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NEWSLETTER

of the International Society of Difference Equations

Volume 9 | Issue 1 | January 2024



<http://isdeds.com/>



A LETTER FROM THE PRESIDENT



Dear ISDE members,

Warmest regards and best wishes for a wonderful New Year. I hope that the holiday season brought you happiness and the New Year 2024 will bring you all the desired.

The ISDE society is governed by a board of directors consisting of 9 members that are elected in odd years (every two years). The board elects the president and the vice president for a two-year term. The last year, 2023, included the election of the new ISDE board of directors, that started their 2-years term on August 1: Martin Bohner, Elena Braverman, Jim Cushing, Saber Elaydi, Laura Gardini, Rene Lozi, Adina Luminița Sasu, Jianshe Yu, Weinian Zhang.

The board has elected me as President and René Lozi as Vice President. The next election will be in April 2025

We have had a fantastic Annual 2023 Conference at Phitsanulok, in Thailand, organized by Prof. Wirot Tikjha, and the conference PODE (Progress on Difference Equations) in Milan, organized by Prof. Davide Radi, also successful.

For the present year, it is my pleasure to invite you to participate in the following society's conferences that will be held in Spring-Summer 2024.

There is the ECIT-2024 conference (European Conference on Iteration Theory) which will be held on May 27-31, in Lisbon, Portugal, and will take place In Memoriam of Alexander Sharkovsky (a mathematical Genius (1936-2022)), organized by Henrique Oliveira, Luís Silva and João Alves. For registration, please go to the link:

<https://ecit2024.isel.pt/>

The 29th International Conference on Difference Equations and Applications ICDEA 2024 will be held on 24-28 June, 2024 in Paris, France, organized by Prof. Svetlin Georgiev of the Sorbonne University

<https://icdea2024.sciencesconf.org/>

The location, Paris, does not require any comment, there will be many plenary speakers and surely it will be a fruitful meeting.

Let me invite you all to participate and give a presentation. Moreover, Special Sessions can also be proposed, see how to apply at the ICDEA website

<https://icdea2024.sciencesconf.org/resource/page/id/6>

Financial support for the participation to ICDEA 2024 may be provided by the society. The application form for support may be found at the link of the conference. A fee reduction is provided to the sponsoring members of the present year.

Let me invite all the members to become sponsoring members. The new board of directors has changed this status defining three categories, that give right to some benefits for the present year, among which a fee reduction to the participation at the ISDE conferences:

<http://www.isdedds.com/membershipapplication/sponsoringmembership.html>

Recall that our society needs strong support from their members. Other donations are also helpful:

<http://www.isdedds.com/donate.html>

The annual meeting of the society will be held during ICDEA 2024, where the best 2023 paper of the Journal Difference Equations and Applications (best JDEA-23) will be announced.

Updated information about ISDE and its activities can be found on the ISDE homepage at

<http://isdeds.com/>

and in the [Newsletter](#).

You may use the login and password received via email to access ISDE Membership Directory and to make sure that the information entered is correct.

While the next Annual Conference 2024 is in preparation in Paris, the forthcoming conference in 2025 can also be announced. The Board of Directors has approved that the 30th International Conference on Difference Equations and Applications will take place in Guangzhou, China.

In 2025 there will also be the conference PODE (Progress on Difference Equations), and we are open to proposals.

If you need to make any changes to your account such as changing the email address, please send an email to me: laura.gardini@uniurb.it

If your photo is not posted with your name, please send your photo to Prof. Davide Radi, davide.radi@unicatt.it to be posted on the ISDE website.

Best Wishes,
Laura Gardini
President, ISDE

Urbino, January 10, 2024



FOREWORD



Dear ISDE members,

The present Newsletter of the International Society of Difference Equations brings together information regarding the society events that took place during the past year: PODE 2023 and ICDEA 2023, as well as about the forthcoming conferences: ICDEA 2024 and ECIT 2024. In addition, two sections are dedicated to the prestigious prizes of the society – JDEA Best Paper Prize and Bernd Aulbach Prize, awarded in 2023.

