SAE INTERNATIONAL®

ADDITIVE MANUFACTURING IN MOTION

EVENT GUIDE

March 13–14, 2018 | Cleveland, OH | sae.org/events/ams

THE PREMIER ADDITIVE MANUFACTURING EVENT FOR THE MOBILITY INDUSTRY.

ADDITIVE MANUFACTURING IN MOTION SYMPOSIUM

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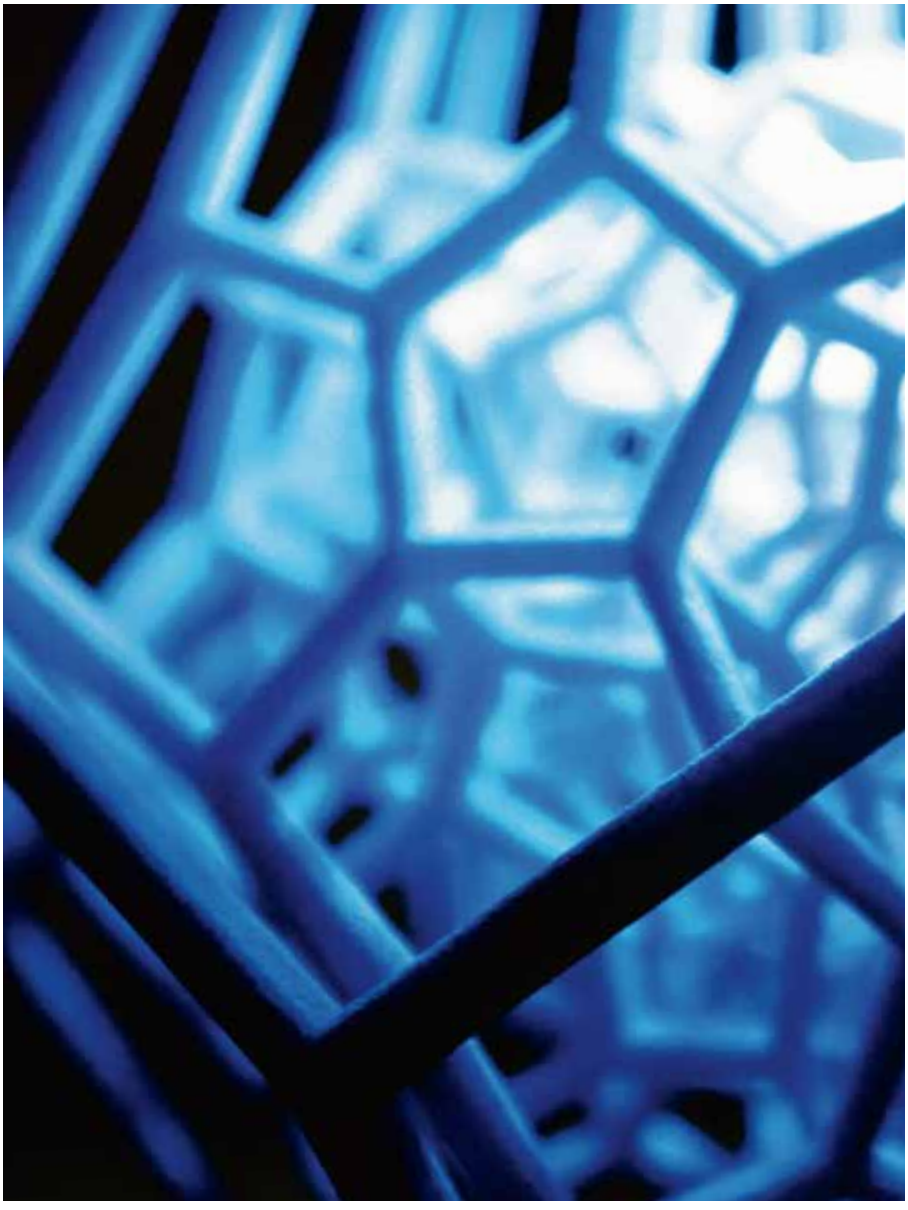

EMERGENCY PROCEDURES DURING THE ADDITIVE MANUFACTURING IN MOTION SYMPOSIUM

During the event attendees are to follow the established emergency guidelines of the facility where the emergency occurs. **Based on the location of the incident, report emergencies to the nearest venue representative and/or security personnel if available, or report to the SAE registration area.**

Should a catastrophic event occur, attendees should follow the safety and security instructions issued by the facility at the time of the event. This includes listening for instructions provided through the public address system and following posted evacuation routes if required.

