

METAL AMMS

International Metal Additive
Manufacturing Symposium

PROGRAM

20 & 21 March 2024

Cetim Senlis
France



metal-ams.com

#MetalAMS



CETIM





International Metal Additive Manufacturing Symposium

About

Metal AMS is the first french scientific symposium 100% dedicated to the Metal Additive Manufacturing technologies. Organized by the french Metal AM community in collaboration with major R&D players from around the world, it addresses every step of the AM value chain. The symposium presents on european areas of expertise including: design, materials, simulation, direct and sintered-base processes, monitoring and control/qualification challenges.

For 2024, we are pleased to welcome southern european guest countries: Italy, Spain and Portugal and exceptional presentations from Australia and Singapore.



Organizing Committee

S. Duarte	<i>Cetim</i>
A. Preux	<i>Cetim</i>
A. Rousseau	<i>Cetim</i>
B. Verquin	<i>Cetim</i>

International Scientific Committee

F. Auricchio	<i>University of Pavia – ITALY</i>
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E. Charkaluk	<i>GIS HEAD, CNRS, Ecole polytechnique – FRANCE</i>
E. Hug	<i>GDR ALMA, CNRS, UNICAEN – FRANCE</i>
N. Saintier	<i>Addimalliance, GIS HEAD CNRS, Arts et Métiers Institute of Technology – FRANCE</i>
B. Verquin	<i>Cetim – FRANCE</i>

Exhibitors

AddUp	French national Metal AM cohesion
Cetim	Hexagon
Civan Lasers	HP 3D Printing
Cognitive Design Systems	Mecallians
EOS France	MMB VOLUM-e
EPMA	Politechno
ERM Fab&Test	UNM

Sponsors



METAL AM S

International Metal Additive
Manufacturing Symposium

Wednesday, March 20th



A mechanical ex
by your side

- Design tools
- Dimensioning - simulation
- Software
- Structural organisation
- Process innovation
- Assembly
- Polymer and composite
- Resin materials
- Surface treatment



8.30 am - 9.00 am

Opening Statement

Philippe Lubineau - *Cetim Chief Research Officer*

French national Metal AM cohesion

Jean-Jacques Blandin - *Initiative 3D, Grenoble INP – Univ. Grenoble Alpes, CNRS*

Eric Charkaluk - *GIS HEAD, CNRS, Ecole Polytechnique*

Nicolas Saintier - *Addimalliance, GIS HEAD CNRS, Arts et Métiers Institute of Technology*

9.00 am - 10.30 am

Room 6

S01-1 Guests

Chairmen: **Francisca Garcia Caballero / Oriane Baulain**

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Microstructure control during wire and arc additive manufacturing

João Pedro Oliveira

CENIMAT, FCT/UNL - Caparica, Portugal

75

Ultrastrong nanotwinned titanium alloys through additive manufacturing

Aijun Huang¹, Yuman Zhu¹, Kun Zhang¹, Hamish Fraser², Peter Hodgson³

¹Monash Centre for Additive Manufacturing, Monash University - Melbourne, Australia. ²Department of Materials Science and Engineering, Ohio State University - Columbus, USA. ³Institute of Frontier Materials, Deakin University - Melbourne, Australia

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Process modelling and uncertainty quantification in laser-based powder bed fusion of metals

Massimo Carraturo

University of Pavia - Pavia, Italy

10.30 am - 11.15 am



Coffee break

Wednesday, March 20th

11.15 am - 12.35 pm

Room 6

S02-1 Process monitoring and NDT

Chairmen: Christophe Grosjean / Vincent Bonnefoy

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Process monitoring and simplified FE modeling of LPBF melt-pools. Influence on the microstructures and mechanical properties of small Inconel 625 struts

[Patrice Peyre](#)¹, Julien Rodrigues Da Silva¹, Anne-Laure Helbert², Zehoua Hamouche¹, Corinne Dupuy¹, Thierry Baudin²

¹PIMM, UMR 806 CNRS-Cnam-Arts et Métiers - Paris, France. ²ICMMO, UMR 8182 CNRS, Université Paris Saclay - Orsay, France

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Powder bed absorptivity in LPBF additive manufacturing: exploring the interplay of powder characteristics, recoating parameters and substrate effects

[Robin Kromer](#), Thibaut Robert, Guillaume Nordet, Corinne Arvieu, Eric Lacoste

