



2020 AMUG Conference

Hilton Chicago
March 22 - 26, 2020

PRELIMINARY

AS OF FEBRUARY 26, 2020



ADDITIVE MANUFACTURING
USERS GROUP
FOR USERS. BY USERS.

WWW.AMUG.COM



Table of Contents

Plan your time at AMUG.

AMUG CONFERENCE DETAILS.....	3
AGENDA-AT-A-GLANCE.....	4 - 5
CONFERENCE PROGRAM	
Sunday, March 22.....	6 - 7
Pre-Conference Programs	
Offsite Tours	
Technical Courses and Workshops	
Monday, March 23.....	8 - 9
Tuesday, March 24.....	10 - 11
Wednesday, March 25.....	12 - 13
Thursday, March 26.....	14 - 15
MAPS	
AMUGexpo Floor Plan	16 - 17
Hotel Floor Plans.....	18-23
2020 AMUG SPONSORS.....	24

Front Cover:
(Center) Erika Berg of Carbon - digitally printed helmet liner components and Riddell's SpeedFlex Precision Diamond Helmet;
(Right) Maddie Frank of University of Wisconsin - cello, and (Left) Bill Braune/Met-L-Flo - Master Chief reproduction.

2020 AMUG Conference

AMUG Conference starts on Sunday afternoon and concludes on Thursday night. Training and education continues through late Thursday afternoon - don't leave early and miss out on all AMUG has to offer !

Conference March 22 - March 26, 2020

4 days of presentations, networking sessions, and evening activities. Conference opens Sunday afternoon with the AMUGexpo.

AMUGexpo March 22 - 23, 2020 (Sunday and Monday only)

AMUGexpo is open Sunday and Monday only. Diamond and Platinum booths are open all week.



Location

Hilton Chicago
720 South Michigan Avenue
Chicago, Illinois USA 60605

Conference Registration

Attendee fees

Through 12/31/19	\$895
Through 2/22/2020	\$995
After 2/22/2020	\$1495

Registration includes:

Conference (4 days), AMUGexpo (2 nights), Keynote presentations, general sessions, technical sessions, workshops, AMUG Off-site Event and Dinner, technical competition, networking lunches, all meals and beverages

Hotel Rates

\$149.00 at Hilton Chicago

(excludes tax and hotel charges)

Hotel registration is separate from AMUG registration

<http://www.amug.com/conference-hotels/>

Agenda-at-a-Glance

Saturday, 21 March 2020

PRE-CONFERENCE ACTIVITY

SUPPLEMENTARY CONFERENCE TRAINING AND CERTIFICATION

NEW! SME/UL Technician Course
Additive Manufacturing – Technician review program
8:00am-5:00pm
Register online at [AM-Technician Review Program](#)

New for 2020!

New Times!

Sunday, 22 March 2020

PRE-CONFERENCE ACTIVITY

SUPPLEMENTARY CONFERENCE TRAINING AND CERTIFICATION

NEW! SME/UL Technician Course
Additive Manufacturing – Technician review program
8:00am-3:00pm
Register online at [AM-Technician Review Program](#)

NEW! ASTM
Accelerating AM Technology Adoption Through
Standardization and Certification
8:00am-3:00pm
Register online at [ASTM workshop](#)

OFF SITE TOURS

Renishaw Inc, West Dundee Location
Take a tour and meet the team at West Dundee location of
Renishaw.
Register online at <https://www.amug.com/tours/>

DMG MORI Headquarters, Hoffman Estates
Take a tour and meet DMG MORI, HERAEUS, Materialise and
Siemens.
Register online at <https://www.amug.com/tours/>

Fast Radius
Take a tour and meet the team at Fast Radius
Register online at <https://www.amug.com/tours/>

CONFERENCE ACTIVITY BEGINS

REGISTRATION OPEN

10:00AM-8:00PM

SPEAKER CENTER AND APP DESK OPEN

10:00AM-8:00PM

CONFERENCE PROGRAM

New Member Welcome

3:30pm-4:00pm
First-time conference attendees welcome and introduction to the
AMUG Conference.

AMUGexpo, Training Lab and Dinner

EXPO OPEN

4:00pm - 10:00pm
Join us Sunday night for the AMUGexpo Opening. Enjoy a buffet
dinner and beverages as you tour the AMUGexpo and Training
Lab.

Monday, 23 March 2020

REGISTRATION OPEN

7:00am-8:00pm

SPEAKER CENTER AND APP DESK OPEN

7:00am-4:30pm

BREAKFAST

7:00am-8:00am

CONFERENCE PROGRAM

AMUG Opening Address - Insights and Highlights
8:00am-9:30am

Building the Future of AM

9:30am-10:00am
2020 AMUG Scholarship Recipients
Presentations from Guy Bourdeau and Randy Stevens Scholarship
recipients

Break

10:00am-10:30am

AMUGexpo and Training Lab

EXPO OPEN

10:00am - 2:30pm (note: sessions begin at 1:30pm)
All exhibits open

Networking Lunch

12:00pm-1:15pm
Sponsors and Exhibitors welcome

AMUG, Sponsor Sessions and Training Lab Sessions

1:30pm - 2:30pm

Break

2:30pm-3:00pm

AMUG, Sponsor Sessions and Training Lab Sessions

2:30pm - 5:30pm

AMUGexpo, Training Lab and Dinner

EXPO OPEN with Technical Competition

6:00pm - 10:00pm
All demo spaces and exhibits open

Tuesday, 24 March 2020

REGISTRATION OPEN
7:00am-5:00pm

SPEAKER CENTER AND APP DESK OPEN
7:00am-4:00pm

BREAKFAST
7:00am-8:00am

CONFERENCE PROGRAM
International Report
8:00am-8:30am

DRIVING INNOVATION:
DINO
8:30am-9:00am
Distinguished INnovator Operator (DINO) Presentation

Keynote:
James Hobson, a.k.a. the Hacksmith, *Hacksmith Entertainment*
9:00am-10:00am

Break
10:00am-10:30am

**AMUG, Sponsor Sessions
and Training Lab Sessions**
10:30pm - 12:00pm

Networking Lunch
12:00pm-1:15pm

AMUG, Sponsor Sessions and Training Lab Sessions
1:30pm - 4:00pm

Board Buses for Off-Site Dinner
5:00pm - 5:15pm
Buses leave promptly at 5:15pm
Everyone must wear their AMUG badge or show their purchased ticket to board the bus.
Location: Chicago Hilton, East 8th Street (next to AMUG Registration Desk) and Palmer House Hilton, S Wabash Avenue

AMUG Off-Site Dinner
5:00pm - 10:00pm
An event for all full-conference pass attendees and sponsors.

Transportation provided. Additional dinner tickets are available for purchase.

Wednesday, 25 March 2020

REGISTRATION OPEN
7:00am-6:00pm

SPEAKER CENTER AND APP DESK OPEN
7:00am-4:00pm

BREAKFAST
7:30am-8:30am

CONFERENCE PROGRAM
DRIVING INNOVATION:
2019 Technical Competition Winners
8:30am-9:00am
The 2019 AMUG Technical Competition Winners will provide a presentation on their winning applications

DRIVING INNOVATION:
Innovators Showcase
Dr. Hans Langer, EOS Group
9:00am-10:00am

Break
10:00am-10:30am

DRIVING INNOVATION:
2020 Technical Competition Winners Announced
10:30am-11:00am

AMUG Business Meeting
11:00am-12:00pm
Open to all full-conference pass attendees.
New Board announced.

Networking Lunch
12:00pm-1:15pm

AMUG, Sponsor Sessions and Training Lab Sessions
1:30pm - 2:30pm

Break
2:30am-3:00am

AMUG, Sponsor Sessions and Training Lab Sessions
2:30pm - 5:30pm

Dinner - Roaring 20's Chicago Style
6:00pm-10:00pm
An event for all full conference pass attendees and sponsors.
Step back in time to the roaring 20s Chicago Style. Enjoy a night of great food, games, and more.

