## Technical Sessions

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**May, 16th 2016 – Monday**

8h00-8h30 – Registration

8h30-9h00 – Open Ceremony

9h00-10h30 – Parallel Sessions: Minisymposia and Contributive Sessions

MS-01 – Transient Chaos in Complex Systems I/II

Room:
Organizers: Abraham Chian, ITA, INPE & University of Adelaide, São Jose dos Campos & Adelaide, Brazil & Australia; Erico Rempel, ITA & INPE, São Jose dos Campos, Brazil; and Miguel Sanjuán, Universidad Rey Juan Carlos, Madrid, Spain.

- 9h00-9h30: **Route to hyperchaos and intermittency in Rayleigh-Bernard Convection; E.V. Chimanski**, ITA, São Jose dos Campos, Brazil; **R. Chertovskih**, ITA, São José dos Campos, Brazil; **Erico Rempel**, ITA & INPE, São Jose dos Campos, Brazil.
- 9h30-10h00: **Edge of chaos and genesis of turbulence; Abraham Chian**, ITA, INPE & University of Adelaide, São Jose dos Campos & Adelaide, Brazil & Australia; **Pablo Munoz**, Universidad de La Serena, La Serena, Chile; **Erico Rempel**, ITA & INPE, São José dos Campos, Brazil.
- 10h00-10h30: **Supertransient and amplitude-phase synchronization in astrophysical shear flows; Erico Rempel**, ITA & INPE, São José dos Campos, Brazil; **Rodrigo Miranda**, Faculdade Gama, Universidade de Brasilia (UnB), Brasilia, Brazil; **Abraham Chian**, ITA, INPE & University of Adelaide, São Jose dos Campos & Adelaide, Brazil & Australia;

**MS-02 – Chaos, Scalling Laws and Dynamical Systems – I/II**

Room:

Organizer: André Luis Prando Livorati, Departamento de Física – UNESP Rio Claro-SP, Brazil.

- 09h00-9h30: A dynamical phase transition for a family of Hamiltonian mappings: a phenomenological investigation to obtain the critical exponents; **Edson Denis Leonel**, Departamento de Física – UNESP Rio Claro -SP, Brazil;
- 09h30-10h00: Chaotic dynamics in an elliptical billiard with soft walls; **Tiago Kroetz**, Universidade Tecnológica Federal do Paraná, Pato Branco-PR, Brazil;
- 10h00-10h30: Stickiness influence in a driven stadium-like billiard: An ensemble separation mechanism; **André Luis Prando Livorati**, Departamento de Física- UNESP, Rio Claro-SP, Brazil.

**TS-01 – Nonlinear Dynamical Systems and Application – I**

Room:

Chair: Ricardo Viana, UFPR, Curitiba, Brazil

- 09h00-9h20: TS-01-1 - Variational iteration method in the time fractional Burgers equation; **Adrian R. Gómez**, Nueva Granada Militar University – Colombia; **Edmundo Capelas de Oliveira**, UNICAMP, Brazil.
- 09h20-9h40: TS-01-2 - Complexity Metric Applied to the Discrete Events Systems; **João Paiva**, UFG, Brazil; **Viviane Gomes**, IFG, Brazil; **Bruno Aniceto**, UFG, Brazil; **Geovanne Furriel**, UFG, Brazil; **Lais Fernanda**, UFG, Brazil; **Wesley Calixto**, UFG, Brazil.
- 09h40-10h00: TS-01-3 – Nonlinear Dynamics of an Origami Structure Coupled to Smart Materials; **Larissa Fonseca**, Federal University of Rio de Janeiro, Brazil; **Guilherme Vieira**, UFRJ, Brazil; **Marcelo Savi**, UFRJ, Brazil; **Alberto Paiva**, UFF, Brazil.
10h00-10h20: TS-01-4 – A switching scheme between conventional and chaos-based communication systems; Renato Candido, USP, Brazil; Magno Silva, USP, Brazil; Marcio Eisencraft, USP, Brazil.

10h30-10h45 – Coffee-Break

10h45-12:15 – Plenary Talks
Room:
• 10h45-11h30: P-01 – Jason Gallas, Universidade Federal da Paraíba-PB, Brazil; Periodicity and chaos: How are they organized in lasers, circuits, biochemical oscillators and other complex flows?
• 11h30-12h15: P-02 – Christian Bick, University of Exeter, Exeter, United Kingdom; Dynamics of Phase Oscillators with Generalized Coupling

12h15-13h30 – Lunch

13h30-15h30 – Parallel Sessions: Minisymposia and Contributive Sessions

MS-01 – Transient Chaos in Complex Systems II/II
Room: Organizers: Abraham Chian, ITA, INPE & University of Adelaide, São Jose dos Campos & Adelaide, Brazil & Australia; Erico Rempel, ITA & INPE, São Jose dos Campos, Brazil; and Miguel Sanjuán, Universidad Rey Juan Carlos, Madrid, Spain.
• 13h30-14h00: Transport Barriers In Bidimensional And Multidimensional Systems; Caroline Martins, ITA, São Jose dos Campos, Brazil; Marisa Roberto, ITA, São Jose dos Campos, Brazil; Iberê Caldas, USP, São Paulo, Brazil.
• 14h00-14h30: Boundary crisis and chaotic transient in a model of tumor growth; Miguel Sanjuán, Universidad Rey Juan Carlos, Madrid, Spain.

MS-02 – Chaos, Scalling Laws and Dynamical Systems – II/II
Room: Organizer: André Luis Prando Livorati, Departamento de Física – UNESP Rio Claro -SP, Brazil.
• 13h30-14h00: Sensitive Dependence on Parameters of Continuous-time Nonlinear Dynamical Systems; Everton Medeiros, Instituto de Física – USP, São Paulo-SP, Brazil; Iberê Luis Caldas, Instituto de Física –
USP, São Paulo-SP, Brazil; Murilo S. Baptista, University of Aberdeen, ICMB, Aberdeen, Scotland.

- 14h00-14h30: **Scaling laws and critical exponents in discrete mappings**; Juliano Antônio de Oliveira, Universidade Estadual Paulista-UNESP, São João da Boa Vista-SP, Brazil.
- 14h30-15h00: **Chaotic Explosions**; Eduardo G. Altmann, Max Planck Institute of Physics of Complex Systems, Dresden, Germany; Jefferson Stafuso Elias Portela, Universidade Tecnológica Federal do Paraná, Pato Branco-PR, Brazil; Tamás Tél, Eötvös Loránd University, Budapest, Hungary

### TS-02 – Celestial Mechanics and Dynamical Astronomy

**Room:**

**Chair:** Othon Winter, UNESP, Guaratinguetá, Brazil

- 13h30-13h50: TS-02-1 - **The influences of the companion for the formation of the Gamma-Cephei planetary system**; Ricardo Moraes, Universidade de São Paulo – UNESP, Brazil; Ernesto Vieira Neto, UNESP, Brazil.
- 13h50-14h10: TS-02-2 - **A Firefly Planetary Ring**; Othon Winter, UNESP, Brazil; Alexandre Souza, UNESP, Brazil; Rafael Sfair, UNESP, Brazil; Silvia Giuliatte Winter, UNESP, Brazil; Decio Mourão, UNESP, Brazil; Dietmar Foryta, UFPR, Brazil.
- 14h10-14h30: TS-02-3 – **Different population of hypothetical objects in the Pluto system and the New Horizons mission**, Silvia M. Giuliatte Winter, UNESP, Brazil.
- 14h30-14h50: TS-02-4 – **On the oldest asteroid families in the main belt**; Valerio Carruba, UNESP, Brazil; David Nesvorný, Southwest Research Institute, USA; Safwan Aljbaae, UNESP, Brazil; Rita Domingos, UNESP, Brazil; Mariela Huaman, UNESP, Brazil; Ricardo Luiz Viana, UFPR, Brazil.
- 14h50-15h10: TS-02-5 – **On the Karin family**; Valerio Carruba, UNESP, Brazil; David Nesvorný, Southwest Research Institute, USA.
- 15h10-15h30: TS-02-6 – **Lags of Prometheus and Pandora**; Thamiris de Santana, UNESP, Brazil; Othon Winter, UNESP, Brazil; Decio Mourão, UNESP, Brazil.