I2M, UMR 5295, Univ. de Bordeaux, Arts et Métiers, CNRS - Talence, France

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Sinogram-based data augmentation to automate the non-destructive control of mechanical parts

[Nina Lassalle-Astis](#)

Cetim Sud-Ouest - Pau, France. LaBRI - Talence, France

65

Review on in-situ thermal monitoring during direct energy deposition: methods, principles and applications

[Marcia Meireles](#)¹, Morgan Dal², Jérôme Favergeon³, Cristian Alvarez¹

¹ArcelorMittal - Montataire, France. ²Laboratoire PIMM, Arts et Métiers Institute of Technology, CNRS, Cnam, HESAM Université - Paris, France. ³University of Technology of Compiègne - Compiègne, France

12.35 pm - 2.00 pm



Lunch



Conference group photo (1.45 pm)

Room 7

S03-1 Materials & characterization

Chairmen: Eric Charkaluk / Giorgio De Pasquale

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Influence of defect shape and position on the high cycle fatigue behaviour of additively manufactured Ti-6Al-4V alloy

Matthieu Bonneric¹, Nicolas Saintier¹, Driss El-Khoukhi², Jérémie Bega¹

¹Arts et Métiers Institute of Technology - Talence, France.

²Cetim - Senlis, France

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Fatigue life assessment of WAAM ER70S-6 steel

Ivanna Pivdiablyk¹, Ninian Ho², Sébastien Brzuchacz³, Robert Shandro¹, John H. L. Pang²

¹Cetim-Matcor Technology & Service Pte Ltd - Singapore, Singapore. ²Singapore Centre for 3D Printing, School of Mechanical and Aerospace Engineering, Nanyang Technological University - Singapore, Singapore.

³Cetim - Senlis, France

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Numerical investigation of the influence of defects on the multiaxial fatigue strength of additively manufactured alloys

Sai Sreenivas Penkulinti¹, Matthieu Bonneric¹, Nicolas Saintier¹, Benoit Verquin², Fabien Lefebvre³, Thierry Palin-Luc¹, Pascal Ghys⁴

¹I2M Bordeaux, ENSAM - Bordeaux, France.

²Cetim - Saint-Étienne, France. ³Cetim - Senlis, France.

⁴Alstom - Saint-Ouen, France

28

Numerical study of first cyclic loadings on additively manufactured 316L stainless steel using a compartmentalized finite element model

Axel Monnier, Franck Toussaint, Christophe Déprés

Univ. Savoie Mont-Blanc, SYMME - Annecy, France

Room 8

S04-1 Digital process chain & simulation

Chairmen: Xavier Lorang / Didier Boisselier

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Numerical simulation of WLAM process for metal forming tool repair

Yabo Jia¹, Hans Boungomba¹, Tarik Sadat¹, Philippe Moreau¹, André Dubois¹, Jean-Dominique Guerin¹, Mirentxu Dubar¹, Laurent Dubar¹, Jean-Michel Bergheau²

¹UPHF-LAMIH - France. ²ECL-ENISE LTDS - France

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Application of thermomechanical model for ded process simulation

Vaibhav Nain, Didier Boisselier

IREPA LASER, Illkirch - Graffenstaden, France

67

Numerical model for the laser metal deposition additive manufacturing process: multi-scale approach and experimental validation

Ghassen Dali

UTC - Compiègne, France

33

Speeding up mesoscale conduction-based simulations of additive manufacturing processes: focus on temporal discretization and spatial adaptivity

Simon Essongue

Université de Bordeaux, Talence, France. Institut de mécanique et d'ingénierie I2M - Talence, France

Wednesday, March 20th

2.00 pm - 4.00 pm

Room 6

S01-2 Guests

Chairmen: Aishwarya / Jean-Jacques Blandin

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Strategies for qualification of parts printed by metal additive manufacturing with review of fatigue testing requirements

John H. L. Pang

Nanyang Technological University (NTU) - Singapore, Singapore

74

Effects of heat treatment on the microstructure and mechanical performance of an additively manufactured AISi7Mg alloy

Gwenaëlle Proust, James Warner, Cecilie Funch, Simon Ringer

The University of Sydney - Sydney, Australia

1

Revealing the complexity of 3D printed microstructures of steels

Ana Santana¹, Adriana Eres-Castellanos², Rosalía Rementería³, Jonathan Poplawsky⁴, Carlos Capdevila¹, Francisca Caballero¹

