



Program - CHAOS 2022

15th Chaotic Modeling and Simulation International Conference
14 - 17 June 2022, Athens, Greece

Webex Meeting Link: <https://isast.webex.com/isast/j.php?MTID=m68fce07cc06ec67221d142610330c782>

Meeting number: 2742 318 1242

Password: CHAOS2022

It is recommended to download and install the latest Webex desktop client
(<https://www.webex.com/downloads.html>) in order to use the latest benefits

Tuesday, 14.6.2022

09:00- 09:30 Registration - Preparation, interconnections

09:30 - 10:00

MUSES

Opening Ceremony

10:00-10:40

Chair: Leszek Sirko

Plenary Session

Wieslaw M. Macek

Institute of Physical Sciences, Cardinal Stefan Wyszyński University, Warsaw, Poland and
Space Research Centre, Polish Academy of Sciences, Warsaw, Poland

Speech Title:

Nonlinear Phenomena on Small Scales in Space Plasmas

10:40- 11:00 Coffee Break - Preparation, interconnections

11:00-12.15

SCS1

Special Session

Fractional Dynamics I

Chair: Mark Edelman

Mark Edelman

Stability of the Fixed Points in Low Order Fractional Maps

Amin Jajarmi, Dumitru Baleanu

New Advancement and Progress of Fractional Calculus for the Stability and Control of Chaotic Systems

Rasa Smidtaite, Daiva Petkeviciute-Gerlach, Minvydas Ragulskis

Intermittent bursting in the fractional logistic map of matrices

Lyubomir Boyadzhiev

Fractional Schrodinger Equation with Riesz-Feller Derivative

12:15-13.30
SCS2
Special and Contributed Sessions

COVID-19

Chair: Yiannis Dimotikalis

Yiannis Dimotikalis, Christos H Skiadas
Exploring the Chaotic Nature of COVID-19 Pandemic: Limit Cycles and Time-Lag Around the World

Arsenios-Georgios N. Prelontzos, Konstantinos N. Konstantakis, Ioannis G. Melissaropoulos, Panayotis G. Michaelides

Volatility Spillovers in the CoVid-19 era: A GVAR-GARCH model for East Asia

Vasiliy D. Pechuk, Tatyana P. Konovalyuk, Evgeniy D. Pechuk, Tatyana S. Krasnopol'skaya
Cardiorespiratory System under Delta Covid Variant Disease

Touria Jdid, Mohammed Benbrahim, Mohammed Benboubker, Mohammed Nabil Kabbaj
A Novel Compartmental Mathematical Model for COVID-19 Spread Analysis

13:30-14:30 Lunch Break

14:30-16:00
SCS3
Special and Contributed Sessions

Fractals

Chair: Valeriy Abramov

Valeriy S. Abramov
Active Objects and the Higgs Field in the Quark-gluon Model of Fractal Systems

Olga P. Abramova
Influence of Variable Amplitude and Modulation of the Fractal Index on the States of the Deformation Field of Coupled Structures

George Vostrov, Andrii Khrinenko
Chaotic Dynamical Processes on Fractal Sets of Given Structure

Levent Yilmaz
Fractal Dimensions in Sediment at Meandering Channels

16:00- 16:15 Coffee Break - Preparation, interconnections

16:15-17:30
SCS4
Special and Contributed Sessions

Limit Cycles

Chair: Shunji Kawamoto

Shunji Kawamoto

2-D Generalized Turing Maps and Discrete Limit Cycles with Phase Shift

Jakub Zátěhurecký

Formal setting for period doubling bifurcation of limit cycles

Marco Desogus, Beatrice Venturi

Global Indeterminacy and Cycles in a Monetary Policy Rules Optimal Control Model

Yigit Percin, Ilknur Kusbeyzi Aybar

Limit Cycles of Biochemical Reactions in the Morphogenesis Process Represented by the Gierer-Meinhardt Model

17:30-19:00

SCS5

Special and Contributed Sessions

Attractors – Chaos Theory

Dmitrijs Pikulins, Sergejs Tjukovs, Juris Grizans, Aleksandrs Ipatovs, Iheanacho Chukwuma Victor

