Program CHAOS 2021

14th Chaotic Modeling and Simulation International Conference

8-11 June 2021 Athens, Greece - Turned into Virtual

Tuesday, 8.6.2021

TIME ZONE: CEST – Central European Summer Time

11:00- 11:30 Preparation, interconnections

11:30 – 12:00
Room 1
Opening Ceremony

12:00-12:40
Plenary Session
Room 1 (PS1)
Chair: Christos H Skiadas
Speaker: Professor Alexander Alekseevich Potapov
(on the occasion of the 70th birthday) Honorary Speech.
Applications of Fractal Analysis
Elements in the Theory of Finance on the Example of the Russian Stock Market and COVID-19

12:40-13:20
Plenary Session
Room 1 (PS2)
Chair: Leszek Sirko
Speaker: Stefano Lenci
Valeria Settimi, Giuseppe Rega

Chaos in cable and beams

13:20- 13:30 Preparation, interconnections

13:30-14.45
SCS1
Special and Contributed Sessions

Room 1	Room 2	
Special Session **Chaos in Nonideal Dynamic Systems** **Chairs: Aleksandr Shvets and Tatyana Krasnopolskaya**	**SYSTEMS**	
Serhii Donetskyi, Alekandr Shvets	**Agnes Fulop** Chaotic driven systems of qbit on KAM surface	

Double Symmetry and Generalized Intermittency in Transitions to Chaos in Electroelastic Systems		
Tatyana S. Krasnopolskaya, Evgeniy D. Pechuk Nonideality of a parametric system as a trigger of chaos	**Iryna Kovalevska, Volodymyr Bondarenko, Ildar Salieiev, Mykhailo Barabash** Optimization approaches when calculating the "massif - innovative fastening parameters" spatial system	
Vasiliy D. Pechuk, Tatyana S. Krasnopolskaya, Evgeniy D. Pechuk Accuracy Improvement of the Highest Lyapunov Exponent Estimation	**N.V. Stankevich** Scenario of occurrence of chaos with additional zero Lyapunov exponent in flow systems	
Aleksandr Shvets, Serhii Donetskyi Maximal attractors in nonideal hydrodynamic systems	**Chunxiao Yang, Ina Taralova, Jean-Jacques Loiseau** Fractional Chaotic system solutions and their impact on chaotic behavior	

14:45-15:00 Break

15:00- 15:15 Preparation, interconnections

15:15-16:45
SCS2
Special and Contributed Sessions

Room 1	Room 2	
Special Session Causality detection for time series with applications to complex systems Chairs: Teddy Craciunescu and Andrea Murari	**DATA ANALYSIS I**	
Andrea Murari Correlation is not causality: a conceptual and mathematical framework	**Samira Fathizadeh, Masume Garagozi, Fatemeh Nemati** Piezo spintronic effect in DNA molecular Chains	
Michela Gelfus, Teddy Craciunescu, Andrea Murari and JET Contributors Complex Networks and Causality between Time Series	**Aleksandra Gawlik, Vsevolod Vladimirov, Andrzej Klepka, Sergii Skurativskyi** Nonlinear forced vibrations of plates with oscillating inclusions	
Teddy Craciunescu and Andrea Murari Detecting Causal Relations between Time Series with the Cross Markov Matrix Technique	**Irina Knyazeva, Arseny S. Khakhalin** Designing efficient echo state reservoirs for chaotic time series prediction	
E. Peluso, T. Craciunescu, A. Murari, M.Gelfus and JET Contributors Assessing Causality with Conditional Recurrence Plots	**A.L. Pankratov, A.A. Yablokov, L.S. Revin, A.V. Gordeeva, E.V. Pankratova** Joint effects of chaos and noise in Josephson junctions	
Riccardo Rossi On the Potential of Time Delay Neural Networks to identify Causality Graphs	**Jarret Petrillo** Goodness-of-fit for Second Order Power Laws	
J. Vega, D. Gadariya, G. Rattá, A. Murari Anomaly Detection and Unsupervised Classification of Plasma Events	**Éva Rácz, M. Manceau, K. Y. Spasibko, L.Ruppert, G. Leuchs, R. Filip, M. Chekhova** Analysis of rogue waves in quantum optics	
G.A. Rattá, J. Vega, A. Murari and JET Contributors Tiding up the chaos with Genetic Algorithms: examples in Magnetically Confined Nuclear Fusion	**Lorenzo Escot, Julio E. Sandubete** Estimating Lyapunov exponents by local jacobian indirect methods	

