The 31st Conference on Applied and Industrial Mathematics

CAIM 2024

September 19–22, 2024, Oradea

Conference Programme

General Schedule

Thursday, September 19, 2024

14.30-19.30	**Registration**
	Faculty of Informatics and Sciences, University of Oradea, University 1, Oradea

Friday, September 20, 2024

09.00-10.30	**Registration & Opening Ceremony:**
	Aula, University of Oradea, University 1, Oradea
10.30-11.00	*Coffee Break*
11.00-12.20	**Plenary Session**
12.20-14.30	*Lunch*
14.30-15.50	**Communications**
15.50-16.10	*Coffee Break*
16.10-17.30	**Communications**
17.30-16.50	*Coffee Break*
17.50-18.30	**Communications**
20.00-22.00	**Official Dinner**

Saturday, September 21, 2024

09.30-10.50	**Plenary Session**
10.50-11.20	*Coffee Break*
11.20-12.20	**Communications**
12.20-14.30	*Lunch*
14.30-15.30	**Communications**
15.30-16.10	*Coffee Break*
16.10-17.10	**Communications**
17.30-17.40	*Closing Ceremony*
18.00-18.30	**ROMAI General Assembly**

Sunday, September 22, 2024

	Excursion: Stâna de Vale
	Departure of participants

Plenary Sessions
Friday, September 20

Chairperson: Stelian Ion

11.00- *Control in minimum time for phase-field equations*
11.40 **Gabriela Marinoschi**

11.40- *Mathematics of phase separation in interacting ternary mixtures under evaporation: The unexpected*
12.20 *story of a non-local evolution system*
       Adrian Muntean

Saturday, September 21

Aula

Chairperson: Georgia Oros

9.30- *Algebraic solutions and integrability of planar polynomial differential systems*
10.10 **Dumitru Cozma**

10.10- *Design and development of intelligent tourist destination image decision information system*
10.50 **Pankaj Srivastava**

ODEs
Friday, September 21

Chairperson: Carmen Roşoreanu

16.10-
16.30 *Local Stability in a SEIR Type Epidemic Model*
Raluca Efrem, Mihaela Sterpu, Dana Constantinescu

16.30-
16.50 *A system with six parameters related to the competition relationship of two populations*
Raluca-Mihaela Georgescu, Eugen Vasile

16.50-
17.10 *Quadratic systems possessing one invariant parabola and one invariant hyperbola*
Nicolae Vulpe

17.10-
17.30 *Stability conditions of unperturbed motion for critical three-dimensional differential system of Lyapunov-Darboux type $s^3(1,5)$*
Natalia Neagu, Mihail Popa

17.50-
18.10 *Averaging in a generalized multifrequency system with a delay*
Yaroslav Bihun, Roman Petryshyn, Ihor Skutar

ODEs
Saturday, September 21

C119

Chairperson: Anca Veronica Ion

11.20-
11.40 *Application of a generalization of the Grey Lotka-Volterra model to an economic model*
Carmen Rocşoreanu, Mihaela Sterpu

11.40-
12.00 *Facultative mutualisms and θ-logistic growth: how larger exponents promote global stability of co-existence equilibria*
Paul Georgescu, Hong Zhang

12.00-
12.20 *On LMIs mathematical context and algorithms for constructing efficient control Lyapunov functions for dynamical systems*
Adela Ionescu

PDEs
Saturday, September 21

11.20- **11.40**	*New fixed point properties for a general class of positive operators* **Loredana-Florentina Iambor, Sorin Mureşan, Mirela Târnoveanu**
11.40- **12.00**	*On a nonlocal and nonlinear second-order anisotropic reaction-diffusion system with in-homogeneous* *Cauchy-Neumann boundary conditions. Applications on epidemic infection spread* **Cătălin Stoicescu**
12.00- **12.20**	*Inverse Methods and Integral Equations in Optimal Design for Aerodynamics Profiles* **Mircea Lupu**
14.30- **14.50**	*Determination of some solutions of the stationary 3D Navier-Stoke equations* **Iurie Baltag**

Mathematical Modeling
Friday, September 20

C109
Chairperson: Costică Moroşanu

14.30- **14.50**	*Random multiple–fragmentation and flow of particles on a surface* **Oana Lupaşcu-Stamate**
14.50- **15.10**	*Algebraic study and stability analysis for the solutions corresponding to first order chemical reactions mechanisms* **Victor Martinez-Luaces**
15.10- **15.30**	*Natural convection in a square cavity filled by an EPCM porous medium* **Teodor Grosan, Camelia Berghian Grosan**
15.30- **15.50**	*Mathematical instruments involved in water purification of pharmaceutical pollutants* **Irina Meghea**