Rare Attractors and Chaos in Buck Converter under Peak-Current Mode Control

Lucian Eva, Alina Gavrilut, Maricel Agop

Diagnosis of Epileptic Diseases through Strange Attractor Dynamics

Sónia H. Marques

Evaluation of Probability Bounds in the Context of Nonlinear Analysis in Geotechnics

Sónia H. Marques

Reliability-Based Numerical Analysis of Spread Foundations Incorporating Spatial Variability on a Complex Substratified Layered Medium

Alexander M. Krot

On the soliton solution of the cubic Schrödinger-like equation describing cosmogonical body formation in the state of nonlinear wave disturbances

End of the 1st Day



CHAOS 2022

15th Chaotic Modeling and Simulation International Conference
14 - 17 June 2022, Athens, Greece

Wednesday, 15.6.2022

08:00- 08:15 Preparation, interconnections

08:15-09:45

SCS6

Special Session

Fractional Dynamics II

Chair: Mark Edelman

Mark Edelman

Asymptotically Periodic Points in Arbitrary Positive Order Fractional Maps

J. Alberto Conejero, Carlos Lizama, Òscar Garibo-i-Orts

Inferring the nature of fractional Wu Baleanu trajectories

Pavel B. Dubovski, Jeffrey A. Slepoy

Fundamental Systems for Fractional Differential Equations: Determinism or Chaos?

Yuexi Peng, Shaobo He, Kehui Sun

Chaos in the Discrete Memristor-Based System with Fractional-Order Difference

Carlos Lizama

Evolution Equations: From Chaos to Control

09:45- 10:00 Coffee Break - Preparation, interconnections

10:00-10:40

Plenary Session II

Chair: Dimitrios Sotiropoulos

Speaker: Leszek Sirko

Institute of Physics, Polish Academy of Sciences, Warsaw, Poland

Title:

A new spectral invariant for quantum graphs and networks: properties and Applications

10:40-11:50

SCS7

Special and Contributed Sessions

Theory

Chair: Wieslaw M. Macek

Szymon Górk, Wieslaw M. Macek

Analysis of Reconnection in the Magnetosphere on Small Scales

George Vostrov, Roman Opiata

Hidden chaotic periodicities in the classes of primes formed by an arbitrary natural number a in the extended and generalized Artin conjecture

Alica Miller

Devaney's Chaos and Eventual Sensitivity

11:50-13:00

SCS8

Special and Contributed Sessions

Chaos Theory - Time Series

Chair: Lorenzo Escot, Co-Chair: Yiannis Dimotikalis

Saad Adjal, Aklouche-Benouaguef, Belkacem Zeghmati
The Roads to Chaos of Natural Convection in Inclined Porous Cavity

Lorenzo Escot, Julio E. Sandubete
Numerical Simulations for Detecting Chaos in Time Series with Dynamic Noise

Valery Gaiko
Multistability and Chaos in Polynomial Dynamical Systems

Radek Halfar
Chaos in cardiac electrophysiology

Mounira Kesmia
Modeling Study of Nonlinear Cardiac Dynamics

13:00- 14:00 Lunch

14:00-15:45

SCS9

Special Sessions

Field-theoretic and statistical models of stochastic dynamics, developed turbulence and critical phenomena I

Co-Chairs: Michal Hnatič, Juha Honkonen, Tomáš Lučivjanský

L.Ts. Adzhemyan, D.A. Evdokimov, M. Hnatič, E.V. Ivanova, M.V. Kompaniets, AndreyKudlis, D.V. Zakharov
The Critical Dynamic Exponent z of A Model: Five-loop Study

L. Ts. Adzhemyan, M. Hnatič, E. V. Ivanova, M. V. Kompaniets, T. Lučivjanský, L. Mižišin
Higher order calculations in field-theoretic model of directed percolation

N.V. Antonov, P.I. Kakin, N. M. Lebedev, A.Yu. Luchin
Self-organized criticality in anisotropic system within a randomly moving environment

D. Davletbaeva, M. Hnatič, M. V. Komarova, T. Lučivjanský, L. Mižišin, M. Yu. Nalimov
Scaling behaviour of viscosity near the superfluid phase transition