¹National Centre for Metallurgical Research (CENIM-CSIC) - Madrid, Spain. ²Colorado School of Mines - Golden, USA. ³ArcelorMittal Global R&D SLab Steel Labs - Avilés, Spain. ⁴Oak Ridge National Lab - Oak Ridge, USA

70

Designing fatigue-resistant additively-manufactured components: from understanding damage mechanisms in common metallic alloys to establishing a reliable fatigue assessment methodology

Luca Patriarca

Politecnico di Milano - Milano, Italy

4.00 pm - 4.40 pm



Coffee break

4.40 pm - 6.40 pm

Room 6

S05-1 Process / DED

Chairmen: David Plélan / John H. L. Pang

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XXL metal additive manufacturing: technological challenges and opportunities

Didier Boisselier, Nathan Mayer, Jérôme Wursthorn

IREPA LASER - Illkirch, France

57

Assessment of wire arc additive manufacturing (WAAM) techniques through metallurgical and mechanical characterization in mild carbon steel

Aishwarya¹, Wengang Zhai², Yibo Guo², Robert Shandro¹, Zhou Wei², Benoit Verquin³

¹Cetim-Matcor - Singapore, Singapore. ²Singapore Centre for 3D Printing, Nanyang Technological University - Singapore, Singapore. ³Cetim - St-Etienne, France

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Maturity, characterization and decision support system: a multidisciplinary approach to select WAAM-CMT process parameters

Julie Lartigau¹, Laurent Terrenoir¹, Laura Laguna Salvadó¹, Christophe Merlo¹, Arun Arjunan²

¹Univ. Bordeaux, ESTIA-Institute of Technology - Bidart, France. ²Additive Manufacturing of Functional Materials (AMFM) Research Group, Centre for Engineering Innovation and Research, University of Wolverhampton - Telford, United Kingdom

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Digital process chains for powder and wire-based 3D DED processes

Rainer Beccard

LUNOVU GmbH - Aachen, Germany

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Optimization of WLAM process parameters for metal forming tool repair

Hans Bounghomba, Philippe Moreau, Yabo Jia, Tarik Sadat, Mirentxu Dubar, J-D Guérin, André Dubois, Laurent Dubar

Université Polytechnique des Hauts-de-France LAMIH UMR CNRS 8201 Campus Mont Houy - Valenciennes, France

63

Residual stress in wire arc additive manufacturing: modeling – instrumentation – traceability

Elia Zgheib^{1,2}, Joël Alexis², Yannick Balcaen², Morgane Mokhtari², Philippe Verlet¹

¹Société VLM Robotics - Lacanau de Mios, France. ²Laboratoire Génie de Production, INP-ENIT - Tarbes, France

Wednesday, March 20th

4.40 pm - 6.40 pm

Room 7

S06-1 Process / AM sinter-based

Chairmen: Christophe Reynaud / Iñgio Agote

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Mastering binder-powder interaction using Metal Binder Jetting process parameters for improved green parts quality

Thomas Cheny¹, Christophe Colin¹, Benoit Verquin²

¹MINES Paris - Paris, France. ²Cetim - Saint-Etienne, France

34

Effect of the debinding/sintering strategy on the densification of aluminium alloys processed through material extrusion (MEX) additive manufacturing

Marion Coffigniez¹, Gurminder Singh², Swathi Manchili³, Didier Bouvard¹, Jean-Michel Missiaen¹

¹Université Grenoble Alpes - Saint-Martin d'Hères, France. ²IIT Bombay - Bombay, India. ³Chalmers University - Göteborg, Sweden

37

Experimental study on the mechanical post-treatments applied on 17-4PH stainless steel additively manufactured parts

Mahmoud Naim^{1,2}, Mahdi Chemkhi^{1,2}, Julien Boussel³, Akram Alhussein¹

¹Université de technologie de Troyes (UTT) - Troyes, France. ²EPF école d'ingénieur.e.s - Troyes, France. ³Rösler - Saint-Clément, France

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Development of an economical sintering strategy for 316L stainless steel parts printed by material extrusion additive manufacturing (MEAM)

Sophie Badin¹, Denis Najjar², Vincent Magnier³, Jean-François Witz², Delphine Auzène¹

¹CRITT - Matériaux Innovation - Charleville - Mézières, France. ²Centrale Lille - Lille, France. ³Polytech Lille - Lille, France

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Composite Ti-6Al-4V/polymers pellets additive manufacturing: improvement of the printing parameters to obtain dense and defectless part