16:45- 17:00 Preparation, interconnections		
17:00-18:45 **SCS3** **Special and Contributed Sessions**		
Room 1	**Room 2**	
Special Session **Applications of Fractal Analysis** **Chair: Alexander A. Potapov**	**OSCILLATORS** **-** **CRYPTO-SYSTEMS**	
Ilya V. Boykov, Alla I. Boikova, Alexander A. Potapov, Alexander E. Rassadin Approximate Methods for Solving Hypersingular Integral Equations on Fractals	**Danil Doubochinski** Doubochinski's Argumental Macro-quantic Oscillator	
Ilya V. Boykov, Alexander A. Potapov, Alexander E. Rassadin, Vladimir A. Ryazantsev Approximate Solution of Inverse Problems of Gravity Exploration on Fractals	**H. Sabbagh** Core expansion and spiral breakup in oscillatory recovering media	
Alexander A. Potapov, Viktor A. Kuznetsov, Anton N. Pototsky New Fractal Features for Textural Morphologic Analysis	**Igor A. Shepelev, Galina I. Strelkova** Anti-phase synchronization in networks of repulsively coupled 2D lattices of oscillators	
Alexander A. Potapov, Viktor A. Kuznetsov, Anton N. Pototsky Practical Application of New Fractal Features	**Maria S. Sinitsina, Susanna Yu. Gordleeva, Victor B. Kazantsev, Evgeniya V. Pankratova** Various oscillatory modes of spontaneous calcium concentration in astrocytes	
Alexander V. Shishulin, Alexander A. Potapov, Anna V. Shishulina Fractal Nanoparticles of Phase-Separating Solid Solutions: Nanoscale Effects on Phase Equilibria, Thermal Conductivity, Thermoelectric Performance	**Ilias Tomaras, Panagiotis Photopoulos, Odysseus Tsakiridis** Synchronization of Chaotic Colpitts Oscillators	
Agalar M.-Z. Agalarov, Elena S. Alekseeva, Alexander A. Potapov, Alexander E. Rassadin Remark on Stochastic Resonance in the Bullard Dynamo	**Belqassim Bouteghrine, Camel Tanougast, Said Sadoudi** New discrete chaotic cipher key generation for digital embedded crypto-systems	
	Belqassim Bouteghrine, Camel Tanougast, Said Sadoudi A survey on chaos-based cryptosystem: Implementations and applications	
18:30- 18:45 Preparation, interconnections		
18:50-19:30 **Room 1 (PS3)** **Plenary Session** **Chair: Wieslaw M. Macek** **Speaker: Katica R. (Stevanović) Hedrih** ***Nonlinear Phenomena in the Dynamics of a Class of Rolling Pendulums: A Trigger of Coupled Singularities***		
End of the 1st Day		

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11:30- 12:00 Preparation, interconnections

12:00-13:30
SCS4
Special and Contributed Sessions

Room 1	Room 2
MODELS and MODELING I	**COVID-19**
S. Aklouche-Benouaguef, S. Adjal, B. Zeghmati Quantification of the chaotic phenomenon in natural convection	**Walter Aliaga** Covid-19 transmission model under delays in the vaccination campaign
Shunji Kawamoto The Turing Model and Discrete Limit Cycles with Eddy and Convection	**Theodoros Daglis** Addiction during COVID-19
Susanna Gordleeva Modeling working memory in spiking neuron network accompanied by astrocytes	**Giorgio Sonnino, Fernando Mora, Pasquale Nardone** A Stochastic Compartmental Model for COVID-19
E. Jurčišinová, M. Jurčišin, R. Remecky Anomalous scaling under the influence of helicity and finite time correlations in the Kazantsev-Kraichnan model of fully developed turbulence	**Kamal, Cyril Shaju, Pratibha** Ubiquitous forbidden patterns in codon triplets side chain sequences of SARS-COV-2
Innokentiy A. Kastalskiy, Anastasia V. Ermolaeva, Viktor B. Kazantsev, Susanna Yu. Gordleeva Noise-induced calcium patterns in a biophysical model of astrocytic process	**Pratibha, Cyril Shaju, Kamal A** Modified Chaos Game Representation based phylogeny analysis of SARS-COV-2