This newsletter has been elaborated as a teamwork with the support of the society members. The section devoted to the ICDEAs held in the period 1994-2022 has been written jointly with Saber Elaydi. The part regarding the ISDE conferences that took place in 2023 has been prepared jointly with Laura Gardini, Davide Radi and Wirot Tikjha. The presentations of the ISDE prizes have been achieved with the support of René Lozi and Sorin Olaru. The information about the upcoming conferences is based on the materials received from Laura Gardini, Svetlin Georgiev, Henrique Oliveira and Luís Silva. I would like to express my special thanks to all of them for this collaboration. Furthermore, we are grateful to the colleagues who gave us photos for this newsletter and to all those who contributed to its accomplishment.

I hope you will enjoy reading this newsletter and that you will attend future conferences and events of our society. Moreover, I hope we shall meet in person somewhere soon!

With my best wishes,
Adina Luminița Sasu

Timișoara, January 11, 2024



ICDEA

INTERNATIONAL CONFERENCE ON DIFFERENCE EQUATIONS AND APPLICATIONS

ICDEA 1994-2022

The [*International Conference on Difference Equations and Applications*](#) (ICDEA) is the official conference of the [*International Society of Difference Equations*](#). ICDEA aims to bring together researchers and scientists from around the world, to present, discuss and offer solutions in the fields of difference equations, discrete dynamical systems, and their applications to various sciences.

The first international conference on difference equations and applications (ICDEA 1) was held in 1994 at Trinity University in San Antonio, Texas. This was the first conference ever dedicated exclusively to difference equations and discrete dynamical systems. The next ICDEAs were held in Veszprém (Hungary) in 1995, Taipei (Taiwan) in 1997, Poznan (Poland) in 1998, Temuco (Chile) in 2000, Augsburg (Germany) in 2001. The impact of the ICDEA conferences has grown considerably since 2001, when the [*International Society of Difference Equations*](#) (ISDE) was founded at ICDEA 6.



Prof. Dr. Bernd Aulbach, the first ISDE President



ICDEA 2001 Group Picture

The landmark ICDEA 6 in Augsburg was followed in the years to come by an important number of successful meetings held as follows: in Changsha (China) in 2002, Brno (Czech Republic) in 2003, Los Angeles (USA) in 2004, München (Germany) in 2005, Kyoto (Japan) in 2006, [Lisbon](#)

[\(Portugal\)](#) in 2007, Istanbul (Turkey) in 2008, [Estoril \(Portugal\)](#) in 2009, [Riga \(Latvia\)](#) in 2010, Trois-Rivières (Quebec, Canada) in 2011, [Barcelona \(Spain\)](#) in 2012, Muscat (Oman) in 2013, Wuhan (China) in 2014, [Bialystok \(Poland\)](#) in 2015, [Osaka \(Japan\)](#) in 2016, [Timisoara \(Romania\)](#) in 2017, [Dresden \(Germany\)](#) in 2018, [London \(UK\)](#) in 2019, [Sarajevo \(Bosnia and Herzegovina\)](#) in 2021, [Paris-Saclay - Gif-sur-Yvette \(France\)](#) in 2022.

The most recent event in this series - the [28th ICDEA](#) - was held in [Phitsanulok \(Thailand\)](#) in 2023. This conference will be presented later in the newsletter.

The annual General Assembly meeting of ISDE is held during every ICDEA. In this meeting, ISDE president announces the winner(s) of the Best Paper published in the official journal of the society: [Journal of Difference Equations and Applications](#) and in odd-numbered years, the winner of the prestigious [Bernd Aulbach Prize](#).

Group photos from [ICDEA](#) – selection:



[ICDEA 2007 Lisbon](#)



[ICDEA 2012 Barcelona](#)



[ICDEA 2016 Osaka](#)



[ICDEA 2017 Timișoara](#)



[ICDEA 2019 London](#)



[ICDEA 2022 Paris Saclay](#)

Starting with [ICDEA 2017](#) held at West University of Timisoara in Romania, the logo of the conference and its banner created on that occasion were adopted for the following ICDEA conferences and became official. In the past years, the proceedings of the ICDEAs have been published in the book series Springer Proceedings in Mathematics & Statistics edited by Springer Nature:



Since its inception 30 years ago, the ICDEA meetings have been a forum for important discussions, presentations and dissemination of valuable research advances, that attracted a significant number of leading mathematicians worldwide. Thus, ICDEA considerably contributed to the progress in the areas of difference equations and discrete dynamical systems. The success of the ICDEA meetings is also reflected in the increasing number of the society membership - in early January 2024, ISDE had 1086 members from 81 countries.

