

## SCIENTIFIC PROGRAMME

### CONFERENCES ON CELLULAR MATERIALS

Second Edition of the National Conference on Cellular Materials (MatCel'2017)

International Conference of Dynamic Behaviour of Cellular Materials (DynMatCel'2017)

José Grácio Auditorium, Department of Mechanical Engineering, University of Aveiro, Portugal

Conference Chair-Persons: Isabel Duarte (University of Aveiro, Portugal) & Nuno Peixinho (University of Minho, Portugal)

Day 1 (25 <sup>th</sup> September)	
8:00-9:00	<b>Registration</b>
9:00-9:15	<b>Welcome and Opening session</b>
9:15-10:00	<b>Plenary lecture</b> <b>In-situ X-ray tomography: Insights into the evolution of liquid Aluminium alloy foams</b> <b>John Banhart, Technical University of Berlin, Helmholtz-Centre, Germany</b>
10:00-10:30	<b>Coffee-break (*Session Poster)</b>
10:30-10:50	<b>Metal foams in research and development –new approaches in industrial aluminium foam production</b> T. Hipke, Fraunhofer-Institute for Machine Tools and Forming Technology, Germany <b>René Vogel</b> , Fraunhofer-Institute for Machine Tools and Forming Technology, Germany J. Hohlfeld, Fraunhofer-Institute for Machine Tools and Forming Technology, Germany F. Schuller, Havel Metal Foam GmbH, Germany
10:50-11:10	<b>Use of polymers for the production of metal matrix composite porous structures</b> <b>Lisa Biasetto</b> , University of Padova, Italy H. Elsayed, University of Padova, Italy; National Research Centre, Egypt
11:10-11:30	<b>Remote Laser cutting of open cell foams: Processes for the factory of the future</b> <b>Robert Baumann</b> , Technical University (TUD) of Dresden, Germany P. Herwig, Fraunhofer Institute for Material and Beam Technology (IWS), Germany A. Wetzig, Fraunhofer Institute for Material and Beam Technology (IWS), Germany E. Beyer, Technical University (TUD) of Dresden, Germany
11:30-11:50	<b>Development of SLM cellular structures for injection molds manufacturing</b> D. Oliveira, Polytechnic Institute of Leiria, Portugal C. Santos, Polytechnic Institute of Leiria, Portugal <b>Artur Mateus</b> , Polytechnic Institute of Leiria, Portugal C. Malça, Polytechnic Institute of Coimbra, Portugal
11:50-12:10	<b>Processing of open-pore silicon foams using graphite composite as space holder</b> <b>Johann Heimann</b> , Pforzheim University of Applied Sciences, Germany A. M. Matz, Pforzheim University of Applied Sciences, Germany B. S. Mocker, Pforzheim University of Applied Sciences, Germany N. Jost, Pforzheim University of Applied Sciences, Germany
12:10-12:30	<b>Functional bio-based polyurethane foams from industrial residues</b> <b>Nuno Gama</b> , University of Aveiro, Portugal R. Silva, Sapec-Química SA, Portugal A. Ferreira, Escola Superior de Tecnologia e Gestão de Águeda, Portugal A. Barros-Timmons, University of Aveiro, Portugal
12:30-14:00	<b>Lunch</b>



