### **08:00 - 12:00 - Auditorium Administration Building (IGCE)**

**08:00 - 09:00: Registration**

**09:00 - 09:50: Zaslavsky Award Lecture**

**Shearless Invariant Curves in Hamiltonian Phase Space**

**Awardee:** Prof. Iberê L. Caldas

**Chair:** Prof. Edson Denis Leonel

**09:50 - 10:15: Exploring Basin Structures and Transitions in Time-Delayed Systems through Entropy-Based Analysis**

**Speaker:** Prof. Arturo C. Marti

**Chair:** Prof. Edson Denis Leonel

**10:15 - 10:45: Coffee Break**

**10:45 - 11:35: Hsu Award Lecture**

**Obstructions to shadowability of chaotic dynamical systems: the role of unstable dimension variability**

**Awardee:** Prof. Ricardo Luiz Viana

**Chair:** Prof. Miguel A. F. Sanjuán

**11:35 - 12:00: Parameter Space Analysis: Scenarios of Pseudofractality, Quasiperiodicity and Chirality**

**Speaker:** Prof. Marcelo Ramírez-Avila

**Chair:** Prof. Miguel A. F. Sanjuán

**12:00 - 14:00: Lunch Break**

### **14:00 - 16:00 - Parallel Sessions - Physics Department**

**CT1. Dynamics and transport phenomena in spatially extended systems**

**Physics Department - Room 1**

**14:00-14:20:** Dynamics and sorting of run-and-tumble particles in fluid flows with transport barriers

**14:20-14:40:** Chaotic transport in the drift motion for a large-aspect ratio Tokamak with nonlinear mode coupling

**14:40-15:00:** Compression-induced crossovers for the ground-state of classical dipole lattices on a Möbius strip

**15:00-15:20:** On the basins of attraction of the Kuramoto model

**15:20-15:40:** Diffusion Regimes in a Soft Lorentz Gas with Lennard-Jones Interactions

**CT2. Nonlinear dynamics in billiards and impacting mechanical systems**

**Physics Department - Room 2**

**14:00-14:20:** Classical and quantum elliptical billiards: Mixed phase space and short-range correlations in singlets and doublets

**14:20-14:40:** Effects of stickiness in the classical and quantum chaotic billiards with  $n$ -fold symmetry

**14:40-15:00:** Mixed-phase space of an active particle in experimental Lemon Billiards

**15:00-15:20:** A New Framework for Collision-Based Nonlinear Systems: Case Study of the Fermi–Ulam Model with a Harmonic Spring

**15:20-15:40:** Symmetry breaking in time-dependent billiards

**MS7. Complexity Science, Mathematical Sciences and Complex Systems**

**Physics Department - Room 3**

**14:00-14:20:** Opening session

**14:20-14:40:** Extracting randomness from hyperchaotic systems for cryptography applications

**14:40-15:00:** Recurrence microstates applied to machine learning classification

**15:00-15:20:** Instrument Recognition via ResNet Deep Learning Architecture Through MFCC Feature Extraction (pre-recorded presentation)

**15:20-15:40:** Modeling Nonlinear Dynamics for Sustainable Transportation Using Digital Twins, Traditional Simulation and Generative AI

## **16:00 - 21:00 - ASFAFI - UNESP**

**16:00 - 16:30: Coffee Break**

**16:30 - 18:30: Poster Session**

**18:30 - 21:00: Conference Dinner**

## **Thursday (07/08)**

### **08:00 - 12:00 - Auditorium Administration Building (IGCE)**

**08:00 - 09:00: Registration**

**09:00 - 09:50: Lagrange Award Lecture**

**Multidimensional Solitons**

**Awardee:** Prof. Boris Malomed

**Chair:** Prof. José R. C. Piqueira

**09:50 - 10:15: Degenerating Diffusion and Structural Limits of Consensus: Nonlinear Models of Belief Propagation in Networked Societies**

**Speaker:** Prof. Dimitri Volchenkov

**Chair:** Prof. José R. C. Piqueira

**10:15 - 10:45: Coffee Break**

**10:45 - 11:35: Hsu Award Lecture**

**Control of dynamics and transitions on multiplex networks**

**Awardee:** Prof. G. Ambika

**Chair:** Prof. Marcus W. Beims

**11:35 - 12:00: Multidimensional Kuramoto models with Matrix Coupling**

**Speaker:** Prof. Marcus A. M. de Aguiar

**Chair:** Prof. Marcus W. Beims

**12:00 - 14:00: Lunch Break**

### **14:00 - 16:00 - Parallel Sessions - Physics Department**

**CT3. Modeling dynamics of living and natural systems**

**Physics Department - Room 1**

**14:00-14:20:** The statistical physics of zebrafish larvae experiment

**14:20-14:40:** Prey Reproductive Strategies and Their Role in Predator–Prey Dynamics in a Discrete-Time Model

**14:40-15:00:** Implicit Sentinel Dynamics in Animal Populations Under Threat: A Nonlinear Modeling Approach

**15:00-15:20:** Effectiveness of three-stage switching control for suppressing synchronous neuronal behavior in three-dimensional clustered networks