The guidelines for ICDEA proposals and the Regulations can be found on the ISDE website:

- [Guidelines for ICDEA Proposals](#)
- [ICDEA Regulations](#)

Following the instructions given at the links above, prospective organizers are welcome to submit their proposals to hold an ICDEA meeting to ISDE President.



Progress on Difference Equations - PODE 2023

International Conference

PODE 2023

[Progress on Difference Equations - PODE 2023](#) was held at Università Cattolica del Sacro Cuore, Milan Campus, Milan, Italy, in the period 29th-31st May 2023. This was the 13th edition in the series of the [PODE](#) international conferences, which were held on the same topics since 2007 - see also the [ISDE Newsletter, January 2023](#).

PODE 2023 was held under the auspices of the [International Society for Difference Equations](#), the [Association for Mathematics Applied to Social and Economic Sciences](#) (AMASES) and the Italian Society for Chaos and Complexity (SICC). The conference was co-organized by the Department of Mathematics for Economic, Financial and Actuarial Sciences (DIMSEFA) of the Catholic University of Sacred Heart and by the Department of Management of University of Turin.



PODE 2023 – Group Photo

The conference was attended by 34 regular participants, 4 invited speakers and 10 PhD students. During the conference there were 33 specialized presentations on various topics of difference equations. The invited speakers were: [Saber Elaydi](#), [Anastasiia Panchuk](#), [Peter Raith](#) and [Tatyana Perevalova](#).



The main organizers [Davide Radi](#), [Alessia Cafferata](#) and [Maria Cristina Uberti](#) are warmly congratulated for this very successful event. Special thanks go to the conference committees for all the work they have done.

Organizing Committee:

- [Davide Radi](#), Department of Mathematics for Economic, Financial and Actuarial Sciences (DiMSEFA), Catholic University of Sacred Heart, Milan
- [Alessia Cafferata](#), Department of Management, University of Torino
- [Maria Cristina Uberti](#), Department of Management, University of Torino



[Davide Radi](#)



[Alessia Cafferata](#), [Saber Elaydi](#), [Davide Radi](#)

Scientific Committee:

- [Gian Italo Bischi](#), University of Urbino Carlo Bo, Italy
- [Jim Cushing](#), University of Arizona, USA
- [Laura Gardini](#), University of Urbino Carlo Bo, Italy
- [Armengol Gasull](#), Universitat Autònoma de Barcelona, Spain
- [Malgosia Guzowska](#), University of Szczecin, Poland
- [Fabio Lamantia](#), Università della Calabria, Italy
- [Adina Luminița Sasu](#), West University of Timișoara, Romania
- [Henrique Oliveira](#), University of Lisbon, Portugal
- [Davide Radi](#), Catholic University of Sacred Heart, Italy

There were two social events connected to the conference, a visit to the Milan Cathedral - [Duomo di Milano](#) - and a visit to the sixteenth-century Library at the Catholic University.



Group Photo – Milan Duomo Rooftop

Special issue: A collection of papers will be published in a special issue entitled *Discrete time dynamic modelling in economics, finance and social sciences* in the journal [Decisions in Economics and Finance](#), Guest Editors: Anastasiia Panchuk, Davide Radi, Iryna Sushko and Fabio Tramontana.

For more details please visit: <https://link.springer.com/journal/10203/updates/23972000>



ICDEA
2023

28TH INTERNATIONAL CONFERENCE
ON DIFFERENCE EQUATIONS
AND APPLICATIONS
17 - 21 JULY 2023, PHITSANULOK, THAILAND



ICDEA 2023

The [28th International Conference on Difference Equations and Applications](#) was held in the period 17-21 July 2023 in Phitsanulok, Thailand. The conference was organized in hybrid mode by Pibulsongkram Rajabhat University (PSRU) in Phitsanulok, Thailand, under the auspices of the [International Society of Difference Equations](#). On this occasion, since the official color of the university is green, by exception, the logo and the banner of ICDEA have been colored by the organizer in that very special green color. The conference was held at the WangChan campus of PSRU located in the heart of Phitsanulok and hosted on site and virtually 96 registered participants from 32 countries. The organizers coordinated by [Wirot Tikjha](#) - the Chair of the Organizing Committee and the members of the Scientific Committee led by [Laura Gardini](#) - the Chair of the Scientific Committee are warmly congratulated for this very successful event. Special thanks go to the conference committees for all the work they have done.