Thursday, 26 March 2020

REGISTRATION OPEN
7:00am-11:00am

SPEAKER CENTER AND APP DESK OPEN
7:00am-2:00pm

BREAKFAST
7:30am-8:30am

CONFERENCE PROGRAM
AMUG Closing and Feedback
8:30am-9:00am

Keynote:
Johnathan Morris, MD, *Mayo Clinic*
9:00am-10:00am

Break
10:00am-10:30am

AMUG, Sponsor Sessions and Training Lab Sessions
10:30pm - 12:00pm

Networking Lunch
12:00pm-1:15pm

AMUG, Sponsor Sessions and Training Lab Sessions
1:30pm - 2:30pm

Break
2:30pm-3:00pm

AMUG, Sponsor Sessions and Training Lab Sessions
3:00pm - 5:30pm

Family Dinner & Closing
An event for all full-conference pass attendees and sponsors.

AMUG Family Dinner is the official closing event at the AMUG Conference. Attendees and sponsors are encouraged to submit their family or favorite recipes for consideration. Submit your family recipe to eventmanager@amug.com by February 28.

Along with a family dinner there will be music and activities for everyone to participate.

CONFERENCE CONCLUDES

REGISTRATION - SPEAKER CENTER - MOBILE APP DESK

	Hours Open	Location
REGISTRATION and BADGE PICK-UP	10:00am - 8:00pm	8th St North Registration, Lobby Level
Speaker Center and Mobile App Desk Open	10:00am - 8:00pm	8th St South Registration, Lobby Level

General Sessions and Breakouts open to all Conference Attendees

Speakers, Dates and Times subject to change without notice - updates made through mobile app

AMUGexpo Lower Level	7:00am-8:00am	Pre-Conference Programs Additional Registration and Costs apply		Off-Site Tours		AMUG Programs			
AMUGEXPO AREA CLOSED	8:00am-8:30am	NEW! SME/UL Technician Course	NEW! ASTM Workshop Accelerating AM Technology Adoption Through Standardization and Certification Sunday, March 22 8:30 am – 3:00 pm ASTM members: \$150 Non-ASTM members: \$200 Register at: ASTM workshop						
	8:30am-9:00am								
	9:00am-9:30am	Additive Manufacturing – Technician review program							
	10:00am-10:30am	Saturday, March 21 (1 1/2-day review) 8:00 am – 5:00 pm		10:00am - 3:15pm Renishaw Tour	10:15am-2:00pm DMG MORI Tour	Registration Open 10:00am - 8:00pm			
	10:30am-11:00am			Where: Renishaw, Inc., Wesemann Drive, West Dundee, Illinois When: Sunday, March 22 from 10:00am to 3:15pm Transportation: Provided by Renishaw Board buses at 10:00am* Cost: FREE Registration at: Renishaw Tour	Where: DMG MORI USA Headquarters – Hoffman Estates, IL. When: Sunday, March 22 from 10:15 am to 2:30 pm Transportation: Provided by DMG MORI Board bus at 10:15 am at the Hilton Chicago* Returning bus departs DMG MORI at 2:00 pm Cost: FREE Registration: DMG MORI Tour		12:00pm - 2:00pm Fast Radius Tour Where: Fast Radius, 113 N. May Street (West Loop), Chicago, Illinois When: Sunday, March 22 from noon to 2:00 pm Transportation: Provided by Fast Radius (Uber code to be provided) Cost: FREE Registration: FastRadius Tour		
	11:00am-11:30am								
	11:30am-12:00pm								
	12:00pm-12:30pm								
	12:30pm-1:00pm	Sunday, March 22 (1/2-day exam) 8:00 am – 3:00 pm				Badge Pick-up Speaker Center Mobile App Center			
	1:00pm-1:30pm			Cost: \$695/person					
	1:30pm-2:00pm			Register at: AM-Technician Review Program					
	2:00pm-2:30pm								
	2:30pm-3:00pm								
3:00pm-3:30pm									
3:30pm-4:00pm			*Tour Bus Boarding: use the Hilton Chicago hotel East 8th Street entrance, which is in the AMUG registration area						

Offsite, Pre-conference Tours

On Sunday, March 22, 2020, DMG MORI, Fast Radius and Renishaw are opening their doors for tours of their facilities and information exchange.

Please note that both require advanced registration and have a cap on the number of people they can host.

DMG MORI Tour

You are invited to experience the holistic AM workflow at DMG MORI's HQ in Hoffman Estates. Get insights into all production stages from the design and programming through additive manufacturing to post processing, provided by 4 top AM suppliers in the industry: DMG MORI, HERAEUS, MATERIALISE and SIEMENS.

Get in touch with SIEMENS experts to learn more about the advantages of DfAM and a holistic software suite for your production of tomorrow. Explore how MATERIALISE Magics is pushing the edge in job preparation for 3D printing.

As a leading powder supplier, HERAEUS will show concepts on secure powder handling and challenges to overcome when working with metal additive powders.

To round things up, you will experience an integrated process chain from additive manufacturing to the finished part during a guided tour through the DMG MORI facility.



Fast Radius Tour

Fast Radius will be offering a free tour of its facility on Sunday, March 22. The agenda will include a guided tour of its advanced factory, view its additive applications gallery, absorb best practices, hear 'lessons learned', and kick off the AMUG Conference week with a happy hour.

Visitors to these headquarters see a "factory of the future", one recognized by the World Economic Forum as one of the most innovative factories in the world, operating in real time. Additionally, Fast Radius is home to the largest publicly-accessible Carbon factory in North America, along with extensive capabilities in HP MJF, Stratasys FDM, and Desktop Metal.



For more information regarding Tours, visit

<https://www.amug.com/tours/>

Renishaw Tour

Renishaw will be offering a free tour of its facility on Sunday, March 22. You will depart from the Hilton Chicago at 10:00 am and return well before the new member welcoming meeting and start of the AMUGexpo.

Renishaw is offering you the chance to learn about the challenges, complexities, machine capabilities, processes and qualification required to take AM into production. This is a unique opportunity to mix with HP, a world-leading 3D Printing Solutions company, and nTopology, a notable engineering software company. You will also get a quick tour of Renishaw's core Industrial Metrology businesses—all essential to control manufacturing process variation and how these interact with the 3D print space.



Pre-Conference Programs

NEW! SME/UL Technician Course Additive Manufacturing – Technician review program

Saturday, March 21 (1 1/2-day review) & Sunday, March 22 (1/2-day exam)

Cost: \$695/person

Register at: [AM-Technician Review Program](#)

This program is ideal for a candidate with a two-year associate degree in additive manufacturing or is currently enrolled in a college program, and/or has one or more years of working experience in a manufacturing-related field. The certification covers key roles and responsibilities for an additive manufacturing technician, the additive manufacturing process chain, design for additive manufacturing, materials and process selection, secondary processes, and key safety considerations.

The prep course is a discussion-oriented and interactive session in which participants receive comprehensive application-based knowledge of the 3D printing industry. Covering key roles and responsibilities for an AM technician, the AM process chain, design for AM, material and process selection, secondary processes, and key safety considerations, you will begin to understand how to apply AM in your organization. The certification exam consists of 120 multiple choice questions.

Objectives:

- Summarize the AM process chain, materials, technologies and economic drivers
- Evaluate designs for AM covering general guidelines, file formats, build factors and optimization strategies.
- Evaluate differentiating factors when selecting AM materials and processes
- Describe the end to end manufacturing chain from build preparation to quality assurance.
- Explain how to leverage AM to support various traditional manufacturing methods
- Describe the impact of AM on the manufacturing environment and key risk and safety considerations.



Registration for the Pre-Conference Courses are separate from the AMUG Conference fee and registration process.

