

NANOConVEX CIG – Nanofluids for convective heat transfer devices

(COST CIG Action)



in cooperation with



“Gheorghe Asachi”
Technical University of Iasi
Romania

**“Gheorghe Asachi” Technical University of Iasi –
Romania**

3rd European Symposium on Nanofluids (ESNf)

9-10 September, 2021, Iasi, Romania



COST is supported by
the EU Framework Programme
Horizon 2020

Organizers

- COST CIG project NANOCONVEX (www.nanoconvex.eu)
- "Gheorghe Asachi" Technical University of Iasi, Romania

Symposium Sections

- **Section 1.** Nanofluids preparation and characterization techniques
- **Section 2.** Numerical approach on nanofluids studies
- **Section 3.** Real life applications of nanofluids

Message from the organizers

At its third edition, the European Symposium on Nanofluids (ESNf) aims to provide researchers closely working in the new enhanced fluids area with a favourable framework for communicating the results of their research, exchanging ideas and initiating new collaborations, refine their theoretical and methodological approaches, encouraging presentation and continuous development of interdisciplinary research in such a challenging topic.

These are a series of international symposiums under the auspices of the European Cooperation in Science and Technology (COST) CIG Action – NANOCONVEX (nanoconvex.eu – [NANOConVEX CIG project](#)), under the continuation of COST Action CA15119 - Overcoming Barriers to Nanofluids Market Uptake (NANOUP TAKE) (<https://www.cost.eu/actions/CA15119/#tabs|Name:overview>, www.nanouptake.eu). The event provides a platform for global collaboration and exchange of knowledge between researchers and engineers working on nanofluids – suspensions with particles ranging in size from 10 nm to 100 nm – and related areas.

Focuses of ESNf 2021 include nanofluid aspects ranging in a wide field from basic research to real world industrial applications. Main topics include the following:

- Nanofluid thermophysical properties (measurements, modelling etc.)
- Fundamentals of nanofluids research (magnetics, hydrodynamics, fluid flow, stability etc.)
- Phase change processes (boiling, heat pipes, thermosyphons etc.)
- Industrial applications (convection, conduction, solar energy, storage etc.)

During the two days of the Symposium, the researchers in nanofluids area will find the best framework to present and to discuss their scientific results. The symposium program will also include a series of plenary lectures given by prestigious researchers in the nanofluids area.

Scientific Committee

Alina Adriana Minea	<i>"Gheorghe Asachi" Technical University of Iasi</i>	Romania
Leonor Hernandez	<i>Universitat Jaume I Castellón</i>	Spain
Bengt Sundén	<i>University Lund</i>	Sweden
Patrice Estelle	<i>University Rennes</i>	France
Matthias H. Buschmann	<i>ILK Dresden</i>	Germany
Simone Mancin	<i>University Padua</i>	Italy
Elisa Sani	<i>National Institute CNR-INO</i>	Italy
Jure Ravnik	<i>University Maribor</i>	Slovenia
Oronzio Manca	<i>Università degli Studi della Campagna</i>	Italy
Bartosz Zajackowski	<i>Wroclaw University of Science and Technology</i>	Poland

Selecting Committee for the «Enrique Julia Prize 2021»

Sohel Murshed	<i>University of Lisbon</i>	Portugal
Alpaslan Turgut	<i>Dokuz Eylul University</i>	Turkey

Organizing Committee - "Gheorghe Asachi" Technical University of Iasi

professor Alina Adriana Minea, PhD

assistant professor Andrei Ionuț Donțu, PhD (*section 2 and 3 host*)

assistant professor Elena Ionela Cherecheș, PhD (*section 1 host*)