**15h30-15h45 – Coffee-Break**

**15h45-16:30 – Plenary Talks**

**Room:**

- 15h45-16h30: P-03 – **Mark Edelman**, Courant Institute of Mathematical Sciences, New York, USA; Systems with power-law memory and fractional dynamics
16h30-18h30 – Parallel Sessions: Minisymposia and Contributive Sessions

MS-03 – Dynamics and synchronization in complex networks I/III
Room:  
Organizers: Rafael Soares Pinto, USP, São Carlos, Brazil and Tiago Pereira, USP, São Carlos, Brazil.

- 16h30-17h00: Synchrony patterns on gradient networks; Miriam Manoel, Departamento de Física, ICMC – USP São Carlos-SP, Brazil; M. Roberts, Department of Mathematics, University of Surrey, Guildford, United Kingdom;
- 17h00-17h30: Robust heteroclinic networks in coupled identical cell networks: Realization and patterns of synchronization; Mike J Field, Department of Mathematics – Imperial College, London, United Kingdom & Rice University, Houston-TX, USA;
- 18h00-18h30: Squared sine logistic map; R. Egyptio de Carvalho, UNESP, Rio Claro-SP, Brazil; Edson D. Leonel, Departamento de Física - UNESP, Rio Claro-SP, Brazil;

MS-04 – Chaos-based communications and signal processing – I/II
Room:  
Organizer: Marcio Eisencraft, Escola Politécnica - USP, São Paulo-SP, Brazil

- 16h30-17h00: Chaotic Map Sequence as Fingerprint for Physical Authentication System; Joao V. C. Evangelista, Daniel Chaves, Cecilio Pimentel, Universidade Federal de Pernambuco, Recife, Brazil;
- 17h00-17h30: Spectral Properties of the Orbits of the Hénon map; Rafael Costa & Marcio Eisencraft, Escola Politécnica, University of São Paulo, São Paulo, Brazil;
- 17h30-18h00: White Gaussian Chaos; Marcio Eisencraft, Escola Politécnica - USP, São Paulo-SP, Brazil.

TS-03 – Chaos and Global Phenomena – I
Room:  
Chair: Sérgio Lopes, UFPR, Curitiba, Brazil

- 16h30-16h50: Spatio-temporal dynamics and pattern formation in a two-dimensional reaction-diffusion model with non-local interactions; Fabio Alliguieri dos Santos Silva, Instituto Federal de Ciência e Tecnologia do Paraná, Brazil; Ricardo Viana, UFPR, Brazil.
- 16h50-17h10: First return times to approximated generating partitions of induced Duffing map; Rodrigo Pereira, Federal University of Technology - Paraná, Brazil.
17h10-17h30: TS-03-3 – **Numerical Imprecision and its Impact on Discrete Systems as Logistic Map**; Bruno Ossalin Paiva, Universidade Federal de São João del Rei, Brazil; Erivelton Geraldo Nepomuceno, UFSJ, Brazil; Gleison Amaral, UFSJ, Brazil.

17h30-17h50: TS-03-4 – **Anomalous sea surface structures (rogue waves) as an object of statistical topography**; Valeriy Klyatskin, (1)Obukhov Atmospheric Physics Institute of RAS, Russia; Konstantin Koshe, Pacific Oceanological Institute, Russia.

17h50-18h10: TS-03-5 – **Effect of the turbulent diffusion on passive scalar transport induced by an isolated vortex model**; Konstantin Kosche, Pacific Oceanological Institute, Russia; Eugeny Ryzhov, Pacific Oceanological Institute, Russia; Vladimir Zhmur, Institute of Oceanology of RAS, Russia.

18h10-18h30: TS-03-6 – **Nonlinear free vibrations of shear deformable beams with axially movable boundary conditions**; Francesco Clementi, Polytechnic University of Marche, Italy; Stefano Lenci, Polytechnic University of Marche, Italy; Giuseppe Rega, Sapienza University of Rome, Italy.

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**May, 17th 2016 – Tuesday**

**8h30-10h30 – Parallel Sessions: Minisymposia and Contributive Sessions**

**MS-03 – Dynamics and synchronization in complex networks II/III**

**Room:**

**Organizers:** Rafael Soares Pinto, USP, São Carlos, Brazil and Tiago Pereira, USP, São Carlos, Brazil

- **8h30-9h00:** **Synchronization and Applications;** Hildebrand M. Rodrigues, Departamento de Matemática Aplicada e Estatística, ICMC-USP, São Carlos-SP, Brazil;
- **9h00-9h30:** **Homophily and heterophily on networks of coupled oscillators: a preliminary study about transient time;** Celso Bernardo Nóbrega Freitas, LAC-INPE, São José dos Campos – SP, Brazil.
- **9h30-10h00:** **Using neuroimaging techniques to reveal the brain complex networks at rest;** R.C. Mesquita, S.L. Novi, Instituto de Física, UNICAMP, Campinas-SP, Brazil; R.F. Casseb, Faculdade de Ciências Médicas, UNICAMP, Campinas-SP, Brazil; G. Castellano, Instituto de Física, UNICAMP, Campinas-SP, Brazil;
- **10h00-10h30:** **Collective dynamics in two populations of noisy oscillators with asymmetric interactions;** Thomas Kauê Dal’Maso Peron, ICMC-USP, São Carlos-SP, Brazil; Francisco Rodrigues, ICMC-USP, São Carlos-SP, Brazil;
MS-04 – Chaos-based communications and signal processing – II/II
Room: 
**Organizer:** Marcio Eisencraft, Escola Politécnica - USP, São Paulo-SP, Brazil

- 8h30-9h00: **Chaotic Properties of the Hénon Map with a linear filter**; Rodrigo T. Fontes & Marcio Eisencraf, Escola Politécnica - USP, São Paulo-SP, Brazil;
- 9h30-10h00: **IIR Equalization Based on Complexity Measures in the Context of Chaotic Information Sources**; Patrick F. Coutinho, DCA/FEEC/UNICAMP, Campinas, Brazil, Diogo C. Soriano, CECS/UFABC, Santo André, Brazil, Filipe Ieda Fazanaro, CECS/UFABC, Santo André, Brazil, Romis Attux, DCA/FEEC/UNICAMP, Campinas, Brazil;
- 10h00-10h30: **A Switching Scheme Between Conventional and Chaos-based Communication Systems**; Renato Candido, Magno T. M. Silva & Marcio Eisencraft, Escola Politécnica - USP, São Paulo-SP, Brazil.

TS-04 – Chaos and Global Phenomena – II
Room: 
**Chair:** Iberê Luiz Caldas, IF, USP, São Paulo, Brazil

- 8h30-8h50: **TS-04-1 - A Dynamical Approach to Time Series with Fluctuating Statistical Parameters**; Ivan Roa Gonzalez, UFPE, Brazil; Giovani Lopes Vasconcelos, UFPE, Brazil; Antonio Murilo Macedo, UFPE, Brazil.
- 8h50-9h10: **Spectral properties of temporal evolution of brain network structure**; Rong Wang, Xi’an Jiaotong University, P. R. China; Pan Lin, Xi’an Jiaotong University, P. R. China; Ying Wu, Xi’an Jiaotong University, P. R. China.
- 9h10-9h30: **TS-04-3 – Dynamical potentials for non-equilibrium stationary states driven by multiplicative stochastic processes**; Daniel Barci, University of the State of Rio do Janeiro, Brazil; Miguel Moreno, UERJ, Brazil; Zochil González Arenas, UERJ.
- 9h30-9h50: **TS-04-4 – Detecting dynamical changes in data streams**; Fausto Guzzo da Costa, USP, Brazil; Rodrigo Mello, USP, Brazil.
- 9h50-10h10: **TS-04-5 – Set Stability of Fixed Points for Discrete Maps**; Bruno Ossalin Paiva, Universidade Federal de São João del Rei, Brazil; Erivelton Geraldo Nepomuceno, UFSJ, Brazil; Gleison Amaral, UFSJ, Brazil.
- 10h10-10h30: **TS-04-6 – Analysis of Plasma Turbulence in Texas Helimak**; Dennis Toufen, USP, Brazil; Felipe Pereira, USP, Brazil; Zwinglio Guimarães Filho, USP, Brazil.
10h30-10h45 – Coffee-Break

10h45-12h15 – Plenary Talks
Room:
- 10h45-11h30: P-04 – **Miguel Sanjuán**, King Juan Carlos University, Móstoles, Madrid, Spain; Basin Entropy: A new tool to explore uncertainty in dynamical systems.
- 11h30-12h15: P-05 - **Lev A. Ostrovsky**, National Oceanic and Atmospheric Administration (NOA), Boulder, CO, USA; Acoustic radiation force, dynamics of particles and bubbles in acoustic field, and biomedical applications.