AMUG Conference Registration:

www.amug.com

SME/UL Technician Course:

[AM-Technician Review Program](#)

ASTM Workshop:

[ASTM workshop](#)

NEW! ASTM Workshop Accelerating AM Technology Adoption Through Standardization and Certification

Sunday, March 22, 8:30 am – 3:00 pm

Cost: ASTM Members \$150/person

Non-ASTM Members: \$200/person



Register at: [ASTM workshop](#)

As additive manufacturing matures into mainstream manufacturing, standards are the key to accelerate the adoption of the technology to the next level. Several gaps exist in additive manufacturing to meet many industry-specific needs. Especially in regulated industries, such as aerospace, medical and automotive, certification is essential to gain market access. Hence the development of certification schemes is quickly advancing but depends on specific standards to cover the entire AM value chain. Therefore, globally accepted market-relevant standards are required to meet the growing demand in the application of AM technology.

While standards for AM continue to develop, it is a challenge to keep up with the industry needs as technologies advance rapidly. Standard development is collaborative and voluntary, which makes the process slow. Another hurdle in the advancement of standards development is the lack of awareness among the AM community on the standardization process and how the community can actively be involved in the process. To accelerate AM standardization process, ASTM came up with a unique initiative, the Additive Manufacturing Center of Excellence (AM CoE), which bridges the gap between R&D and standards development by performing focused research.

This workshop is intended to provide a detailed understanding of the following topics with a general focus on:

- Bridging the gap between standards and certification
- Certification approach for Additive Manufacturing: Meeting the requirements to deliver AM parts to regulated industries.

And, a specific focus on the implication on standardization in PBF processes in the below areas

- Multi-laser technology on powder bed fusion process
- In-situ Process Monitoring and Control in PBF processes
- PBF process workflow
- AM digital workflow
- Materials for PBF Process
- Powder Bed polymer AM process

This workshop features eleven technical talks, followed by a panel discussion, based on the topics mentioned above.

8:30am	Registration	10:50am-11:10am	Tech Talk 6: <i>Standardization requirements in PBF based polymer processes</i>
8:45am	Opening Address	11:10am-11:30am	Tech Talk 7: <i>Mechanical performance as a function of both process and material</i>
9:00am-9:20am	Tech Talk 1: <i>Role of ASTM AM CoE in Bridging the Gap Between Standardization and Certification</i>	11:30am-11:50am	Tech Talk 8: <i>Material specifications and qualification in laser powder bed fusion</i>
9:20am-9:40am	Tech Talk 2: <i>AM Certification: Meeting the requirements to deliver AM parts to regulated industries</i>	11:50am-12:50pm	Lunch break/networking
9:40am-10:00am	Tech Talk 3: <i>Multi-laser technology on powder bed fusion process and the implication on standardization</i>	12:50pm-1:10pm	Tech Talk 9: <i>Advances in additive manufacturing automation and the impact of standardization</i>
10:00am-10:20am	Tech Talk 4: <i>Recent innovations in the PBF process and its impact on standardization</i>	1:10pm-1:30pm	Tech Talk 10: <i>Standardization in Digital AM Workflow</i>
10:20am-10:30am	Break	1:30pm-1:50pm	Tech Talk 11: <i>Modeling and Simulation for process and material property prediction</i>
10:30am-10:50am	Tech Talk 5: <i>Real-Time Melt Pool Monitoring and Analytics for Metal Additive Manufacturing</i>	2:00pm-3:00pm	Panel Discussion

PRELIMINARY AGENDA - Subject to change as of 26 Feb 2020-For Users By Users ■ 7

REGISTRATION - SPEAKER CENTER - MOBILE APP DESK

	Hours Open	Location
REGISTRATION and BADGE PICK-UP	7:00am - 8:00pm	8th St North Registration, Lobby Level
Speaker Center and Mobile App Desk Open	7:00am - 4:30pm	8th St South Registration, Lobby Level

General Sessions and Breakouts open to all Conference Attendees

Speakers, Dates and Times subject to change without notice - updates made through mobile app

AMUGexpo Lower Level	7:00am-8:00am	BREAKFAST					Grand Ballroom, Normandie and Boulevard, 2nd Floor	
AMUGEXPO AREA CLOSED	8:00am-9:30am	AMUG OPENING ADDRESS Carl Dekker, <i>AMUG President</i> INSIGHTS AND HIGHLIGHTS Mark Barfoot, <i>AMUG Advisor</i> and Todd Grimm, <i>AMUG AM Advisor</i>					International Ballroom, 2nd Floor	
	9:30am-10:00am	BUILDING THE FUTURE OF AM: <i>Scholarship Recipients Presentation</i> Brett Charlton, <i>AMUG Scholarship Chair</i> 2020 Guy Bourdeau Scholarship Winner: Katherine Schneidau, <i>University of Louisville</i> 2020 Randy Stevens Scholarship Winner: Chris Kaminsky, <i>Muskegon Community College</i>					International Ballroom, 2nd Floor	
	10:00am-10:30am	BREAK					Salon A/B/C/D, Lower Level	
AMUGExpo Area OPEN 10:00am-2:30pm	10:00am-2:30pm	AMUGEXPO AND SPONSOR DEMO OPEN					Salon A/B/C/D, Lower Level	
	12:00pm-1:15pm	NETWORKING LUNCH					Salon A/B/C/D, Lower Level	
	BREAKOUT SESSIONS BEGIN							
		AMUG PROGRAM					PLATINUM SPONSOR PROGRAM	
	ROOM	Continental A Lobby Level	Continental B Lobby Level	Continental C Lobby Level	International Ballroom 2nd Floor	PDR 2 3rd Floor	Joliet Room 3rd Floor	Astoria Room 3rd Floor
	TRACK	Aerospace/Transportation	AM Metal Technologies	Scanning & Metrology	Medical	AM Technologies (Non-Metal)	PLATINUM SESSIONS	PLATINUM SESSIONS
	1:30pm-2:30pm	Advanced Runway Texture Imitations for Specialized Tiles Fabrication via LPBF Olga Ivanova, Ph.D. <i>Open Additive</i>	ROUNDTABLE PANEL User Approach to Post Process of Metal AM Parts MODERATOR Matthew Duffey, <i>EWI</i> PANELIST Timothy Hall, <i>Faraday Technologies</i> Steve Szczesniak, <i>Johns Hopkins APL</i> Derek Straub, <i>MIT Lincoln Labs</i>	Scanning Workshop Introduction MODERATOR: Derek Ellis 1:30pm - 2:00pm An Introduction to 3D Scanning and Metrology Giles Gaskell <i>Hexagon</i> 2:00pm-2:30pm The Facts and Fiction of 3D Scanning for Reverse Engineering Cullen Williams <i>CATI</i>	Augmented Reality and 3D Printing at the Cleveland Clinic Karl West, M.S. <i>Cleveland Clinic</i>	ROUNDTABLE PANEL Post Processing & Finishing AM (Non-Metals) MODERATOR Colton Rooney, <i>EMI Corp.</i> PANELIST Steven Alviti, <i>Bel Air Finishing</i> Jeff Mize, <i>PostProcess Technologies</i> Ana Neves, <i>Ramco Equipment</i> Michael Schorr, <i>DyeMansion</i> Luis Folgar, <i>Additive Manufacturing Technologies</i>	Platinum Sponsor: BigRep PANEL Integrating Large Format Additive Into Your Production MODERATOR Frank Marangell, <i>BigRep</i> PANELIST Michael Whitens, <i>Michael Whitens LLC</i> Stefanie Brickwede, <i>Mobility Goes Additive</i> Francois Minec, <i>BASF</i>	Platinum Sponsor: EnvisionTec What Do You Need to Move Photopolymer 3D Printing From Prototyping to Real Production? Al Siblani <i>EnvisionTEC</i>
	2:30pm-3:00pm	BREAK						
	3:00pm-4:00pm	Advancement of Metal Additive Manufacturing Techniques and Materials for Rocket Propulsion Applications Paul Gradl <i>NASA</i>	Additive Manufacturing in Industrial Production Martin Friedrich Torsten Burkert <i>BMW</i>	3D SCANNING HANDS-ON WORKSHOP Laser and Structured Light Hands-on Scanning Workshop MODERATOR Derek Ellis ROUNDTABLE WORKSHOP Giles Gaskell, <i>Hexagon</i> Bob Renella, <i>CATI</i> Phil Rediger, <i>Exact Metrology</i>	PANEL Regulatory Discussion for Medical AM MODERATOR Shannon Van Deren, <i>Layered Manufacturing</i> PANELIST James Coburn, <i>US Food and Drug Administration</i> Dirk Scholvin, <i>Wright Medical Group</i>	ROUNDTABLE PANEL Machine Maintenance & Troubleshooting MODERATOR Andrew Allshorn, <i>AT 3D-SQUARED LTD</i> Mike Littrell, <i>BuildParts by CIDEAS Inc.</i> PANELIST David Vecchio, <i>Forecast3D</i> David Storey, <i>RPS</i> Zac Holcomb, <i>Additive America</i> Dustin Altenhofen, <i>RP America</i> Chris Keidl, <i>Midwest Composite Technologies</i>	Platinum Sponsor: Desktop Metal Key Use Cases for Metal 3D Printing Ilya Mirman <i>Desktop Metal</i> Jason Harjo <i>John Zink Hamworthy Combustion</i>	Platinum Sponsor: PostProcess Technologies Unlocking the Scalability of Additive with Automated Post-Printing: Case Study & Technology Demonstration Nathan Harris Daniel Hutchinson <i>PostProcess Technologies</i>
	4:00pm-4:30pm	transition						
	4:30pm-5:30pm	Leveraging Additive Manufacturing for UAS: a General Atomics ASI's Perspective Steve Fournier <i>General Atomics Aeronautical Systems Inc.</i>	DfAM Case Studies from Product Development at Grundfos Tom Jæger Martin Bang Kristensen <i>Grundfos</i>	4:30pm - 5:00pm From Inspection to Process Optimization with Industrial Computed Tomography Philip Sperling <i>Volume Graphics GmbH</i> 5:00pm - 5:30pm ROUNDTABLE PANEL 3D Scanning Panel MODERATOR Derek Ellis PANELIST Giles Gaskell, <i>Hexagon</i> Bob Renella, <i>CATI</i> Philip Sperling, <i>Volume Graphics</i>	4:30pm - 5:00pm Biomedical Additive Manufacturing for the Warfighter Vincent Ho <i>Uniformed Services University of the Health Sciences</i> 5:00pm - 5:30pm How Johnson & Johnson is Creating a 3D Printing Ecosystem Sam Onukuri <i>Johnson & Johnson</i>	4:30pm - 5:00pm Effect of Micro and Macro Defects on FDM-Printed Nylon-12CF Bracket Part Performance Harsh Baid Reza Hajiha <i>AlphaSTAR Corp</i> 5:00pm - 5:30pm The Right Material for Small Parts Joerg Griessbach <i>The SL Pro</i>	Platinum Sponsor: Ultimaker A Digital Warehouse for On-Demand Manufacturing Marcus Schindler <i>Schubert</i>	Platinum Sponsor: Materialise Optimize ANY 3D Printer Evan Kirby <i>Materialise</i>
	5:30pm-6:00pm	ALL SESSIONS CLOSED						
AMUGExpo Area OPEN 6:00pm-10:00pm	6:00pm-10:00pm	AMUGexpo and Technical Competition Dinner and Networking					Salon A/B/C/D, Lower Level	

