Program CHAOS2024

17th Chaotic Modeling and Simulation International Conference *Chania, Crete, Greece, 11 – 14 June, 2024 Hybrid*

Cultural Centre Of Chania

Tuesday, 11.6.2024

Andrea Papandreou 74

TIME ZONE: EEST — Eastern European Summer Time

8:30 – 10:00
Room 1
Registration

10:00 – 10:40 -
Room 1
Opening

10:40-11:00
Plenary Session
Room 1 (PS1)
Chair: Christos Floros
Speaker: Leszek Sirko
Institute of Physics, Polish Academy of Sciences, Warsaw, Poland
Title: Some Important Properties of Quantum Graphs and Microwave Networks with Broken and Preserved Time Reversal Symmetries

11:00- 11:30 Coffee Break

11:30-14.00
SCS1
Special and Contributed Sessions

Room 1	Room 2
SPECIAL SESSION Special session of LAFIM of HMU on "Accounting and Financial Management" **Chair: Christos Floros**	**Invited session** LENL: Localized Excitations in Nonlinear Lattices. **Chair: Jānis Bajārs and Juan FR Archilla**
What drives Connectedness? Stylized Facts from Mean and Volatility Dynamics **Nikolaos Antonakakis, Ioannis Chatziantoniou, and David Gabauer**	Development of Nonmonotonically Propagating Annealing of Defects with Oscillating Temperature at the Wave Front **Pavel Selyshchev**
Empirical Evidence of Key Audit Matters (KAM) in Independent Audit Reports: The Case of Greece **Dimitrios I. Vortelinos and Yiannis Yiannoulis**	Effects of Self-correlated Gaussian Noise on the Emergence of Robust Breathers in the Ac-driven, Dissipative sine-Gordon Model **Duilio De Santis, Giovanni Di Fresco, Claudio Guarcello, Bernardo Spagnolo,**

	Angelo Carollo, and Davide Valenti
The Impact of Climate Risk and Policy Uncertainty on U.S. Financial Stability: A Focus on ESG Disclosure **Konstantinos Kapetanakis and Christos Floros**	Nonlinear Energy and Charge Transport in Silicates. Experiments and Semiclassical Models **Juan F.R. Archilla, Jānis Bajārs, Yusuke Doi, Masayuki Kimura**
Unraveling the Influence of Board Tenure and Financial Expertise on Bank Performance: Evidence from US Banking Industry **Evangelos G. Varouchas, Stavros E. Arvanitis, George M. Agiomirgianakis and Christos Floros**	Numerical Integration of Thermostated Semiclassical Hamiltonian Lattice Equations **Jānis Bajārs, Juan F.R. Archilla**
World Uncertainty and Volatility Transmission on Global Sustainability Indices: Mixed Data Sampling Approach **Nektarios Gavrilakis and Christos Floros**	Soliton Dynamics in an Oscillating Magnetic Field **Larissa Brizhik**
	Thermalization slowing down for weakly nonintegrable many-body dynamics **Sergej Flach**
14:00-15:00 Lunch	
15:00-16.00 **SCS2** **Special and Contributed Sessions**	
Room 1	**Room 2**
Delay	**Applications to Art**
Delay as an Energy Regulator of the Generation of Deterministic Chaos in Hydrodynamic Systems with Limited Excitation **Aleksandr Shvets and Ilmi Seit-Dzhelil**	Evolution of the Ode to Joy Melody from Mozart to Mahler **Avadis S. Hacinliyan**
Stationary States for Dynamical Systems on Graph and Delay Differential Equations **Armando Bazzani and Giulio Colombini**	The phonology of the 1,000 most frequent words in Greek and English **Elena Babatsouli**
Synchronized States in Coupled Time-Delayed Chaotic Systems with Direct and Indirect Couplings **Berc Deruni, Ali Cihan Keles, and Engin Kandiran**	Completion Attempts of incomplete works in Classical Music with Literature Search and Artificial Intelligence **Avadis S. Hacinliyan**
16:00-16:40 **Room 1 (PS3)** **Plenary Session** **Chair: Dimitrios Sotiropoulos** **Speaker:** Vyacheslav Somsikov *Al-Farabi Kazakh National University, Almaty, Kazakhstan*	