GENERAL ESNF 2021 PROGRAM

Thursday, 9 September 2021

Time	Event	
10.00 - 10.15	Opening ceremony meet.google.com/wsn-ynmv-xrb	
10.15 – 11.00	Plenary Speaker 1 meet.google.com/wsn-ynmv-xrb	
11.00 - 11.30	Coffee Break	
11.30-13.00	<p>Parallel Session 1.1</p> <p>Section 1. Nanofluids preparation and characterization techniques meet.google.com/apj-efpd-cnh 6 papers</p>	<p>Parallel Session 2.1</p> <p>Section 2. Numerical approach on nanofluids studies meet.google.com/opb-iojf-fit 5 papers</p>
13.00-14.00	Lunch	
14.00-15.30	<p>Parallel Session 1.2</p> <p>Section 1. Nanofluids preparation and characterization techniques meet.google.com/gbi-osdp-bhm 6 papers</p>	<p>Parallel Session 2.2</p> <p>Section 2. Numerical approach on nanofluids studies meet.google.com/opb-iojf-fit 5 papers</p>
15.30 – 16.00	Coffee Break	
16.00-17.45	<p>Parallel Session 1.3</p> <p>Section 1. Nanofluids preparation and characterization techniques meet.google.com/zsx-yusx-knv 7 papers</p>	<p>Parallel Session 1.4</p> <p>Section 1. Nanofluids preparation and characterization techniques meet.google.com/opb-iojf-fit 7 papers</p>
17.45 – 18.15	CIG meeting meet.google.com/qfo-dgyr-vtt	

Time zone is EEST, Bucharest time (GMT + 2) (CET +1)

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Friday, 10 September 2021

Time	Event	
10.00 - 10.30	Enrique Julia prize ceremony – presentation meet.google.com/jdr-huho-qnu	
10.30 – 11.00	Plenary Speaker 2 meet.google.com/jdr-huho-qnu	
11.00 - 11.15	Coffee Break	
11.15-12.30	Parallel Session 1.5 Section 1. Nanofluids preparation and characterization techniques meet.google.com/jxz-ewgv-tyt 4 papers	Parallel Session 3.1 Section 3. Real life applications of nanofluids meet.google.com/gkg-bgye-vwr 5 papers
12.30-13.30	Lunch	
13.30-14.45	Parallel Session 1.6 Section 1. Nanofluids preparation and characterization techniques meet.google.com/ngq-xptc-cxi 3 papers	Parallel Session 3.2 Section 3. Real life applications of nanofluids meet.google.com/gkg-bgye-vwr 5 papers
14.45-15.00	Coffee Break	
15.00 – 16.00	Closing ceremony meet.google.com/xtb-rvgh-epi	

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ESNF2021 DETAILED PROGRAM

Thursday, 9 September 2021

Time	Event	
10.00 – 10.15	Opening ceremony	
	PD DR.-Ing. habil. Matthias Buschmann	CIG Action Chair ILK Dresden, Germany
	Prof.dr. Dan Cașcaval	Rector of the Technical University of Iasi, Romania
	Prof.dr. Alina-Adriana Minea	Co-organizer of ESNf 2021 Director of the Council for Doctoral Studies, "Gheorghe Asachi" Technical University of Iasi, Romania
PLENARY SESSION 1 Chairman: Prof.dr. Alina-Adriana Minea		
10.15 – 11.00	The Extraordinary Case of Nanofools in Paradise by Marc J. Assael Danai Velliadou Konstantinos D. Antoniadis William A. Wakeham	Prof. Marc J. Assael Aristotle University, Thessaloniki, Greece
11.00 - 11.30	Coffee Break	

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Thursday, 9 September 2021

11.30-13.00	<p>Section 1. Nanofluids preparation and characterization techniques Parallel Session 1.1 Chairman: Leonor Hernandez, Universitat Jaume I Castellón, Spain</p>	
Time	Oral presentation	Authors
11.30-11.45	The preparation of novel nanofluids based on deep eutectic solvents by choline chloride and ethylene glycol: an experimental study	K. Jafari, MH. Fatemi and L. Lugo
11.45 – 12.00	Synthesis and characterization of goethite (α -FeOOH) magnetic nanofluids	M. R. Martina, L. Zoli and E. Sani
12.00-12.15	Study of Thermophysical Properties of Nanofluids with Single-Walled Carbon Nanotubes	V. Rudyak, A. Minakov, M. Pryagnikov and D. Guzey1
12.15-12.30	Theoretical study of GaN and InN-nanosheets for being used as nanofluids in CSP	F. Moreno-Velarde, E.I. Martín, F.J. Fernández-de-Cordova, J. Hidalgo and A. Sánchez-Coronilla
12.30-12.45	On the Diffusion of Carbon Nanotubes in Liquid	V. Rudyak, A. Belkin, S. Krasnolutskii
12.45-13.00	Cetyl alcohol-in-water nanoemulsions for thermal management: preparation and thermophysical profile	D. Cabaleiro, S. Losada-Barreiro, F. Agresti, C. Hermida-Merino, L. Fedele, L. Lugo, S. Barison, M.M. Piñeiro
13.00-14.00	Lunch	