Michal Hnatič, Matej Kecer, Tomáš Lučivjanský, L. Mižišin
Dynamic isotropic percolation process: renormalization group analysis

15:45- 16:00 Coffee Break - Preparation, interconnections

16:00-17:45

SCS10

Special and Contributed Sessions

Chaos Theory - Quantum - Lorenz

Chair: Sungju Moon

Parisa Hosseinneshad, Sohrab Behnia, Samira Fathizadeh
An efficient photodetector, Based on the engineered virus - based genetic: the quantum chaos approach
Parinaz Khaledi, Mohammad Khaledi, Mohammad Hossein Khaledi, Yousef Ali Abedini, Mohammad Karimi
A Study of Behaviorism in Psychology Using the Chaos Approach

Iryna Kovalevska, Volodymyr Bondarenko, Hennadii Symanovych, Oleksandr Husiev
Changes in the Rock Mass Geomechanical Properties with Account of the Chaos Theory based on a Computational Experiment

Sungju Moon, Jong-Jin Baik
Chaos Synchronization in Generalized Lorenz Systems and Connections to Data Assimilation

Sabiha Aklouche-Benouaguef, Saad Adjal, Belkacem Zeghamati
Quantification of the Chaotic Phenomenon in Natural Convection

Vyacheslav M. Somsikov
"Order" and "Chaos" in the Evolution of Matter

17:45-20:15

SCS11

Special and Contributed Sessions

Theory - Nonlinear Problems - Equations

Chair: Rodica Luca Tudorache

Verónica E. Pastor, Graciela A. González
Stability switches in the Huijberts-Michiels-Nijmeijer problem

Hajar Alshoufi
Bore Problem in Open Cylindrical Channel under Precession Experimental and Theoretical Results

Soumeya Hacene-Chaouche, Mounira Kesmia
Asymptotic Analysis of an Antiplane Electro-Elastic Contact Problem

Luc Pastur, Nan Deng, Laurette Tuckerman, Bernd R. Noack
Coinciding local bifurcations in the Navier-Stokes equations

Alexandru Tudorache, Rodica Luca Tudorache
On a singular Riemann-Liouville fractional boundary value problem with parameters

Alexandru-Gabriel Tudorache, Vasile Manta, Simona Caraiman
Quantum steganography using two hidden thresholds

Alexander V. Sosnitsky, Anatoly I. Shevchenko
Multiphase Intelligence

Asher Yahalom
A Fisher Information Perspective of Pauli's Electron

End of the 2nd Day



CHAOS 2022

15th Chaotic Modeling and Simulation International Conference
14 - 17 June 2022, Athens, Greece

Thursday, 16.6.2022

09:00- 09:15 Preparation, interconnections

09:15-11:00

SCS12

Special and Contributed Sessions

Field-theoretic and statistical models of stochastic dynamics, developed turbulence and critical phenomena II

Co-Chairs: Michal Hnatič, Juha Honkonen, Tomáš Lučivjanský

Michal Hnatič, Matej Kecer, Tomáš Lučivjanský

Smoluchowski approximation: Analysis of reaction-diffusion systems with long-range spreading

E. Jurcisinova, M. Jurcisin, R. Remecky

Influence of a small-scale anisotropy on anomalous scaling in Kraichnan model of turbulence in the two-loop approximation

Georgii Kalagov

Stochastic Analysis of Scaling in Complex Critical Fluids

Marina Komarova, Mikhail Nalimov, Mikhail Kompaniets

Strong coupling asymptotics of RG-function

Andrey Kudlis, L. Ts. Adzhemyan, Andrey Pikelner

Critical behavior of isotropic ferromagnets in the dipole-dipole region

11:00-11:20 Coffee-Break

11:20-12:40

SCS13

Special and Contributed Sessions

Field-theoretic and statistical models of stochastic dynamics, developed turbulence and critical phenomena III

Co-Chairs: Michal Hnatič, Juha Honkonen, Tomáš Lučivjanský

Yuri (Iurii) Molotkov, Juha Honkonen, M. Nalimov, M. Komarova
Critical Dynamic of the superfluid phase transtition. Calculation of z critical exponent and stability of IR fixed point

