



INCAS - National Institute for Aerospace Research "Elie Carafoli"  
(under the Aegis of the Romanian Academy)



ISMMA - Institute of Mathematical Statistics  
and Applied Mathematics of the Romanian Academy  
"Gheorghe Mihoc - Caius Iacob"



University of Bucharest



"Politehnica" University of Bucharest  
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## The 39<sup>th</sup> "Caius Iacob" Conference on Fluid Mechanics and its Technical Applications

### 28 – 29 October 2021, Bucharest, Romania

### Virtual Conference

#### CONFERENCE TOPICS

1. Basic Methods in Fluid Mechanics
2. Equations of Mathematical Physics
3. Dynamical Systems
4. Mathematical Modeling
5. Technical Applications

#### Events associated with of the conference

- WORKSHOP ASRO/CT 72 Aeronautica si spatiu
- The "Caius IACOB" Prize Award Ceremony
- The "Nicolae TIPEI" Prize Award Ceremony
- The "Gheorghe VASILCA" Prize Award Ceremony

### List of participants (alphabetically by first author)

#### Plenary Lectures

No.	Author(s)	Title of paper	Company
1	Ruxandra Mihaela BOTEZ*	Prediction of a Flight Dynamics Model for the Unmanned Aerial System UAS-S4 from Hydra Technology	École de technologie supérieure, Université du Québec, LARCASE, 1100 Notre Dame West, Montréal, Qué., Canada, H3C-1K3
2	Diana BROBOANA, Ana-Maria BRATU, Corneliu BALAN*	Dynamics of immiscible liquids in rotational motion	REOROM Laboratory, University POLITEHNICA Bucharest Splaiul Independenței 313, 060042, Bucharest, Romania
3	Adrian MUNTEAN*, <sup>1</sup>	Motion of social masses: Application of modelling with measures to pedestrian flows	*Department of Mathematics and Computer Science, Karlstad University, Sweden, <sup>1</sup> Centre for Societal Risk Research (CSR), Karlstad University, Sweden

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**Section 1. Basic Methods in Fluid Mechanics**

Alphabetically by first author

<b>No.</b>	<b>Author(s)</b>	<b>Title of paper</b>	<b>Company</b>
1	Valentin Adrian Jean BUTOESCU	Wing in Ground Effect: A new Method for Modeling a Wavy Surface	INCAS – National Institute for Aerospace Research “Elie Carafoli”, B-dul Iuliu Maniu 220, Bucharest 061126, Romania
2	Adrian CHELARU* <sup>1</sup> , Cristian Constantin ANDREI <sup>1</sup>	Comparison between Compressible and Incompressible Solvers in OpenFoam	<sup>1</sup> INCAS – National Institute for Aerospace Research “Elie Carafoli”, B-dul Iuliu Maniu 220, sector 6, 061126 Bucharest, Romania
3	Horia DUMITRESCU <sup>1</sup> , Vladimir CARDOȘ* <sup>1</sup> , Radu BOGATEANU <sup>2</sup>	The truth on gravity and terrestrial global warming	<sup>1</sup> “Gheorghe Mihoc – Caius Iacob” Institute of Mathematical Statistics and Applied Mathematics of the Romanian Academy, Calea 13 Septembrie no. 13, 050711 Bucharest, Romania <sup>2</sup> INCAS – National Institute for Aerospace Research “Elie Carafoli”, B-dul Iuliu Maniu 220, sector 6, 061126 Bucharest, Romania
4	Alexandra STĂVĂRESCU* <sup>1</sup> , Mihai-Victor PRICOP <sup>1</sup> , Georgiana ICHIM <sup>1</sup> , Ion FUIOREA <sup>2</sup>	Low Speed Propeller Optimization	<sup>1</sup> INCAS – National Institute for Aerospace Research “Elie Carafoli”, B-dul Iuliu Maniu 220, sector 6, 061126 Bucharest, Romania <sup>2</sup> University POLITEHNICA of Bucharest, Faculty of Aerospace Engineering, str. Polizu 1, Bucharest, Romania, 011061

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## Section 2. Equations of Mathematical Physics