Day 1 (25 <sup>th</sup> September)	
14:00-14:45	<p style="text-align: center;"><b>Plenary lecture</b></p> <p style="text-align: center;"><b>Cork: a natural cellular material</b></p> <p style="text-align: center;"><b>M. Emília Rosa, Instituto Superior Técnico, University of Lisbon, Portugal</b></p>
14:45-15:05	<p><b>Low weight, highly porous, biomimetic 3-dom ecoceramics using cork as a natural sustainable template</b></p> <p><b>Robert C. Pullar</b>, University of Aveiro, Portugal                      R. M. Novais, University of Aveiro, Portugal</p>
15:05-15:25	<p><b>Mechanical behaviour of aluminium-cork hybrid foams</b></p> <p><b>Susana Pinto</b>, University of Aveiro, Portugal                      N. Novak, University of Maribor, Slovenia                      M. Vesenjsek, University of Maribor, Slovenia                      R. Vicente, University of Aveiro, Portugal                      P. Marques, University of Aveiro, Portugal                      I. Duarte, University of Aveiro, Portugal</p>
<b>Coffee-Break (Poster session *)</b>	
15:50-16:10	<p><b>Open-cell and glass-ceramic filled cellular zirconia structures for biomedical applications</b></p> <p><b>Bruno Henriques</b>, Federal University of Santa Catarina, Brazil                      J. Mesquita-Guimarães, University of Minho, Portugal                      J. C.M. Souza, Federal University of Santa Catarina, Brazil                      M. Celso Fredel, Federal University of Santa Catarina, Brazil                      F. S. Silva, University of Minho, Portugal</p>
16:10-16:30	<p><b>Wear and ageing behaviour of porous zirconia layers</b></p> <p><b>Telma A. Dantas</b>, University of Minho, Portugal                      S. Roedel, Federal University of Santa Catarina, Brazil                      J. Mesquita-Guimarães, University of Minho, Portugal                      B. Henriques, University of Minho, Portugal                      M.C. Fredel, Federal University of Santa Catarina, Brazil                      F. S. Silva, University of Minho, Portugal</p>
16:30-16:50	<p><b>Hydrothermal synthesis of biphasic calcium phosphate scaffolds from cuttlebone</b></p> <p><b>Ana Sofia Neto</b>, University of Aveiro, Portugal                      J. M.F. Ferreira, University of Aveiro, Portugal</p>
16:50-17:10	<p><b>Production of zirconia structures for dental implants</b></p> <p>P. Vieira, University of Minho, Portugal  <b>Ana Marques</b>, University of Minho, Portugal                      F. S. Silva, University of Minho, Portugal                      O. Carvalho, University of Minho, Portugal</p>
17:10-17:30	<p><b>Asphaltenes' precipitation as a mechanism to obtain a hydrophobic surface in aluminium foams</b></p> <p><b>Laura Álvarez</b>, Universidad Nacional de Colombia, Colombia                      J. Ramírez, Universidad Nacional de Colombia, Medellín, Colombia                      P. Fernández-Morales, Universidad Pontificia Bolivariana, Medellín, Colombia</p>



Day 2 (26 <sup>th</sup> September)	
8:00-9:00	
9:00-9:15	<b>Registration</b>
9:15-10:00	<b>Plenary lecture</b> <b>Mechanical behavior of cellular metals</b> <b>Matej Vesenjak, University of Maribor, Slovenia</b>
10:00-10:30	<b>Coffee-break</b>
10:30-10:50	<b>Visualizing Strain in dynamically loaded cellular materials</b> <u> Lovre Krstulović-Opara</u> , University of Split, Croatia M. Vesenjak, University of Maribor, Slovenia I. Duarte, University of Aveiro, Portugal
10:50-11:10	<b>Control of the compressive properties of metallic foams through the fractal distribution of the porosity</b> <u> Ismeli Afonso</u> , Universidad Nacional Autónoma de México, México J. C. Carranza, Universidad Nacional Autónoma de México, México L. Pérez, Universidad Técnica Federico Santa María, Chile I. A. Figueroa, Universidad Nacional Autónoma de México, México
11:10-11:30	<b>The role of randomness in the elastic properties of soft mechanical metamaterials</b> <u> Mohammadi Mirzaali</u> , Politecnico di Milano, Italy R. Hedayati, Delft University of Technology, The Netherlands P. Vena, Politecnico di Milano, Italy L. Vergani, Politecnico di Milano, Italy M. Strano, Politecnico di Milano, Italy A. Zadpoor, Delft University of Technology, The Netherlands
11:30-11:50	<b>Experimental and numerical impact testing an aluminium corrugate layered structure</b> M. Güden, Izmir Institute of Technology, Turkey <u> Mustafa Sarıkaya</u> , Izmir Institute of Technology, Turkey A. Taşdemirci, Izmir Institute of Technology, Turkey
11:50-12:10	<b>Mechanical properties of high-density TRIP-steel honeycomb structures with varying cell profile under different load conditions</b> <u> Christine Baumgart</u> , Technische Universität Bergakademie Freiberg, Germany L. Krüger, Technische Universität Bergakademie Freiberg, Germany
12:10-12:30	<b>Multiaxial experimental tests on a polypropylene foam</b> A. Donnard, Arts et Metiers ParisTech, France S. Guérard, Arts et Metiers ParisTech, France <u> Laurent Maheo</u> , CREC, St-Cyr Military Academy, University of South Brittany, France P. Viot, Arts et Metiers ParisTech, France
12:30-14:00	<b>Lunch</b>