Scientific Committee

Chair: [Laura Gardini](#), University of Urbino, Italy

Members:

- [René Lozi](#), Université Côte d'Azur, France
- [Henrique Manuel Oliveira](#), University of Lisbon, Portugal
- [Wirot Tikjha](#), Pibulsongkram Rajabhat University, Thailand
- [Jianshe Yu](#), Guangzhou University, China



Organizing Committee

General Chair: [Wirot Tikija](#), Pibulsongkram Rajabhat University, Thailand

Members: (*International*)

- Zachary Kudlak, US Coast Guard Academy, United States
- Evelina Lapierre, Johnson & Wales University, United States
- Hideaki Matsunaga, Osaka Metropolitan University, Japan

Members: (*Local*)

- Issara Inchan, Uttaradit Rajabhat University, Thailand
- Poom Kumam, Mongkut's University of Technology Thonburi, Thailand
- Narin Petrot, Naresuan University, Thailand
- Somyot Plubtieng, Naresuan University, Thailand
- Pakkapon Preechasilp, Pibulsongkram Rajabhat University, Thailand
- Manoj Siripitukdet, Naresuan University, Thailand
- Thanin Sitthiwirattham, Suan Dusit University, Thailand
- Suthep Suantai, Chiang Mai University, Thailand
- Jessada Tariboon, King Mongkut's University of Technology North Bangkok, Thailand
- Jittiporn Tangkhawiwetkul, Pibulsongkram Rajabhat University, Thailand
- Kasamsuk Ungchittrakool, Naresuan University, Thailand
- Rabian Wangkeeree, Naresuan University, Thailand

At ICDEA 2023, the Plenary Speakers were:



Tomasz Downarowicz
Wrocław University of
Science and Technology,
Poland



Lyudmila Efremova
National Research
University of Nizhni
Novgorod, Russia



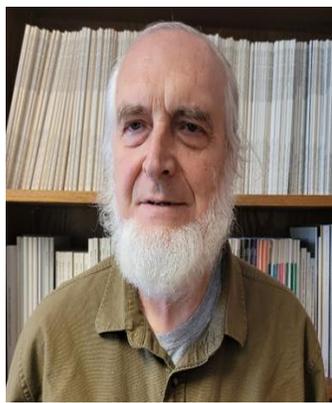
Saber Elaydi
Trinity University,
USA



Galina Filipuk
University of Warsaw,
Poland



Laura Gardini
University of Urbino
Carlo Bo, Italy



Michal Misiurewicz
Indiana University-
Purdue University
Indianapolis, USA



Miquel Sanjuan
King Juan Carlos
University, Spain



Kenneth James Palmer
National Taiwan
University, Taiwan



David Simpson
Massey University, New
Zealand



Bo Zheng
Guangzhou University,
Guangzhou, China

More information about the conference's program can be found on its website:

<http://icdea2023.psu.ac.th/index.php>

Some Photos – ICDEA 2023



ICDEA 2023 hosted the following special sessions:

 Dynamics of Smooth and Nonsmooth Maps: Theory and Applications

Organizers: **Iryna Sushko & Davide Radi**

 **Dynamics and bifurcations of piecewise-linear maps**

Organizer: **David Simpson**

 **Qualitative Properties of Discrete Dynamical Systems and Applications**

Organizers: **Davor Dragičević, Adina Luminița Sasu & Weinian Zhang**

 **Stability Theory for Difference Equations**

Organizers: **Hideaki Matsunaga & Masakazu Onitsuka**

 **Discrete dynamical systems: theory, methods, and applications in biology**

Organizers: **Bo Zheng, Zhan Zhou, Jianshe Yu & Jia Li**

Prizes awarded during ICDEA 2023

The [JDEA Best Paper Prize in 2022](#) was awarded to the remarkable article: **Flaviano Battelli, Matteo Franca and Kenneth J. Palmer**, [Exponential dichotomy for noninvertible linear difference equations: block triangular systems](#), Journal of Difference Equations & Applications 28 (8) (2022), 1054-1086.

The [Bernd Aulbach Prize 2022](#) was awarded to **Laura Gardini** from Università di Urbino Carlo Bo, Italy, for outstanding contributions in the fields of difference equations and discrete dynamical systems. A more detailed presentation of these awards is given in the next two sections.