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Thursday, 9 September 2021

11.30-12.45	Section 2. Numerical approach on nanofluids studies Parallel Session 2.1 Chairman: Bengt Sundén, University Lund, Sweden	
Time	Oral presentation	Authors
11.30-11.45	Numerical Investigation on Heat Transfer and Flow Behaviours of NiO/H ₂ O Nanofluid Flowing in Dimpled Tube	H.K. Pazarlıoğlu, M. Gürdal, K. Arslan and E. Gedik
11.45 – 12.00	Perovskite Quantum Dots Luminescent Nanofluids as Biological Thermometer by Ratiometric Method	Juan Jesús Gallardo, Ana Jiménez, Eduardo Blanco and Javier Navas
12.00-12.15	Numerical Analysis of Ionic Liquids Based Nanocolloids Behaviour at Heat Transfer	E. I. Chereches, M. Chereches and A. A. Minea, S M Sohel Murshed
12.15-12.30	Numerical investigation on natural convection in vertical channel heated at uniform heat flux with nanofluids	B. Buonomo, O. Manca, S.Nardini, S. Pragliola
12.30-12.45	Multiphase CFD-model of a nanofluid in a tubular direct absorption solar collector	B.V. Balakin and P.G. Struchalin
12.45-14.00	Lunch	

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Thursday, 9 September 2021

14.00-15.30	Section 1. Nanofluids preparation and characterization techniques Parallel Session 1.2 Chairman: Patrice Estelle, University Rennes, France	
Time	Oral presentation	Authors
14.00-14.15	Zeta potential and colloidal stability of nanoparticle dispersions: how can the choice of the electrokinetic models influence the interpretation of results?	Daniel José Pochapski, Caio Carvalho dos Santos, Sandra Helena Pulcinella, Celso Valentim Santilli
14.15-14.30	The influence of specific surface area and size of carbon black nanoparticles on the thermal conductivity, heat capacity and surface tension of ethylene glycol based nanofluids	J. Sobczak, J.P. Vallejo, J. Traciak, S. Hamze, J. Fal, P. Estellé, L. Lugo and G. Żyła
14.30-14.45	Atomistic Insight into the Nanomechanical Characteristics of Trapped Oil Droplet/ Nanofluid System in Confined Nanochannels	Yuanhao Chang, Senbo Xiao, Zhiliang Zhang and Jianying He1
14.45-15.00	About the dependence of the specific heat of nanofluids on the nature of interactions at solid-liquid interfaces	I. Carrillo-Berdugo, J. Sampalo-Guzmán, T. Aguilar, R. Grau-Crespo, D. Zorrilla and J. Navas
15.00-15.15	Graphene nanoplatelet nanofluids thermal and hydrodynamic performances revisited	E. B. Elcioglu, B. Kamenik, A. Turgut, R. Mondragon, L. Hernandez Lopez, J. P. Vallejo, L. Lugo, M. H. Buschmann and J. Ravnik
15.15-15.30	Dielectric and rheological behaviour of stable nano carbon black dispersions in PEG200	M.A. Marcos, J. Fal, J.P. Vallejo, G. Zyla, L. Lugo
15.30-16.00	Coffee Break	

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Thursday, 9 September 2021

14.00-15.15	Section 2. Numerical approach on nanofluids studies Parallel Session 2.2 Chairman: Jure Ravnik, University Maribor, Slovenia	
Time	Oral presentation	Authors
14.00-14.15	Analysis at cell scale of porosity effect on forced convection with nanofluids in porous structures with Kelvin cells	B. Buonomo, A. di Pasqua, O. Manca, S. Nappo and S. Nardini
14.15-14.30	Heat transfer performance of ZrO₂ nanofluids in a gasketed plate heat exchanger	U. Calviño, W. Ajeeb, L. Lugo and S. M. S. Murshed
14.30-14.45	Estimation of Thermophysical Properties for Accurate Numerical Simulation of Nanofluid Heat Transfer : A Review	Roger R. Riehl, Simone Mancin
14.45-15.00	Nanoparticles to Enhance Melting Performances of Phase Change Materials in a Finned Tubular Thermal Energy Storage System	Yan Yang, Haoping Peng, and Chuang Wen
15.00-15.15	The Numerical Investigation on Natural Convection Effects in Single-Phase Natural Circulation Mini Loops	S. C. Bozkır, N. Çobanoğlu, S. Doğanay, Z. H. Karadeniz and A. Turgut
15.15-16.00	Coffee Break	