<b>Day 2 (26<sup>th</sup> September)</b>	
<b>14:00-14:45</b>	<b>Plenary lecture</b>  <b>On the forming of sandwich shells with closed-cell foam cores</b> <b>Renato Natal Jorge, Faculty of Engineering of the University of Porto, Porto</b>
<b>14:45-15:05</b>	<b>Multi-scale analysis of composite materials using the natural neighbour radial point interpolation method</b> <b>Daniel Rodrigues</b> , Institute of Science and Innovation in Mechanical and Industrial Engineering (INEGI), Portugal J. Belinha, Institute of Science and Innovation in Mechanical and Industrial Engineering (INEGI), Faculty of Engineering, University of Porto, Portugal L.M.J.S. Dinis, Institute of Science and Innovation in Mechanical and Industrial Engineering (INEGI), Portugal R. M. Natal Jorge, Faculty of Engineering, University of Porto, Portugal
<b>15:05-15:25</b>	<b>Multiscale simulation of temperature and stress state for high temperature gradient for 3D periodic composites</b> <b>Gleb Gorynin</b> , Surgut State University, Russia A. Vlasko, Surgut State University, Russia
<b>15:25-15:50</b>	<b>Coffee-break</b>
<b>15:50-16:10</b>	<b>Modelling and effective properties prediction of metal foams</b> <b>José Aquino</b> , University of Aveiro, Portugal I. Duarte, University of Aveiro, Portugal J. Dias-de-Oliveira, University of Aveiro, Portugal
<b>16:10-16:30</b>	<b>Defining the anisotropic constitutive tensor of trabecular bone using the fabric tensor concept</b> <b>Marco Marques</b> , Institute of Science and Innovation in Mechanical and Industrial Engineering (INEGI), Portugal J. Belinha, Institute of Science and Innovation in Mechanical and Industrial Engineering (INEGI), Faculty of Engineering, University of Porto, Portugal A.F. Oliveira, Abel Salazar Institute of Biomedical Sciences, Portugal R. M. Natal Jorge, Faculty of Engineering, University of Porto, Portugal
<b>16:30-16:50</b>	<b>Dynamic mechanical behaviour of cellular materials under compressive load</b> <b>Gerald Portemont</b> , Onera-The French Aerospace Lab, France B. Langrand, Onera-The French Aerospace Lab, France V. Marcadon, Onera-The French Aerospace Lab, France C. Davoine, Onera-The French Aerospace Lab, France S. Kruch, Onera-The French Aerospace Lab, France
<b>16:50-17:00</b>	<b>Application of virtual cellular material concept for the simulations of dynamic loading processes</b> <b>Ryszard Pecherski</b> , Institute of Fundamental Technological Research, Poland Z. Nowak, Institute of Fundamental Technological Research, Polish Academy of Sciences, Poland
<b>17:00-17:15</b>	<b>Information</b>
<b>17:15-19:30</b>	<b>Social Programme</b>
<b>20:00</b>	<b>Conference Dinner</b>