Julien Bossu¹, Laurent Spitaels¹, Edouard Rivière-Lorphèvre¹, François Ducobu¹, Fabienne Delaunois¹, Cathy Delmotte², Grégory Martic², Enrique Juste², Fabrice Petit²

¹University of Mons - Mons, Belgium. ²Belgian Ceramics Research Center - Mons, Belgium

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Influence of the layer thickness and contours on mechanical properties of 17-4PH obtained by metal extrusion additive manufacturing

Joseph Maraé Djouda^{1,2}, Mohammed Ali Bouaziz², François Hild²

¹EPF Ecole d'ingénieurs - Cachan, France. ²Laboratoire de Mécanique de Paris-Saclay - Gif-sur-Yvette, France.

³CEA Paris - Saclay, France

6.40 pm

End of Conferences

7.00 pm - 10.30 pm



Gala evening in Château de Pontarmé

Room 8

S04-2 Digital process chain & simulation

Chairmen: Patrice Peyre / Socona Traoré

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Optimizing velocity and accuracy in robotic 3D printing: impact of point density and interpolation methods

Sami Fadil, Henri Bernard
ADAXIS - Bayonne, France

55

Material data analytics in Nikon SLM Solutions

Deniz Sera Ertay
Nikon SLM Solutions - Lübeck, Germany

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Novel multi-scale additive manufacturing PBF process simulation approach for location-specific defect predictions within full-scale geometries

Jeff Robertson¹, Sergei Burlatsky², David Furrer³, Simon Poly⁴

¹Hexagon Manufacturing Intelligence, Inc, - Detroit, USA. ²Raytheon Technologies Research Center - East Hartford, USA.

³Pratt & Whitney Division of Raytheon Technologies Corporation - East Hartford, USA. ⁴Hexagon Manufacturing Intelligence - Cobham, United Kingdom

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QuadWire: an extended 1D model for efficient mechanical simulations of bead-based additive manufacturing processes – optimization use case

Laurane Preumont¹, Daniel Weisz-Patrault¹, Grégoire Allaire², Pierre Margerit³

¹LMS, CNRS, École Polytechnique, Institut Polytechnique de Paris - Palaiseau, France. ²CMAP, CNRS, École Polytechnique, Institut Polytechnique de Paris - Palaiseau, France. ³PIMM, CNRS, Arts et Métiers Institute of Technology, Cnam, HESAM University - Paris, France

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A thermal-metallurgical-mechanical analysis and hot cracking characterization of grain structure generation via laser powder bed fusion

Zixuan Li¹, Michel Bellet¹, Manas Upadhyay², Charles-André Gandin¹, Yancheng Zhang¹

¹Mine Paris - Sophia Antipolis, France. ²Ecole Polytechnique - Palaiseau, France

60

Numerical study of vapor generation on LPBF process - effect on process stability

Morgan Dal¹, Julien Daligault¹, Patrice Peyre¹, Jérémie Girardot²

¹Laboratoire Procédés et Ingénierie en Mécanique et Matériaux (PIMM) – UMR 8006, Arts et Métiers Institute of Technology, CNRS, cnam, PIMM, HESAM Université - Paris, France. ²Arts et Métiers Institute of Technology, University of Bordeaux, CNRS, Bordeaux INP, INRAE, I2M - Bordeaux, France





International Metal Additive
Manufacturing Symposium

Thursday, March 21st

8.30 am - 10.00 am

Room 6

S01-3 Guests

Chairmen: Carmen Cepeda-Jimenez / Ferdinando Auricchio

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Additive manufacturing of commercial Fe-based metallic glasses for soft magnetic applications

Maria Teresa Perez-Prado¹, Marcos Rodríguez¹, Saumya Sadanand¹, Amirhossein Ghavimi², Ralf Busch², Isabella Gallino², Paola Tiberto³, Enzo Ferrara³, Gabrielle Barrera³

¹Imdea Materials Institute - Madrid, Spain. ²Saarland University - Saarbrücken, Germany. ³INRIM - Torino, Italy

42

Characterization of stainless steel produced by Binder Jetting and qualification process for applications in Oil & Gas industries

Tommaso Tirelli, Gabriele Impellizzeri

Aidro - Desktop Metal Company - Taino (Varese), Italy

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Additive manufacturing process optimization for innovative aluminium-carbon fibre reinforced polymer co-cured joints