13:30- 13:45 Preparation, interconnections

13:45-14:30
Room 1 (PS4)
Plenary Session
Chair: Christos H Skiadas
Speaker: Alexander V. Sosnitsky, Anatoly I. Shevchenko

Meta-Theories and Scientific Reformation

14:30- 15:00 Break

15:00- 15:15 Preparation, interconnections

15:15-16:00
SCS5
Special and Contributed Sessions

Room 1	Room 2

SIGNALS	ROTATION	
Andrey Dmitriev, Anastasiia Kazmina, Victor Dmitriev, Yuriy Sanochkin, and Evgenii Gradusov Detection of Early Warning Signals for Self-Organized Criticality in Cellular Automata	**Hajar ALSHOUFI** Wavy Aspects in a Precessing Open Cylindrical Channel	
Aliyu Isah, Aurélien Serge Tchakoutio Nguetcho, Stéphane Binczak, Jean-Marie Bilbault The interaction of memristor in nonlinear networks for image and signal processing	**Bernd Binder** Vivid Chaotic Solitons and Orbital Structures from Discrete Rotation-Translation Sequences in the Plane	
Lev Kuzmin, Elena Efremova Filter for Ultra-Wide-Band chaotic signals of the microwave band	**J. Ziaei, J. Awrejcewicz** On the Energy Harvesting from a Base-Rotating Double Pendulum	
16:00- 16:15 Preparation, interconnections		
16:15-17:45 SCS6 Special and Contributed Sessions		
Room 1	**Room 2**	
WORKSHOP Financial effects / consequences of the COVID-19 pandemic on Crete Chairs: Christos Floros and George Matalliotakis Implementing body and participants: Region of Crete, Accounting and Finance Laboratory (LAFIM) of the Hellenic Mediterranean University	**DYNAMICS I**	
George Matalliotakis and Efthalia Tabouratzi Business Strategy and COVID-19: Evidence from Crete	**Rezki Chemlal** A note on combining chaotic dynamical systems using the fuzzy logic XOR operator	
Moawia Alghalith, Christos Floros, Konstantinos Gkillas Modeling the economic impact of COVID-19	**Davide Faranda, Gabriele Messori, Pascal Yiou, Soulivanh Thao, Flavio Pons, Berengere Dubrulle** Hurricanes as Bose-Einstein condensates of atmospheric dynamics	
Konstantinos Gkillas, Christos Floros and Dimitrios Vortelinos The Forecasting Performance of Nearest Neighbor in Realized Correlation	**Luca Grilli, Domenico Santoro** Deterministic vs Stochastic Behavior in Bitcoin Dynamics: evidence from Poincaré Recurrence Theorem	
George Matalliotakis The optimum health expenditure allocation in Greece	**Valeriy Grytsay** Spectral analysis and invariant measure in studying the dynamics of a metabolic process in the glycolysis-gluconeogenesis system	
Mihalis Kyriakakis, George Matalliotakis Motivation and professional satisfaction of medical and nursing staff of Primary Health Care structures (Urban and Regional Health Centers) of the Prefecture of Heraklion, under the responsibility of the Ministry of Health, 7th Health district of Crete	**Samuele Guernieri, Alessio Perinelli, Michele Castelluzzo, Leonardo Ricci** A double-pendulum interacting with an ideal gas: investigation of a mixed chaotic-stochastic dynamics	
Sachinidou Maria, George Matalliotakis Socio-Economic Consequences and Health Inequalities in the Light of the Pandemic Covid-19	**Sergey Astakhov, Oleg Astakhov, Natalia Fadeeva, Vladimir Astakhov** Multistability formation and transition to chaos through the bifurcations of two- and three-frequency quasiperiodic oscillations in ring self-oscillating systems based on the van der Pol oscillator	

17:45- 18:00 Preparation, interconnections

18:00-18:30
Room 1 (PS5)
Plenary Session
Chair: Harold Hastings
Speaker: Jenny Magnes, Harold Hastings, Susannah Zhang, Katherine Canavan, Asia Baker, Anshul Singhvi

Shedding light on complex locomotion

18:30-19:00
Room 1 (PS6)
Plenary Session
Chair: Yiannis Dimotikalis
Speaker: Harold M. Hastings, Tai Young-Taft