[Kenneth James Palmer](#) as Laureate of the JDEA Best Paper Prize



[Laura Gardini](#) as Laureate of the Bernd Aulbach Prize

- ❖ The Proceedings of the ICDEA 2023 will be edited as a special volume entitled “Progress in Discrete Dynamical Systems, Difference Equations and Their Applications” within the series **Springer Proceedings in Mathematics & Statistics**, Editors: Saber Elaydi, Laura Gardini and Wirot Tikjha. For more details, please see <https://icdea2023.psu.ac.th/Authors.php>

JDEA BEST PAPER PRIZE

The [International Society of Difference Equations](#) in collaboration with the [Journal of Difference Equations and Applications](#) (JDEA) - the official journal of the society, awards every year the [JDEA Best Paper Prize](#). Based on the recommendation of the Prize Selection Committee approved by the [Board of Directors](#) this prestigious prize goes to the best paper published in the previous year in [JDEA](#). This prize has been awarded since 2002, during the ISDE Meetings at the ICDEA conferences and, generally, one of the authors is invited as a Plenary Speaker.

At the [28th International Conference on Difference Equations and Applications](#), during the ISDE General Meeting, the JDEA Best Paper Prize was awarded to the article:

❖ [Exponential dichotomy for noninvertible linear difference equations: block triangular systems](#),

Journal of Difference Equations & Applications 28 (8) (2022), 1054-1086

authors: Professor [Flaviano Battelli](#) Department of Industrial Engineering and Mathematical Sciences, Marche Polytechnic University, Ancona, Italy, Professor [Matteo Franca](#) Department of Mathematics, Bologna University, Bologna, Italy, and Professor [Kenneth J. Palmer](#) Department of Mathematics, National Taiwan University, Taipei, Taiwan.



Laura Gardini – ISDE President, [Kenneth J. Palmer](#) - Laureate of the JDEA Best Paper Prize,
Wirot Tikjha – ICDEA Organizer and Saber Elaydi – Editor-in-Chief of JDEA
July 18th, 2023, Convention room, ISDE General Meeting



Exponential dichotomy for noninvertible linear difference equations: block triangular systems

Flaviano Battelli^a, Matteo Franca^b and Kenneth J. Palmer^c

^aDepartment of Industrial Engineering and Mathematical Sciences, Marche Polytechnic University, Ancona, Italy; ^bDepartment of Mathematics, Bologna University, Bologna, Italy; ^cDepartment of Mathematics, National Taiwan University, Taipei, Taiwan

ABSTRACT

In this paper, block upper triangular systems of linear difference equations are considered, in which the coefficient matrices are not assumed invertible. The relationship between the exponential dichotomy properties of such a system and its associated block diagonal system is studied. The reason it is important to study triangular systems is that any system of linear difference equations is kinematically similar to an upper triangular system. In the bounded invertible case, it is known that for equations on the intervals $J = \mathbb{Z}_+$ or \mathbb{Z}_- , a block upper triangular system has an exponential dichotomy if and only if the associated block diagonal system has one. However, when $J = \mathbb{Z}$, only the sufficiency holds. The sufficiency extends to the noninvertible case, provided the off-diagonal matrices are bounded. However, the necessity does not hold even when $J = \mathbb{Z}_+$ or \mathbb{Z}_- . Nevertheless, if certain conditions are added, then the necessity does hold and it is also shown that these conditions are needed since it turns out that if both the triangular and diagonal systems have dichotomies, then these extra conditions must hold.

ARTICLE HISTORY

Received 12 May 2022

Accepted 29 July 2022

KEYWORDS

Linear; difference equations; noninvertible; exponential dichotomy; triangular; diagonal

2020 MATHEMATICS SUBJECT CLASSIFICATIONS

34D05; 34C25

For the full text of the awarded article – please see:

<https://www.tandfonline.com/doi/full/10.1080/10236198.2022.2113072>

On this occasion, [Professor Kenneth James Palmer](#) presented at ICDEA 2023 an invited **Plenary Lecture** entitled [Exponential dichotomies in noninvertible linear difference equations](#)



Thursday, July 20th 2023, PangUbol Room: Plenary talk: Kenneth J. Palmer, Chair: Saber Elaydi



Saber Elaydi & Kenneth J. Palmer at ICDEA 2023

THE BERND AULBACH PRIZE 2023



Laura GARDINI

the laureate of the **Bernd Aulbach Prize 2023**

Professor **Laura Gardini** from Department of Economics, Society, Politics, University of Urbino Carlo Bo, Italy, is the winner of the Bernd Aulbach Prize 2023.