12h15-13h30 – Lunch

13h30-15h30 – Poster Session I

15h30-15h45 – Coffee-Break

15h45-16:30 – Plenary Talks
Room:
- 15h45-16h30: P-06 – **José Roberto Castilho Piqueira**, Escola Politécnica, USP, Brazil; Hopf bifurcation and chaos in a third-order phase-locked loop

16h30-18h30 – Parallel Sessions: Minisymposia and Contributive Sessions

**MS-03 – Dynamics and synchronization in complex networks – III/III**
Room:
**Organizers:** Rafael Soares Pinto, USP, São Carlos, Brazil and Tiago Pereira, USP, São Carlos, Brazil
- 16h30-17h00: **Hidden symmetries in coupled cell network vector fields**, Eddie Nijholt, Department of Mathematics, VU University Amsterdam, The Netherlands;
- 17h00-17h30: **Dynamics of phase oscillator populations with heterogeneous phase lags**, Christian Bick, College of Engineering, Mathematics and Physical Sciences University of Exeter, Exeter, United Kingdom;
• 17h30-18h00: Chimera states from explosive synchronization, Rafael Soares Pinto, Tiago Pereira & Jaap Eldering, ICMC-USP, São Carlos-SP, Brazil;
• 18h00-18h30: Stochastic Quasispecies Model: Form Self-Replicating Polynucleotides to RNA viruses; Fernando Antoneli, Laboratório de Genômica Evolutiva e Biocomplexidade & DIS Escola Paulista de Medicina – Unifesp, São Paulo-SP, Brazil.

MS-05 – Computational Neuroscience
Room:
Organizers: Leandro Alexandre da Silva¹ & Rafael Dias Vilela¹
¹UFABC, Santo André -SP, Brazil.

• 16h30-17h00: Collective Dynamics suppresses Fluctuations; Tiago Pereira da Silva, USP, São Carlos-SP, Brazil;
• 17h00-17h30: Conditional Lyapunov Exponents for Izhikevich Neuronal Model; Filipe I. Fazanaro, Ricardo Suyama & Diogo Soriano, CECS/UFABC, Santo André-SP, Brazil;
• 17h30-18h00: Colored noise and memory effects on formal spiking neuron models; Leandro Alexandre da Silva & Rafael Dias Vilela, UFABC, Santo André-SP, Brazil;
• 18h00-18h30: On the beneficial role of memory for signal detection by threshold systems; Leandro Alexandre da Silva & Rafael Dias Vilela, UFABC, Santo André-SP, Brazil;

TS-06 – Control in Chaos and Complex Systems
Room:
Chair: Leonardo Santos, CEMADEN, São José dos Campos, SP

• 16h30-16h50: Supernovae Automatic Classification Method by Modeling Human Analysis using Artificial Neural Networks; Marcelo Módolo, INPE, Brazil; Lamartine Nogueira Frutuoso Guimarães, IEAv, Brazil; Reinaldo Rosa, INPE, Brazil.
• 16h50-17h10: TS-06-2 - Reactive model for convergence of active agents to moving formations; Vander Freitas, INPE, Brazil; Elbert E. N. Macau, INPE, Brazil.
• 17h10-17h30: TS-06-3 – Complexity Reduction for An Optimal Stopping Problem: A Two-Time-Scale Approach; Qing Zhang, University of Georgia, USA; George Yin, Wayne State University, USA.
• 17h30-17h50: TS-06-4 – Modeling the atmospheric turbulence with intermittency; Haroldo Campos Velho, INPE, Brazil; Reinaldo Rosa, INPE, Brazil; Fernando Ramos, INPE, Brazil; Roger Pielke, Sr., CIRES, USA.
• 17h50-18h10: TS-06-5 – Nonlinear suboptimal controller design for chaotic motions of mobile robot formations; Marat Rafikov, UFABC, Brazil; Guilherme Rinaldo, UFABC, Brazil.
May, 18th 2016, Wednesday

8h30-10h30 – Parallel Sessions: Minisymposia and Contributive Sessions

MS-06 – Complex Networks as an Interdisciplinary Tool on Measurement of Critical Infrastructure’s Vulnerability Against Natural Disasters – I/II
Room:
Organizer: Leonardo B. L. Santos, Cemaden/MCTI, São José dos Campos -SP, Brazil;

- 8h30-9h00: Conceptual Interfaces Between The Natural Disaster Terminology And Complex Systems Theory; Luciana R. Londe & Leonardo B. L. Santos, CEMADEN, São José dos Campos-SP, Brazil;
- 9h00-9h30: Pghydro – Hydrographic Objects In Spatial Database Management System; Alexandre A. Teixeira, National Agency of Water-ANA, Brasília-DF, Brazil;
- 9h30-10h00: Weather Radar Forecasting For Natural Disasters Early Warning At The Scale Of Susceptibility Areas; Tiago Carvalho, Marcos L. Rodrigues & Jojhy Sakuragi, CEMADEN, São José dos Campos-SP, Brazil;

TS-07 – Bifurcation Theory and Applications – I
Room:
Chair: Tiago Pereira, USP, São Carlos, Brazil

- 8h30-8h50: TS-07-1 - Asymptotic analysis of the everted state of circular cylindrical shell; Leonid Srubshchik, Cooper Union College, USA.
- 8h50-9h10: TS-07-2 - Stochastic dynamics with multiplicative noise: An analysis on time reversibility; Zochil González Arenas, University of the State of Rio de Janeiro, Brazil; Daniel Barci, UERJ, Brazil.
- 9h10-9h30: TS-07-3 – Bifurcation and Shock Wave Solutions of Burgers Equation; Chunqing Lu, Southern Illinois University Edwardsville, USA.
- 9h30-9h50: TS-07-4 – Analytical bifurcation trees of periodic motions to chaos in a periodically driven pendulum; Albert Luo, Southern Illinois University Edwardsville, USA; Yu Guo, Midwestern State University, USA.
- 9h50-10h10: TS-07-5 – Dynamics and indirect nite-time stability of modi ed relay-coupled chaotic systems; Patrick Herve Louodop, UNESP, Brazil; Hilda Cerdeira, UNESP, Brazil.
- 10h10-10h30: TS-07-6 – Devil’s Staircase in an Optomechanical Cavity; Eyal Buks, Technion, Israel.

TS-08 – Synchronization and Complex Networks - I
Room:
Chair: Marcos Quiles, UNIFESP, São José dos Campos, Brazil

- 8h30-8h50: TS-08-1 - **Community detection using coupled Kuramoto oscillators with conditional repulsion**; João Eliakin Mota de Oliveira, INPE, Brazil; Marcos Daniel N. Maia, INPE, Brazil; Elbert E. N. Macau, INPE, Brazil; Marcos G. Quiles, UNIFESP, Brazil.

- 8h50-9h10: TS-08-2 - **Monitoring of Waste Generated in the Classroom of Uninorte rooms through sensors Ultrasonic and CO² in the Recycle Bins**; Eucriney Albuquerque de Melo, Centro Universitário do Norte, Brazil;

- 9h10-9h30: TS-08-3 – **Using neuroimaging techniques to reveal the brain complex networks at rest**; Rickson Coelho Mesquita, UNICAMP, Brazil; Sergio Novi Junior, UNICAMP, Brazil.

- 9h30-9h50: TS-08-4 – **Frequency synchronization in power-grid models of Kuramoto-like model**; José Mario Vicensi Grzybowski, Federal University of Fronteira Sul, Erechim, Brazil; Elbert E. N. Macau, INPE, São José dos Campos, SP; Takashi Yoneyama, ITA, São José dos Campos, Brazil.

