Innovative Materials for Additive Manufacturing III

Tomar, Portugal
8-13 January 2024

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Engineering Conferences International
32 Broadway, Suite 314
New York, NY 10004
USA

Phone: (212) 514-6760
Fax: (212) 514-6030

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Tuesday, January 9, 2024

07:30 – 08:45	Breakfast Buffet	
	Session 1	
08:45 – 09:30	**Invited** **Tailor made polymeric feedstocks for additive manufacturing using polymer science principles** Mark Dadmun, University of Tennessee, USA	1
09:30 – 10:00	**Conformal and custom radiation shielding composites for human extremity protection enabled by non-planar additive manufacturing** Nicholas Baumann, Los Alamos National Laboratories, USA	2
10:00 – 10:30	**Comparison of HDPE manufactured via compression molding versus selective laser sintering** Joseph Torres, Los Alamos National Laboratories, USA	3
10:30 – 11:00	Coffee Break	
	Session 2	
11:00 – 11:45	**Invited** **3D-printing liquid crystal polymers to replicate the anisotropic complexity of wood** Kunal Masania, TU Delft, Netherlands	4
11:45 – 12:15	**Invited** **The development of high temperature organic materials for SLS at Sandia National Laboratories** C. Garrett Campbell, Sandia National Laboratories, USA	5
12:15 – 12:45	**Direct ink writing of custom UV curable rubbers with radiation absorbing particles and its challenges** Jacob Mingear, Los Alamos National Laboratories, USA	6
12:45 – 13:15	**Kinetic modeling of cure behavior to enable simulation of material extrusion AM of reactive thermoset polymers** Madeline Wimmer, University of Tennessee, Knoxville, USA	7
13:15 – 14:30	Lunch Buffet	
14:30 – 16:30	Networking	
16:30 – 17:00	Afternoon Coffee	
	Session 3	
17:00 – 17:45	**Invited** **Novel rheological measurements to understand structural stability of DIW-printed epoxy composites during thermal curing** Stian Romberg, National Institute of Standards and Technology, USA	8
17:45 – 18:15	**Enabling digital manufacturing cyber-physical system for future manufacturing** Nikhil Gupta, New York University, USA	9

Tuesday, January 9, 2024 (continued)

18:15 – 18:45	**The thermoresponsive character of biopolymers and its impact on the scaffold performance in 3D bioprinting** Tijana Kavrakova, Ecole Centrale Nantes, France	10
18:45 – 19:15	**Invited** **Additive manufacturing of elastomer, ceramic and metal multi-functional structures** Eric MacDonald, UTEP, USA	11
19:30 – 21:30	Dinner followed by Social Hour in Lobby Bar area	

Wednesday, January 10, 2024

07:30 – 08:45	Breakfast Buffet	
	Session 4	
08:45 – 09:30	**Invited** **Focus on some peculiar behaviors of polymers in the context of additive manufacturing processes** René Fulchiron, Universite Claude Bernard Lyon 1, France	12
09:30 – 10:00	**3D and 4D printing of polypropylene having different content of copolymer** Joamin Gonzalez-Gutierrez, Luxembourg Institute of Science and Technology, Luxembourg	13
10:00 – 10:30	**Understanding AM feedstock recyclability using small angle X-ray scattering** Samantha Talley, Honeywell FM&T, USA	14
10:30 – 11:00	Coffee Break	
	Session 5	
11:00 – 11:45	**Invited** **4D printing of hybrid materials with material extrusion method** Mika Salmi, Aalto University, Finland	15
11:45 – 12:30	**Invited** **Material extrusion additive manufacturing of thermoset-based short fiber composites** Brett Compton, University of Tennessee Knoxville, USA	16
12:30 – 13:30	Lunch Buffet	
13:55	Meet at hotel entrance for excursion	
14:00 – 18:00	Excursion – Guided walking Tour of Covento de Cristo *Situated in the geographic center of Portugal, Tomar was founded by the notorious Knights Templar in 1160. The Templars were part monks, part warriors and plotted crusades from Tomar for centuries. They established the beginnings of the Convento de Cristo, Tomar's most famous landmark, on a hill overlooking town. The Convento combines architectural styles from the 12th through 17th centuries. An ornate octagonal canopy protects the high altar of the Templo dos Templares, modeled after the Holy Sepulchre in Jerusalem, and the grounds of the convent contain eight cloisters embracing a variety of styles.*	
18:00	Dinner on your own	