Title: Physics of Evolution and Problems of Physics	
End of the 1st Day	

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Wednesday, 12.6.2023

TIME ZONE: EEST — Eastern European Summer Time

10:00-11:30
SCS3
Special and Contributed Sessions

Room 1	Room 2
Workshop session **Exploring the Frontiers of Chaos Theory and Dynamical Systems** **Organisers: Chris Antonopoulos and Denis Edson Leonel**	**Chaotic Aspects/1**
Advances in Chaos Theory and Dynamical Systems **Chris G. Antonopoulos**	Chaos Frequency Shift Keying Modulator based on Memristor Colpitts Oscillator **Aikaterini Tsianaka and Tsakiridis Odysseus**
Network Inference Combining Mutual Information Rate and Statistical Tests **Chris G. Antonopoulos**	Chaos Functions, Discrete Limit Cycles and Active Dynamics **Shunji Kawamoto**
Networks, Collective Behaviour and Applications **Chris G. Antonopoulos**	Chaotic Reshaping: Improving LCG Outputs with Chaotic Techniques **Bewar Nemat, Muhammet Baykara, and Fatih Özkaynak**
loring the Frontiers of Chaos Theory and Dynamical Systems **Chris Antonopoulos and Denis Edson Leonel**	Design of Synchronized Coupled Chaotic Map and FPGA Implementation **Nafiseh Hematpour, and Berna Ors Yalcin**

11:30- 12:00 Coffee Break

12:00-14:00
SCS4
Special and Contributed Sessions

Room 1	Room 2
Control	**Chaotic Aspects/2**
Analysis of Fractional MPC nonlinear control applied to Fractional Rössler oscillator **Devasmito Das, Ina Taralova, and Jean-Jacques Loiseau**	Exploring Chaos and Ergodic behavior of an Inductor less Circuit driven by Stochastic Parameters **Soumyajit Seth Abhijit Bera, and Vikram Pakrashi**
Chaotic Jerk Generator: Circuit and Practical Realizations, Analysis and Control of the	Improve the Organizational Reliability of Socio-technical Systems by using the Chaotic

Oscillations **Volodymyr Rusyn and Christos H. Skiadas**	Approach **Abdelbaki Laidoune**
Homoclinic orbit and Sunspot in a Monetary Policy Optimal Control Model **Beatrice Venturi**	Investigating Hyperchaos in the Locomotion of C. elegans **Dimitrios Tzepos, Jenny Magnes, and Susannah Zhang**
Optimization based Sliding Mode Control for Attitude control of a Delta-wing UAV **Gulivindala Kishore, Neetesh kumar, and Subrahmanyam Saderla**	Investigating Temperature Effect on the Electrical conductivity of Graphene Lattice: Chaos Approach **Sohrab Behnia, Roghayeh Pooshgan, and Masumeh Garagozi**
State Estimation and Control Synthesis Problems for a Class of Nonlinear Dynamical Systems under Uncertainty **Tatiana F. Filippova and Oxana G. Matviychuk** Synchronization of Chaotic Buck Converters under Current Mode Control and its Applications **Dmitrijs Pikulins, Aleksandrs Ipatovs, Sergejs Tjukovs, Daniils Surmacs, and Juris Grizans**	Optimization of the Management of the Quality of Living Environment using the Chaotic Approach **Nabil Sahraoui**
14:00-15:00	
LUNCH	
15:00 – 21:00	
Excursion to Chania Archeological Museum and Eleftherios Venizelos Foundation ending with a Greek "Meze" in a local Taverna	
End of the 2nd Day	