Welcome to AMUG

Insights and Highlights

8:00am-9:30am

Carl Dekker, Mark Barfoot,
and Todd Grimm
AMUG



12:00pm-1:15pm	NETWORKING LUNCH						Salon A/B/C/D, Lower Level	
BREAKOUT SESSIONS BEGIN								
	DIAMOND SPONSOR PROGRAM				TRAINING LAB DIAMOND SPONSOR TRAINING SESSIONS			
ROOM	Waldorf 3rd Floor	Williford A/B 3rd Floor	Williford C 3rd Floor	Marquette Room 3rd Floor	Lake Ontario 8th Floor	Lake Michigan 8th Floor	Lake Huron 8th Floor	Lake Erie 8th Floor
1:30pm-2:30pm	Diamond Sponsor: Stratasys Deploying and Sustaining AM in Your Organization: A Guide For Transformation Kunal Mehta Oliver Smith David Busacker Blueprint	Diamond Sponsor: DSM 3D Printed Pedestrian Bridge: How an Automated Digital Workflow Improved Production Bram Joosen Greg Constantino DSM	Diamond Sponsor: SLM Solutions 1:30pm - 2:00pm Production Efficiencies on SLM Technology Scott Volk Keselowski Advanced Manufacturing 2:00pm - 2:30pm Neighborhood 91 – The Production AM Campus John Barnes The Barnes Group Advisors	Diamond Sponsor: GE Additive Additive Taking Flight: GE Aviation's Path to Production Steven Woods GE Aviation	Diamond Sponsor: 3YOURMIND Examining the Three AM Workflow Steps with the Highest Automation Potential André Drochner 3YOURMIND	Diamond Sponsor: Essentium Moisture Control in Additive Manufacturing Thermoplastics: Proper Material Handling for High Quality Parts Dr. Brandon Sweeney Essentium	Diamond Sponsor: CATI Design for 3D Printing – Tips, Tricks & Techniques Mark Abshire CATI	Break area
2:30pm-3:00pm	BREAK							
3:00pm-4:00pm	Diamond Sponsor: ExOne Using Binder Jetting for Industrial Tooling: Why it's the Perfect Solution Rick Lucas ExOne	Diamond Sponsor: Renishaw PANEL Commercializing Metal AM Successfully in Various Industries MODERATOR Stephen Anderson, Renishaw PANELIST Patrick Hare, KLS Martin Shri Shetty, PrinterPrezz Mike Stawovy, H.C. Starck Jason Sollecito, Moog Sean Hilbert, Cobra-Aero	Diamond Sponsor: 3D Systems Software as an Enabler for Optimized Additive Manufacturing Workflows Radhika Krishnan 3D Systems	Diamond Sponsor: HP Hybrid Supply Chain Models: When 3D Printing Can Complement Injection Molding Edward Davis HP	Diamond Sponsor: Air Force Visit Rapid Sustainment in Their Booth Air Force Rapid Sustainment Office	Diamond Sponsor: Dyndrite Driving Next Generation Efficiency for Additive Manufacturing Steve Walton Hayden Osborn Dahlon Lyles Dyndrite	Diamond Sponsor: DMG MORI Identifying Characteristics of Ideal Hybrid Additive Parts and Programming in SiemensNX Tilo Buerge DMG MORI	Break area
4:00pm-4:30pm	transition							
4:30pm-5:30pm	Diamond Sponsor: Carbon Lattices as Programmable Materials Hardik Kabaria, Ph.D. Carbon	Diamond Sponsor: EOS AM and the Digital Value Chain: Optimize Your Product Lifecycle Glynn Fletcher EOS	Diamond Sponsor: BASF The Role of Additive Manufacturing in Manufacturing Ecosystem Clément Moreau Sculpteo, a subsidiary of BASF	closed	Diamond Sponsor: Nexa3D NEXA3D File Preparation and Printer Set up Marios Levi Nexa3D	closed	Diamond Sponsor: Velo3D How to Select Parts for VELO3D Support Free Manufacturing Brian Spink Velo3D	Break area
5:30pm-6:00pm	ALL SESSIONS CLOSED							
6:00pm-10:00pm	AMUGexpo and Technical Competition Dinner and Networking						Salon A/B/C/D, Lower Level	

REGISTRATION - SPEAKER CENTER - MOBILE APP DESK

General Sessions and Breakouts open to all Conference Attendees

Speakers, Dates and Times subject to change without notice - updates made through mobile app

REGISTRATION and BADGE PICK-UP

Hours Open
7:00am - 5:00pm
7:00am - 4:00pm

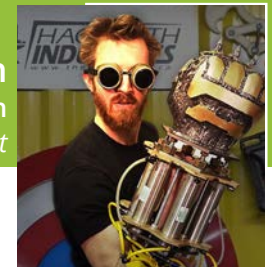
Location
8th St North Registration, Lobby Level
8th St South Registration, Lobby Level