- 9h50-10h10: TS-08-5 – **Watershed delineation – inverse problem and stochastic approach**; Leonardo B. L. Santos, CEMADEN, São José dos Campos, Brazil; Tiago N. S. Miranda, FATEC, Cruzeiro, Brazil; Lucas V. Oliveira, UNESP, São José dos Campos, Brazil; Maria C. B. Jurema, UNESP, São José dos Campos, Brazil; Solon V. Carvalho, INPE, São José dos Campos, SP.

**10h30-10h45 – Coffee-Break**

**10h45-12:15 – Plenary Talks**

Room:

- 10h45-11h30: P-07 – **J. A. Tenreiro Machado**, Politécnica do Porto, Porto, Portugal; Fractional calculus and applications

- 11h30-12h15: P-08 – **Lea F. Santos**, Yeshiva University, New York, USA; Powerlaw Decays and Thermalization in Chaotic Quantum Systems

**12h15-13h30 – Lunch**

**May, 19th 2016 – Thursday**

**8h30-10h30 – Parallel Sessions: Minisymposia and Contributive Sessions**
MS-06 – Complex Networks as an Interdisciplinary Tool on Measurement of Critical Infrastructure’s Vulnerability Against Natural Disasters – II/II
Room:
**Organizer:** Leonardo B. L. Santos, Cemaden/MCTI, São José dos Campos -SP, Brazil;
- 8h30-9h00: **Survivability Evaluation Of Critical Infrastructures** Daniel S. Menasche, UFRJ, Rio de Janeiro-RJ, Brazil;
- 9h00-9h30: **Complex Networks In Geographical Information Systems - Crossing Hydrography And Transportation Networks;** Leonardo B. L. Santos, Aurelienne A. Souza Jorge & Beatriz M. M. Silva, CEMADEN, São José dos Campos-SP, Brazil; Alessandro C. Miola, UFSM, Santa Maria-RS, Brazil;

MS-07 – Nonlinear Dynamics Of Conservative And Dissipative Complex Systems – I/II
Room:
**Organizer:** Ricardo Luiz Viana, Departamento de Física, Universidade Federal do Paraná, Curitiba-PR, Brazil.
- 8h30-9h00: **Analysis of Plasma Turbulence in Texas Helimak;** D. L. Toufen, Federal Institute of Education, Science and Technology of São Paulo, Guarulhos-SP, Brazil; F. A. Pereira, Z. O. Guimarães-Filho & I. L. Caldas, Instituto de Física - USP, São Paulo-SP, Brazil; K. W. Gentle, Department of Physics and Institute for Fusion Studies, The University of Texas at Austin, Austin-TX, USA.
- 9h00-9h30: **Community detection in complex networks via dynamics;** Elbert E. N. Macau, INPE, São José dos Campos-SP, Brazil;
- 9h30-10h00: **Synchronization of nonlinear phase oscillators with coupling mediated by a diffusing substance;** Carlos Adalberto Schnaider Batista, UFPR, Pontal do Paraná-PR, Brazil; José Danilo Szezech Jr. & Antônio Marcos Batista, UEPG, Ponta Grossa-PR, Brazil; Elbert E. Nehrer Macau, INPE, São José dos Campos-SP, Brazil; Sérgio Roberto Lopes & Ricardo Luiz Viana, UFPR, Curitiba-PR, Brazil;
- 10h00-10h30: **Control of anomalous transport and stickiness in Hamiltonian systems;** Taline Suellen Krüger, Paulo Paneque Galuzio, Thiago de Lima Prado & Ricardo Luiz Viana, UFPR, Curitiba-PR, Brazil; José Danilo Szezech Jr., UEPG, Ponta Grossa-PR, Brazil; Sergio Roberto Lopes, UFPR, Curitiba-PR, Brazil;

TS-09 – Synchronization and Complex Networks – II
Room:
**Chair:** Ricardo Viana, UFPR, Curitiba, Brazil
- 8h30-8h50: **Lyapunov spectrum of chaotic maps with a coupling mediated by a diffusing substance;** Ricardo Viana, UFPR, Brazil; Carlos Batista, UEPG, Brazil; Antonio Batista, UEPG, Brazil; Kelly Iarosz, USP, Brazil.
- 8h50-9h10: **Hurst exponent estimation of self-affine time series through a complex network approach;** Andriana Campanharo, UNESP, Brazil; Fernando Ramos, INPE, Brazil.
• 9h10-9h30: TS-09-3 – **On the Fundamental Characteristics of Complex Network with Multi-Agent Constituents**; Chun-Lin Yang, Texas A&M University, USA; C. Steve Suh, Texas A&M University, USA.

• 9h30-9h50: TS-09-4 - **Synchronization of phase oscillators with coupling mediated by a diffusing substance**; Carlos Batista, UEPG, Brazil; Ricardo Viana, UFPR, Brazil; Jose Danilo Szezech Junior, USP, Brazil; Antonio Batista, UEPG, Brazil; Elbert E. N. Macau, INPE, Brazil.

• 9h50-10h10: TS-09-5 – **Complex Network Into Geographical Information Systems**; Beatriz da Silva, FATEC, Brazil; Maria Jurema, UNESP, Brazil; Leonardo Santos, CEMADEN-MCTI, Brazil.

• 10h10-10h30: TS-09-6 – **A geographically-aware complex network approach for foot-and-mouth disease phylodynamics**; Luiz Max F. de Carvalho, University of Edinburgh, United Kingdom; Leonardo Santos, CEMADEN-MCTI, Brazil; Paulo E. P. Burke, UNIFESP, Brazil; Marcos Quiles, UNIFESP, Brazil; Waldemir de Castro Silveira, Trimatrix LTDA, Brazil.

10h30-10h45 – Coffee-Break

10h45-12:15 – Plenary Talks

Room:
• 10h45-11h30: P-09 – **Luis Fernando Costa Alberto**, USP de São Carlos, Brazil; Avoiding Blackouts with Theory of Stability Regions

• 11h30-12h15: P-10 – **Martin Mönnigman**, Ruhr-Universität Bochum, Germany; Constructive Nonlinear Dynamics: Integrating Applied Bifurcation Theory with Optimization

12h15-13h30 – Lunch

13h30-15h30 – Poster Session II

15h30-15h45 – Coffee-Break

15h45-16:30 – Plenary Talks

Room:
• 15h45-16h30: P-11 – **J. M. Martínez**, IMECC, UNICAMP, Brazil; Complexity in Unconstrained and Constrained Optimization

Room:
• 15h45-16h30: P12 – **Matteo Tanzi**, Imperial College, London, UK; Expanding Dynamics on Heterogeneous Networks: Mean Field Reduction and Synchronisation

**16h30-18h30 – Parallel Sessions: Minisymposia and Contributive Sessions**

**MS-08 – Lie group analysis and its applications**

Room: Maria Luz Gandarias¹, Maria Santos Bruzón¹ & Chaudry Masood Khalique²,³

¹Department of Mathematics, University of Cadiz, Puerto Real, Spain
²Department of Mathematical Sciences, North-West University, Mafikeng Campus, Mmabatho, South Africa

• 16h30-17h00: **Some Conservation laws of a Boussinesq equation with strong internal damping**; Maria Luz Gandarias & Maria Rosa, University of Cadiz, Spain;
• 17h00-17h30: **Nonlinear Self-Adjointness And Conservation Laws Of A Generalized Benjamin-Bona-Mahony-Burgers Equation**; M.S. Bruzón, T. Garrido & R. de la Rosa, University of Cádiz, Puerto Real, Spain;
• 17h30-18h00: **Solutions and conservation laws of a class of nonlinear dispersive wave equations**; Chaudry Masood Khalique, North-West University, Mafikeng Campus, Mmabatho, South Africa;
• 18h00-18h30: **An optimal system and group-invariant solutions of the Vasicek pricing equation of mathematical finance**; Tanki Motsepa, North-West University, Mafikeng Campus, Mmabatho, South Africa;