Mikhail Nalimov, Juha Honkonen, Marina Komarova, Vyacheslav Krivorol, Yuriy Molotkov
Quantum field theory in statistical physics: four peculiar and useful facts for a quantum particle physicist

A. V. Ovsianikov, M. Yu. Nalimov
Convergent perturbation theory as an instrument for renormalization group analysis of quantum field models

Juha Honkonen
Field theories for stochastic problems

12:40-13:40
LUNCH

13:40-15:30
SCS14
Special and Contributed Sessions

Muses

Models and Modeling
Chair: A. E. Botha

I.R. Andrei, C. Onea, M.L. Pascu, M. Bulinski
Numerical Model and Simulation of the Multimode Visible Emission of a Chaotic Laser Device

M. Ansariara, A. E. Botha, S. Emadi, M. R. Kolahchi
Emergence of chimera state in a model for memory

Alya Atoui, Samir Abbad Andaloussi, Kamal Slim, Régis Moilleron, Zaher khraibani
Assessment and modeling of the chaotic variation of the physicochemical parameters at Quaraoun Lake

Fausto Cavalli, Mario Gilli, Ahmad Naimzada
Endogenous interdependent preferences in a dynamical contest model

M. Courbage, L. Mangin, F. Rozi
Entropy increase in a Chaotic Bursting Model of the Respiratory Neural System

Evangelia N. Petraki
Digital storytelling for developing ICT skills in primary education

Yousef Jafarzadeh
Some results and theorems related to the triple Laplace transform

15:30- 15:45 Coffee Break - Preparation, interconnections

15:45-18:00
SCS15
Special and Contributed Sessions

Models - Orbits - Nonlinear Problems

Chair: Bo-Wen Shen

J. Galan-Vioque, J. Valverde
Modelling, continuation and bifurcations in non holonomic dynamical systems: applications to the rattleback

Wei Paxson, Bo-Wen Shen

A KdV-S.I.R.-type Model under a Weak Outbreak: Analytical Solutions of Solitary Epidemic Waves and Homoclinic Orbits

Paolo Russu

Bogdanov-Takens, Homoclinic Orbits and Routes of Chaos, in a Management Protected Areas 3D Model

Deeptajyoti Sen, Sudeshna Sinha

Emergence of extreme events through the Allee effect in a single and coupled patches and its diminution through noise in a three-species population model

Bo-Wen Shen, Roger A. Pielke Sr., Xubin Zeng

Finite Predictability and Two Types of Sensitivities within the Lorenz 1963 and 1969 Models

Zahraa Ibrahim, Rabih Sultan

In-Situ Reaction-Transport Processes in Some Rock Systems

Sónia H. Marques

Simulation and Optimisation Techniques for Construction of a Probability Box Structure

18:00-19:00

SCS16

Special and Contributed Sessions

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

Christos Floros

Seasonality and volatility of farm prices: The case of Crete

George Matalliotakis and Efthalia Tabouratzi

The economic impact of the COVID-19 pandemic on Greek companies: Evidence from Crete

Maria Sachinidou and George Matalliotakis

Financial Analysis and Comparative Study of 4 Hospitals under the Jurisdiction of the 2nd Regional Health Authority of Piraeus & North Aegean during 2017 -2020

Yiannis K. Yiannoulis

Synopsis of the Accounting Research in Hellas

End of the 3rd Day



CHAOS 2022

15th Chaotic Modeling and Simulation International Conference

14 - 17 June 2022, Athens, Greece

Friday, 17.6.2022

09:00- 09:10 Preparation, interconnections

09:10-11:20

SCS17

Special and Contributed Sessions

Nonlinear Problems - Data Analysis

Chair: André E. Botha

Luis Vázquez, David Usero, M. Pilar Velasco
Schrödinger Equation: Competition of Action and Length Scales

Radim Pánis, Karel Adámek and Norbert Marwan
Parameter-less Recurrence Quantification Analysis