Alphabetically by first author

1	Ilinca-Laura BURDULEA <sup>1,2</sup> , Alina BOGOI <sup>*.1</sup>	Smooth interface analysis in Kelvin-Helmholtz instability	<sup>1</sup> POLITEHNICA University Bucharest, Faculty of Aerospace Engineering, Department of Aerospace Sciences, Splaiul Independenței 313, 060042, Bucharest, Romania <sup>2</sup> Rheinisch-Westfälische Technische Hochschule Aachen, Deutschland
2	Cosmin MICH <sup>1</sup> , Alina BOGOI <sup>*.2</sup>	Acoustics pressure estimation due to thickness noise of a hovering helicopter	<sup>1</sup> POLITEHNICA University Bucharest, Faculty of Aerospace Engineering, Department of Aerospace Sciences, Splaiul Independenței 313, 060042, Bucharest, Romania

## Section 3. Dynamical Systems

Alphabetically by first author

1	Florin COSTACHE <sup>*.1</sup> , Sandra-Elena NICHIFOR <sup>*.1</sup> , Mihaela-Luminița COSTEA <sup>1</sup> , Achim IONIȚĂ <sup>1</sup>	Automatic approach procedure of a flying vehicle on a mobile platform using backstepping controller	<sup>1</sup> INCAS – National Institute for Aerospace Research “Elie Carafoli”, B-dul Iuliu Maniu 220, Bucharest 061126, Romania
2	Laurentiu MORARU <sup>*.1</sup> , Marius STOIA-DJESKA <sup>1</sup>	Regarding the Linear and Linearized Responses of an Airplane in a Gust	<sup>1</sup> The University Politehnica Bucharest, The Faculty of Aerospace Engineering, The “Elie Carafoli” Department of Aerospace Sciences, Bucharest, Romania
3	Sandra-Elena NICHIFOR <sup>*.1</sup> , Florin COSTACHE <sup>*.1</sup> , Mihaela-Luminița COSTEA <sup>1</sup> , Achim IONIȚĂ <sup>1</sup>	Automatic landing procedure of a flying vehicle on a mobile platform using optical flux	<sup>1</sup> INCAS – National Institute for Aerospace Research “Elie Carafoli”, B-dul Iuliu Maniu 220, Bucharest 061126, Romania
4	Florin-Adrian STANCU <sup>*.1</sup> , Adrian-Mihail STOICA <sup>1</sup>	Satellites FDI system design using sliding mode observers	<sup>1</sup> POLITEHNICA University Bucharest, Splaiul Independenței 313, 060042, Bucharest, Romania

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**Section 4. Mathematical Modeling**

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1	Alexandra CIOROGAR <sup>1</sup> , Ruxandra STAVRE* <sup>1</sup>	Variational and numerical analysis of a thermal fluid-structure interaction problem	<sup>1</sup> Simion Stoilow Institute of Mathematics of the Romanian Academy, Bucharest, Romania
2	Stelian ION <sup>1</sup> , Dorin MARINESCU <sup>1</sup> , Stefan Gicu CRUCEANU <sup>1</sup>	Dam Break Problem. Numerical Simulations.	<sup>1</sup> “Gheorghe Mihoc-Caius Iacob” Institute of Mathematical Statistics and Applied Mathematics of ROMANIAN ACADEMY
3	Ruxandra Maria Ileana MATEI <sup>1</sup> , Sterian DĂNĂILĂ <sup>2</sup>	Numerical Estimation of Pressure Loss in Labyrinth Seals	<sup>1</sup> INCAS – National Institute for Aerospace Research “Elie Carafoli”, B-dul Iuliu Maniu 220, Bucharest 061126, Romania <sup>2</sup> POLITEHNICA University Bucharest, Faculty of Aerospace Engineering, Department of Aerospace Sciences, Splaiul Independenței 313, 060042, Bucharest, Romania
4	Alexandru M. MOREGA* <sup>1</sup> , Marin PETRE <sup>2</sup> , Alin A. DOBRE <sup>1</sup> , Yelda VELI <sup>1</sup> , Alexandra V. NECOLA <sup>2</sup>	Numerical analysis of the aging heat treatment of Aluminum alloy plates	* <sup>1</sup> Faculty of Electrical Engineering, University Politehnica of Bucharest, Bucharest, Romania <sup>2</sup> Vimetco ALRO, Slatina, Romania
5	Gelu PAȘA	Three-layer Hele-Shaw displacement with intermediate non-Newtonian fluid	Simion Stoilow Institute of Mathematics of Romanian Academy, Calea Grivitei 21, Bucharest 010702, Romania
6	Dan POLIȘEVSCI* <sup>1</sup> , Isabelle GRUAIS <sup>2</sup>	Thermal flows in fractured porous media	<sup>1</sup> Institute of Mathematics “Simion Stoilow” of the Romanian Academy, Bucharest, Romania <sup>2</sup> University Rennes 1, CNRS, IRMAR - UMR 6625, France
7	Florin SĂFTOIU, Alexandru M. MOREGA*	Cooling the photovoltaic panels by natural and forced convection	*Doctoral School of Electrical Engineering, University Politehnica of Bucharest, Bucharest, Romania
8	Alexandru SOLOMON <sup>1</sup> , Valentin Claudiu OLTEI <sup>1</sup> , Alina BOGOI* <sup>1</sup>	Some practical remarks in solving partial differential equations using reduced order schemes obtained through the POD method	<sup>1</sup> POLITEHNICA University Bucharest, Faculty of Aerospace Engineering, Department of Aerospace Sciences, Splaiul Independenței 313, 060042, Bucharest, Romania
9	Claudia TIMOFTE	Multiscale modeling and analysis for reaction-diffusion processes in composite media	Faculty of Physics, University of Bucharest, P.O. Box Mg-11, Bucharest-Magurele, Romania