**TS-05 – Infinite Dimension Systems, Plasma and Turbulence – I**

Room: Reinaldo Rosa, INPE, São José dos Campos, Brazil

• 16h30-16h50: **TS-05-1 - 3DBMO: A Time Series Canonical Generator to Study the PSD Dimensional Dependence in Complex Physical Systems**; Paulo Zeferino, INPE, Brazil; Reinaldo Rosa, INPE, Brazil; Murilo Dantas, IFSP, Brazil.
• 16h50-17h10: **TS-05-2 – Perturbative methods in agent based epidemic models**; Alexandre Martinez, USP, Brazil; Gilberto Nakamura, USP, Brazil.
• 17h10-17h30: **TS-05-3 – High-Order Numerical Approach for Computational Model of the Pressureless Gas Dynamics Equations**; SungKi Jung, UFABC, Brazil.
• 17h30-17h50: **TS-05-4 – Scattering theory of walking droplets in the presence of obstacles**; Remy Dubertrand, University of Liege, Belgium.
• 17h50-18h10: **TS-05-5 – Discrete Elements on Paralell Multi-core Using Dynamic Particle Flow Simulations to Examine Fresh Concrete and Slump Test Parameters**; Luiz Carlos Sanches, UNESP, Brazil.
• 18h10-18h30: **TS-05-6 – Simulation of the interaction of a comet with the solar wind using a magnetohydrodynamic model**; Edgard de
Freitas Diniz Evangelista, INPE, Brazil; Margarete Domingues, INPE, Brazil; Odim Mendes, INPE, Brazil; Oswaldo Duarte Miranda, INPE, Brazil.

**TS-10 – Nonlinear Dynamical Systems and Application – II**

**Room:**

**Chair:** Thiago Prado, INPE, São José dos Campos, Brazil

- **16h30-16h50:** **TS-10-1 - Charge Behavior Analysis In Ball Mills By Using Torque Signal - An Alternative To Increase The Efficiency Of Ball Mills;** Luiz Carlos Silva, UFABC, Brazil; Jesus Franklin Andre Romero, UFABC, Brazil; Gustavo Taets Nascimento, UFABC, Brazil; Thiago de Oliveira Pistola, UFABC, Brazil.
- **16h50-17h10:** **TS-10-2 - Chaotic Properties of the Hénon Map with a linear filter;** Rodrigo T. Fontes, USP, Brazil; Marcio Eisencraft, USP, Brazil.
- **17h10-17h30:** **TS-10-3 – Nonlinear damping in MEMS/NEMS beam resonators resulting from clamping loss;** Andre Gusso, UFF, Brazil; Jéssica Pimentel, UFF, Brazil.
- **17h30-17h50:** **TS-10-4 – Investigating the helicopter dynamics by bred vector;** Ivana Sumida, INPE, Brazil; Thiago Ritto, UFRJ, Brazil; Haroldo Campos Velho, INPE, Brazil.
- **17h50-18h10:** **TS-10-5 – Invariant solutions of (2+1) dimensional modified dispersive water wave system;** Sachin Kumar, Central University of Punjab, India.
- **18h10-18h30:** **TS-10-6 – Estimation of pitch period in voice signals using Poincaré section;** Fernando Sobrinho, Instituto Federal do Sul de Minas, Brazil; Maria Dajer, UTFPR, Brazil; Luís Alberto, USP, Brazil.

**TS-11 – Modeling, Numerical Simulation and Optimization – I**

**Room:**

**Chair:** José Tenreiro Machado, Polytechnic of Porto, Portugal.

- **16h30-16h50:** **TS-11-1 - Multiobjective optimization application in DOE problems with multiple responses;** Douglas Rodrigues, INPE, Brazil; Aneirson Silva, UNESP, Brazil; Fernando Augusto Marins, UNESP, Brazil; Rafael de Carvalho Miranda, UNIFEI, Brazil; Erica Dias, UNESP, Brazil; J. Luche, UNESP, Brazil.
- **16h50-17h10:** **TS-11-2 - A delayed p53 ubiquitination induced via c-Myc-ARF interaction pathway;** Md Jahoor Alam, University of Hail, Saudi Arabia.
- **17h10-17h30:** **TS-11-3 – Excitatory and Inhibitory Synapses in Coupled Model Neurons;** Epaminondas Rosa, Illinois State University, USA; Rosangela Follmann, Illinois State University, USA.
• 17h30-17h50: TS-11-4 – Uncertainty Analysis of Smart Composite Materials; Fabian Andres Lara Molina, Federal Technological University of Paraná, Brazil; Edson Hideki Koroishi, UTFPR, Brazil; Albert Willian Faria, UFTM, Brazil.

• 17h50-18h10: TS-11-5 – Fractional-Order Models for Vegetable Tissues; José Tenreiro Machado, Polytechnic of Porto, Portugal; Antonio Lopes, Universidade do Porto, Portugal.

• 18h10-18h30: TS-11-6 – Parametric excitation of offshore riser using reduced-order models based on Bessel-type modes: calibration of hydrodynamic coefficients; Guilherme Franzini, USP, Brazil; Thiago Dias, USP, Brazil; Carlos Mazzilli, USP, Brazil; Celso Pesce, USP, Brazil.

May, 20th 2016 – Friday

8h30-10h30 – Parallel Sessions: Minisymposia and Contributive Sessions

MS-07 – Nonlinear Dynamics Of Conservative And Dissipative Complex Systems
Room: Organiser: Ricardo Luiz Viana, Departamento de Física, Universidade Federal do Paraná, Curitiba-PR, Brazil.

• 8h30-9h00: Escape time and transport in E x B drift motion; R. S. Oyarzabal, J. D. Szezech Jr, Department of Physics-UEPG, Ponta Grossa-PR, Brazil; A. M. Batista, Department of Mathematics and Statistics-UEPG, Ponta Grossa-PR, Brazil; S. L. T. de Souza, UFSJ, Ouro Branco-MG, Brazil; I. L. Caldas, USP, São Paulo-SP, Brazil; R. L. Viana, UTFPR, Curitiba-PR, Brazil; M. A. F. Sanjuan, Universidad Rey Juan Carlos, Móstoles, Madrid, Spain;

• 9h00-9h30: Coexistent subharmonic resonant modes of a forced bilinear oscillator; Tiago Kroetz, UTFPR, Pato Branco-PR, Brazil; Ricardo Luiz Viana, UTFPR, Curitiba-PR, Brazil;

TS-12 – Bifurcation Theory and Applications – II
Room: Chair: Thiago Prado, INPE, São José dos Campos, SP

• 8h30-8h50: TS-12-1 - Analisys of a Temperature Dependent Multi Stable Pendulum System; Dimitri Costa, UFRJ, Brazil; Marcelo Savi, UFRJ, Brazil.

• 8h50-9h10: TS-12-2 - Conditional Lyapunov Exponents for Izhikevich Neuronal Model; Filipe Fazanaro, UFABC, Brazil; Ricardo Suyama, UFABC, Brazil; Diogo Soriano, UFABC, Brazil.

• 9h10-9h30: TS-12-3 – Eigenvalue analysis of a simple flexible rotor; Renan Correa, Federal Technological University of Paraná, Brazil; Edson Hideki Koroishi, UTFPR, Brazil; Fabian Andres Lara Molina, UTFPR, Brazil; Elenice Stiegelmeier, UTFPR, Brazil.
• 9h30-9h50: TS-12-4 - Simulations and details of a physical prototype addressing the influence of kinematic redundancy on a parallel robot; João Santos, USP, Brazil; Maira da Silva, USP, Brazil.

• 9h50-10h10: TS-12-5 – Influence of Sample Rate and Discretization Methods in the Identification of Systems with Hysteresis; Wilson Junior, UFSJ, Brazil; Vinícius da Silva Borges, UFSJ, Brazil; Alisson Daniel de Macedo Vitor, UFSJ, Brazil; Samir A. M. Martins, UFSJ, Brazil.

TS-13 – Synchronization and Complex Networks - III
Room: José Mendes, Universidade de Aveiro, Portugal

• 8h30-8h50: TS-13-1 - Building phase synchronization equivalence between coupled bursting neurons and phase oscillators; Fabiano Ferrari, UFVJM, Brazil; Ricardo Viana, UFPR, Brazil.

• 8h50-9h10: TS-13-2 - Collective dynamics in two populations of noisy oscillators with asymmetric interactions; Bernard Sonnenschein, Humboldt University, Germany; Thomas Peron, USP, Brazil; Francisco Rodrigues, USP, Brazil; Juergen Kurths, Humboldt University, Germany; Lutz Schimansky Geier, Humboldt University, Germany.