Thursday, January 11, 2024

07:30 – 08:45	Breakfast Buffet	
	Session 6	
08:45 – 09:30	**Invited** **Directed assembly of ceramic particle microstructures to realize emergent mechanical and thermal properties** Randy Erb, Northeastern University, USA	17
09:30 – 10:00	**Binder jet additive manufacturing of functional 4D components from NiMnGa magnetic shape memory alloy powders** C. Virgil Solomon, Youngstown State University, USA	18
10:00 – 10:30	**Lunar regolith as a feedstock for selective laser melting** Joris Kadok, Luxembourg Institute of Science and Technology, Luxembourg	19
10:30 – 11:00	Coffee Break	
	Session 7	
11:00 – 11:45	**Invited** **3D/4D printing of high-performance nanocomposites and AI/ML strategies** Rigoberto Advincula, University of Tennessee, USA	20
11:45 – 12:15	**Mapping the light scattering distribution in a three-phase photopolymer resin system to predict cured dimensions** Darshil Shah, University of Massachusetts Lowell, USA	21
12:15 – 12:45	**Anchoring-based control of dissimilar material interface for multi-material laser direct energy deposition** Wookjin Lee, Pusan National University, South Korea	22
12:45 – 13:15	**Phase evolution and high temperature compressive strength of Ti-based alloy developed by micro-plasma powder additive manufacturing** Pradyumn Kumar Arya, Indian Institute of Technology, Indore, India	23
13:15 – 14:30	Lunch Buffet	
14:30 – 17:00	Networking	
17:00 – 17:45	Afternoon Coffee Break	
17:45 – 18:45	Brief Poster Talks and Discussion	
	CNT-free ESD DIW silicone development - Mechanical & dissipative response Luke Urry, AWE, United Kingdom	24
	Optimisation of pre-print processing and thermal treatment of DIW printed silicone pads Gabrielle Davies, AWE, United Kingdom	25

	Utilizing small angle X-ray scattering to understand material failures and improve material lifetime Bethany Wilburn, Kansas City National Security Campus - Department of Energy (KCNSC), USA	26
19:30 – 21:30	Dinner followed by Social Hour	

Friday, January 12, 2024

07:30 – 08:45	Breakfast Buffet	
	Session 8	
08:45 – 09:30	**Invited** **Additive manufacturing of Oxide Dispersion Strengthened (ODS) alloys** Christian Leinenbach, Empa-Swiss Federal Laboratories for Materials Science and Technology, Switzerland	27
09:30 – 10:00	**From pre-ceramic polymer to high-toughness ceramic: An SLA 3D printing approach** Hamidreza Yazdani Sarvestani, National Research Council Canada, Canada	28
10:00 – 10:30	**Multipurpose ABS composites for fused filament fabrication** Shelbie Legett, Los Alamos National Laboratory, USA	29
10:30 – 11:00	Coffee Break	
	Session 9	
11:00 – 11:45	**Invited** **Field-assisted assembly and printing of functional composites** Matthew Begley, University of California, Santa Barbara, USA	30
11:45 – 12:15	**3D printed ceramics structures - Challenges and applications** Pedro Cortes, Youngstown State University, USA	31
12:15 – 12:45	**Enhanced thermal conductivity and fracture toughness in additive manufacturing through graphene-diamond composites** Shani Ligati Schleifer, Ben Gurion University of the Negev, Israel	32
12:45 – 13:15	**Effect of Co-content on microstructure and phases of laser additive manufactured Cox(CrNi)100-x alloy** Poonam Deshmukh, Indian Institute of Technology, Indore, India	33
13:15 – 13:45	**Tensile, fracture, and damage resistance characterization of 3D printed PLA with Morse code architectures** Deepesh Yadav, Indian Institute of Technology, Bombay, India	34
13:45 – 15:00	Lunch	
15:00 – 16:30	Networking	
16:30 – 17:00	Afternoon Coffee Break	
	Session 10	
17:00 – 17:45	**Invited** **Multi-material printing of thermoplastic and highly filled resin materials** Christopher Hansen, University of Massachusetts Lowell, USA	35
17:45 – 18:15	**Nanostructuring of an additively manufactured CoCrFeNi multi-principal element alloy using severe plastic deformation** Kamilla Mukhtarova, Eötvös Loránd University, Hungary	36

Friday, January 12, 2024 (continued)

18:15 – 18:45	**Adapting new materials for SLS: A case study** Daniel Schmidt, Luxembourg Institute of Science and Technology (LIST), Luxembourg	37
18:45 – 19:15	**Additive manufacturing of anisotropic graphene-based composites for thermal management applications** Oren Regev, Ben-Gurion University of the Negev, Israel	38
19:45 – 21:30	Banquet followed by Social Hour	

Saturday, January 13, 2024

07:30 – 09:00	Breakfast
09:00 – 10:00	Conference Summary
10:00 – 11:30	IM²AM III Conference Planning
12:00	Lunch and departures