The prize was established in 2009 by ISDE to honor the memory of the founding member and first President of ISDE, the late Bernd Aulbach, who passed away in 2005. The [Bernd Aulbach Prize](#) is a very prestigious prize of the [International Society of Difference Equations](#), being awarded every two years for significant contributions to the areas of difference equations and/or discrete dynamical systems.

We provide in what follows a selection of the main arguments presented in the **Laudatio** that supported her nomination for this award.

Laura Gardini, born in 1952, is currently Emeritus Professor at the University of Urbino Carlo Bo, Italy. As soon as she graduated with honors in 1975 (at that time the doctorate degree did not exist in Italy, being introduced only a few years later, in 1983), she took up a research position at ENI (National Hydrocarbons Agency) in the Department devoted to research and development and began applied intense research activity driven by industrial grants.

In the early 1980s, as part of her activities, she studied the recent books at that time by R. Thom, C. Zeeman, T. Postom and I. Stewart, P. Collet and J.-P. Eckmann, J. Guckenheimer and Ph. Holmes. Fascinated by the investigated subjects, a profound attraction emerged for dynamic systems. She decided to pursue fundamental research on these topics and to pursuit a scientific career. She resigned from ENI in Summer 1987, preparing for the competition to access the academic position at the University of Urbino. This competition was successfully secured by the following year, and she started as a researcher in November 1988. Since then, and for the next 35 years, she has devoted her outstanding career to the domain of difference equations. Thus, it is quite surprising that having given more than 200 talks at International Conferences and Workshops since 1998, having published six books, about 500 articles or chapters of books during the same period, having organized an impressive number of conferences and workshops on difference equations, being involved in numerous collaborations she was not previously awarded, not even once, despite the unanimous recognition of her research activity. Hence, the Bernd Aulbach Prize 2023 is a well-deserved recognition for Professor Gardini in our community. We provide in what follows only a few elements about Laura Gardini's research achievements which prove that she is an outstanding researcher of our society.

❖ **Development of new areas**

Laura Gardini has developed studies in the field of continuous and discontinuous piecewise-smooth one-dimensional maps. The known results on such maps in terms of possible dynamics and bifurcations are not so well consolidated as for smooth maps. In 2019, jointly with her colleagues Victor Avrutin, Iryna Sushko, Fabio Tramontana, she published a book which has been cited 89 times, summarizing the research in such domain including her own.

She has also thoroughly explored such 2D maps, publishing several articles on this topic, as for example, L. Gardini, I. Sushko and K. Matsuyama, [2D discontinuous piecewise linear map: Emergence of fashion cycles](#), *Chaos: An Interdisciplinary Journal of Nonlinear Science*, 28 (5), 055917, cited 23 times.

In 2022, it is with Gian Italo Bischi that she edited a Special Issue in *Journal of Difference Equations and Applications* (2022) [Invertible and noninvertible Maps: Theory and Applications](#). Linked to this special issue, both proposed and conducted a special session of the *International Conference on Difference Equations and Applications 2022* (ICDEA 22).

Border-collision first introduced in 1992 by H. E. Nusse and J. A. Yorke, is also her domain of predilection (the article I. Sushko, V. Avrutin, L. Gardini, [Bifurcation structure in the skew tent map and its application as a border collision normal form](#), *Journal of Difference Equations and Applications* 22 (8), 1040-1087, (2016) is cited 41 times).

❖ The discovery of important new theorems about difference equations and/or discrete dynamical systems

Most of the papers published by Laura Gardini contain very important results, carefully proved. According to the context, these results are formulated as theorems or detailed mathematical formulations, and complete specialized formal description of discrete dynamical systems landscapes as for example those available in:

- L. Gardini, R. Makrooni, and I. Sushko, [Cascades of alternating smooth bifurcations and border collision bifurcations with singularity in a family of discontinuous linear-power maps](#), Discrete and Continuous Dynamical Systems B, vol. 23, no. 2, March 2018, pp. 701-729
- I. Sushko, V. Avrutin, L. Gardini, [Center Bifurcation in the Lozi Map](#), International Journal of Bifurcation and Chaos, Vol. 31, No. 16 (2021) 2130046 (28 pages).