In the event of an emergency or a major disruption to the schedule of events at the event, attendees and exhibitors may call this number to receive further information about the resumption of this event. Updates will also be provided via the SAE website at www.sae.org.

SAE EMERGENCY HOTLINE

+1.724.772.4044
+1.800.581.9295

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Attendees are permitted to bring camera equipment onto the show floor. Exhibitors retain the right to restrict photography of their products or displays and such decisions are within the discretion of the exhibitor and are not controlled by SAE International.

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EVENT INFORMATION

Registration
Hope A Foyer

Monday, March 12
3:00 p.m.–6:00 p.m.

Tuesday, March 13
7:00 a.m.–4:00 p.m.

Wednesday, March 14
7:00 a.m.–1:00 p.m.

Exhibit Hours
Hope D

Tuesday, March 13
9:30 a.m.–7:15 p.m.

Wednesday, March 14
9:30 a.m.–3:45 p.m.

Networking Lunches
Hope D

Tuesday, March 13
12:00 p.m.–1:30 p.m.

Wednesday, March 14
12:00 p.m.–1:30 p.m.

Networking Reception
Hope D

Tuesday, March 13
6:00 p.m.–7:15 p.m

Wi-Fi Informaton
SSID: Hilton_Meeting
Password: AMS18

EVENT INFORMATION

Keynote Speaker:

Tuesday, March 13
8:45 a.m.–9:30 a.m.
Richard Grylls, SLM Solutions

Richard Grylls has worked in the metal additive manufacturing industry for almost 20 years and is currently the Technical Director for SLM Solutions North America. Grylls started in metal 3D printing as a post-doctoral researcher at The Ohio State University, where he became the first user of the newly commercialized Optomec LENS metal 3D printer. After working at GE Aviation, Grylls joined Optomec and served in a variety of positions including applications manager and general manager for the LENS metal 3D printing technology. He joined SLM Solutions in 2015, where his responsibilities include applications development, training, troubleshooting, and technical leadership for the North American market. Grylls holds a bachelor's degree in materials science from the University of Oxford, a Ph.D. in metallurgy from the University of Birmingham, is co-inventor on 22 U.S. and three European patents and has co-authored 23 technical papers.

Keynote Speaker:

Wednesday, March 14
8:45 a.m.–9:30 a.m.
Paula Hay, UTC Aerospace Systems

Paula Hay is Executive Director for Additive Design and Manufacturing for UTC Aerospace Systems. Paula is responsible for advancing the use of additive across UTAS.

During her 20 years with United Technologies Aerospace Systems, Paula has held positions of increasing responsibility in engineering, program management, business development, and operations. Before joining UTAS, Paula was a Captain in the Air Force working on launch vehicle programs. Paula holds a Bachelor's degree in Aeronautical and Astronautical Engineering from Purdue University as well as Master's degrees in Mechanical Engineering and Technology Management, both from Rennselaer Polytechnic Institute.

Keynote Speaker:

Tuesday, March 13
1:30 p.m.–2:15 p.m.
Markus Heinimann, Arconic

Dr. Markus Heinimann is the Vice President, Engineered Product and Process Technology for Arconic. In this role, Markus is leading the development and execution of the technology strategy for Arconic's Engineered Structures (AES) business unit. He is responsible for advancing new and existing material, process, product and manufacturing technologies for metallic materials, machining and structural assemblies to meet the needs of the aerospace, defense, energy and other high tech segments. Dr. Heinimann has more than 25 years of aerospace experience in engineering and technology development. Previously he was the Technology Manager for Aerospace at the Alcoa Technical Center where he led the technology development for aerospace structures, materials and advanced manufacturing technologies.