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**Section 5. Technical Applications**

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1	Mihai Alexandru BARBELIAN <sup>*,1</sup> , Cornel DINU <sup>1</sup> , Cassandra Venera PIETREANU <sup>1</sup>	Neural Network and Linear Programming Aircraft Boarding Strategy based on Passengers Preference	University POLITEHNICA of Bucharest, Faculty of Aerospace Engineering, Department of Aeronautical Systems Engineering and Aeronautical Management “Nicolae Tipei”, str. Polizu 1, Bucharest, Romania, 011061
2	Ionut BUNESCU <sup>*,1,2</sup> , Mihai-Vladut HOTHAZIE <sup>1,2</sup>	Performance analysis of electric aircraft configurations	<sup>1</sup> Faculty of Aerospace Engineering, POLITEHNICA University Bucharest, Str. Gheorghe Polizu 1-7, 011061, Bucharest, Romania <sup>2</sup> INCAS – National Institute for Aerospace Research “Elie Carafoli”, B-dul Iuliu Maniu 220, Bucharest 061126, Romania
3	Radu DIMA <sup>*,1</sup> Dragos BORDESCU <sup>*,1</sup> Ciprian OROS <sup>*,1</sup>	Prezentare Cluster INVENTIKUS	<sup>1</sup> NOD Makerspace, Splaiul Unirii 160, București 040041 Sector 4, Bucuresti, <a href="https://inventikus.com/">https://inventikus.com/</a>
4	Cornel DINU <sup>*,1</sup> , Ion FUIOREA <sup>2</sup>	De-icing of aircraft on the ground and means of environmental protection	<sup>*,1</sup> UPB – Universitatea POLITEHNICA din București, Department of Aeronautical Systems Engineering and Aeronautical Management, Str. Gheorghe Polizu, nr. 1-7, corp E 015, Bucharest, Romania <sup>2</sup> UPB – Universitatea POLITEHNICA din București, Department of Aerospace Sciences, University, Str. Gheorghe Polizu, nr. 1-7, corp I 010, Bucharest, Romania
5	Mihai-Vladut HOTHAZIE <sup>*,1,2</sup> , Ionut BUNESCU <sup>1,2</sup> , Mihai-Victor PRICOP <sup>2</sup>	Low-speed airfoil shape optimization using high-fidelity CFD analysis	<sup>1</sup> Faculty of Aerospace Engineering, POLITEHNICA University Bucharest, Str. Gheorghe Polizu 1-7, 011061, Bucharest, Romania <sup>2</sup> INCAS – National Institute for Aerospace Research “Elie Carafoli”, B-dul Iuliu Maniu 220, Bucharest 061126, Romania
6	Aynul HOSSAIN	Conceptual design of a Dandelion and Maple seed based Micro Unmanned Aerial Vehicle	School of Aerospace, Xi’an Jiaotong University, No.28 West Xianning Road, Xi’an, Shaanxi, 710049, P.R. China
7	Georgiana ICHIM <sup>*,1,2</sup> , Sterian DANAILA <sup>2</sup> , Mihai-Victor PRICOP <sup>1</sup>	Fast inviscid transonic airfoil optimization using a nonlinear potential solver	<sup>1</sup> INCAS – National Institute for Aerospace Research “Elie Carafoli”, B-dul Iuliu Maniu 220, Bucharest 061126, Romania <sup>2</sup> University POLITEHNICA of Bucharest, Faculty of Aerospace Engineering, str. Polizu 1, Bucharest, Romania, 011061