❖ Significant applications of difference equations and/or discrete dynamical systems

Laura Gardini, Full Professor of Mathematics for Social Sciences, School of Economics, University of Urbino has published numerous papers applying difference equations in economy which is her predilection domain, for example:

- C. Chiarella, R. Dieci, L. Gardini, [Speculative behaviour and complex asset price dynamics: a global analysis](#), Journal of Economic Behavior & Organization, 49 (2), 173-197 (2002), cited 215 times.
- T. Puu, L. Gardini, I. Sushko, [A Hicksian multiplier-accelerator model with floor determined by capital stock](#), Journal of Economic Behavior & Organization, 56 (3), 331-348, (2005) cited 105 times.
- M. Gallegati, L. Gardini, I. Sushko [Dynamics of a business cycle model with two types of governmental expenditures: the role of border collision bifurcations](#), Decisions in Economics and Finance, 44 (2), 613-639 (2021).

She has also explored applications in other domains like:

- ◆ M. Yahia, D. Radi, L. Gardini, V. Freschi, [Use of Chebyshev Polynomial Kalman Filter for pseudo-blind demodulation of CD3S signals](#), International Journal of Control, Automation and Systems, 13, 1193-1200 (2015).
- ◆ V. Avrutin, E. Mosekilde, Z.T. Zhusubaliyev, L. Gardini, [Onset of chaos in a single-phase power electronic inverter](#), Chaos: An Interdisciplinary Journal of Nonlinear Science, 25 (4), 043114 (2015), cited 37 times.
- ◆ D. Radi, L. Gardini, [Entry limitations and heterogeneous tolerances in a Schelling-like segregation model](#), Chaos, Solitons and Fractals, 79, (2015), 130-144.

❖ **Involvement in the organization of conferences on difference equations, participation in research societies**

We refer to the [CV](#) of Laura Gardini for a detailed list of activities. Among numerous involvements, one can highlight that she was the Chair of the scientific committee of ICDEA 2023. She has organized 33 conferences or workshops since 1996, with remarkable investment of time and energy as for example for the European Conference on Iteration Theory (ECIT-1996) September 1996, Urbino. We add that she was recently the main organizer of PODE 2017 and has remained over the years the main coordinator of the ECIT meetings. She is the Editor-in-Chief of the journal [Mathematics and Computers in Simulation](#). Laura Gardini is an active member of the ISDE since 2016, serving on the Board of Directors from 2019 to present and as a President of ISDE since August 2023. We mention that between 2011-2021, she has been elected 3 times to the Scientific Committee of the SICC - Società Italiana di Caos e Complessità.



Laura Gardini Laureate of Bernd Aulbach Prize & Saber Elaydi ISDE Founder and President
July 18th, 2023, Convention room, ISDE General Meeting

In conclusion, in describing Laura Gardini's life-time achievements, we emphasize her scientific excellence, stress her longstanding contributions to the evolution of our research field and underline that she will always represent a remarkable ambassador for our Society. Finally, we add, even more, that the Bernd Aulbach Prize awarded to her (the prize was up to now awarded exclusively to men) is a powerful and significant message for our community. As Laureate of the Bernd Aulbach Prize, at ICDEA 2023, Professor Laura Gardini presented an invited **Plenary Lecture** entitled [Border collision bifurcations in a PWL stock market model described by a 2D discontinuous map](#).

ECIT 2024

The [24th European Conference on Iteration Theory \(ECIT 2024\)](#) will take place in Vimeiro, Portugal, between Monday, 27th May 2024 (arrival) and Friday, 31st May 2024 (departure). The scientific sessions will be scheduled on the days of May 28th, May 29th, and May 30th.

The conference will be organized in association with the [International Society of Difference Equations](#).

This event is dedicated to the memory of [Oleksandr Mykolayovych Sharkovsky](#), who passed away on November 21, 2022. In honor of O. Sharkovsky, a special session will be organized on May 29th, 2024, to celebrate his life and contributions. The host and chairman of the session is [Professor Francisco Balibrea](#).

The main topic of this conference is iteration theory. Among the main topics are discrete dynamical systems, functional equations, and difference equations. Questions of this type arise for example in biology, physics, economics, and engineering.