Keynote Speaker:

Wednesday, March 14
1:30 p.m.–2:15 p.m.
Greg Hayes, EOS North America

Greg Hayes is a strategic technology development consultant with a strong background in high-end research and development, and a focus in materials science and engineering. Greg's professional background began as a consulting materials scientist and technical program lead, working internationally in the health-tech, high-tech, and aerospace markets. Currently, Greg is director of consulting and applications of EOS North America, where he works to identify market needs and uses of Additive Manufacturing technology to develop products to fulfill those opportunities. Most recently as a program manager and director of new partnerships for AM at TNO, he concentrated on design and structure of research programs, acquisition of funding and partners, and general management. In 2016, he joined the JuntoHealth advisory board. Prior to that in 2014, Greg co-founded Complex Materials, a bespoke bioresorbable materials company with a focus on magnesium alloy stent tubing. Greg holds an ME degree from the University of Delaware; a Ph.D. in Materials Science from The Pennsylvania State University; and Start-up and Entrepreneurship certification from the Vlerick Business School in Belgium.

EVENT-AT-A-GLANCE

March 12
MONDAY

4:00–6:00 p.m.
Technical Tour of rp+m

March 13
TUESDAY

8:45–9:30 a.m.
Keynote Speaker: Metal Additive Manufacturing – Disruptive and Evolutionary Technology for Transportation
Richard Grylls, SLM Solutions NA Inc.

9:30–10:30 a.m.
Networking Break with Exhibits

10:30 a.m.–12:00 p.m.
Technical Session: Economics

12:00–1:30 p.m.
Networking Lunch with Exhibits

1:30–2:15 p.m.
Keynote Speaker: From the Lab to the Skies: Printing the Future of Flight
Markus Heinimann, Arconic

2:15–3:45 p.m.
Technical Session: Design

3:45–4:15 p.m.
Networking Break with Exhibits

4:15–5:45 p.m.
Technical Session: Training

6:00–7:15 p.m.
Networking Reception with Exhibits

March 14
WEDNESDAY

8:45–9:30 a.m.
Keynote Speaker: Ready For Take-Off? Advancing Additive Into Aerospace
Paula Hay, UTC Aerospace Systems

9:30–10:30 a.m.
Networking Break with Exhibits

10:30 a.m.–12:00 p.m.
Technical Session: Process Control

12:00–1:30 p.m.
Networking Lunch with Exhibits

1:30–2:15 p.m.
Keynote Speaker: Successfully Transitioning to Industry 4.0
Greg Hayes, EOS North America

2:15–3:15 p.m.
Technical Session: Finished Material Properties

3:15–3:45 p.m.
Networking Break with Exhibits

3:45–4:15 p.m.
Technical Presentation: IoT + AM

4:15–5:15 p.m.
IoT + AM Panel Discussion

End Of Symposium

AGENDA

Tuesday, March 13

Time	Title
8:45 a.m.	**Metal Additive Manufacturing – Disruptive and Evolutionary Technology for Transportation** *Richard Grylls, SLM Solutions Na Inc.*
9:30 a.m. - Networking Break with Exhibits	
10:30 a.m.	**Improving the Economic Impact of Your Metal AM with Predictive Simulation** *Chris Robinson, ANSYS Inc.*
11:00 a.m.	**The Adoption of Additive Manufacturing: What Differentiates Aerospace from Automotive** *Bill Bihlman, Aerolytics LLC*
11:30 a.m.	**Economic Perspectives of Additive Manufacturing** *Douglas Thomas, NIST Precision Engineering Division*
12:00 p.m. - Networking Lunch with Exhibits	
1:30 p.m.	**From the Lab to the Skies: Printing the Future of Flight** *Markus Heinimann, Arconic*
2:15 p.m.	**Advancements in Plastics for Heavey Truck Manufacturing & the Use of Additive Manufacruting** *Max Morton, SABIC*
2:45 p.m.	**Powder's Role in Additive Manufacturing's Growth** *Eric Bono, Carpenter Powder Products*
3:15 p.m.	**Prototype to Production: Validation Efforts for Qualification of Materials and Processes for Additive Manufacturing** *Tracy Albers, rp+m Inc.*
3:45 p.m. - Networking Break with Exhibits	
4:15 p.m.	**Accelerator-Based, Large Format Computed Tomography for Additive Manufacturing** *Andrew Good, JG&A Metrology Center*
4:45 p.m.	**Replicate-Adapt-Optimize: Crawl-Walk-Run when Designing for Additive Manufacturing** *Timothy W. Simpson, Pennsylvania State University*
5:15 p.m.	**Where are You on Your Additive Manufacturing Training Journey? Where are Your Colleagues? Where Do You Want to Go? An Interactive Survey and Discussion About Additive Manufacturing Training** *Maura Callahan, SAE International and Joe Razum, 3D Systems*
6:00 p.m. - Networking Reception with Exhibits	