8	Ilie NICOLIN <sup>*,1</sup> , Bogdan Adrian NICOLIN <sup>*,2</sup>	The Fly-by-Light system for military aircrafts	<sup>1</sup> INCAS – National Institute for Aerospace Research “Elie Carafoli”, B-dul Iuliu Maniu 220, Bucharest 061126, Romania
9	Ilie NICOLIN <sup>*,1</sup> , Bogdan Adrian NICOLIN <sup>*,2</sup>	Failure Mode and Effect Analysis for military nose landing gear project	<sup>1</sup> INCAS – National Institute for Aerospace Research “Elie Carafoli”, B-dul Iuliu Maniu 220, Bucharest 061126, Romania
10	Mihai Leonida NICULESCU <sup>1</sup> , Ruxandra Maria Ileana MATEI <sup>1</sup>	Numerical prediction of transonic airfoil buffet	<sup>1</sup> INCAS – National Institute for Aerospace Research “Elie Carafoli”, B-dul Iuliu Maniu 220, Bucharest 061126, Romania
11	Ioan-Laurențiu PĂDUREANU <sup>*,1</sup> , Ștefan BOGOS <sup>1</sup> , Dorin BÂRSAN <sup>1</sup> , Bogdan RUSU <sup>1</sup>	RANS-based global performance analysis of a four-seater general aviation aircraft	<sup>1</sup> INCAS – National Institute for Aerospace Research “Elie Carafoli”, B-dul Iuliu Maniu 220, Bucharest 061126, Romania
12	Radu-Călin PAHONIE <sup>*,1</sup> , Ciprian LARCO <sup>1</sup>	A review on applications and technologies for flexible-winged-based UAVs	<sup>1</sup> Military Technical Academy “Ferdinand I”, B-dul George Coșbuc, nr. 39-49, Bucharest 050141, Romania
13	Marius Alexandru PANAIT	Analog versus Digital Anti-Aliasing Filtering in Modern Data Acquisition	INCAS – National Institute for Aerospace Research “Elie Carafoli”, B-dul Iuliu Maniu 220, Bucharest 061126, Romania
14	Dumitru PEPELEA <sup>*,1</sup> , Alexandru-Iulian ONEL <sup>1</sup> , Alexandru-Gabriel PERȘINARU <sup>1</sup>	Aerodynamic assessment of a Vertical Take-Off and Landing rocket vehicle in hover and ground proximity	<sup>1</sup> INCAS – National Institute for Aerospace Research “Elie Carafoli”, B-dul Iuliu Maniu 220, Bucharest 061126, Romania
15	Mihai-Victor PRICOP <sup>*,1</sup> , Mihaita Gilbert STOICAN <sup>1</sup> , Dumitru PEPELEA <sup>1</sup>	Generalized optimization of supersonic ramp intakes in ideal and calorically perfect gas	<sup>1</sup> INCAS – National Institute for Aerospace Research “Elie Carafoli”, B-dul Iuliu Maniu 220, Bucharest 061126, Romania
16	Emilia-Georgiana PRISĂCARIU <sup>1</sup> , Tudor PRISECARU <sup>2</sup>	An extended comparison between BOS, thermal-calibrated and color-filter schlieren	<sup>1</sup> Romanian Research and Development Institute for Gas Turbines COMOTI <sup>2</sup> POLITEHNICA University of Bucharest
17	Alexandru Valentin RADULESCU <sup>*</sup> , Irina RADULESCU	Experimental investigations on rheological properties of biogreases	<sup>*</sup> University POLITEHNICA of Bucharest, 313 Spl. Independentei, 060042 Bucharest, Romania
18	Mihăiță Gilbert STOICAN <sup>*,1,2</sup> , Mihai Victor PRICOP <sup>1</sup>	Design and development of a set of reentry capsule wind tunnel models to achieve the aerodynamic characterization at all angles of attack	<sup>1</sup> INCAS – National Institute for Aerospace Research “Elie Carafoli”, B-dul Iuliu Maniu 220, 061126, Bucharest, Romania <sup>2</sup> “POLITEHNICA” University of Bucharest, Faculty of Aerospace Engineering, Str. Gheorghe Polizu 1-7, 011061, Bucharest, Romania
19	Tudor VLADIMIRESCU <sup>*,1</sup> , Ion FUIOREA <sup>2</sup> , Tudor VLADIMIRESCU-jr <sup>1</sup>	Free-free vibrations analysis of the aircraft IAR-99 HAWK based on a new and modern finite element model	13 BLACK BUSINESS SOLUTIONS SRL, <sup>2</sup> “POLITEHNICA” University of Bucharest, Romania