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Thursday, 13.6.2023

TIME ZONE: EEST — Eastern European Summer Time

9:30-11:45
SCS5
Special and Contributed Sessions

Room 1	Room 2
Invited Session Complex Nonlinear and Chaotic Dynamics toward Supreme Functions in Real System **Fumiyoshi Kuwashima**	**Chaotic Aspects/3**
Analysis of Dynamic Isotropic Percolation Process in Higher Orders of Perturbation Theory **Michal Hnatič, Matej Kecer, Tomáš Lučivjanský, Lukáš Mižišin, and Yuri G. Molotkov**	Proving Chaos in a Simple Model of Interdependent Economies: A Topological Approach **Marina Pireddu (joint work with Alessio Bosisio and Ahmad Naimzada)**
Analysis of Magnetohydrodynamic Turbulent Systems with Parity Symmetry breaking in Higher Orders of Perturbation Theory **M. Hnatič, T. Lučivjanský, L. Mižišin, Yu. Molotkov, And A. Ovsiannikov**	Separation of a Class of Chaotic and Random Signals using MLP and Recurrence Plots **Fernando Henrique dos Santos and Marcio Eisencraft**
Changes in the Dynamics of the Dam Body Behavior during Exploitation of Enguri High Arch Dam **Teimuraz Matcharashvili, Tamaz Chelidze, Aleksandre Sborshchikovi, Ekaterine Mepharidge and Dimitri Tephnadge**	Study of Sliding Tectonic Fault Chaotic Behavior **Vasily Riga and Sergey Turuntaev**
Chaotic Dynamics of the Kinetics of Crystallization of Liquids from the Gas Phase **Ivan G. Grabar, Yuri O. Kubrak, and Mykola M. Marchuk**	Preliminary Analysis of Molten Material Self-Organization during Laser Polishing **Evgueni V. Bordatchev**
Complex Dynamics generated by Simultaneous Route and Departure Time Choice in Transportation Networks **M.M. Khoshyaran and J.P. Lebacque**	Symmetry and Chaos with SO(3) Rotation-Reflection "Charges" in the Time-Discrete Frenet Frame **Bernd Binder**
Complex Traffic Dynamics in Very Large Dense Networks: The 2D Approach **M.M. Khoshyaran and J.P. Lebacque**	Testing Nonlinearity and Chaos Analysis in the Electricity Prices in the Iberian Electricity Market (MIBEL) **Ana Maria Guedes**
Dynamics and Integrability of the Double-spring Pendulum **Wojciech Szumiński**	Marble Block Evaluation: Detecting Cracks with Lyapunov Exponents **Ümmühan Özkaynak and Fatih Özkaynak**

11:45-12:15	
Coffee Break	
12:15-14:15 **SCS6** **Special and Contributed Sessions**	
Room 1	**Room 2**
Chaotic Dynamics	**Models and Modeling/ 1**
Global Limit Cycle Bifurcations, Chaos and Multistability in Polynomial Dynamical Systems **Valery Gaiko**	Advanced Algorithms of Framework DataBase (FDB) Model: An example of Automatic Greek Scientific Medical Articles Classification **Evangelia N. Petraki**
Mathematical Formalism of Phenomenology of Mind: Dynamics of Space-Time Clouds **Ihor Lubashevsky and Vasily Lubashevskiy**	Anomalous Scaling in the Kraichnan Model under the Influence of Small-scale Anisotropy. Two-loop analysis **E. Jurčišinová, M. Jurčišin and R. Remecky**
Micro-fluid Dynamic Simulations of Hyperlipidemia-induced Changes on the Level of Capillary Blood Biscosity Origin of Nonstochasticity at the Capillary Network **Lubomir Traikov, Todor Bogdanov, Maria Dimitrova, Elitsa Stoyanova, Radka Tafradjiiska-Hadjiolova, Zafer Sabit, Akira Ushiyama and Chiodji Ohkubo**	Application of an Invariant Model of Boltzmann Statistical Mechanics and Convolution Theory to Turbulent Combustion **Siavash H. Sohrab**
On the Dynamics of a Cournot Duopoly Game with Heterogeneous Players, Social Welfare and Asymmetric Information **Georges Sarafopoulos, Kosmas Papadopoulos, and Despoina Terzopoulou**	Modeling the Circumference of a Generalized Superellipse **Maria-Sofia Sotiropoulou and Dimitrios A. Sotiropoulos**
Real-time Aerodynamic Parameter Estimation of Aircraft using Adaptive Law-based Technique **Neetesh Kumar and Subrahmanyam Saderla**	Creep Phenomena for Self-similar Models of Viscoelastic Materials **Andriy Kryvko†, Didier Samayoa Ochoa, and Lucero Damián Adame**
Towards Naturalized Phenomenology: Dynamics of Space-Time Clouds and Power Law of Working Memory **Ihor Lubashevsky**	Comparison of Approaches to Business Process Optimization: Classical Methods and Modeling Using Logistic Mapping **Korniy Kostkin**
14:15-15:00 Lunch	
15:00-15:40 **Room 1 (PS3)** **Plenary Session** **Chair: Christos H Skiadas** **Speaker: Victor J Law and Denis P Dowling** *School of Mechanical and Materials Engineering, University College Dublin, Belfield, Dublin, Ireland* **Title: Green Chemistry Dual Power-law Test for Microwave-assisted Synthesis of Transition Metal Nanostructures**	
15:40-16:00 **Coffee Break**	