Z. Beyza Metin, Fatih Özkaynak
CPCG: Chaotic Permuted Congruential Generator

Veronika Eclerová, Mohammad R. Kolahchi, André E. Botha
Effects of frustrated coupling, node degree and load distribution on synchronicity in electrical power grids

Veronika Eclerová, Lenka Přibylová, André E. Botha
Transformation of master-slave systems with harmonic terms for improved stability in numerical continuation

Belqassim Bouteghrine, Camel Tanougast, Said Sadoudi
Chaotic Properties of New 1-D, 2-D Maps

Evelina V. Prozorova
Analysis of the Influence of Boundary Conditions in Kinetic Problems

11:20- 11:40 Coffee Break - Preparation, interconnections

11:40-13:30

SCS18

Special and Contributed Sessions

Dynamics - Systems

Chair: Aleksandr Shvets, Co-Chair: Siavash H. Sohrab

Nickolay Korabel

Fractional dynamics of endosomes in cells

Nicolò Pecora

Dynamics and bifurcations in a new Keynesian model with heterogeneous expectations: the role of monetary policy

Sabrina Francesca Pellegrino

Spectral Methods for an Integro-Differential Model in Elastodynamics

Georges Sarafopoulos, Despoina Terzopoulou

On the Dynamics of a Heterogeneous Duopoly Game Participating in Nitrogen Emission Reduction

Aleksandr Shvets

Bifurcations of limit sets in some dynamic systems with limited excitations

Siavash H. Sohrab

Examples of Application of an Invariant Statistical Theory of Field to Cosmology, Astrophysics, Hydrodynamics, Electrodynamics, and Photonics

Eyüp Eröz, Erkan Tanyıldızı, Fatih Özkaynak

New Results on Obtaining Optimal LFSR Configurations Using Optimization Algorithms

13:30- 14:30 Lunch

14:30-16:30

SCS19

Special and Contributed Sessions

Chaos Theory - Control - Covid

Chair: Victor Law

Dimitrios Dellaportas, Anna Alexandratou

The Global atmosphere's energy balance. Is it a possibility?

Georgios N. Adamopoulos, Odysseus P. Tsakiridis

Modification of Chua's Circuit to Create Chaotic Carriers Controlled by Current Sources

Claudio García-Grimaldo, Eric Campos

One Dimensional Chaotic Map without Fixed Points and with Amplitude Control

Sohrab Behnia, Samira Fathizadeh, Fatemeh Nemati

A Controller system for Preventing the Covid-19 Infection

Theodoros Daglis

The effect of Google trends in the Sin stocks during the COVID-19 crisis and the crisis of 2008 – A Multi-Fractal and Econometric Approach

Victor J Law, Denis P Dowling
Microwave Detection and Inactivation of Influenza Viruses

Aleksandr Shvets
Symmetry and Generalized Intermittency in the Lorenz Model

16:30-16:45 Coffee Break

16:45-18:15
SCS20
Special Session
Chair: Jean-Patrick Lebacque

Chaos – Dynamics - Applications

Georges Sarafopoulos, Kosmas Papadopoulos
Complexity and chaos control of a Bertrand duopoly game with bounded rational and imitative expectations

Bernd Binder
3-Dimensional Orbital Density Structures from Discrete Rotation-Translation Sequences

Mauricio Díaz
Other levels of chaoticity using Furstenberg families

Wojciech Szumiński
Dynamics and integrability analysis of the swinging Atwood generalisations

Megan M. Khoshyaran, Jean-Patrick Lebacque
Dynamical Aspects of Numerical Methods for Equilibria in Traffic

Beyzanur Durmuş, Fatih Özkaynak
A Chaos-Based Post-Processing Algorithm to Improve Statistical Randomness Requirements of True Random Number Generator Hardware

18:15- 18:30 Preparation, interconnections

18:30-19:10
Plenary Session III
Room 1 (PS7)
Chair: Christos H Skiadas
Speaker: Elena Babatsouli
University of Louisiana at Lafayette, USA
Title:
Scattering of Phonological Errors in Child Speech: A Developmental Perspective

19:10-19:30
Muses
Closing Ceremony

End of the Conference