Translating ecology into economics

19:00- 19:00 Preparation, interconnections

19:10-20:40
SCS7
Special and Contributed Sessions

Room 1	Room 2	
Cycle and Complex dynamics in Economics Models **Chair: Beatrice Venturi**	**DATA ANALYSIS II**	
Marco Desogus Understanding shifts in intra-firm trade portfolios through economic system entanglement	**Alexandru Tudorache, Rodica Luca Tudorache** Positive Solutions for a Singular Fractional Boundary Value Problem	
Beatrice Venturi Generalized Lorenz Chaotic System in Optimal Control Model	**A.N. Valyaev** Statistical processes of transformation and accumulation of energy under irradiation of solids	
MICRO - NANO	**Victor J Law, Denis P Dowling** 'Dubro' Resophonic Guitar: Glissando Gestures	
Philippe Beltrame Anomalous diffusion through micropillar arrays of suspending microparticles	**Dimitris Papakonstantinou, Vaso Zanni, Zacharenia Nikitaki, Christina Vasileiou, Konstantinos Kousouris and Alexandros G. Georgakilas** Using Machine Learning Techniques for asserting Cellular Damage Induced by Ionizing Radiation	
B. Ahansaz, J. Ziaei Entanglement distribution in a nitrogen doped graphene nanoribbon	**Radim Pánis** Application of Recurrence Quantification Analysis (RQA) on astronomical data	
P. Khaledi, S. Behnia, R. Hoseini Bandgap Engineering in Graphene Using Quantum Chaos Approach	**Christos H Skiadas** A Fractional Health State Model	

End of the 2nd Day

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11:30- 12:00 Preparation, interconnections

12:00-14:00
SCS8
Special and Contributed Sessions

Room 1	Room 2	
FRACTAL	**ECONOMY I**	
Valeriy S. Abramov The Higgs boson and the Higgs field in fractal models of the Universe: supermassive black holes, relativistic jets, solar coronal holes, active microobjects	**Artem Balyakin, V. Zhulego** Uneven Demographic Dynamics in Nonhomogeneous Economic Communities as an Institutional Trap	
Olga P. Abramova, Andrii V. Abramov Memory cell based on qubit states and its control in a model fractal coupled structure	**Harold M Hastings, Tai Young-Taft** Exploring dynamical regime change in natural and economic systems	
Maricel Agop, Alain Le Méhauté, Alina Gavriluţ, Lucian Eva, Gabriel Crumpei Model of AI Involving Dynamics. Symmetry Breaking in Multifractal Medium	**Pavel Zakharchenko, Dmitriy Simonenko, Viktor Mukhin** Chaos in the Economic System in the Conditions of Innovation and Market Transformations	
Vasileios Drakopoulos, Nallapu Vijender Bivariate fractal interpolation methods	**Lucía Inglada-Pérez** Investigating the presence of chaotic structure in the crude oil market	
Samira Fathizadeh, Narmin Sefidkar, Fatemeh Nemati Multifractal analysis of bioenergy transport in a protein nanomotor	**Arupratan Santra** Implication of Chaos Theory in Startup Entrepreneurship	
	Yiannis Dimotikalis Analytics of Portfolio Selection Dimensions: Return, Risk, Diversification	

14:000- 15:00 Break

15:00- 15:15 Preparation, interconnections

15:15-16:00
Room 1 (PS7)
Plenary Session
Chair: Dimitrios Sotiropoulos
Speaker: Alexander M. Krot
The wave gravitational field arising and wave processes under orbital motion of a gravitating body