16:00-18:00 SCS7 Special and Contributed Sessions	
Room 1	Room 2
Chaotic Theory	**Models and Modeling/ 2**
Derivation of Wave Equations and Investigation of Gravitational Waves in the Gravitational Field of a Condensing Cosmogonical Body based on the Statistical Theory **Alexander M. Krot**	Models of Critical Neural Dynamics and Inhibition based on Neon Lamps **Antonio de Candia**
Dirac Relativistic Quantum Mechanics as a Fluid Dynamical Theory **Asher Yahalom**	Parametric Model Identification of Flight Vehicles using Metaheuristic Optimization **Neetesh Kumar and Subrahmanyam Saderla**
Principles of Chaos Theory in Solving Applied Geomechanics Problems **Volodymyr Bondarenko, Iryna Kovalevska, Mykhailo Petlovanyi, and Valerii Yakovenko**	Spatial-temporal Dynamics of Physical Processes in the Marine Environment of the Southern Baltic Sea - Numerical Modeling **Lidia Dzierzbicka-Głowacka, Maciej Janecki, Dawid Dybowski, Artur Nowicki, and Jaromir Jakacki**
Study of viscoelastic fourth-order Problem **Meflah. Mabrouk and Ataouat. Mohamed**	Stability of φ4-vector model: four-loop ε expansion study **L. Ts. Adzhemyan and A. Kudlis**
Linear Inversive Generator of PRN's over Q (i) **Pavel Varbanets and Sergey Varbanets**	Temperature Blow-up Regimes in Nuclear Reactor Uranium Fuels in the Automodel Approximation **Sergiy A. Chernezhenko, Victor A. Tarasov, Sergiy I. Kosenko, Volodymyr M. Vashchenko, Mihaylo R. Shcherbyna and Vyacheslav V. Lavruhin**
Knowledge Transfer Platform – FindFISH **Lidia Dzierzbicka-Głowacka, Maciej Janecki, Dawid Dybowski, Artur Nowicki, Piotr Pieckiel, Michał Wójcik, and Jacek Wittbrodt**	On the Two-Week Predictability Limit Hypothesis: A Revisit of Lorenz's Modeling and Predictability Studies from 1960 to 2008 **Bo-Wen Shen, Roger A. Pielke Sr., Xubin Zeng, and Xiping Zeng**
20:00 – 24:00	
Farewell Dinner **Cretan food, music and dances**	
End of the 3rd Day	

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Friday, 14.6.2023

TIME ZONE: EEST – Eastern European Summer Time

10:00-11:30
SCS8
Special and Contributed Sessions

Room 1	Room 2
Cryprographic	**Chaotic Applications /1**
A New Cryptographic Key Generator Algorithm Based on Chaos-based Selection Approach of Prime Numbers in Blum Blum Shub Generator **Fatih Özkaynak and Ahmet Can Çakıl**	Kolmogorov-Sinai Entropy: Connecting Two Types of Phase Space Divergences of C. elegans Locomotion **Susannah G. Zhang, Claire Dwyer, and Jenny Magnes**
A Robust Cryptographic Primitive Based on Chaotic System and Lava Lamp **Omer Kaya and Fatih Ozkaynak**	On the Applicability of Vilnius Oscillator as the Configurable Chaotic Logic Gate **Dmitrijs Pikulins, Sergejs Umnovs, Sergejs Tjukovs, and Juris Grizans**
Comparing Encryption and Decryption Message Using DES, AES and Chaos Algorithms to Secure Cloud Computing **Ismehene Chaouch, Anis Naanaa, and Sadok ElAsmi**	Dissipative Soliton Thermodynamics: "hot" Soliton versus "hot" Vacuum **Vladimir L. Kalashnikov, Evgeni Sorokin, Alexander Rudenkov, and Irina T. Sorokina**
Cryptanalysis of DNA-Inspired Encryption Algorithms: Uncovering Vulnerabilities and Security Challenges **Mehmet Ekinci and Fatih Özkaynak**	Optics and Energy Solar Systems Concentrators **Dimitrios Dellaportas and Anna Alexandratou**
SDR Implementation of Chaos-based Cryptosystem for Real-time Data Transmission **Houssem Benimam, Said Sadoudi, Djamal Teguig and Abdelraouf Azizi**	Influence of Moment on Processes Near and Inside the Crystalline Surface **Evelina V. Prozorova**

11:30 – 12:00
Coffee Break

12:00-14:00
SCS9
Special and Contributed Sessions

Room 1	Room 2
Equations	**Dynamics and Fractals**
On a System of Hadamard Fractional Differential	Fractal Structures in Electrolytic and Electroless