DIAMOND & PLATINUM	7:00am-8:00am	BREAKFAST					Grand Ballroom, Normandie and Boulevard, 2nd Floor	
DIAMOND & PLATINUM BOOTH AREA CLOSED	8:00am-8:30am	AMUG INTERNATIONAL REPORT Stefan Ritt, <i>AMUG International Committee Chair</i>					International Ballroom, 2nd Floor	
	8:30am-9:00am	DRIVING INNOVATION Distinguished INNovator Operator (DINO) Award Presentation Gary Rabinovitz, <i>AMUG Chairman</i> and Todd Grimm, <i>AMUG AM Advisor</i>					International Ballroom, 2nd Floor	
	9:00am-10:00am	KEYNOTE ADDRESS: James Hobson, a.k.a. the Hacksmith <i>Hacksmith Entertainment</i> Using Additive Manufacturing to Turn Fiction into Reality					International Ballroom, 2nd Floor	
	10:00am-10:30am	BREAK					Grand Ballroom, Normandie and Boulevard, 2nd Floor	
	BREAKOUT SESSIONS BEGIN							
		AMUG PROGRAM					PLATINUM SPONSOR PROGRAM	
	ROOM	Continental A Lobby Level	Continental B Lobby Level	Continental C Lobby Level	International Ballroom 2nd Floor	PDR 2 3rd Floor	Joliet Room 3rd Floor	Astoria Room 3rd Floor
	TRACK	Aerospace/Transportation	AM Metal Technologies	Scanning & Metrology	Education & Training	Casting	PLATINUM SESSIONS	PLATINUM SESSIONS
DIAMOND & PLATINUM BOOTH AREA ACCESSIBLE 10:30am-12:00pm	10:30am-11:00am	PANEL Department of Defense Panel	WORKSHOP Part Evaluation Workshop MODERATOR Matthew Duffey, <i>EWI</i>	10:30am - 11:15am The Role of X-Ray and Computed Tomography for Additive Manufactured Parts Jacob S. Ricker <i>Pinnacle Industrial X-Ray Laboratory</i>	WORKFORCE DEVELOPMENT PROGRAM 10:30am - 11:00am Ensuring We Have The People Power To Drive The Industry Forward Paul Croft <i>The CREATE Education Project</i>	PANEL A World Shared Between 3D Printed Metal and Castings MODERATOR Edward Graham, <i>ProtoCAM</i>	Platinum Sponsor: BeAM State of the Art in DED Process Monitoring Zeke Sudbury Jeffrey Burdick <i>BeAM Machines, Inc.</i>	Platinum Sponsor: GKN Additive Building the Factory of the Future with 3D Printing Ken Burns <i>Forecast 3D, a subsidiary of GKN</i>
	11:00am-11:30am	MODERATOR Justin Artis, <i>U.S. Navy</i>	PANELIST TBA	11:15am - 12:00pm 3D DIC: The Bridge Between Simulation and Testing for Additive Manufacturing Justin Bucienski <i>Trilion Quality Systems</i>	11:00am-11:30am Attracting and Developing Tomorrow's AM Workforce: An Internship Program Case Study Michelle Pang <i>Sandia National Labs</i>	PANELIST CASTING/FOUNDRY Mike Hasher, <i>Eagle Engineered Solutions</i> Thomas Becker, <i>ACTech North America</i> Gerard Thiel, <i>University of Northern Iowa</i> DMLS/3D PRINTING Mike McLean, <i>3DPrintedParts.com</i> Sean Whittaker, <i>Incodema3D</i> Ron Adams, <i>Imperial Macine</i>	CLOSED	
	11:00am-12:00pm	PANELIST Adam Hicks, <i>U.S. Air Force</i> Jonathan Hopkins, <i>U.S. Navy</i> Kelli Blaise Wise, <i>4D Bio</i> James Zunino, <i>U.S. Army</i>			11:30am-12:00pm Training and Developing Employees for Success David Vecchio <i>FORECAST 3D</i>			
DIAMOND & PLATINUM BOOTH AREA CLOSED	12:00pm-1:15pm	NETWORKING LUNCH LOCATION: Grand Ballroom, Normandie and Boulevard, 2nd Floor						
	ROOM	Continental A Lobby Level	Continental B Lobby Level	Continental C Lobby Level	International Ballroom 2nd Floor	PDR 2 3rd Floor	Joliet Room 3rd Floor	Astoria Room 3rd Floor
	TRACK	Aerospace/Transportation	AM Technologies (Non-Metal)	Materials	Education & Training	Casting	PLATINUM SESSIONS	PLATINUM SESSIONS
DIAMOND & PLATINUM BOOTH AREA ACCESSIBLE 1:30pm-4:00pm	1:30pm-2:30pm	Boeing Additive Manufacturing Dr. Melissa Orme <i>The Boeing Company</i>	EMERGING TECHNOLOGIES MICRO SESSIONS Start-ups and New Innovations Javier Ramos, <i>Inkbit</i> Ben Arnold, <i>Fortify</i> Peter Durcan, <i>3DCeram</i> Tyler Alvarado, <i>Continuous Composites</i>	An Automotive Perspective on the Materials Development and Verification Pipeline Matthew Cassoli Giuseppe Lacaria <i>Ford Motor Company</i>	Teaching the Legal Issues of Additive Manufacturing Timothy Simpson Daniel Cahoy Christopher Higgins <i>Penn State University</i>	Printed Lost Foam Expendable Patterns in Lieu of Machined Foam Patterns Marshall Miller <i>Flowserve Corporation</i>	Platinum Sponsor: Plural Additive FFF Printing: Get the Results You Expect Ed Israel <i>Plural Additive Manufacturing</i>	Platinum Sponsor: AddUp AddUp & Oak Ridge National Laboratory - Advancing Metal Additive Manufacturing for Tooling Applications Andrew Nguyen <i>AddUp Solutions</i>
	2:30pm-3:00pm	transition						
	TRACK	Aerospace/Transportation	Medical	Materials	Education & Training	Casting	PLATINUM SESSIONS	PLATINUM SESSIONS
DIAMOND & PLATINUM AREA CLOSES PROMPTLY AT 4:00PM	3:00pm-4:00pm	Fielded Applications of Naval AM Technology Justin Artis Ryan Fisher Johnathan Hopkins Scott Ziv <i>U.S. Navy</i>	Implications of Additive Manufacturing Creating Dynamic Ankle Foot Orthoses Brent Wright <i>Eastpoint Prosthetics and Orthotics</i>	PANEL Bringing Photopolymers to Light: Discussion on Advancements in Photopolymer Materials MODERATOR Nate Schumacher, <i>Midwest Prototyping</i> PANELIST Amelia Davenport, <i>Colorado Photopolymer Solutions</i> Andrew Graves, <i>DSM</i> Steve Kranz, <i>Origin</i> Raymond Weitekamp, <i>polySpectra</i>	Incorporating Combustible Dust Controls into the Facility Design for Additive Manufacturing Processes Jason Reason <i>SEAM Group</i>	A Small Foundry, Some Additive Technology, and What Works For Us Erich Knoespel <i>Artcast Inc.</i>	Platinum Sponsor: Tekna Powder Processing in a Circular Economy Jerome Pollak Jean-François Carrier <i>Tekna</i>	Platinum Sponsor: Praxair Atomization Techniques for Improving Powder Distribution and Performance Dr. Andrew Heidloff <i>Praxair Surface Technologies</i>
	4:00pm	ALL SESSIONS CLOSED						
	5:15pm- 5:30pm	Buses leave at 5:30pm Location: Chicago Hilton, East 8th Street and Palmer House Hilton, S Wabash Avenue						
	6:00pm-10:00pm	AMUG Off-Site Dinner and Networking Event						
DIAMOND & PLATINUM AREA CLOSED								