Day 3 (27 <sup>th</sup> September)	
8:00-9:00	
9:00-9:15	<b>Registration</b>
9:15-10:00	<p><b>Plenary lecture</b></p> <p><b>Infrared thermography as THE tool for tracing plastification of cellular materials and composite structures</b></p> <p><b>Lovre Krstulović-Opara, University of Split, Croatia</b></p>
10:00-10:30	<b>Coffee-break</b>
10:30-10:50	<p><b>Crush behaviour of auxetic cellular structures</b></p> <p>M. Vesenjak, University of Maribor, Slovenia N. Novak, University of Maribor, Slovenia <b>Zoran Ren,</b> University of Maribor, Slovenia</p>
10:50-11:10	<p><b>Significance of cell number in the bulk elastic properties of auxetic reentrant lattices</b></p> <p><b>Vitor Carneiro,</b> University of Minho, Portugal J. Meireles, University of Minho, Portugal N. Peixinho, University of Minho, Portugal</p>
11:10-11:30	<p><b>Effective thermal conductivity of open cell foams for gas-solid reactors</b></p> <p><b>Marie-Line Zanota,</b> Université de Lyon, France Jonathan Gerardin, Université de Lyon, France Isabelle Pitault, Université de Lyon, France Régis Philippe, Université de Lyon, France</p>
11:30-11:50	<p><b>Direct monte Carlo simulation of radiation heat transfer in semi-transparent cellular foams/ comparison with homogenized methods</b></p> <p><b>Salvatore Cunsolo,</b> 1LaMCoS, INSA-Lyon, France R. Coquard, 2EC2-MODELISATION, France D. Baillis1, 1LaMCoS, INSA-Lyon, France N. Bianco, Università degli Studi Federico II Napoli, Italy</p>
11:50-12:10	<p><b>Bi-material vehicle hood for impact absorption during pedestrians accidents</b></p> <p><b>Sergio Santos,</b> Polytechnic Institute of Leiria, Portugal D. Bastos, Polytechnic Institute of Leiria, Portugal P. Freitas, Polytechnic Institute of Leiria, Portugal H. Amorim, Polytechnic Institute of Leiria, Portugal</p>
12:10-12:30	<b>Closing</b>

\* Poster Session, with about 15 poster presentation.



Poster	
#1	<b>3D printed Ti6Al4v porous structures by robocasting technology</b> Lisa Biasetto, University of Padova, Italy Hamada Elsayed, University of Padova, Italy & National Research Centre, Egypt
#2	<b>Radiant porous burners produced from an alternative ceramic raw material</b> N. P. Stochero, Federal University of Santa Catarina (UFSC), Brazil E. G. de Moraes, Federal University of Santa Catarina (UFSC), Brazil <u>A. P. Novaes de Oliveira</u> , Federal University of Santa Catarina (UFSC), Brazil
#3	<b>Ceramic foams produced from ceramic shell waste and expandable styrofoam (eps) as pore former: processing and characterization</b> L. Sangiacomo, University of Modena and Reggio Emilia (UniMore), Italy E. G. de Moraes, Federal University of Santa Catarina (UFSC), Brazil S. Arcaro, Federal University of Santa Catarina (UFSC), Brazil N. P. Stochero, Federal University of Santa Catarina (UFSC), Brazil C. Siligardi1, University of Modena and Reggio Emilia (UniMore), Italy <u>A. P. Novaes de Oliveira</u> , Federal University of Santa Catarina (UFSC), Brazil
#4	<b>Vitrocrystalline foams from expandable styrofoam (EPS) as pore former: processing and characterization</b> M. Bigi, University of Modena and Reggio Emilia (UniMore), Italy E. G. de Moraes, Federal University of Santa Catarina (UFSC), Brazil N. P. Stochero, Federal University of Santa Catarina (UFSC), Brazil S. Arcaro, Federal University of Santa Catarina (UFSC), Brazil C. Siligardi, University of Modena and Reggio Emilia (UniMore), Italy <u>A. P. Novaes de Oliveira</u> , Federal University of Santa Catarina (UFSC), Brazil
#5	<b>Additive manufacturing of 3D porous alkali-free bioactive glass scaffolds by robocasting</b> Anna De Marzi, University of Padua, Italy <u>A. S. Neto</u> , University of Aveiro, Portugal H. R. Fernandes, University of Aveiro, Portugal P. Colombo, University of Padua, Italy J. M. F. Ferreira, University of Aveiro, Portugal
#6	<b>Porous chitosan-polyethyleneglycol composite membranes for antibacterial and controlled drug delivery applications</b> I. Pereira, University of Aveiro, Portugal <u>A. S. Neto</u> , University of Aveiro, Portugal A. S. Duarte, University of Aveiro, Portugal J. M. F. Ferreira, University of Aveiro, Portugal
#7	<b>Process development of process for manufacturing of cellular structures with controlled geometry and properties</b> <u>N. Peixinho</u> , University of Minho, Portugal P. Pinto, University of Minho, Portugal F. Silva, University of Minho, Portugal D. Soares, University of Minho, Portugal
#8	<b>Metal nanocomposite foams</b> <u>I. Duarte</u> , University of Aveiro, Portugal J.M.F. Ferreira, University of Aveiro, Portugal