Equations with Nonlocal Boundary Conditions on an Infinite Interval **Rodica Luca Tudorache and Alexandru Tudorache**	Redox Systems **Lara Haroun and Mohammad Mridenand Rabih Sultan**
Analytical Solutions of a Hybrid KdV-Burgers Equation with Arbitrary Real Coefficients **Kuldeep Singh, Steffy Sara Varghese, Ioannis Kourakis**	Modeling of Separate Structural Objects in New Materials with a Fractal Structure **Valeriy S. Abramov**
Integrable Nonlinear PDEs as Evolution Equations derived from Multi-ion fluid Plasma Models **Steffy Sara Varghese, Kuldeep Singh, and Ioannis Kourakis**	Tensor Structure of Multifractals Synthesized by the Method of Brownian Point Dynamics in a Field of N Forces **Ivan G. Grabar and Yuri O. Kubrak**
12:00-14:00 **SCS10** **Special and Contributed Sessions**	
Room 1	**Room 2**
Chaotic Applications/2	**Chaotic Applications/3**
Assessing the Impact of Renewable Energy Sources on Energy Economics: A Non-Linear Regression Analysis of Hellenic Energy Exchange Market Clearing Prices **Emmanuel Karapidakis, Yiannis Katsigiannis, Konstantinos Blazakis, Marios Nikologiannis, Georgios Matalliotakis, Georgios Stavrakakis, and Nikos Venianakis**	Brownian Motion: From Einstein to Mandelbrot. An Application to Characterize Cells **Ana María Korol and Bibiana Riquelme**
Portfolio 3D Analytics: Using Simulations to Explore Return, Risk and Diversification Dimensions **Yiannis Dimotikalis, Aristodimos Gkiaourakis and Christos H. Skiadas**	Concept-Drift Detection for Fusion Plasma Disruption Prediction **Teddy Craciunescu and Andrea Murari**
Influencers Detection in a Weighted Social Network based on an Evidential Centrality Measure **J. Leonel Rocha, S. Carvalho and B. Coimbra**	Experience Implementation of "LitAr" Material for Recovery after Severe Injuries **Alexander N. Valyaev. S.D Litvinov, and S.V. Petrov**
Traveling Localized Vibrations in a Magnetically Coupled 2-DOF Resonators **Masayuki Kimura**	Gait Identification C. elegans Locomotion Jenny Magnes **Dimitris Tzepos, and Susannah Zhang**
Energy Failure after Ischemic Stroke Accounts for Epileptic Seizures **Yangyang Yu, Yongchen Fan, and Ying Wu**	Memories Reservoir in a Spiking Modular Neural Network **Silvia Scarpetta and Vincenzo Palmieri**
BERTWitz: How Sentiment Score can Improve Portfolio Optimization via LSTM Predictions **Antonio Di Bari, Domenico Santoro and Giovanni Villani**	
14:00- 15:00 LUNCH	
15:00-15:40	

Room 1 (PS4) **Plenary Session** **Chair: Victor Law** **Speaker: Wieslaw M. Macek** [1]*Institute of Physical Sciences, Faculty of Mathematics and Natural Sciences, Cardinal Stefan Wyszyński University, Warsaw, Poland* [2]*Space Research Centre, Polish Academy of Sciences, Warsaw, Poland* **Title: Testing for Markov Turbulence in Space Plasma on Kinetic Scales**
15:40- 16:00 Coffee Break
16:40-17:00 **Room 1** **Closing Ceremony**
End of the Conference

ROOM 1

Meeting link:
https://isast.webex.com/isast/j.php?MTID=m546c98467cd9519e47bb1ae1990f888f
Meeting number:
2744 011 5456
Password:
nJZjyyzn452
Host key:
900550
Join by video system
Dial 27440115456@isast.webex.com
You can also dial 62.109.219.4 and enter your meeting number.
Join by phone
+44-20-7660-8149 United Kingdom Toll
Access code: 2744 011 5456
Host PIN: 1358
Global call-in numbers

ROOM 2

Meeting link:
https://isast.webex.com/isast/j.php?MTID=m91b65bc412365b536287f4fe04364c49
Meeting number:
2741 564 5804
Password:
SMuXF8b7Ub8
Host key:
544812
Join by video system
Dial 27415645804@isast.webex.com
You can also dial 62.109.219.4 and enter your meeting number.
Join by phone
+44-20-7660-8149 United Kingdom Toll
Access code: 2741 564 5804
Host PIN: 1358
Global call-in numbers