Giorgio De Pasquale, Antonio Cutolo

Politecnico di Torino - Torino, Italy

10.00 am - 10.45 am



Coffee break



10.45 am - 12.25 am

Room 6

S07-1 Materials & process

Chairmen: Arnold Mauduit / Jean-Christophe Augé

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Tensile properties of AlSi7Mg thin specimens manufactured by laser-powder bed fusion

[Charles Bianchetti](#)¹, Hugo Le Mestrealan¹, Louise Toualbi¹, Gilles Gaillard², Alexandre Boulzaguet³

¹ONERA - Châtillon, France. ²CEA - Grenoble, France. ³Sogclair Aerospace - Toulouse, France

21

Identifying laser beam melting (LBM) process window for thin walls by enriching design of experiments with analytical physical models

[Clément Ernould](#)¹, Cassiopée Galy^{1,2}, Ludovic Barrière¹

¹IRT Saint Exupéry - Toulouse, France. ²ICAM - Toulouse, France

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Understanding ageing mechanism of Al-based metallic powders: probing grain/grain interactions with atomic force microscopy

[Yassine Lakroune](#), Vincent Barnier, Laetitia Vieille, Loïc Favergeon, Maelig Ollivier

Mines Saint-Etienne, CNRS, UMR 5307 LGF, Centre SPIN - Saint-Etienne, France

29

High performance aluminium components produced by laser powder bed fusion: fatigue performance of Ahead[®] CP1

[Jean-Christophe Ehrström](#), Erembert Nizery, Dominique Saletti, Ravi Shahani

Constellium C-TEC - Voreppe, France

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Comparative study of gaussian, top-hat and donut laser distribution for powder bed fusion additive manufacturing of AlSi10Mg alloy

[Pierre Hébrard](#)¹, Bassem Barkia¹, Emilie Le Guen², Frédéric Coste¹, Patrice Peyre¹

¹PIMM Lab - Arts et Métiers - Paris, France. ²I2M - Bordeaux, France

10.45 am - 12.25 am

Room 7

S03-2 Materials & characterization

Chairmen: Matthieu Bonneric / Solange Vivès

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Printability of titanium alloy Ti64 by additive friction stir deposition: study of process-microstructure-macroscopic properties

Ismail Zabeeullah Kolimi¹, Julie Marteau¹, Salima Bouvier¹, Pierre Auguste², Fabien Lefebvre², Eric Nivet²

¹Université de technologie de Compiègne, CNRS, Roberval (Mechanics Energy and Electricity) - Compiègne, France.

²Cetim - Senlis, France

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Optimization of heat treatments for a LP – DED Maraging 18Ni300 steel to improve mechanical properties

Hugo Huttenschmitt¹, Jonathan Hugues¹, Florian Galliano¹, Dominique Poquillon²

¹MBDA - Bourges, France. ²CIRIMAT - Toulouse, France

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Predicting powder spreadability for Metal AM

Aurélien Neveu, Filip Francqui
GranuTools - Awans, Belgium

54

Latest advances in additive manufacturing characterization at European Synchrotron Radiation Facility (ESRF)

Andrea Francesco Ciuffini
ESRF - Grenoble, France

69

Contribution of TEM to the study of metals processed by additive manufacturing

Arthur Despres, Léo Monier, Maxence Buttard, Muriel Véron, Edgar Rauch, Guilhem Martin
Grenoble INP, Laboratoire SIMaP - Grenoble, France

Room 8

S08-1 Post processing / surface post-treatment

Chairmen: Guillaume Badinier/ Ivanna Pivdiablyk

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A new hybrid electrochemical-mechanical process (PEMEC) for polishing additively manufactured parts

Joel Rech¹, Daniel Krzak¹, Ferdinando Salvatore¹, Antoine Gidon²

¹ECL-ENISE - Saint-Etienne, France. ²Cetim - Saint-Etienne, France

4

Super finishing MMP Technology: surface engineering to make your parts perform even better

Frédéric Bajard

Binc Industries - Saint-Priest, France

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Strength/ductility trade-off of laser powder bed fusion Ti-6Al-4V: synergetic effect of alpha-case formation and microstructure evolution upon heat treatments

Quentin Gaillard¹, Xavier Boulnat², Sophie Cazottes², Sylvain Dancette², Christophe Desrayaud¹

¹Mines Saint-Étienne, LGF, UMR CNRS 5307 - Saint-Étienne, France. ²INSA Lyon, MATEIS, UMR CNRS 5510 - Villeurbanne, France

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Surface finishing technologies adapted for 3D printing mechanical components. Multi process post processing treatment of high value additive manufacturing components

Martin JAY

POLITECHNO - Bonson, France

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Support-free DMLS® printing: myth or reality?