• 9h10-9h30: TS-13-3 – The postgraduate Brazilian studies in Physics Teaching using Complex Network; Jefferson Nascimento, SENAI CIMATEC, Brazil; Camila de Sousa Pereira Guizzo, SENAI CIMATEC, Brazil; Roberto Monteiro, FIB, Brazil; Davidson Moreira, UFES, Brazil; Marcelo Moret, SENAI CIMATEC, Brazil; Hernane Pereira, SENAI CIMATEC, Brazil.

• 9h30-9h50: TS-13-4 - The influence of hubs in the structure of a neuronal network during an epileptic seizure; Abner Rodrigues, USP, Brazil; Hilda Cerdeira, UNESP, Brazil; Birajara Machado, Hospital Israelita Albert Einstein, Brazil.

• 9h50-10h10: TS-13-5 – Structural Properties of Multiplex Networks; José Mendes, Universidade de Aveiro, Portugal.

• 10h10-10h30: TS-13-6 – Ranking scientists; José Fernando Mendes, Universidade de Aveiro, Portugal; Sergey Dorogovtsev, Universidade de Aveiro, Portugal.

10h30-10h45 – Coffee-Break

10h45-12:15 – Plenary Talks
Room:

• 10h45-11h30: P-13 – Mike Filed, Imperial College London, London, United Kingdom and Rice University, Houston, USA; A Modulation of dynamics theorem for asynchronous networks

• 11h30-12h15: P-14 – Albert C. J. Luo, Southern Illinois University, USA; Complete route of period-1 motions to chaos in a time-delayed Duffing oscillator
12h15-13h30 – Lunch

13h30-15h30 – Parallel Sessions: Minisymposia and Contributive Sessions

TS-14 – Modeling, Numerical Simulation and Optimization – II

Room:

Chair: Marcio Eisencraft, USP, Brazil

- 13h30-13h50: TS-14-1 - A Short-Term Load Forecasting Model Based In Support Vector Machines; Ricardo Salgado, UNIFAL, Brazil; Takaaki Ohishi, UNICAMP, Brazil.
- 13h50-14h10: TS-14-2 - Comparative Study Of Short-Term Load Forecasting Models; Ricardo Salgado, UNIFAL, Brazil; Takaaki Ohishi, UNICAMP, Brazil.
- 14h10-14h30: TS-14-3 – A Monthly Streamflow Forecasting Model Using Bayesian Inference Theory; Ricardo Salgado, UNIFAL, Brazil; Bethânia Brito, UNIFAL, Brazil; Luiz Alberto Beijo, UNIFAL, Brazil.
- 14h30-14h50: TS-14-4 – Signal Propagation in Axons; Rosangela Follmann, Illinois State University, USA; Epaminondas Rosa, Illinois State University, USA; Wolfgang Stein, Illinois State University, USA.
- 14h50-15h10: TS-14-5 – Extending Numerical Solutions Of Potential Fields Method Based On Boundary Value Problems For 3d Environments; Marcelo O. Silva, USP, Brazil; Lucas Tomazela, USP, Brazil; Roseli F. Romero, USP, Brazil.

TS-15 – Nonlinear Dynamical Systems and Application – III

Room:

Chair: Thiago Prado, INPE, São José dos Campos, Brazil

- 13h30-13h50: TS-15-1 - Particle Trajectories Driven By Drift-Waves in Sheared Flows; Kaue Cabrera Rosalem, ITA, Brazil; Marisa Roberto, ITA, Brazil; Iberê Luiz Caldas, USP, Brazil.
- 13h50-14h10: TS-15-2 - Features of edge-centric collective dynamics in machine learning tasks; Liang Zhao, USP, Brazil; Filipe Verri, USP, Brazil; Paulo Urio, USP, Brazil.
- 14h10-14h30: TS-15-3 – Stationarity breaking in biological coupled physical systems in mice sleep revealed by recurrence analysis; Thiago Prado, UFPR, Brazil; Sergio Lopes, UFPR, Brazil.
- 14h30-14h50: TS-15-4 – Control of extreme events in the bubbling onset of wave turbulence; Paulo Galuzio, UFPR, Brazil; Ricardo Viana, UFPR, Brazil; Sergio Lopes, UFPR, Brazil.


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**TS-16 – Infinite Dimension Systems, Plasma and Turbulence – II**

**Room:**

**Chair:** Reinaldo R. Rosa, INPE, São José dos Campos, Brazil

- 13h30-13h50: TS-16-1 - **On the verification of an adaptive three-dimensional magnetohydrodynamic model**; *Anna Karina Gomes*, INPE, Brazil; *Margarete Domingues*, INPE, Brazil; *Odim Mendes*, INPE, Brazil.

- 13h50-14h10: TS-16-2 - **The Characteristic Based Split scheme applied to solve the Navier-Stokes equations**; *Gustavo Baggio*, UNESP, Brazil; *João Campos Silva*, UNESP, Brazil; *João Batista Aparecido*, UNESP, Brazil.

- 14h10-14h30: TS-16-3 – **Characterization of inhomogeneous turbulence from fluctuations of density and electromagnetic fields in space plasmas**; *Reinaldo Rosa*, INPE, Brazil.

- 14h30-14h50: TS-16-4 – **A new second order local time scheme for numerical simulations of evolutionary partial differential equations with localized physical phenomena**; *Müller Lopes*, INPE, Brazil; *Margarete Domingues*, INPE, Brazil; *Odim Mendes*, INPE, Brazil.

- 14h50-15h10: TS-16-5 – **Lagrangian Dynamics of Separation Bubble in Its Evolution from Generating to Breaking**; *Jiazhon Zhang*, Xi’an Jiaotong University, P. R. China.

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**15h30-16:15 – Plenary Talks**

**Room:**

- 15h30-16h15: P-15 – **Gonzalo M. Ramirez-Ávila**, Universidad Mayor de San Andrés, La Paz, Bolivia; Arithmetic progression of spiking and bursting in Rulkov's Model

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**16h15-16h30 – Closing Ceremony**