AGENDA

Wednesday, March 14

Time	Title
8:45 a.m.	**Ready For Take-Off? Advancing Additive Into Aerospace** *Paula Hay, UTC Aerospace Systems*
9:30 a.m. - Networking Break with Exhibits	
10:30 a.m.	**From AM Production to AM Volume Manufacturing - Renishaw's Additive Vision** *Stephen Anderson, Renishaw Inc.*
11:00 a.m.	**Carbon- Digital Light Synthesis Moving 3D Printing to 3D Manufacturing** *Mark Horner, The Technology House*
11:30 a.m.	**Additive Manufacturing of Composite Tooling for Automotive Applications** *Ahmed Hassen, Oak Ridge National Laboratory*
12:00 p.m. - Networking Lunch with Exhibits	
1:30 p.m.	**Successfully Transitioning to Industry 4.0** *Greg Hayes, EOS North America*
2:15 p.m.	**Amplifying Additive Manufacturing Standardization: Role of R&D Community** *Mohsen Seifi, ASTM International*
2:45 p.m.	**Polymer and Nanomaterials in 3D Printing: Towards High Performance and Lightweighting** *Qiyi Chen, Case Western Reserve University*
3:15 p.m. - Networking Break with Exhibits	
3:45 p.m.	**3D Post-Printing and the Direct Relationship to the Advancement of the Digital Thread for Direct Digital Manufacturing** *Daniel Hutchinson, PostProcess*
4:15 p.m.	**Panel Discussion: IoT and AM** *Moderator - Bill Bihlman, Aerolytics LLC* *Panelists -* *Jesse Boyer, Pratt & Whitney* *Greg Hayes, EOS North America* *Daniel Hutchinson, PostProcess* *Albert Jones, NIST Manufacturing Engineering Lab*
5:15 p.m. - Conclusion of Symposium	

EXHIBITOR PROFILE

Exhibitor Directory text is published as submitted by exhibiting companies.

3D PRINTERWORKS LLC Booth 103

241 W Federal St
Youngstown, PA 44503
United States
3dprinterworks.com

3D Printerworks manufactures professional grade FDM printing systems ideally suited for manufacturing, rapid prototyping, engineering, educational and many other areas that require real time models. The large build volume speeds up large scale prototypes while the dual extrusion system allows printing with soluble support materials to produce complex geometrics.

ADDITIVE ENGINEERING SOLUTIONS (AES) Booth 103

990 Evans Ave
Akron, OH 44305
United States
additiveeng.com

Additive Engineering Solutions (AES) is the global leader in Large Format Additive Manufacturing services. As the first company to provide services in a contract manufacturing capacity as this scale, AES focuses on Tooling & Mold productions, serving the FRP Composites Industry, Precast Concrete, and more.

ASM INTERNATIONAL Booth 213

9639 Kinsman Rd
Materials Park, OH 44073
United States
asminternational.org

ASM International connects materials professionals and their organizations to the resources necessary to provide professional development and to improve materials performance. As the world's largest and most established materials information society, ASM engages members through a global network of peers and provides access to trusted materials information through reference content and data, education courses, international events, and applied research.

FRESHMADE 3D Booth 103

241 W Federal St
Youngstown, PA 44503
United States
freshmade3d.com

Freshmade 3D uses digital manufacturing and a proprietary 3D printing product called AMClad to provide solutions for a variety of applications included manufacturing tooling, artwork and displays, functional parts and prototypes. AMClad is a cost effective and versatile isotropic material ideal for 3D printing medium/large functional and strong parts.