André Surel

EOS France - Lyon, France

12.25 pm - 1.50 pm



1.50 pm - 3.20 pm

Room 6

S01-4 Guests

Chairmen: María Teresa Pérez-Prado / Gwenaelle Proust

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Laser-powder bed fusion of high strength AlFeCrX aluminium alloys

Carmen Cepeda-Jimenez¹, Fernando Carreño¹, Alberto Orozco-Caballero², Farid Bahari-Sambran^{1,2}

¹National Center for Metallurgical Research (CENIM, CSIC) - Madrid, Spain. ²Department of Mechanical Engineering, Chemistry and Industrial Design, Polytechnic University of Madrid - Madrid, Spain

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Binder Jetting process sustainability: powder management

Iñigo Agote, Asier Lores, Naiara Azurmendi

TECNALIA - San Sebastián, Spain

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Binder Jetting additive manufacturing for jewellery and fashion items production

Andrea Friso, Mattia Lago

Legor Group S.p.A. - Vicenza, Italy

3.20 pm - 4.05 pm



Coffee break

4.05 pm - 5.45 pm

Room 6

S09-1 Applications and sustainability /
process qualification

Chairmen: Christophe Reynaud / Maxime Fayolle

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**Additive manufacturing of nuclear
fuel assembly metallic components
- overview of machine/process
qualification strategy**

Guillaume Badinier¹, Didier Bardel¹, Claire Morelière¹,
Kevin Sohn²

¹Framatome - Lyon, France. ²Framatome - Karlstein,
Germany

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**Additive manufacturing of austenitic
stainless steel non-planar and small
thickness product by WAAM process**

Théo Racine, Guillaume Rückert
Naval Group - Indret, France

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**Wire and arc additive manufacturing of
large safety-critical components in the
nuclear industry: influence of deposition
rate in the submerged arc process**

Antoine Kieffer^{1,2}, Flore Villaret¹, Frédéric Delabrouille¹,
Michel Perez², Xavier Boulnat², Alexandre Brosse³,
Corentin Chavignon⁴, Michel Jany⁵, Loic Verwaerde⁵

¹EDF R&D, Les Renardières - Moret sur Loing, France. ²Univ.
Lyon, INSA Lyon, UCBL, MATEIS, UMR5510 - Villeurbanne,
France. ³Framatome - Lyon, France. ⁴Framatome Centre
Technique - Saint-Marcel, France. ⁵Lincoln Electrics - Le
Grand-Quevilly, France

18

**Laser powder bed fusion process
development for copper-aluminium
alloys: towards spare parts for the
railway infrastructures**

Marie Fischer¹, Paul Didier¹, Pascal De Guio²

¹Pint - Metz, France. ²SNCF reseau - Paris, France

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**From R&D to mass production with the
HP Metal Jet S100**

Rocío Muñoz Moreno

Room 7

S10-1 Advanced materials

Chairmen: Fabien Lefebvre / Massimo Carraturo

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**Microstructure and mechanical
properties of as-built and heat-treated
laser powder bed fusion Al^{0.3}CoCrFeNi
high entropy alloy**

Florian Peyrouzet¹, Thierry Baffie¹, Stéphane Gorsse²,
Christelle Navone¹, Julie Maisonneuve¹

¹CEA-LITEN, Univ. Grenoble Alpes - Grenoble, France.

²Univ. Bordeaux, CNRS, Bordeaux INP, ICMCB,
UMR 5026 - Pessac, France

66

**New generation of high-performance
metal powders designed for AM**

Solange Vives, Adeline Riou
Aubert & Duval - Paris, France

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**Heat exchangers using TPMS
architectures manufactured by LPBF**

Vincent Bonnefoy, Alizée Thomas, Gilles Gaillard, Franck
Pra, Pierre Coste, Hervé Gleyzes

CEA LITEN, Université Grenoble Alpes - Grenoble, France

27

**Experimental and numerical evaluation
of mechanical properties of hybrid
lattice structures manufactured by
selective laser melting**

Zhaozhen Huang, Caroline Antion, Franck Toussaint
Univ. Savoie Mont Blanc SYMME - Annecy, France

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**Effect of AM processes on the
compressive behaviour of 316L
architected materials**