16:00- 16:15 Preparation and Interconnections

16:15-17:30 SCS9 Special and Contributed Sessions		
Room 1	Room 2	
DYNAMICS II	**MODELS - CHIMERA**	
Asher Yahalom Noether Currents for Eulerian Variational Principles in Non-Barotropic Magnetohydrodynamics and Restriction of Chaos by Topological Conservation Laws	**Jakub Záthurecký, Lenka Přibylová** Coupled Fitzhugh-Nagumo Type Neurons Driven by External Voltage Stimulation	
E.P. Seleznev, N.V. Stankevich, A,O. Kazakov, S.V. Gonchenko Mixed type of attractor and visualization of system dynamics in reverse time in a physical experiment	**Mauricio Díaz** Levels of local chaos for special Blocks Families and applications for Turing Machine	
Siavash H. Sohrab Robert McCormick Invariant Model of Boltzmann Statistical Mechanics, Generalized Thermodynamics, and Shannon Information Theory	**Mabrouk Meflah, Alae Nore Khoukhi** Stability of the Similar Viscoelastic Telegraph Problem Governed by Lamé Operator	
Georges Sarafopoulos, Kosmas Papadopoulos On the Dynamics of a Bertrand Game with Homogeneous Expectations and Generalized Relative Profit Maximization	**Andrei V. Bukh, Elena V. Rybalova, Igor A. Shepelev, Galina I. Strelkova** Two-dimensional chimera states and their synchronization	
	Elena Rybalova, Anna Zakharova, Galina Strelkova Competition between Chimeras and Solitary States in Multiplex Neural Networks	
17:30- 17:45 Preparation, interconnections		
17:45-19:00 **SCS10** **Special and Contributed Sessions**		
Room 1	Room 2	
ECONOMY II	**MAGNETIC FIELD - CHAOTIC GENERATORS**	
Georges Sarafopoulos, Evaggelos Drimpetas, Kosmas Papadopoulos, Dimitrios Vezeris Chaotic Behavior in a Duopoly Market and application of the d-Backtest Method	**Jalil Hasanyan** Stability of a moving current carrying conductive string in a magnetic field	
Georges Sarafopoulos, Kosmas Papadopoulos On a Cournot Duopoly Game with Relative Profit Maximization	**U. Paniveni** Supergranulation and the Influence of Magnetic Field	
Kuok Sin Un, G. Charles-Cadogan, Marcel Ausloos Forecasting the equity risk premium with long swings in stock market behaviour	**Dimitrios Dellaportas, Anna Alexandratou** The electromagnetic interaction among watery precipitations in the atmosphere	
Levent Yilmaz Chaos in Water Resources	**Sümeyya Bazna, Ali Arı, Fatih Özkaynak** Modified Blum Blum Shub Random Number Generator using Chaotic Seed Values	
Tai Young-Taft, Harold M Hastings Universality in GDP scaling	**Volodymyr Rusyn, Christos H. Skiadas, Aceng Sambas**	

	Non-autonomous two channel chaotic generator: computer modelling, analysis and practical realization	
19:00- 19:15 Preparation, interconnections		
19:15-20:00 **SCS11** **Special and Contributed Sessions**		
Room 1	**Room 2**	
FRACTALS	**THEORY I**	
Dmitry Maevsky, Andriy Bojko, Elena Maevskaya, Aleksandr Besarab Theoretical Foundations of Fractal Electrotechnic. Fractal Elements and its Properties	**V. L. Kalashnikov, S. Wabnitz** Stabilization of two-dimensional patterns in a weakly-dissipative Bose-Einstein condensate	
Vostrov G. Opiata R. Methods and algorithms for the analysis of chaotic and fractal structures in dynamic processes of formation of classes of prime numbers in the generalized Artin's hypothesis	**Victor J Law, Denis P Dowling** Cloud electrification as an energy ignition source for hydrogen lift-gas airships	
George Vostrov, Andrii Khrinenko Fractals and Chaos in the Fixed Point Trajectories of Nonlinear Dynamical Systems associated with the Wright-Fisher Model and its Generalizations	**Evelina V. Prozorova** The role of the angular momentum in shaping collective effects	
20:10-**20:40** **Room 1 (PS8)** **Plenary Session** **Chair: Dimitrios Sotiropoulos** **Speaker: Alexandra Rodkina** ***Stabilization of Cycles with Stochastic Control***		
End of the 3rd Day		

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11:30- 12:00 Preparation, interconnections