NOVASTAR SOLUTIONS, (HP 3D PRINTER RESELLER) Booth 208

35200 Plymouth Rd
Livonia, MI 48150
United States
novastar.net

Novastar Solutions is a HP Partner selling & servicing the HP 3D Multi Jet Fusion 3D Printer in Michigan and Ohio. We provide best in class IT hardware, software and lifecycle management services for engineering, product design, and simulation. Novastar's A2LA accredited Calibration Services keeps test instruments measuring accurately.

NSL ANALYTICAL SERVICES INC Booth 112

4450 Cranwood Pkwy
Cleveland, OH 44128
United States
nslanalytical.com

NSL Analytical Services, Inc. is an Independent Testing Laboratory specializing in testing powder metal, feedstock, prototype designs and final product in the Additive Manufacturing Industry. Material composition, powder characterization, validating metal printed parts, and powder studies help customers verify the highest standards of materials quality, performance and safety in their products.

PAMTON 3D PRINTING LLC Booth 210

904 S Hazelwood Ave
Youngstown, OH 44509
United States
pamton3d.com

We are a premier 3D commercial printer serving Northeast Ohio and the surrounding areas. Our prototyping, scale models, small production runs, high and low resolutions, two-color options, and FDA approved materials will keep you ahead of the curve in the 21st Century. Customer Service focuses on integrity, respect and professionalism.

EXHIBITOR PROFILE

RAPID PROTOTYPE AND MANUFACTURING LLC Booth 212

33490 Pin Oak Parkway
Avon Lake, OH 44012
United States
rpplusm.com

Rapid Prototype + Manufacturing LLC (rp+m) was founded in 2009 with investments from Thogus Products Company, a plastic injection molding company established in 1950. Rp+m was initially created as a prototyping and short fun production manufacturing service. Today, we provide services that go beyond just printing parts. Our client-focused approach ensures our customers are educated on the benefits and capabilities of additive manufacturing technology. Whether you are in the beginning stages of development, or ready for production you can rely on our expertise to implement a successful manufactured solution for your business.

RENISHAW INC Booth 209

1001 Wesemann Dr
Dundee, IL 60118
United States
renishaw.com

Renishaw Inc. is a global company with core skills in measurement, motion control, additive manufacturing, versatile gauging, and precision machining. The company's innovative products are used for a variety of industrial applications and are designed to significantly advance its customers' operational performance—improving manufacturing efficiencies and raising product quality.

RJ LEE GROUP Booth 110

PO Box 150581
Ogden, UT 84415
United States
rjleegroup.com

RJ Lee Group is an accredited analytical and scientific consulting laboratory. We investigate problems encountered during manufacturing processes, ensure regulatory compliance, and perform root cause failure analyses. Our unique powder metal characterization methods can assure quality (particle size distribution, shape, images and composition) and cleanliness (extraction and characterization of contaminants).

SLM SOLUTIONS NA INC Booth 215

48561 Alpha Dr, Ste 300
Wixom, MI 48393
United States
slm-solutions.us

SLM Solutions is a leading provider of metal additive manufacturing systems that optimize fast and cost-efficient part production across all industries. With multi-laser options, bi-directional recoating, open-software controls and closed-loop powder handling available in three sizes, Selective Laser Melting systems achieve best-in-class safety with increased build speeds for complex and completely dense metal parts.

THE TECHNOLOGY HOUSE Booth 102

10036 Aurora Hudson Rd
Streetsboro, OH 44241
United States
tth.com/prototyping

The Technology House is a leading provider of product engineering, computer-aided design and manufacturing (CAD/CAM), product development, and rapid prototyping services, as well as production manufacturing of custom plastic, urethane, and metal mechanical components. Our integrated, all-under-one-roof approach to design, prototyping, and production allows you to bring your concept to the market faster and more cost-effectively than virtually anyone else. We serve a growing range of businesses in the medical, aerospace, defense, industrial, energy, and consumer products markets.

ULTIMAKER/DELRAY SYSTEMS TECHNOLOGY CTR Booth 114

419 Golf View Ln
Rochester, MI 48309
United States
3d-printer.com

With over 30 years experience in customer service, design engineering and manufacturing, DELRAY Systems was created to assist companies with new technology and training for advanced manufacturing.