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Thursday, 9 September 2021

Parallel Session 1.3		
Chairman: Elisa Sani, National Institute CNR-INO, Italy		
Section 1. Nanofluids preparation and characterization techniques		
Time	Oral presentation	Authors
16.00-16.15	Determination of surface tension of nanofluids using a lab-made tensiometer	J. Traciak, J. Fal and G. Żyła
16.15-16.30	Heat Capacity Measurement and Advanced Data Analysis by Mathematical Gnostics for IoNanoFluids Prepared from a Series of Imidazolium-Based Ionic Liquids	N. Parmar, M. Bendová, Z. Wagner and J. Jacquemin
16.30-16.45	Rheological profile of ethylene glycol based nanofluids containing carbon black nanoparticles	G. Żyła
16.45-17.00	3D MoS₂-based nanofluids for being used in concentrated solar power plants	P. Martínez-Merino, R. Alcántara, P. Gómez-Larrán and J. Navas
17.00-17.15	Experimental Study on Heat Transfer Characteristics of Al₂O₃/DW Nanofluid in a Plate Heat Exchanger	W. Ajeeb, R. R. S. Thieleke da Silva and S. M. S. Murshed
17.15-17.30	Huge electrical conductivity enhancement in anatase titanium dioxide ethylene glycol nanofluid	J.Fal, R. Stagraczyński, J. Sobczak, P. Estellé, Gawęł Żyła
17.30-17.45	Zirconium oxide-based nanofluids with modified thermophysical properties as heat transfer fluids	U. Calviño, J.I. Prado, J.P. Vallejo, S.M.S. Murshed and L. Lugo
17.45 – 18.15	CIG meeting	

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Parallel Session 1.4 Chairman: Oronzio Manca, Università degli Studi della Campagna, Italy Section 1. Nanofluids preparation and characterization techniques		
Time	Oral presentation	Authors
16.00-16.15	Effective Thermal Conductivity of Nanofluids: Measurement and Prediction	Francisco E. Berger Bioucas, Michael H. Rausch, Thomas M. Koller, Andreas P. Fröba
16.15-16.30	Covalent functionalization of graphene nanoplatelets to design nanoenhanced heat transfer fluids	A. Gea, J.I. Prado and L. Lugo
16.30-16.45	Analysis of phase change transition of isopropyl palmitate based nanofluids by experimental enthalpy-temperature curves	J. González-Puelles, N.G. Troncoso, J.I. Prado, U. Calviño and L. Lugo
16.45-17.00	Design of nanoenhanced phase change materials based on isopropyl palmitate for cold applications	N.G. Troncoso, J. González-Puelles, J.I. Prado, U. Calviño, and L. Lugo
17.00-17.15	Parameters Influencing Thermal Conductivity of Ionanocolloids	E. Fabre and S. M. S. Murshed
17.15-17.30	Experimental Investigation on Refractive Index of Dispersion of Agricultural Biomass Particles in Ethylene Glycol	S. Bikić, M. Radojčin, I. Pavkov, M. Bukurov, B. Despotović, Z. Stamenković, N. Oluški
17.30-17.45	Transient entropy generation in thermo-hydraulic interaction of the heated impeller blades and nanofluid	F. Alic
17.45 – 18.15	CIG meeting	

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Friday, 10 September 2021

Time	Event	
10.00 – 10.30	<p>«Enrique Julia Prize 2021» ceremony <i>The prize is sponsored by ILK Dresden.</i></p> <p>The prize will be presented by pd dr. ing. habil. Matthias Buschmann – ILK Dresden</p>	<p>ILK Dresden </p> <p>Verein zur Förderung der Luft- und Kältetechnik e.V.</p>
<p>PLENARY SESSION 2 Chairman: PD DR. Ing. habil. Matthias Buschmann</p>		
10.30 – 11.00	<p>Nanofluids at a glance: from NANOUP TAKE to NANO CONVEX</p>	<p>Prof. Leonor Hernandez Universitat Jaume I Castellón, Spain</p>
11.00 - 11.15	<p>Coffee Break</p>	