**Poster Sessions**
Poster Section I:
Analysis and Control of Nonlinear Dynamical Systems with Practical Applications

- P-1-01: Synchronization detection and characterization through mixed state embedding and recurrence quantification analysis; Leonardo Portes dos Santos, UFMG, Brazil; Luis Aguirre, UFMG, Brazil.
- P-1-02: Integrable classical restricted two-center MICZ-Kepler problem on surfaces of revolution; Yeva Gevorgyan, UNESP, Brazil.
- P-1-03: Discrete Complex Wavelet Approach Applied to Phase Synchronization on Solar Parameters; Maria Teodora Ferreira, Faculdade Bilac e Univap, Brazil.
- P-1-04: Simulation of Chua's Circuit by Means of Interval Analysis; Melanie Silva, UFSJ, Brazil; Erivelton Geraldo Nepomuceno, UFSJ, Brazil; Gleison Amaral, UFSJ, Brazil; Valceres Silva, UFSJ, Brazil.
- P-1-05: Nonlinear Particle Filter Applied to Orbit Determination of Artificial Satellites; Paula Pardal, USP, Brazil; Helio Kuga, ITA/DCTA, Brazil; Rodolpho Vilhena de Moraes, UNIFESP, Brazil.
- P-01-06: Analysis of the gravitational potential and the equilibrium points of the asteroid 2063 Bacchus; Tamires de Moura, UNESP, Brazil; Othon Winter, UNESP, Brazil.
- P-01-07: Order-Chaos-Order Transition in a Spring Pendulum; Francisco Marcus, USP, Brazil; Metirilen de Sousa, USP, Brazil; Iberê Luiz Caldas, USP, Brazil.
- P-01-08: Spectral Properties of the Orbits of the Hénon map; Rafael Costa, USP, Brazil; Marcio Eisencraft, USP, Brazil.
- P01-09: Suspension system in a spray boom using a fractional PID controller; Leonardo Magalhães, USP, Brazil; Sergio David, USP, Brazil; Rafael Sousa, USP, Brazil; Rubens Tabile, FZEA-USP, Brazil.
- P01-10: Synchronization detection and characterization through mixed state embedding and recurrence quantification analysis; Leonardo Portes dos Santos, UFMG, Brazil; Luis Aguirre, UFMG, Brazil.
- P01-11: On Nonlinear Oscillations Modelling in Structural Engineering and Solar Corona; Marcelo de Juli, Universidade Presbiteriana Mackenzie, Brazil.
- P01-12: Extension of the Invariance Principle for Switched Delay Systems; Michele Valentino, Paraná Federal Technology University, Brazil.
- P01-13: Parametric Dynamics of an Euler-Bernoulli Beam; Lílian Ribeiro, UFSJ, Brazil; Adelcio Oliveira, UFSJ, Brazil.
- P01-14: Analysing fractal basin boundaries in the Copenhagen problem; Sheila Assis, Instituto Federal de Educação, Ciência e Tecnologia Catarinense IFC, Brazil; Maísa de Oliveira Terra, ITA, Brazil.
- P01-15: Implementing the swarm algorithm in multi robots; Amir Hossein Omidvar, UFABC, Brazil; Luiz Martins Filho, UFABC, Brazil; Annibal Hetem Jr., UFABC, Brazil; Atena Amanati Shahri, UFABC, Brazil.
- P01-16: Development of Contact Interaction-based Navigation of Mobile Robots; Atena Amanati Shahri, UFABC, Brazil; Luiz Martins Filho, UFABC, Brazil; Leandro Baroni, UFABC, Brazil; Amir Hossein Omidvar, UFABC, Brazil.
• P01-17: Kinetic instabilities in the electrochemical reform; José Cruz, USP, Brazil; Mayara Prado, USP, Brazil; Hamilton Varela, USP, Brazil;
• P01-18: Periodic Control Applied To The Attitude Control Of The Serpens II Mission; Felipe Coelho, UFSM, Brazil; André Luís da Silva, UFABC, Brazil.
• P01-19: Using micro and nanoresonators as pseudo-random numbers generators; Wellington Dantas, UFF, Brazil; André Gusso, UFF, Brazil.
• P01-20: Energy distribution in a spring pendulum; Meirielen de Sousa, USP, Brazil; Francisco Marcus, USP, Brazil; Iberê Luiz Caldas, USP, Brazil.
• P01-21: Interaction of scroll waves in an excitable medium; Nirmali Das, IIT-Guwahati, India.

Bifurcation Analysis and Applications

• P01-22: Simulation of Recursive Functions by Means of Interval Analysis and Pseudo-Orbits; Heitor Rodrigues Junior, UFSJ, Brazil; Márcia Peixoto, UFSJ, Brazil; Erivelton Geraldo Nepomuceno, UFSJ, Brazil.
• P01-23: Experimental results of the Chua’s circuit; F.F.G Sousa, IFSULDEMINAS, Brazil; R.M. Rubinger, UNIFEI, Brazil.
• P01-24: Analysis of shear instability inside a flow driven by a cylindrical cavity; Waleed Mouhali, ECE Paris, School of Engineering, France; Thierry Lehner, LUTH, France.
• P01-25: Shearless bifurcation on symplectic map with a local null rotation number; Bruno Figueiredo Bartoloni, USP, Brazil; Iberê Luiz Caldas, USP, Brazil.
• P01-26: Complex dynamics in an electrochemical N-NDR oscillator; Alana Zülke, USP, Brazil; Hamilton Varela, USP, Brazil; Jason Gallas, UFPB, Brazil.
• P01-27: Mascons to find equilibrium points around small bodies of irregular shape; Gabriel Borderes Motta, UNESP, Brazil; Othon Winter, UNESP, Brazil.
• P01-28: Determination of asteroid shapes from lightcurves; Victor Lattari, UNESP, Brazil.

Celestial Mechanics and Dynamical Astronomy

• P01-29: Magnetohydrodynamic equilibria with gravitational forces in symmetric systems; Fabiane Carvalho, UFPR, Brazil; Ricardo Viana, UFPR, Brazil.
• P01-30: The radial distribution of the dusty rings of Uranus; Rafael Sfair, UNESP, Brazil; Bruno Sicardy, LESIA, France.
• P01-31: Planetary formation in a coplanar triple stellar system; Luana Mendes, UNESP, Brazil; Rita Domingos, UNESP, Brazil; Othon Winter, UNESP, Brazil; André Izidoro, UNESP, Brazil; André Amarante, UNESP e USP, Brazil.
• P01-32: **Alternative Paths to Reach Asteroids**: Saymon Santana, INPE, Brazil; Cristiano de Melo, UFMG, Brazil; Elbert E. N. Macau, INPE, Brazil; Othon Winter, UNESP, Brazil.

• P01-33: **Study of the dynamic of micrometric particles in the arcs of Neptune’s Adams ring**: Elvira Rafikova, UFABC, Brazil.

• P01-34: **Hydrodynamics formation of the Gamma Cephei b**: Bárbara Camargo, UNESP, Brazil; Ricardo Moraes, UNESP, Brazil; Othon Winter, UNESP, Brazil; Dietmar Foryta, UFPR, Brazil.

• P01-35: **Testing anomalous diffusion models for simulation of cosmological density fluctuation spectra**: Reinaldo Rosa, INPE, Brazil; Solon Carvalho, INPE, Brazil; Fernando Oliveira, UnB, Brazil; Mariana Pelissari Monteiro Aguiar Baroni, IFSP, Brazil; Diego Stalder Díaz, INPE, Brazil.

• P01-36: **Testing the REBOUND in the Nice Model**: Rafael Sousa, UNESP, Brazil; Ernesto Vieira Neto, UNESP, Brazil.

• P01-37: **Study of Sailboat for binaries systems**: Tiago F.L.L. Pinheiro, UNESP, Brazil; Rafael Sfair, UNESP, Brazil.

**Poster Section II:**

**Chaos and Global Nonlinear Dynamics**

• P02-01: **Revisiting Hammel et al. (1987): Does the shadowing property hold for modern computers?**: Bruno Silva, UFSJ, Brazil; Felipe Milan, UFSJ, Brazil; Erivelton Geraldo Nepomuceno, UFSJ, Brazil; Samir A. M. Martins, UFSJ, Brazil; Gleison Amaral, UFSJ, Brazil.

• P02-02: **Dynamical Characterization Of Nonlinear Systems Through Complex Networks**: Juliana Lacerda, INPE, Brazil; Vander Freitas, INPE, Brazil; Elbert E. N. Macau, INPE, Brazil.

• P02-03: **An Alternative Method for the Dimension Calculation of Fractal Basin Boundaries**: Vitor de Oliveira, UFABC, Brazil; Rafael Vilela, UFABC, Brazil.

• P02-04: **Analysis of Coupled Drill-String Vibrations Using a Nonsmooth System**: Luciano Moraes, Centro Federal de Educação Tecnológica, Brazil; Marcelo Savi, UFRJ, Brazil.

• P02-05: **A web framework for advanced and intensive nonlinear time series analysis**: Bruno Leonor, INPE, Brazil; Walter Abrahão dos Santos, INPE, Brazil; Asiel Bomfin Jr, INPE, Brazil; Reinaldo Rosa, INPE, Brazil.

• P02-06: **Associative wavelets and complex networks detection of periodic windows in the logistic map: preliminary studies**: Luciano Magrini, INPE, Brazil; Elbert E. N. Macau, INPE, Brazil; Margarete Domingues, INPE, Brazil.

• P02-07: **Gradient pattern analysis of coupled map lattices**: Rubens Sautter, INPE, Brazil; Pedro Batista, IFSP, Brazil; Reinaldo Rosa, INPE, Brazil.