Keynote Speaker

9:00am-10:00am

James Hobson
a.k.a. the Hacksmith
Hacksmith Entertainment



BREAKOUT SESSIONS BEGIN								
	DIAMOND SPONSOR PROGRAM				TRAINING LAB DIAMOND SPONSOR TRAINING SESSIONS			
ROOM	Waldorf 3rd Floor	Williford A/B 3rd Floor	Williford C 3rd Floor	Marquette Room 3rd Floor	Lake Ontario 8th Floor	Lake Michigan 8th Floor	Lake Huron 8th Floor	Lake Erie 8th Floor
10:30am-11:00am	Diamond Sponsor: CATI	Diamond Sponsor: Velo3D	Diamond Sponsor: Air Force	Diamond Sponsor: DMG Mori	Diamond Sponsor: HP	Diamond Sponsor: 3D Systems	Diamond Sponsor: Renishaw	Diamond Sponsor: ExOne
11:00am-11:30am	Additive Manufacturing - Trust But Verify Tim Crennen <i>CATI</i>	10:30am - 11:00am Printing Impossible Parts with Protolabs David Bentley <i>Protolabs</i> 11:00am-11:30am Dream vs. Reality for AM production Alison Park <i>Aerojet Rocketdyne</i>	Advanced Manufacturing Olympics: Help Us Bring 3D Printing to the Air Force Lily Arcusa <i>Air Force Rapid Sustainment Office</i>	How to Overcome the Challenge to Integrate AM into Your Profitable Production Nils Niemeyer <i>DMG MORI</i>	An Introduction to Creating Advanced Structures in Grasshopper James McCutcheon <i>HP</i>	Lattice Structures – Bridging the Gap between Cool Geometry and Physical Structures David Lindemann <i>3D Systems</i> 11:00am-11:30am Optimizing Serial Production with AM Software David Lindemann <i>3D Systems</i>	Practical Melting and Solidification Mechanics for Multi-laser AM Systems John Laureto <i>Renishaw</i>	Designing for Binder Jetting and Sintering Francisco Medina Ph.D. <i>University of Texas at El Paso</i> 11:00am-11:30am Simulation-Driven Workflow to Optimize Design for Additive Manufacturing (DfAM) Jaideep Bangal <i>Altair</i>
11:30am-12:00pm	CLOSED							
12:00pm-1:15pm	NETWORKING LUNCH LOCATION: Grand Ballroom, Normandie and Boulevard, 2nd Floor							
	DIAMOND SPONSOR PROGRAM				TRAINING LAB DIAMOND SPONSOR TRAINING SESSIONS			
ROOM	Waldorf 3rd Floor	Williford A/B 3rd Floor	Williford C 3rd Floor	Marquette Room 3rd Floor	Lake Ontario 8th Floor	Lake Michigan 8th Floor	Lake Huron 8th Floor	Lake Erie 8th Floor
1:30pm-2:30pm	Diamond Sponsor: Velo3D 3:00pm-3:30pm Novel Rocket Design Featuring Aerojet Rocketdyne, nTopology, and VELO3D Alison Park, <i>Aerojet Rocketdyne</i> Ryan O'Hara, <i>nTopology</i> Zach Murphree, <i>VELO3D</i> 3:30pm-4:00pm The Siemens AM-Monitor: A Necessary Puzzle Piece For Industrial 3D-Printing Jonas Eriksson, <i>Siemens Industrial Turbomachinery</i>	Diamond Sponsor: NEXA3D Breaking the Speed Barrier in Photopolymers Avi Reichental <i>Nexa3D</i>	Diamond Sponsor: Dyndrite Enable Your Purpose with Dyndrite Harshil Goel Shawn Hopwood <i>Dyndrite</i>	Diamond Sponsor: Essentium Reinventing the Factory Floor: A Discussion With Reebok Josh Lawson <i>Essentium</i> Gary Rabinovitz <i>Reebok</i>	Diamond Sponsor: BASF 130pm - 2:00pm Seating and Engine Mounts Enabled by Virtual Engineering Daniel Leutz, <i>BASF</i> Patrick Maloney, <i>Ford</i> 2:00pm-2:30pm Helmets and Footwear – Better with Virtual Engineering Design Kara Noack, Daniel Leutz <i>BASF</i>	Diamond Sponsor: Carbon How to Optimize Part Design for Carbon® Digital Light Synthesis™ Beth Bernhardt <i>Carbon</i>	Diamond Sponsor: Formlabs Generating End-Use Parts with SLA Printing and Electroplating Analisa Russo <i>Formlabs</i> Sean Wise <i>Repliform</i>	Diamond Sponsor: EOS AM Quality Workshop Fabian Alefeld Anja Loesser <i>EOS</i>
2:30pm-3:00pm	transition							
3:00pm-4:00pm	Diamond Sponsor: 3YOURMIND A Systematic Approach to Building a Highly Valuable AM Digital Warehouse Alexandre Donnadieu <i>3YOURMIND</i> Fabian Alefeld <i>EOS North America</i>	Diamond Sponsor: Formlabs Anyone Can Make Anything: The Future of 3D Printing Dávid Lakatos <i>Formlabs</i>	Diamond Sponsor: Air Force Advanced Manufacturing Olympics: Help Us Bring 3D Printing to the Air Force Lily Arcusa <i>Air Force Rapid Sustainment Office</i>	closed	Diamond Sponsor: GE Additive Understanding Qualification and Industrialization Leonhard Klein <i>GE Additive</i>	Diamond Sponsor: SLM Solutions SLM Solutions Machine Productivity: Maximizing Speed Without Sacrificing Quality Kyle Adams <i>SLM Solutions Americas</i>	Diamond Sponsor: DSM Pros and Cons of Pellet Printing vs Filament Printing Greg Costantino, <i>DSM</i> Dan Fernback, <i>JuggerBot 3D</i> Zac DiVencenzo, <i>JuggerBot 3D</i>	Diamond Sponsor: Stratasys J750 Digital Anatomy Printer: Materials and Software with the Stratasys Healthcare Team Evan Hochstein <i>Stratasys</i>
4:00pm	ALL SESSIONS CLOSED							
5:00pm- 5:15pm	Buses leave at 5:00pm Location: Chicago Hilton, East 8th Street and Palmer House Hilton, S Wabash Avenue							
6:00pm-10:00pm	AMUG Off-Site Dinner and Networking Event							

REGISTRATION - SPEAKER CENTER - MOBILE APP DESK

General Sessions and Breakouts open to all Conference Attendees

Speakers, Dates and Times subject to change without notice - updates made through mobile app