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Friday, 10 September 2021

11.15-12.15	Section 1. Nanofluids preparation and characterization techniques Parallel Session 1.5 Chairman: Simone Mancin, University Padua, Italy	
Time	Oral presentation	Authors
11.15 – 11.30	Specific heat enhancement in Cu nanowires – containing nanofluids for thermal energy storage	Juan A. Poce-Fatou, Javier Navas
11.30-11.45	2D GO-nanofluids with high stability and improved thermal properties	T. Aguilar, I. Carrillo-Berdugo, E. Sani, L. Mercatelli, J. Navas
11.45 – 12.00	Nanofluids specific heat capacity: a sampling study	A. Svobodova-Sedlackova, C. Barreneche, P. Gamallo and A. Inés Fernández
12.00-12.15	Investigation of carbon based nanofluids containing carbon nanospheres and carbon nanopowder	Marcell Bohus, Thong Le Ba. and Imre Miklós Szilágyi
12.15-13.30	Lunch	

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11.15 - 12.30	Section 3. Real life applications of nanofluids Parallel Session 3.1 Chairman: Bartosz Zajackowski, Wroclaw University of Science and Technology, Poland	
Time	Oral presentation	Authors
11.15 – 11.30	Uncertainty estimates for nanofluid heat exchanger design	B. Kamenik, E. Begum Elcioglu, A. Turgut, R. Mondragon, L. Hernandez Lopez, J. P. Vallejo, L. Lugo, M. H. Buschmann and J. Ravnik
11.30-11.45	A business model approach towards the commercialisation of Nanofluids for the European Industries	A. Ortigosa-Blanch, J.M. Berné-Martínez, S. Mancin and M.H. Buschmann
11.45 – 12.00	Nanofluids Spray Cooling for Industrial Applications	G. Marseglia, M. Sanches, A. P. C. Ribeiro, A. L. N. Moreira, A. S. Moita
12.00-12.15	Life Cycle Assessment of nanofluids in thermal management applications. Challenges and opportunities	J. Krupanek
12.15-12.30	Nanofluid-inspired coating for corrosion prevention in molten salts thermal storage applications	Luis González-Fernández, Angel Serrano, Iker Camacho, Elena Palomo and Yaroslav Grosu
12.30-13.30	Lunch	

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Friday, 10 September 2021

13.30-14.15	<p align="center">Section 1. Nanofluids preparation and characterization techniques Parallel Session 1.6 Chairman: Sohel Murshed, University of Lisbon, Portugal</p>	
Time	Oral presentation	Authors
13.30-13.45	Experimental investigation of rheological properties and thermal conductivity of SiO₂-P25 TiO₂ hybrid nanofluids	Zalán István Várady, Thong Le Ba, Imre Miklós Szilágyi
13.45-14.00	Experimental investigations on the improvement in thermal contact resistance with the Al₂O₃ nanoparticles as the filler material at the interface	R. Choudhary, A. Singh, A. Kumar, and S. Subudhi
14.00-14.15	Fe₃O₄ ferronanofluid contact angle and impact of the magnetic field on the drying droplet	R. Mulka, B. Zajączkowski, E. Neuber, and M. H. Buschmann
14.15-15.00	Coffee Break	
15.00 – 16.00	Closing ceremony	

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Friday, 10 September 2021

13.30-14.45	Section 3. Real life applications of nanofluids Parallel Session 3.2 Chairman: Alpaslan Turgut, Dokuz Eylul University, Turkey	
Time	Oral presentation	Authors
13.30-13.45	Cooling Enhancement with Nanofluid inside an inclined Multi-Vented Cavity	I. Arroub, A. Bahlaoui, S. Belhouideg, A. Raji and M. Hasnaoui
13.45-14.00	The Developing Flow Characteristics of Water - Ethylene Glycol Mixture based Fe₃O₄ Nanofluids in Eccentric Annular Ducts in Low Temperature Applications	N. Çobanoğlu, A. Banisharif, P. Estellé and Z.H. Karadeniz
14.00-14.15	Experimental investigation of a nanofluid-based tubular direct absorption solar collector performance	P.G. Struchalin, V.S Yunin and B.V. Balakin
14.15-14.30	Application of iron oxide nanoparticles for solar-driven seawater desalination	D.M. Kuzmenkov, I.A. Nekalo, P.G. Struchalin, K.V. Kutsenko and B.V. Balakin
14.30-14.45	Overview of Performance of Nanofluids in Two-Phase Cooling Systems	Roger R. Riehl and S. M. S. Murshed
14.45-15.00	Coffee Break	
15.00-16.00	Closing ceremony	

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