**15:20-15:40:** Effectiveness of three-stage switching control for suppressing synchronous neuronal behavior in three-dimensional clustered networks

**CT4. Chaos and bifurcations in dissipative systems**

**Physics Department - Room 2**

**14:00-14:20:** Splitting chaos until the order

**14:20-14:40:** Stability analysis of mass-spring-damper systems with nonlinear spring

**14:40-15:00:** Analytically tractable piecewise-smooth reconstructions of chaotic dynamical systems

**15:00-15:20:** Tricorn-like structures in the Lorenz-84 low-order atmospheric circulation model

**15:20-15:40:** Dynamics of Quasi-Periodic Shrimp-Shaped Domains: Emergence and Metamorphosis

**MS8. Applications of nonlinear dynamical systems to physical and social systems: theoretical, numerical and data driven approaches**

**Physics Department - Room 3**

**14:00-14:20:** Bifurcations in the Interaction of Two Dipoles Under the Presence of an External Magnetic Field

**14:20-14:40:** Characterization of the nonlinear behavior of a granular damper using experimental, computational, and data-driven models

**14:40-15:00:** Formation of oriented polar ultracold molecules: an investigation through quantum optimal control

**15:00-15:20:** The Importance of Limited Reactions in Coupled Dynamics

**15:20-15:40:** Synchrony Patterns in Coupled Network Dynamics

### **16:00 - 18:00 - Auditorium Administration Building (IGCE)**

**16:00 - 16:45: Coffee Break**

**16:45 - 17:10: Analytic equations to calculate periodic and bifurcation points in fractional difference maps: too simple to be published**

**Speaker:** Prof. Mark Edelman

**Chair:** Prof. Yeliz Karaca

**17:10 - 17:35: Behavior of the scaling correlation functions under severe subsampling**

**Speaker:** Prof. Sabrina Camargo

**Chair:** Prof. Yeliz Karaca

**17:35 - 18:00: Energy transport and chaos in a one-dimensional disordered nonlinear stub lattice**

**Speaker:** Prof. Haris Skokos

**Chair:** Prof. Yeliz Karaca

**Friday (08/08)**

**08:00 - 12:00 - Auditorium Administration Building (IGCE)**

**08:00 - 09:00: Registration**

**09:00 - 09:25: Synchronization in PLL Networks**

**Speaker:** Prof. José R. C. Piqueira

**Chair:** Prof. Ricardo L. Viana

**09:25 - 09:50: Deterministic and Stochastic Modeling of Dengue and SARS-CoV-2 Coinfection Patterns**

**Speaker:** Prof. Carla M. A. Pinto

**Chair:** Prof. Ricardo L. Viana

**09:50 - 10:15: Finite-time Lyapunov fluctuations and the upper bound of classical and quantum out-of-time-ordered expansion rate exponents**

**Speaker:** Prof. Marcus W. Beims

**Chair:** Prof. Ricardo L. Viana

**10:15 - 10:45: Coffee Break**

**MS9. Discrete Fractional Calculus and its Applications**

**10:45-11:05: A Continuous Phase Transition in Two-Dimensional Mappings: Can the Formalism Be Extended to Discontinuous Maps?**

**11:05-11:25: Dissipative fractional standard maps: Riemann-Liouville and Caputo**

**11:25-11:45: On fractional generalizations of the logistic map and their applications**

**11:45-12:00: Closing**

Best Poster Award Ceremony

Closing Remarks

**12:00 - 14:00: Lunch**

**Presentations available online in the Conference Website:**

**Lagrange Award Lecture**

**Exploring the Dynamics of Large Systems of Coupled Oscillators**

**Awardee:** Prof. Yoshiki Kuramoto

**Lagrange Award Lecture**

**Simple and Complex Nonlinear Dynamical Systems: Integrability, Chaos and Collective Dynamical States**

**Awardee:** Prof. M. Lakshmanan

**Access the QR Code for  
the NSC conference  
Full Abstract Book**



**NSC Official Lunch Site**

For those who previously selected the lunch option during registration (Transport Included)



Churrascaria Estância Gaúcha  
Avenida Três 1602, Jardim Claret

## Lunch options around the city

1) Restaurante Rainha - Self Service  
Rua 6, 1253 Centro



2) Prosa Mineira - Self Service  
Rua 17, 1022 Jd. Claret



3) Restaurante Zeppelin - Self Service  
Av. 6 , 337 Centro



4) Shopping Rio Claro - Several Options  
Av. Conde Francisco Matarazzo Júnior, 205  
Vila Paulista.



5) Seu Bentô Restaurante - Self Service  
Rua. 5 , 1759 Centro



## Suggested Hotels

1) Bristol Infinity Hotel  
Rua 13, 1893, Santa Cruz



2) Hotel Cristal  
Av. Pres. Tancredo de  
Almeida Neves, 1440, Jardim Claret



3) Class Hotel Rio Claro  
Av. 1, 926, Centro



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