The committees of this conference are:

Scientific Committee

- [Laura Gardini](#), DESP, University of Urbino, Italy – **coordinator**
- [Francisco Balibrea Gallego](#), University of Murcia, Spain
- [Wolfgang Förg-Rob](#), University of Innsbruck, Austria
- [Daniele Fournier-Prunaret](#), INSA, Toulouse, France
- [Armengol Gasull](#), University Autònoma of Barcelona, Catalonia, Spain
- [Witold Jarczyk](#), University of Zielona Góra, Poland
- [Henrique Oliveira](#), University of Lisbon, Portugal
- [Peter Raith](#), University of Vienna, Austria
- [Marek Cezary Zdun](#), Pedagogical University of Kraków, Poland

Local Organizing Committee

- [Henrique Oliveira](#)
- [Luís Silva](#)
- [João Alves](#)

Conference location

The conference will take place at [Hotel Golf Mar do Vimeiro](#), located atop a cliff overlooking the sea, with direct access to Porto Novo beach and 3 km from the thermal village of Vimeiro. Vimeiro is a small village on the west coast of Portugal, at about 59 km north of Lisbon.



[Hotel Golf Mar](#)



[Location photos](#)

More details and information about this conference can be found on its website:

<https://ecit2024.isel.pt/>



ICDEA
2024

29TH INTERNATIONAL CONFERENCE ON DIFFERENCE EQUATIONS AND APPLICATIONS

JUNE 24 – JUNE 28, 2024, SORBONNE UNIVERSITY, PARIS, FRANCE



ICDEA 2024

The [29th International Conference on Difference Equations and Applications](#) will be held on 24-28 June 2024 in Paris, France. The conference is organized at the prestigious [Sorbonne University](#) under the auspices of the [International Society of Difference Equations](#).

The aim of the conference is to bring together both experts and novices in the theory and applications of difference equations and discrete dynamical systems.

As part of the General Meeting of the ISDE, the [Best JDEA Paper Prize](#) will be awarded for the best paper published in the [Journal of Difference Equations and Applications](#) (JDEA) in 2023.

The conference will be held at the Campus Pierre et Marie Curie, Sorbonne University, 4 place Jussieu 75005 Paris, France.



The committees of the conference are:

Scientific Committee



René Lozi - Chair

Université de Nice Sophia-
Antipolis, France



Linda Allen

Texas Tech University,
United States of America



Svetlin Georgiev

Sorbonne University, Paris
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Iryna Sushko

National Academy of
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Walter Van Assche

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Organizing Committee

Chairman

Svetlin Georgiev

Sorbonne University,
Paris, France



Local Organizing Committee:

Chair: Olga Cortes, Sorbonne University, Paris, France

Members:

- Manuel Mayer, Sorbonne University, Paris, France
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- Karima Mebarki, University of Bejaia, Algeria
- Arezki Kheloufi, University of Bejaia, Algeria
- Rezki Chemlal, University of Bejaia, Algeria

■ The participants are welcome to register to this important event via:

<https://icdea2024.sciencesconf.org/registration>



City View

The **Plenary Speakers** are:



[Viktor Avrutin](#)



[Soumitro Banerjee](#)



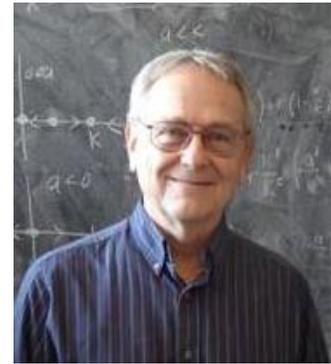
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More details and information about the conference can be found on its website:

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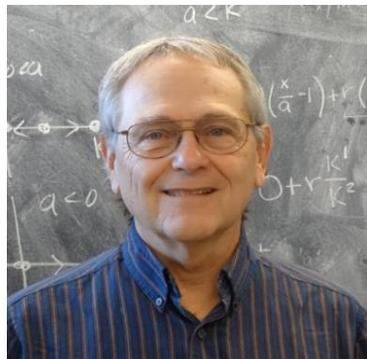
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GOALS OF THE SOCIETY



To promote difference equations and discrete dynamical systems, defined broadly, as one of the fundamental subjects in Mathematics.



To promote discrete models as models of premiere mathematical importance in the natural sciences, engineering, economics, etc.



To coordinate activities in the area of difference equations such as organizing conferences, annual meetings, workshops, special sessions, etc.



To lend support to researchers in difference equations from developing countries and those who need help by making available copies of research articles, lecture notes, technical reports and books.



To promote the publication of books, monographs, lecture notes and expository articles in the area of difference equations.