

Program

Innovative Materials & Methods for Additive Manufacturing II (IM²AM)

January 8 – 13, 2024
Tomar, Portugal

Conference Chairs:

Daniel Schmidt, Luxembourg Institute of Science and Technology (LIST)

Nikhil Gupta, New York University

Eric Eastwood, KCNSC/Honeywell FM&T

Brett Compton, University of Tennessee, Knoxville

Gary Gladysz, Los Alamos National Laboratory



Engineering Conferences International

369 Lexington Avenue, 3rd Floor #389

New York, NY 10017, USA

www.engconfintl.org – info@engconfintl.org

Hotel Dos Templarios
Largo Candido do Reis, 1
Tomar, Portugal

T: +351-249-310-100

www.hoteldostemplarios.com

Engineering Conferences International (ECI) is a not-for-profit global engineering conferences program, originally established in 1962, that provides opportunities for the exploration of problems and issues of concern to engineers and scientists from many disciplines.

ECI BOARD MEMBERS

Eugene Schaefer, Chairman
Mike Betenbaugh
Joye Bramble
Barry C. Buckland
Nick Clesceri
Chetan Goudar
Peter Gray
Michael King

Chair of ECI Conferences Committee: Nick Clesceri

ECI Technical Liaison for this conference: Gary Gladysz

ECI Executive Director: Barbara K. Hickernell

ECI Associate Director: Kevin M. Korpics

ECI Conferences Manager: Tressa D'Ottavio

ECI Registrar: Kathy Chan

Steering Committee

John Bernardin, Los Alamos National Laboratory

Pedro Cortes, Youngstown State University

Eric MacDonald, University of Texas- El Paso

Prof Keng Hsu, Arizona State University

Mika Salmi, Aalto University

Christian Leinenbach, Empa

Rachel Collino, Los Alamos National Laboratory

Previous conferences in this series:

Innovative Materials For Additive Manufacturing (IMAM)

March 8 – 12, 2020

Santa Ana Pueblo, New Mexico

Conference Chairs:

Daniel Schmidt, Luxembourg Institute of Science and Technology

Nikhil Gupta, New York University

Chua Chee Kai, NTU, Singapore

Brett G. Compton, University of Tennessee

Monday, January 8, 2024

17:00 – 18:30	Open check-in
18:00 – 19:30	Welcome reception (with music)
19:30 – 21:30	Dinner

NOTES

- *Audio, still photo and video recording by any device (e.g., cameras, cell phones, laptops, watches) is strictly prohibited during the technical sessions, unless the author and ECI have granted prior permission.*
- *Speakers – Please have your presentation loaded onto the conference computer prior to the session start (preferably the day before).*
- *Speakers – Please leave at least 3 minutes for questions.*
- *Please do not smoke at any conference functions.*
- *Coffee breaks and social hours are in the Lobby Bar area*
- *Turn your cellular telephones to vibrate or off during technical sessions.*
- *After the conference, ECI will send an updated participant list to all participants. Please check your listing now and if it needs updating, you may correct it at any time by logging into your ECI account.*

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

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

10:00 – 10:30

Comparison of HDPE manufactured via compression molding versus selective laser sintering

Joseph Torres, Los Alamos National Laboratories, USA

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

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

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

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

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

17:45 – 18:15

Enabling digital manufacturing cyber-physical system for future manufacturing

Nikhil Gupta, New York University, USA

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
- 18:45 – 19:15 **Invited**
Additive manufacturing of elastomer, ceramic and metal multi-functional structures
Eric MacDonald, UTEP, USA
- 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, Université Claude Bernard Lyon 1, France

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

10:00 – 10:30

Understanding AM feedstock recyclability using small angle X-ray scattering

Samantha Talley, Honeywell FM&T, USA

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

11:45 – 12:30

Invited

Material extrusion additive manufacturing of thermoset-based short fiber composites

Brett Compton, University of Tennessee Knoxville, USA

12:30 – 13:30

Lunch Buffet

13:55

Meet at hotel entrance for excursion

14:00 – 18:00

Excursion – Guided walking Tour of Convento 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

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

10:00 – 10:30

Lunar regolith as a feedstock for selective laser melting

Joris Kadok, Luxembourg Institute of Science and Technology, Luxembourg

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

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

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

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

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

Optimisation of pre-print processing and thermal treatment of DIW printed silicone pads

Gabrielle Davies, AWE, United Kingdom

Thursday, January 11, 2024 (continued)

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

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

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

10:00 – 10:30

Multipurpose ABS composites for fused filament fabrication

Shelbie Legett, Los Alamos National Laboratory, USA

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

11:45 – 12:15

3D printed ceramics structures - Challenges and applications

Pedro Cortes, Youngstown State University, USA

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

12:45 – 13:15

Effect of Co-content on microstructure and phases of laser additive manufactured Co_x(CrNi)_{100-x} alloy

Poonam Deshmukh, Indian Institute of Technology, Indore, India

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

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

17:45 – 18:15

Nanostructuring of an additively manufactured CoCrFeNi multi-principal element alloy using severe plastic deformation

Kamilla Mukhtarova, Eötvös Loránd University, Hungary

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 |
| 18:45 – 19:15 | Additive manufacturing of anisotropic graphene-based composites for thermal management applications
Oren Regev, Ben-Gurion University of the Negev, Israel |
| 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 | IM ² AM III Conference Planning |
| 12:00 | Lunch and departures |