Camille Buros

Univ. Bordeaux, ESTIA-Institute of technology - Bidart,
France

5.45 pm - 6.00 pm

Closing ceremony

Room 8

S07-2 Materials & process

Chairmen: Marc Thomas / Socona Traoré

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Study of oxide nanoprecipitate formation mechanisms in 316L stainless steel produced by rapid solidification processes: gas atomization and Laser Powder Bed Fusion (L-PBF)/ effect on impact toughness

Salima Boualouache, Cécile Langlane, Yoann Danlos, Christophe Verdy
University of technology Belfort-Montbéliard - Sevenans, France

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Portevin-Le Chatelier effects in 316L stainless steels processed by LPBF for nuclear applications

Sylvain Dépinoy, Ivan Lambert, Veronica Arias, Kaiwei Wu, Jean-Christophe Teissedre, Cécilie Duhamel
Mines Paris Université PSL, MAT - Centre des Matériaux, CNRS UMR 7633 - Evry, France

51

Study of strain heterogeneity within the microstructure of an additively manufactured 316L subjected to tensile and fatigue stresses using neutron diffraction and 3DXRD

Lorène Héraud¹, Hugo Roirand¹, Younes El Hachi², Nicolas Saintier¹, Anis Hor³, Benoit Malard⁴
¹I2M, Arts et Métiers Institute of Technology - Talence, France. ²LEM3, Arts et Métiers Institute of Technology - Metz, France. ³Institut Clément Ader - Toulouse, France. ⁴CIRIMAT - Toulouse, France

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Understanding the macroscopic properties of the PBF-LB 17-4 PH steel by a set of microstructural investigations

Renata de Oliveira Melo¹, Jérémie Bouquerel¹, Gang Ji¹, Eric Nivet², Christophe Grosjean³
¹CNRS, INRAE, Centrale Lille, UMR 8207, UMET Unité Matériaux et Transformations, Université de Lille - Lille, France. ²Cetim - Saint-Etienne, France. ³Cetim - Saint-Etienne, France

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Durability of additively manufactured austenitic stainless steels under fatigue-hydrogen coupling

Rahul Subramanian Girija¹, Gilbert Henaff², Mohamed El May¹, Isabelle Aubert¹, Nicolas Saintier¹, Abdelali Oudriss³, Xavier Feaugas³
¹Institut de Mécanique et d'Ingénierie (I2M) UMR 5295 - Bordeaux, France. ²Institut Pprime UPR CNRS 3346, Futuroscope - Chasseneuil, France. ³LaSIE UMR CNRS 7356 - La Rochelle, France

Practical Information



Pictures of the Congress

Conference group photo

March 20th at 1.45 pm
in front of the Cetim



Discover all the photos
on the photo gallery
metal-ams.com/gallery24

Business Room

A business room
is available in free
access if you need
a quiet space to
work. You can find
it in front of the
conference room 6.

Speaker Desk

If you are a speaker
and have a question or
if you need to provide
us with your updated
presentation (on USB
key), reach the speaker
desk. It is located next
to the conference room 6.



Shuttle Schedules

Wednesday, March 20th

Morning shuttle from the Senlis hotels to Cetim

Details:

- 7.55 am Departure from Escapade Best Western Hotel
- 8.05 am Departure from Ibis and Campanile Hotels
- 8.15 am Final stop at Cetim
- 6.50 pm Shuttle from Cetim to Chateau de Pontarmé
- 10.45 pm Shuttle from gala dinner to the Senlis hotels

Thursday, March 21st

Morning shuttle from the Senlis hotels to Cetim

Details:

- 7.55 am Departure from Escapade Best Western Hotel
- 8.05 am Departure from Ibis and Campanile Hotels
- 8.15 am Final stop at Cetim
- 6.10 pm Shuttle from Cetim to Roissy Charles de Gaulle airport (terminal 2E)

*Please show up 5 minutes before the announced time.
The bus may be a few minutes late depending on the traffic.*



Gala Evening in Château de Pontarmé March 20th

- 7.00 pm - 10.30 pm Social Event
Gala evening
in Pontarmé
- 10.45 pm Departure to the hotels

*A cocktail dinner
in a 13th century castle*



Book your Taxi

A hostess is at your disposal
to make reservations
Please submit your
request before 1.30 pm
(Thursday 21st)