C109
Chairperson: Paul Georgescu

16.10- **16.30**	*The problem of parameter estimation in a vegetated Saint-Venant model* **Stelian Ion, Dorin Marinescu, Stefan-Gicu Cruceanu**

Saturday, September 21

C109
Chairperson: Adrian Muntean

12.00- **12.20**	*Computer Vision Framework for Automatic Vehicle Detection and Information Extraction* **Tudor Barbu, Silviu-Ioan Bejinariu, Costica Morosanu**

Analysis
Friday, September 20

Chairperson: Vladimir Seichuc

14.30- **14.50**	*Wentzell problems with nonstandard growth conditions* **Maria-Magdalena Boureanu**

14.50- **15.10**	*Almost everywhere convergence of Nörlund means of Walsh-Fourier series* **Károly Nagy**

15.10- **15.30**	*On the multiplicative convergence on the tensor product* **Omer Gok**

15.30- **15.50**	*Rhaly operators and statistical convergence, statistical boundedness* **George Popescu**

C122
Chairperson: Maria-Magdalena Boureanu

16.10- **16.30**	*Some inequalities related to the numerical radius of a bounded operator on a Hilbert space* **Nicuşor Minculete**

16.30- **16.50**	*Estimates in Banach spaces for weakly singular integral operators and their applications in approximate solving of integral equations* **Vladislav Seichiuc, Eleonora Seichiuc, Gheorghe Carmocanu**

16.50- **17.10**	*Strong sandwich results involving the Riemann-Liouville fractional integral of an extended q-hypergeometric function* **Alina Alb Lupaş**

17.10- **17.30**	*A characterization of Almost Grothendieck sets* **Bariş Akay**

17.50- **18.10**	*Recent investigations on the univalence of Gaussian hypergeometric function by means of Geometric Function Theory* **Ancuţa Maria Rus, Georgia Irina Oros**

18.10- **18.30**	*Studies on new univalent operators defined by using Bessel functions of the first kind* **Daniela Andrada Bardac-Vlada, Georgia Irina Oros**

Saturday, September 21

C122
Chairperson: Alina Alb Luaş

14.50- **15.10**	*Novel multi-step iterative methods based on homotopy perturbation technique* **Poţclean Ana Danca**

15.10- **15.30**	*A second-order fractional steps type method to approximate a nonlinear reaction-diffusion equation with in-homogeneous Cauchy-Neumann boundary conditions* **Gabriela Tănase**

Probabilities&Optimization
Friday, September 20

Chairperson: Boris Hâncu

14.30-	*Optimal maintenance policy*
14.50	**Mario Lefebvre**

14.50-	*A statistical analysis of the cybernetic feedback formula*
15.10	**Raluca-Mihaela Georgescu, Eugen Vasile**

15.10-	*Conditions for the preservation of Motzkin decomposability and the Pareto bordered property under*
15.30	*addition*
	Bogdan Daniel Moldovan

15.30-	*Evolution of queuing system*
15.50	**Iulia Damian**

Saturday, September 21

C209

Chairperson: Mario Lefebvre

11.20-	*A case when common sense fails to be true*
11.40	**Gheorghiţă Zbăganu, Anisoara Maria Răducan**

11.40-	*Matrix games and parallel algorithms for determining equilibrium profiles in pure strategies*
12.00	**Hâncu Boris, Ţurcanu Călin**

12.00-	*The fuzzy method for solving the multicriteria lineal optimization problem in integers*
12.20	**Tkacenko Alexandra**

Algebra&Geometry
Friday, September 20

Chairperson: Dumitru Cozma

16.10- *On topological AD-quasigroups*
16.30 **Liubomir Chiriac, Natalia Josu**

16.30- *Semireflexive, left and right products of two subcategories*
16.50 **Dumitru Botnaru, Olga Cerbu, Alina Turcanu**

16.50- *On self-orthogonal finite n-ary quasigroups*
17.10 **Parascovia Syrbu, Tatiana Rotari**

17.10- *On ternary quasigoups with exactly three distinct and orthogonal parastrophes*
17.30 **Tatiana Rotari**

17.50- *The projected regions over the faces of a polyhedron*
18.10 **Valerian Alin Fodor**

18.10- *Unitary units of modular group algebras*
18.30 **Victor Bovdi**

Saturday, September 21

C209

Chairperson: Stelian Ion

14.30- *On Weyl tensor of six-dimensional planar Hermitian submanifolds of Cayley algebra*
14.50 **Galia Bănaru**

14.50- *On hyperbolic manifolds with fundamental groups generated by parabolic or hyperbolic translations*
15.10 **Florin Damian**

15.10- *An application of some Kirichenko structural tensors of almost contact metric structure*
15.30 **Mihai Bănaru**