REGISTRATION and BADGE PICK-UP

Hours Open

Location

7:00am - 6:00pm

8th St North Registration, Lobby Level

Speaker Center and Mobile App Desk Open

7:00am - 4:00pm

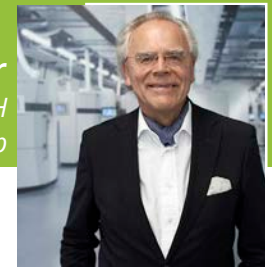
8th St South Registration, Lobby Level

DIAMOND & PLATINUM	7:30am-8:30am	BREAKFAST					Grand Ballroom, Normandie and Boulevard, 2nd Floor	
DIAMOND AND PLATINUM BOOTH AREA CLOSED	8:30am-9:00am	DRIVING INNOVATION PRESENTATION BY 2019 TECHNICAL COMPETITION WINNERS Jason Lopes, <i>AMUG TechComp Chair</i> ADVANCED CONCEPTS Erika Berg, <i>Carbon</i> - digitally printed helmet liner components and Riddell's SpeedFlex Precision Diamond Helmet ADVANCED FINISHING Maddie Frank, <i>University of Wisconsin</i> - cello, and Bill Braune/Met-L-Flo, <i>Met-L-Flo</i> - Master Chief reproduction					International Ballroom, 2nd Floor	
	9:00am-10:00am	DRIVING INNOVATION INNOVATOR SHOWCASE WITH DR. HANS LANGER Dr. Langer, <i>EOS Group</i> and Todd Grimm, <i>AMUG AM Advisor</i>					International Ballroom, 2nd Floor	
	10:00am-10:30am	BREAK					Continental A/B/C, Lobby Level	
	10:30am-11:00am	DRIVING INNOVATION 2020 TECHNICAL COMPETITION WINNERS ANNOUNCED Jason Lopes, <i>AMUG TechComp Chair</i>					International Ballroom, 2nd Floor	
	11:00am-12:00pm	AMUG Business Meeting - AMUG Board of Directors Announced					International Ballroom, 2nd Floor	
	12:00pm-1:15pm	NETWORKING LUNCH					Grand Ballroom, Normandie and Boulevard, 2nd Floor	
	BREAKOUT SESSIONS BEGIN							
	AMUG PROGRAM					PLATINUM SPONSOR PROGRAM		
ROOM	Continental A Lobby Level	Continental B Lobby Level	Continental C Lobby Level	International Ballroom 2nd Floor	PDR 2 3rd Floor	Joliet Room 3rd Floor	Astoria Room 3rd Floor	
TRACK	AM Metal Technologies	Medical	Software	Education & Training	Casting	PLATINUM SESSIONS	PLATINUM SESSIONS	
DIAMOND & PLATINUM BOOTH AREA ACCESSIBLE 1:30pm-5:30pm	1:30pm-2:30pm	PANEL Small and Medium Entry into Metal AM Experience Panel MODERATOR Matt Duffey, <i>EWI</i> PANELIST Greg Nemecek, <i>Action Mold & Machining</i> Chris Beck, <i>Innovative3D</i> TBA	1:30pm - 2:00pm How Ceramics AM Enables Breast Cancer Prevention Raymond Harter <i>Marvel Medtech</i> Dror Danai <i>Xjet</i> 2:00pm - 2:30pm It's Complicated: Scaling Medical 3D Printing Across Veterans Affairs Hospitals Beth Ripley <i>VA Hospital</i>	PANEL Simulation Tools for Additive Manufacturing MODERATOR Tim Gornet, <i>University of Louisville</i> PANELIST Brent Stucker, <i>ANSYS</i> Erik Denlinger, <i>Autodesk</i> Paree Allu, <i>Flow3D</i> Jeff Robertson, <i>Hexagon MCS Software</i> Chad Barden, <i>Siemens Atlas 3/D</i>	Polymer Part Design and the Need for Long-Term Material Performance Studies Todd Menna <i>Element New Berlin</i>	Additive Assisted Casting Methods David Rittmeyer <i>Hoosier Pattern</i> Jack Ziemba <i>Aristo-Cast</i>	Platinum Sponsor: Dinsmore PANEL Additive Manufacturing Unplugged with Insights from Industry Experts MODERATOR Jason Lopes, <i>Carbon</i> PANELIST Jay Dinsmore, <i>Dinsmore & Associates</i> Kyle Cooper, <i>Zverse</i> Bruce Bradshaw, <i>Amastan Technologies</i>	Platinum Sponsor: Arkema Material Specific Solutions for UV Curing, Powder Bed Fusion, and Filament Extrusion William Wolf Steve Serpe <i>Arkema</i>
	2:30pm-3:00pm	BREAK						
	3:00pm-4:00pm	PANEL Metal Direct Energy Deposition (DED) Processes Panel Discussion MODERATOR Mark Barfoot, <i>EWI</i> PANELIST Yash Bandari, <i>EWI</i> Nicholas Day, <i>Raytheon</i> Pavlo Earle, <i>Sintavia</i> Kent Herrick, <i>Kinetic</i> Lee Kerwin, <i>EWI</i>	PANEL Additive Manufacturing in the Biopharmaceutical Industry MODERATOR Steven Kjar, <i>Thermofisher</i> PANELIST Marc Durante, <i>Merck</i> Ryan Hammonds, <i>Solvay</i> Jeremy Pullin, <i>Sartorius</i> Michael Zumbum, <i>Sartorius-Stedim</i>	PANEL Practical Approaches to IoT and Additive Manufacturing MODERATOR Mike Vasquez, <i>3Degrees</i> PANELIST Stefanie Brickwede, <i>Mobility Goes Additive/Deutschebahn</i> Luis Criales, <i>Baxter Healthcare</i> Federico Sciamarella, <i>MxD</i> Jonas Eriksson, <i>Siemens Industrial Turbomachinery</i> Walter Voit, <i>Adaptive3D</i>	The AM Global Value Chain: Value Capture and Change Dynamics Jennifer Johns <i>University of Bristol</i>	Can a Low-Cost Industrial FDM Printer be Viable for Investment Casting Applications? Thomas Mueller <i>Mueller Additive Manufacturing</i>	Platinum Sponsor: Hexagon <i>MSC Software</i> Advances in Additive Manufacturing Simulation Technologies: MBJ Sintering, DED, and Component Repair/Restoration Jeff Robertson <i>Simufact</i>	Platinum Sponsor: Xact Metal Performance of Affordable Metal Additive Manufacturing Jonathon Hollahan <i>Xact Metal</i>
	4:00pm-4:30pm	transition						
	TRACK	AM Metal Technologies	Medical	Materials	Education & Training	AM Technologies (Non-Metal)	PLATINUM SESSIONS	PLATINUM SESSIONS
4:30pm-5:30pm	Practical Use-Cases for AM Designs in Gas Turbine Combustion Applications Zachary Dyer <i>Siemens</i>	4:30pm - 5:00pm 3D Printing Applications and Benefits in Medical Device Design Alexis Dang <i>Printerprezz</i> 5:00pm - 5:30pm 3D Image-Based Methods for Investigating Additive Manufactured Spinal Implants Kerim Genc, Ali Kiapour <i>Synapsys</i>	PANEL Flame Retardant Materials Panel Discussion MODERATOR Nate Schumacher, <i>Midwest Prototyping</i> PANELIST Dave McCann, <i>Clariant</i> Trygve Rogers, <i>Danfoss</i> Cary Baur, <i>EOS</i> Nathaniel Claussen, <i>Stratasys</i> Fred Arazan, <i>UL</i>	WORKSHOP Cast Urethane Workshop Susan Witt <i>EWI</i>	4:30pm - 5:00pm Soft Touch Tooling - A Process Redefined Andrew Roderick <i>Extol Inc</i> 5:00pm - 5:30pm Design for Large Format Additive Manufacturing Alex Roschi <i>ORNL</i>	Platinum Sponsor: ANSYS Additive Manufacturing Transformation in the Energy Business Mikhail Gladkikh <i>Baker Hughes</i> Brent Stucker <i>ANSYS</i>	Platinum Sponsor: Titan Robotics Overview of Pellet Extrusion Applications Featuring Industrial Use Cases Bill Macy <i>Titan Robotics</i>	
DIAMOND & PLATINUM AREA CLOSED	5:30pm-6:00pm	ALL SESSIONS CLOSED						
	6:00pm-10:00pm	Networking Dinner - Roaring 20's Chicago Style Location: Grand Ballroom, Normandie and Boulevard, 2nd Floor						