• P02-08: **Fractal structures in a model for E x B drift motion of charged particles in magnetized plasmas**: Amanda Mathias, UFPR, Brazil; Ricardo Viana, UFPR, Brazil; Iberê Luiz Caldas, USP, Brazil; Tiago Kroetz, USP, Brazil.
Climate Dynamics

- P02-09: Manufacturing Optimization Using Coupled Lot Sizing and Stock Cutting Problems; Glauzia Bressan, Universidade Tecnológica Federal do Paraná, Brazil; Roberto Souza, Universidade Tecnológica Federal do Paraná, Brazil.
- P02-10: Cross-Sample Entropy Analysis for Oceanic Niño Index Data; Stéfano Silva, IFMT, Brazil; Raine Oliveira, IFMT, Brazil; Amanda Souza, IFMT, Brazil; Karla Morales, IFMT, Brazil; Manoel Moreira, IFMT, Brazil.
- P02-11: Bred Vector applied to the atmospheric dynamics; Luis F. Salgeiro, Sandra A. Sandri, Haroldo F. De Campos Velho, Rosângela S. C. Cintra and Saulo R. Freitas, National Institute for Space Research, São José dos Campos, Brazil.

Complex Networks

- P02-12: Study of Communities in a Real Brain Network; Ewandson Lameu, UEPG, Brazil.
- P02-13: Effect of plasticity on the neuronal firing; Paulo Ricardo Protachevicz, UEPG, Brazil; Fernando da Silva Borges, UEPG, Brazil; Kelly Jarosz, USP, Brazil; Antonio Batista, UEPG, Brazil; Iberê Luiz Caldas, USP, Brazil.
- P02-14: Relation Between Autocorrelation Sequence and Average Shortest-Path Length in a Time Serie to Network Mapping; Marcio Eisencraft, USP, Brazil; Amanda Camargo, UFABC, Brazil.
- P02-15: Time series from text co-occurrence networks; Camilo Akimushkin, Instituto de Física de São Carlos, Brazil; Diego Amancio, USP, Brazil; Osvaldo de Oliveira Jr., USP, Brazil.
- P02-16: Cluster formation dynamics of heterogeneous agents; Alcides Castro e Silva; UFOP, Brazil; Everaldo Arashiro, FURG, Brazil; Eduardo Barbosa, UFOP, Brazil; Carlos Saraiva Pinheiro, UFPO, Brazil.
- P02-17: Properties of agent based epidemic models using coherent states; Gilberto Nakamura, USP, Brazil; Alexandre Martinez, USP, Brazil.
- P02-18: Investigating The Origin And Behavior Of Spontaneous Activities Of The Brain With Optical Methods; Sergio Novi Junior, UNICAMP, Brazil; Rickson Coelho Mesquita, UNICAMP, Brazil.
- P02-19: The local dynamic effect on frequency synchronization of neuronal networks; Fabiano Ferrari, UFVJM, Brazil; Ricardo Viana, UFPR; Brazil.

Control in Complex Systems

- P02-20: Dynamic optimization model to control weed infestation by herbicide rotation; Elenice Stiegelmeier, UTFPR, Brazil; Marcos Furlan, UFGD, Brazil; Renan Correa, UTFPR, Brazil.
Control of Chaos

- P02-21: Plasma Response In Cylindrical Tokamaks With Toroidal Effects; André Carlos Fraile Júnior, IEA, Brazil; Marisa Roberto, ITA, Brazil; Iberê Luiz Caldas, USP, Brazil.

Epidemiology and Mathematical Models

- P02-22: Analysis of spatiotemporal patterns of reported cases of AIDS and tuberculosis in the city of São Paulo by administrative districts, using bayesian disease mapping; Elisangela Lizzi, UTFPR, Brazil; Edson Martinez, USP, Brazil; Antonio Ruffino Neto, USP, Brazil; Jonathan Golub, John Hopkins University, USA.
- P02-23: Correlated time series using mixed models in a Bayesian perspective; Roberto Souza, UTFPR, Brazil; Jorge Achcar, USP, Brazil; Glaucia Bressan, UTFPR, Brazil.
- P02-24: Solutions for Fractional Diffusion Equations with Reaction Terms; Ervin Lenzi, UEPG, Brazil; Marcelo Kaminski Lenzi, UFPR, Brazil; Raphael Menechini Neto, UEPG, Brazil.
- P02-25: Fractional Diffusion Equation with Radial Symmetry and Reactive Boundary Conditions; Marcelo Kaminski Lenzi, UFPR, Brazil; Ervin Lenzi, UEPG, Brazil; Andressa Novatski, UEPG, Brazil; Raphael Menechini Neto, UEPG, Brazil; Luciano Rodrigues da Silva, UFRN, Brazil.
- P02-26: Regime shift in a model for vector transmitted disease epidemics; Romuel Machado, UFOP, Brazil; Everaldo Arashiro, FURG, Brazil.

Fluidodynamics, Plasma and Turbulence

- P02-27: Thermal Lattice Boltzmann Method for Dilute Fluids of Bosons and Fermions; Rodrigo Coelho, UFRJ, Brazil; Mauro Doria, UFRJ, Brazil; Anderson Ilha, INMETRO, Brazil.
- P02-28: Using two-dimensional continuous wavelet transform to detect differences among primary forest, water bodies, clouds and cloud shadows on remote sensing images of an Amazon rain forest region: preliminary results; Margarete Domingues, INPE, Brazil; Cledenilson Mendonça de Souza, UFAM/CSEZ, Brazil; Marcos Adami, CRAINPE, Brazil; Leonardo Deane de Abreu Sá, CRAINPE, Brazil.
- P02-29: A Lattice Boltzmann Method for Electrons in Metals; Rodrigo Coelho, UFRJ, Brazil; Anderson Ilha, INMETRO, Brazil; Mauro Doria, UFRJ, Brazil.
- P02-23: Irregular dynamics of the center of mass of droplets; Alexandre de Almeida, USP, Brazil; Nicolas Giovambattista, University of New York, USA; Sergey Buldyrev, Yeshiva University, USA; Adriano Alencar, USP, Brazil.
- P02-31: The Non-Axisymmetric Magnetic Separatrix In Fusion Plasmas; D. Ciro, USP, Brazil; Iberê Luiz Caldas, USP, Brazil.
Modeling, Numerical Simulation and Optimization

- P02-32: **Modelling the Air-Water Interface**; Frank Longford, University of Southampton, UK; Jeremy Frey, University of Southampton, UK; Jonathan Essex, University of Southampton, UK; Chris-Kriton Skylaris, University of Southampton, UK.

- P02-33: **Modeling smart structures to reload smartphones using linear quadratic regulator (LQR) controller and the finite element method (FEM)**; Stefânia Knebel, UFMT, Brazil; Marcelo Volz, UFMT, Brazil; Renato Santos de Souza, UFMT, Brazil; Aguinaldo Soares, UFMT, Brazil.

- P02-34: **Axiomatic Local Metric Derivatives With Mittag-Leffler Eigenfunctions for Low-Level Fractionality**; José Weberszpil, UFRRJ, Brazil; José Helayel, Centro Brasileiro de Pesquisas Fisicas, Brazil.

- P02-35: **Identification of a nonlinear beam through a stochastic model based on a Duffing oscillator**; Luis Villani, UNESP, Brazil; Samuel Silva, UNESP, Brazil; Americo Cunha Jr, UERJ, Brazil.

- P02-36: **Dynamic of neuronal membrane using a numerical model**; Marina González, IFSP, Brazil; Mariana Pelissari Monteiro Aguiar Baroni, IFSP, Brazil; Marco Aurélio Santos, IFSP, Brazil.

- P02-37: **Analysis of RR intervals time serie using second-order difference plot**; Laurita Santos, UNIVAP, Brazil; Joaquim José Barroso, INPE, Brazil; Moacir de Godoy, FAMERP, Brazil; Elbert E. N. Macau, INPE, Brazil.

- P02-38: **Assessment the change on rhythm cardiac produces by the metabolic syndrome in rats: using nonlinear methods**; Alondra Albarado Ibañez, Benemérita Universidad Autonoma de Puebla, Mexico; Marcia Hiriart, UNAM, Mexico; Julian Torres Jacome, Benemérita Universidad Autonoma de Puebla, Mexico.

- P02-39: **Estimation of Dynamical Phase Models for Chaotic Oscillators**; Leandro Abreu, IFMG, Brazil; Luís Aguirre, UFMG, Brazil.

- P02-40: **Chaos and hyperchaos in a reduced model of hydromagnetic convection**; Francis F. Franco, Aeronautics Institute of Technology, São José dos Campos, Brazil; Erico L. Rempel, Aeronautics Institute of Technology, São José dos Campos, Brazil.