AD INDEX

NOTES

SAE INTERNATIONAL EVENTS

2018

High Efficiency IC Engine Symposium
April 8-9
Detroit, MI

WCX™: SAE World Congress Experience
April 10-12
Detroit, MI

Connect2Car at WCX
April 10-12
Detroit, MI

Waste Heat Recovery Symposium
May 23-24
Haifa, Israel

Aviation Technology Forum
June 5-6
Shanghai, China

SAE CyberAuto Challenge™
July 23-27
Warren, MI

Connect2Car Executive Leadership Forum
September 5-6
San Jose, CA

COMVEC 18
September 11-13
Rosemont, IL

On-Board Diagnostics Symposium
September 11-13
Indianapolis, IN

North American International Powertrain Conference
September 12-14
Chicago, IL

International Powertrains, Fuels & Lubricants Meeting
September 17-19
Heidelberg, Germany

From ADAS to Automated Driving
October 8-11
Detroit, MI

Thermal Management Systems Symposium
October 9-11
San Diego, CA

Brake Colloquium & Exhibition
October 14-16
Palm Desert, CA

Heavy Duty Diesel Emissions Control Symposium
October 16-17
Gothenburg, Sweden

SAE/JSAE Small Engine Technology Conference
November 6-8
Dusseldorf, Germany

Aerospace Systems + Technology Conference
November 6-8
London, UK

Defense Maintenance and Logistics Exhibition
December 17-19
Tampa, FL

Defense Maintenance and Logistics Symposium
December 17-20
Tampa, FL

2019

International Powertrains, Fuels & Lubricants Meeting
January 22-24
San Antonio, TX

Hybrid and Electric Vehicle Technologies Symposium
February 19-21
San Diego-Mission Valley, CA

On-Board Diagnostics Symposium
March 12-14
Stuttgart, Germany

Aerotech Americas
March 25-27
Charleston, SC

Government/Industry Meeting
April 3-5
Washington, DC

Hybrid & Electric IC Engine Symposium
April 7-8
Detroit, MI

WCX™: SAE World Congress Experience
April 9-11
Detroit, MI

Noise and Vibration Conference & Exhibition
June 10-13
Grand Rapids, MI

COMVEC19
September 10-12
Rosemont, IL

North American International Powertrain Conference
September 18-20
Chicago, IL

Brake Colloquium & Exhibition
September 22-25
Orlando, FL

Thermal Management Systems Symposium
October 15-17
Plymouth, MI

For an updated listing of events, dates and locations, please refer to **sae.org/events/**

P17186169

H3D

Expert on Metal 3D Printing

Equipment model	SLM-280
Dimensions uncrated(WxDxH)	2200mmx1300mmx2250mm
Printing Size(WxDxH)	250mm×250mm×300mm
Laser Power	200W/500W
Layer Thickness	20μm-80μm
Scanning Track Width	70μm-200μm
Scanning Speed	≤7000mm/s
Forming Speed	600-3000mm/s
Oxygen Content	≤100PPM
Protect Atmosphere	Cycling purifying,collection coefficient≥99%
Print Materials	Stainless steel, Chrome-Cobalt alloy, Titanium alloy, Aluminum alloy, Nickel base alloy, Chisel tool steel and some rare metals.
Relative Density	98%--nearly100%
Dimension Accuracy	0.05-0.2mm

Shanghai Hanbang United 3D Tech Co., Ltd. is an international division of Guangdong Hanbang 3D Technology Co., Ltd., which is a fast-growing manufacturer of metal 3D printers in China, known as H3D or HBD, providing proprietary SLM equipment, industrial solutions, and 3D-print services. Since its pioneers stepped into the metal 3D printing industry in 2007, H3D has obtained more than 60 technical patents, 9 software copyrights, a fairly good market share and proudly public praise in industries of aerospace, automobile, molding, dentistry, orthopedics, education and research, etc. In addition, H3D is connected to the most influential Chinese experts and market resources of additive manufacturing. We value our partners and customers as interest-based community. Now, contact us and see what we can do for you.

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