15.50- *A note on the diophantine exponential equations*
16.10 **Boris Ţarălungă**

16.10- *Spectral spaces*
16.30 **Laurenţiu Calmuţchi, Dorin Pavel**

Computer Sciences
Friday, September 20

Chairperson: Paul Georgescu

14.50- 15.10	*Enhancing user experience by integrating voice recognition technology in AR educational applications* **Titchiev Inga, Caftanatov Olesea, Talambuta Dan**

15.10- 15.30	*Applying convolutional neural networks and visual transformers to satellite image data* **Ţurcan Matei-Octavian**

15.30- 15.50	*Reconstruction and noise reduction with conventional and deep learning algorithms in medical image processing* **Zsolt Adam Balogh**

Saturday, September 21

Chairperson: Adrian Muntean

11.20- 11.40	*On some adaptive time step methods for a non-local model from Materials Science* **Ana-Maria Moşneagu, Iulian Stoleriu**

11.40- 12.00	*An artificial neural network approach for models in Biochemistry* **Iulian Stoleriu, Ana-Maria Moşneagu**

Education
Friday, September 20

Chairperson: Andrei Braicov

14.30- 14.45	*Decision criteria in the games against nature. Theoretical and practical aspects* **Chiriac Liubomir, Josu Natalia**
14.45- 15.00	*Trends in the study of artificial intelligence and machine learning* **Chiriac Liubomir, Lupasco Natalia, Pavel Maria**
15.00- 15.15	*The STEM approach to astronomy lessons in high school* **Postolachi Igor, Postolachi Valentina**
15.15- 15.30	*Virtual reality technology for the study of Astronomy* **Postolachi Igor, Postolachi Valentina**
15.30- 15.50	*The STE(A)M project - the stimulus for the development of active-participatory learning competences in biology lessons* **Grigorcea Sofia, Grecu Tatiana, Chiriac Eugenia, Nedbaliuc Boris**

C216
Chairperson: Postolachi Igor

16.10- 16.25	*The interdependence between the sunflower, mathematics and the house of the future* **Chiriac Eugenia, Grigorcea Sofia, Nedbaliuc Boris, Aluchi Nicolai, Tiganas Odetta**
16.25- 16.40	*Literacy in relation to problem-solving competence* **Angela Globa, Ala Gasnas**
16.40- 16.55	*Interdisciplinarity – key element in forming programming skills* **Angela Globa, Diana Bagrin**
16.55- 17.10	*Exploration of some plane geometry problems related to the construction of polygons on the sides of the triangle. Psychodidactic aspects* **Teleuca Marcel, Sali Larisa**
17.10- 17.30	*Specificity of Implementation of Bilingual Education in Ukrainian Universities* **Nataliia Snizhko**
17.50- 18.05	*Statistical Analysis of Nominal or Ordinal Variables in Pedagogical Research* **Maria Pavel, Dorin Pavel**
18.05- 18.20	*Predarea roboticii prin intermediul laboratoarelor virtuale* **Teodora Vascan**
18.20- 18.35	*Interdisciplinary Links in Teaching Higher Mathematics at a Technical University* **Dmytro Anpilohov**

Education
Saturday, September 21

11.20- **11.35**	*New Challenges in Mathematics and Computer Science Education: Case Study - Republic of Moldova* **Andrei Braicov**
11.35- **11.50**	*Aspects of integrating VR and AR technologies in steam education* **Tatiana Veverita**
11.50- **12.05**	*Applications of straight lines in three-dimensional Euclidian space solved in Maple* **Raluca Mihaela Georgescu**
12.05- **12.20**	*Intervale de incredere - aplicatii rezolvate in R* **Maria-Crina Diaconu, Ioana Ileana**

14.30- **14.45**	*Propeller geometry of an unmanned aerial vehicle* **Afanas Dorin, Brigalda Arina**
14.45- **15.00**	*Mathematical modelling and computer-aided simulation of some problems of launching and handling of satellite in the earth-moon gravity field* **Balmus Nicolae**
15.00- **15.15**	*The impact of educational software and STEAM approach in preparation for the mathematics baccalaureate exam* **Gavrila Simona**
15.15- **15.30**	*Integration of graph theory in education through the STEAM approach* **Bostan Marina**
16.10- **16.25**	*Developing mathematics research skills through parameter problem solving* **Calmutchi Laurentiu, Turan Ozkan**
16.25- **16.40**	*Methodology of teaching systems of equations* **Iulia Damian**
16.40- **16.55**	*Digital pedagogy: dimensions and conceptual benchmarks* **Chiriac Tatiana**
16.55- **17.10**	*Research problems for secondary school students in the process of studying mathematics* **Fetanu Elisa-Ioana**