Free and Unlimited WiFi Access

Connect to the
"Cetim-Public"
network

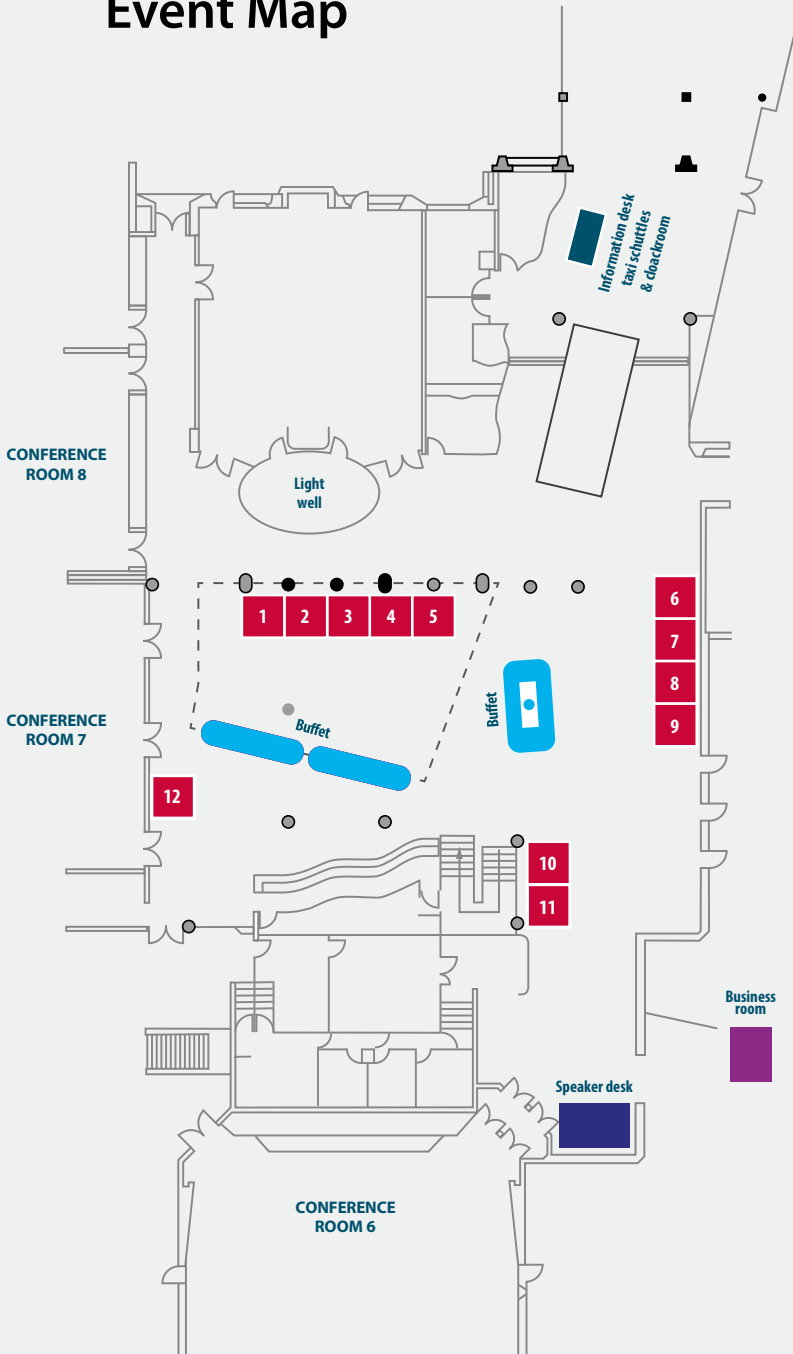


Satisfaction Survey



Give us your
feedback
in just
1 minute.
Thank you!

Event Map



EXHIBITORS:

- 1** MMB VOLUM-e
- 2** Civan Lasers
- 3** Politechno
- 4** Hexagon
- 5** AddUp
- 6** EOS France
- 7** ERM Fab&Test
- 8** Cognitive Design Systems
- 9** HP 3D Printing
- 10** French national Metal AM cohesion
- 11** Mecallians (Cetim et UNM)
- 12** EPMA

METAL AMS

International Metal Additive Manufacturing Symposium

Location

Cetim - 52 avenue Félix-Louat
60300 Senlis - France

Access

25 km drive from the Paris
Charles-de-Gaulle airport,
direct access through the A1 highway, exit 8

Contact

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Information & Registration

metal-ams.com



Download
the abstract book

Senlis



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