12:00-13:30
SCS12
Special and Contributed Sessions

Room 1	Room 2
MAPS	**BIFURCATION**
Jose S. Cánovas The Parrondo's paradox for tent maps	**Zaamoune Faiza** Hidden Bifurcations and the Longitudinal Expansion for the Size of the x-Projection of the Scrolls via Parallel Transformation
André M. McDonald, Michaël A. van Wyk Design of Ergodic Maps with Prescribed Invariant Densities and Multimodal Power Spectra	**Valery Gaiko** Global Bifurcations of Limit Cycles and Chaos Transition in Multi-Parameter Dynamical Systems
Habib Ibrahim, Fatih Özkaynak A Substitution Box Structure Based on Chaotic May Map	**Oleg Kiselev** Evolution of bifurcation boundary in Painleve-2 equation
Denisa Roberts Neural Networks for Lorenz Map Prediction. A Trip through Time	**Nikolai A. Magnitskii** Bifurcation theory of dynamical chaos in Hamiltonian and conservative systems
Fernando Suárez, Graciela A. González Global dynamics of a business-cycle modeled by a triangular map	**Sungju Moon, Jong-Jin Baik, Seong-Ho Hong** Attractor Coexistence in Extended Lorenz Systems Revealed Through Bifurcation Analysis
Nafiseh Hematpour, Sodeif Ahadpour, Sohrab Behnia A quantum dynamical map in the creation of optimized chaotic S-box	**Jan Sevcik, Lenka Pribylova** Forced van der Pol oscillator - synchronization from the bifurcation theory point of view

13:30- 13:45 Preparation, interconnections

13:45-15:15
SCS13
Special and Contributed Sessions

Room 1	Room 2
CONTROL	**MODELS and MODELING II**
Tatiana F. Filippova, Oxana G. Matviychuk Optimality Principles in Solution of Nonlinear Control Problems under Uncertainty Conditions	**Dmitry G. Kiryan, George V. Kiryan** Modeling the Evolution of a cluster of gravitating bodies taking into account their absolutely inelastic collisions

Olga D. Kreerenko Synergetic control of the separation of the upper stage and the carrier aircraft with non-simultaneous breaking the connections	**Yuriy A. Kosevich** Nonlinear Model for Strongly Localized Wrinkling Modes of Mono- and Few-Layer Graphene Sheets in or on a Strained Matrix	
Olga D. Kreerenko Synergistic synthesis of aircraft braking control on the landing strip in difficult weather conditions	**Sara Moradi, Johan Anderson** Modelling Synchronization of Large-Scale Modes in Fluid Systems	
Rabiaa Ouahabi Nonlinear Feedback Controller for Adaptive Generalized Hybrid Projective Synchronisation between Two Identical Chaotic Systems	**Alexandr Petukhov, Sofia Polevaya, Evgeniy Gorbov** Modelling the influence of RT and BBC on cognitive attitudes and psychophysiological indicators of individuals	
Dmitry S. Zavalishchin Optimal Control Problem for a Group of Objects	**Bo-Wen Shen** Two Types of Sensitivities within Lorenz Models	
	Evgeniya V. Pankratova Environmentally induced chaos and synchronization of the neuronal activity	

15:15- 15:30 Break

15:30-16:10
Room 1 (PS9)
Plenary Session
Chair: Alexander M. Krot
Speaker: Sergi Simon
Applications of Higher Variational Equations to the Study of Integrability in Dynamical Systems

16:10-16:40
Room 1 (PS10)
Plenary Session
Chair: Alekandr Shvets
Speaker: G. Bretti,
M. Ceseri, R. Natalini
Forecasting tools for chemical damage and consolidation of building materials: modelling and simulations

16:40- 16:50 Preparation, interconnections

16:50-18:30
SCS14
Special and Contributed Sessions

Room 1	Room 2	
DYNAMICS III	**THEORY II**	
Azzam Hazim, Youssef Belhamadia, Stevan Dubljevic Effects of localized mechanical stimulation of the heart on spiral wave dynamics	**Alina Gavrilut, Maricel Agop** The Atom, from a Mathematical-Physical Perspective	
M.M. Khoshyaran, J.P. Lebacque Chaotic behaviour of vehicular traffic under dynamic reactive assignment and instantaneous network state information	**Victor Chukwuma Iheanacho** Boolean chaos in electronic logic gates	

Teimuraz Matcharashvili, Zurab Tsveraidze, Rusudan Kutateladze, Tamar Matcharashvili, Manana Janiashvili Similarity measures for the classification of dynamical changes in time series of different origin	**V.M. Somsikov** D-Entropy in classical mechanics	
Sabrina Francesca Pellegrino A 2D space-time discretization of a nonlinear peridynamic model	**Alberto Tufaile, Lori -Anne Gardi, Adriana Pedrosa Biscaia Tufaile** Some aspects of Rainbows and Black Holes linked to Mandelbrot set and Farey diagram	
J. Leonel Rocha, S. Carvalho Mutual information rate, Kolmogorov-Sinai entropy and synchronization in cyclic networks with discontinuous local dynamics	**Sergey Varbanets** Pseudorandom numbers generating in the unit circle $\|z\|<1$	
	Sergey Varbanets, Yakov Vorobyov Sequences of pseudorandom numbers from elliptic curves on Z_(p^m)	

18:30- 18:40 Preparation, interconnections

18:40-19:30
Plenary Session
Room 1 (PS11)
Chair: Leszek Sirko
Speaker: Wieslaw M. Macek

On the Origin of the Universe: Chaos or Cosmos?