Poster	
#9	<p><b>Mechanical properties and energy absorption of aluminium foams with modified cellular geometry</b></p> <p><u>N. Peixinho</u>, University of Minho, Portugal                      P. Pinto, University of Minho, Portugal                      F. Silva, University of Minho, Portugal                      D. Soares, University of Minho, Portugal</p>
#10	<p><b>Testing and modelling the behaviour of metal foams, a path towards prediction and optimisation</b></p> <p>J. Aquino, University of Aveiro, Portugal                      T. Rodrigues, University of Aveiro, Portugal                      I. Duarte, University of Aveiro, Portugal  <u>J. Dias-de-Oliveira</u>, University of Aveiro, Portugal</p>
#11	<p><b>Homogenization techniques using meshless methods for structural and biomechanical analysis</b></p> <p><u>D.E.S. Rodrigues</u>, University of Porto, Porto                      M. Marques, University of Porto, Porto                      J. Belinha, University of Porto, Porto                      L.M.J.S. Dinis, University of Porto, Porto                      R. M. Natal Jorge, University of Porto, Porto</p>
#12	<p><b>Multifunctional foam filled tubes</b></p> <p><u>I. Duarte</u>, University of Aveiro, Portugal                      M. Vesenjak, University of Maribor, Slovenia                      L. Krstulović-Opara, University of Split, Croatia</p>
#13	<p><b>Effect of the cell number on the elastic constants of auxetic reentrant lattices</b></p> <p><u>V. H. Carneiro</u>, University of Minho, Portugal                      J. Meireles, University of Minho, Portugal                      N. Peixinho, University of Minho, Portugal</p>
#14	<p><b>Hybrid structures based on cellular materials</b></p> <p><u>S. C. Pinto</u>, University of Aveiro, Portugal                      R. J. B. Pinto, University of Aveiro, Portugal                      C. S.R. Freire, University of Aveiro, Portugal                      I. Duarte, University of Aveiro, Portugal                      R. Vicente, University of Aveiro, Portugal                      P. A.A.P. Marques, University of Aveiro, Portugal                      P. Marques, University of Aveiro, Portugal</p>
#15	<p><b>Static and dynamic behaviour of 3D printed honeycomb cellular structures</b></p> <p>J. Magalhães, University of Minho, Portugal                      H. Gonçalves, University of Minho, Portugal  <u>N. Peixinho</u>, University of Minho, Portugal                      V. H. Carneiro, University of Minho, Portugal</p>