19:30-20:10
Plenary Session
Room 1 (PS12)
Chair: Wieslaw M. Macek
Speaker: Leszek Sirko,
Michał Ławniczak Adam Sawicki, Małgorzata Białous

Isoscattering Chains of Graphs and Networks

20:10-20:40
Room 1
Closing Ceremony

End of the Conference

Tuesday 8 of June

ROOM – 1	
Event link https://isast.webex.com/isast/onstage/g.php?MTID=ec08e0dad65e1ef67d94319651f801562	
Event number:	163 830 7726
Event password:	chaos2021
Video Address:	1638307726@isast.webex.com You can also dial 62.109.219.4 and enter your meeting number.
Audioconference:	United Kingdom Toll +44-20-7660-8149 Show all global call-in numbers Access code: 163 830 7726

ROOM – 2	
Event link https://isast.webex.com/isast/onstage/g.php?MTID=e0ee622122b82ee66f438efba8a43b220	
Event number:	163 627 8548
Event password:	chaos2021
Video Address:	1636278548@isast.webex.com You can also dial 62.109.219.4 and enter your meeting number.
Audioconference:	United Kingdom Toll +44-20-7660-8149 Show all global call-in numbers Access code: 163 627 8548

Wednesday 9 of June

ROOM – 1	
Event link https://isast.webex.com/isast/onstage/g.php?MTID=ed68d1c4c0166b1fef8933d80b94217b3	
Event number:	163 297 2753
Event password:	chaos2021
Video Address:	1632972753@isast.webex.com You can also dial 62.109.219.4 and enter your meeting number.
Audioconference:	United Kingdom Toll +44-20-7660-8149 Show all global call-in numbers Access code: 163 297 2753

ROOM – 2	
Event link https://isast.webex.com/isast/onstage/g.php?MTID=e5eae27bd25638ec7e969719c6969b58f	
Event number:	163 875 5061
Event password:	chaos2021
Video Address:	1638755061@isast.webex.com You can also dial 62.109.219.4 and enter your meeting number.
Audioconference:	United Kingdom Toll +44-20-7660-8149 Show all global call-in numbers Access code: 163 875 5061

Thursday 10 of June

ROOM – 1	
Event link https://isast.webex.com/isast/onstage/g.php?MTID=edb60b7b0b039e91a9ecf1c106347c8bd	
Event number:	163 143 8966
Event password:	chaos2021
Video Address:	1631438966@isast.webex.com You can also dial 62.109.219.4 and enter your meeting number.
Audioconference:	United Kingdom Toll +44-20-7660-8149 Show all global call-in numbers Access code: 163 143 8966

ROOM – 2	
Event link https://isast.webex.com/isast/onstage/g.php?MTID=ef402fa8645a94b5c253742dd06104f8a	
Event number:	163 673 7225
Event password:	chaos2021
Video Address:	1636737225@isast.webex.com You can also dial 62.109.219.4 and enter your meeting number.
Audioconference:	United Kingdom Toll +44-20-7660-8149 Show all global call-in numbers Access code: 163 673 7225

Friday 11 of June

ROOM – 1	
Event link https://isast.webex.com/isast/onstage/g.php?MTID=e89e4670bffc064206b04e6a31986dcfd	
Event number:	163 895 0658
Event password:	chaos2021
Video Address:	1638950658@isast.webex.com You can also dial 62.109.219.4 and enter your meeting number.
Audioconference:	United Kingdom Toll +44-20-7660-8149 Show all global call-in numbers Access code: 163 895 0658

ROOM – 2	
Event link https://isast.webex.com/isast/onstage/g.php?MTID=e98230824d1c45490af1683171373f4fa	
Event number:	163 296 8849
Event password:	chaos2021
Video Address:	1632968849@isast.webex.com You can also dial 62.109.219.4 and enter your meeting number.
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