Innovator Showcase

9:00am-10:00am

Dr. Hans Langer
 Founder and Former CEO, EOS GmbH
 Chairman, EOS Group



12:00pm-1:15pm	NETWORKING LUNCH					Grand Ballroom, Normandie and Boulevard, 2nd Floor		
BREAKOUT SESSIONS BEGIN								
	DIAMOND SPONSOR PROGRAM				TRAINING LAB DIAMOND SPONSOR TRAINING SESSIONS			
ROOM	Waldorf 3rd Floor	Williford A/B 3rd Floor	Williford C 3rd Floor	Marquette Room 3rd Floor	Lake Ontario 8th Floor	Lake Michigan 8th Floor	Lake Huron 8th Floor	Lake Erie 8th Floor
1:30pm-2:30pm	Diamond Sponsor: 3D Systems The Industrialization of AM: High Speed Direct Production with Advanced Polymers Patrick Dunne Marty Johnson 3D Systems	Diamond Sponsor: BASF Industrialization of AM – Enabling Production Through Affordability François Minec BASF	Diamond Sponsor: Carbon Structuring Teams to Deliver 3D Printed Parts at Scale Jon Bruner Carbon	Diamond Sponsor: Formlabs How Resin Families Drive Versatility Kathy Bui Elza Chu Formlabs	Diamond Sponsor: Nexa3D NEXA3D Live Demo Marios Levi Nexa3D	Diamond Sponsor: CATI DFAM Workshop: Texture and Displacement Mapping Danny Levy CATI	Diamond Sponsor: Dyndrite Driving Next Generation Efficiency for Additive Manufacturing Steve Walton Hayden Osborn Dahlon Lyles Dyndrite	Break area
2:30pm-3:00pm	BREAK							
3:00pm-4:00pm	Diamond Sponsor: EOS Digital Foam: What It Is, Why It Matters, and How to Explore Its Potential Fabian Krauss EOS	Diamond Sponsor: SLM Solutions Understanding the Effects of Process Parameters on the Melt Pool Profile Professor Ji Ma The University of Virginia	Diamond Sponsor: DSM BAC Mono R Supercar is Driving Spare Parts Toward Additive Manufacturing Patrick Duis DSM	Diamond Sponsor: Stratsys Implementing High End Additive Jigs, Fixtures and Tooling at General Motors Malini Dusey General Motors	Diamond Sponsor: 3YOURMIND Helping Application Engineers Find the Most Valuable AM Parts for Production Alexandre Donnadieu 3YOURMIND	Diamond Sponsor: DMG Mori Integrated AM Workflow in Powder Bed AM Fred Carter DMG MORI	Diamond Sponsor: Velo3D How to Select Parts for VELO3D Support Free Manufacturing Brian Spink Velo3D	Break area
4:00pm-4:30pm	transition							
4:30pm-5:30pm	Diamond Sponsor: GE Additive Materials Engineering in Additive: From Powder to Production Lyndsay Kibler GE Additive	Diamond Sponsor: HP PANEL Unlocking the Full Potential of 3D Printing for Applications in Different Verticals MODERATOR Aaron DeLong, HP PANELIST Kyle Harvey, Extol TBA	Diamond Sponsor: Renishaw In-situ Process Monitoring and How it Can be Usefully Used in Production Context Kevin Brigden Renishaw	Diamond Sponsor: ExOne 3D Printed Tooling and Tooling-less Opportunities Using Binder Jet AM Technology Brandon Lamoncha Humtown Products	Diamond Sponsor: Air Force Visit Rapid Sustainment in Their Booth Air Force Rapid Sustainment Office	Diamond Sponsor: Essentium Toolmaking With Material Extrusion: Advantages, Materials, and Design Dr. Tom Mulholland Essentium	closed	Break area
5:30pm-6:00pm	ALL SESSIONS CLOSED							
6:00pm-10:00pm	Networking Dinner - Roaring 20's Chicago Style Location: Grand Ballroom, Normandie and Boulevard, 2nd Floor							

REGISTRATION - SPEAKER CENTER - MOBILE APP DESK

General Sessions and Breakouts open to all Conference Attendees

Speakers, Dates and Times subject to change without notice - updates made through mobile app

	Hours Open	Location
REGISTRATION and BADGE PICK-UP	7:00am - 11:00am	8th St North Registration, Lobby Level
Speaker Center and Mobile App Desk Open	7:00am - 2:00pm	8th St South Registration, Lobby Level

DIAMOND & PLATINUM	7:30am-8:30am	BREAKFAST					Grand Ballroom, Normandie and Boulevard, 2nd Floor	
DIAMOND & PLATINUM BOOTH AREA CLOSED	8:30am-9:00am	AMUG CLOSING AND FEEDBACK Jamie Cone and Andrew Allshorn, <i>AMUG Vice Presidents</i>					International Ballroom, 2nd Floor	
	9:00am-10:00am	KEYNOTE ADDRESS: Johnathan Morris, MD <i>Mayo Clinic</i> Point of Care Medical Manufacturing: The Mayo Clinic Experience					International Ballroom, 2nd Floor	
	10:00am-10:30am	BREAK					Grand Ballroom, Normandie and Boulevard, 2nd Floor	
	BREAKOUT SESSIONS BEGIN							
	AMUG PROGRAM					PLATINUM SPONSOR PROGRAM		
ROOM	Continental A Lobby Level	Continental B Lobby Level	Continental C Lobby Level	International Ballroom 2nd Floor	PDR 2 3rd Floor	Joliet Room 3rd Floor	Astoria Room 3rd Floor	
TRACK	Aerospace/Transportation	Medical	Materials	Education & Training	AM Technologies (Non-Metal)	PLATINUM SESSIONS	PLATINUM SESSIONS	
10:30am-11:00am	10:30am-11:15am Maturation of Advanced Manufacturing for Low-cost Sustainment (MAMLS) Adam Hicks <i>Air Force Research Laboratory</i>	PANEL Polymers in Production Medical and Dental Applications Shannon Van Deren, <i>Layered Manufacturing</i>	CERAMIC MATERIALS MINI-SESSION 10:30am-11:00am Additive Manufacturing of Industrial Ceramics & Components Paul Rehrig, <i>Saint-Gobain</i> 11:00am-11:30am Leveraging and Developing Additive Technologies at Sandia National Laboratories Dale Cillessen, <i>SNL</i> Shawn Allen, <i>Lithos</i> 11:30am-11:00am Additive Manufacturing of Reinforced Polymer-Derived Ceramic Kayleigh Porter, <i>HRL Laboratories</i>	Justification Strategy: Building the Right Strategy for Your Business Mark Barfoot <i>EWI</i>	10:30am-11:00am 3D Printing for Electronic Equipment Joerg Sander <i>Hensoldt</i> 11:00am-11:30am Concept to Product - Taking an Entrepreneurs Idea to Production Jessie Lea, <i>GoProto</i> 11:30am-11:00am Textures on Non-Metal 3D Printed Parts - Applications and Use Cases Jessie Lea, <i>GoProto</i>	Platinum Sponsor: Siemens Using Advances in Simulation Software to Achieve "First Time Right" Prints Chad Barden Hao Peng <i>Siemens Digital Industries Software</i>	Platinum Sponsor: Armor Can Additive Manufacturing Meet the Requirements of Sustainable Development Thanks to Co-Industrialization? Pierre-Antoine Pluvinage <i>Armor</i>	
11:00am-11:30am								
11:30am-12:00pm	11:15am-12:00pm TBA	PANELIST Evan Kuester, <i>3D Systems</i> Oleksandra Korotchuk, <i>BASF</i> Steven Pollack, <i>Carbon</i> Gabi Janssen, <i>DSM Somos</i> Al Siblani, <i>EnvisionTEC</i> Elza Chu, <i>FormLabs</i> Aaron Anderson, <i>Stratasys</i>				CLOSED	CLOSED	
12:00pm-1:15pm	NETWORKING LUNCH Location: Lower Level, Salon A, C, D, Lower Level							
	AMUG PROGRAM					PLATINUM SPONSOR PROGRAM		
ROOM	Continental A Lobby Level	Continental B Lobby Level	Continental C Lobby Level	International Ballroom 2nd Floor	PDR 2 3rd Floor	Joliet Room 3rd Floor	Astoria Room 3rd Floor	
TRACK	Aerospace/Transportation	AM Metal Technologies	Materials	Education & Training	AM Technologies (Non-Metal)	PLATINUM SESSIONS	PLATINUM SESSIONS	
1:30pm-2:30pm	Employing Additive Manufacturing for Tooling Applications within the Racing Industry Andrew Miller <i>Team Penske Racing</i>	1:30pm-2:00pm Advances in Laser-Based Metal Additive Manufacturing Manyaliyo J Matthews <i>Lawrence Livermore National Laboratory</i> 2:00pm-2:30pm Neutral Beam Technology - Production Process With Optimal Material Customization Peter Hansford, <i>Wayland Additive</i>	Creating HEA Alloys for Advanced Applications Youping Gao <i>Castheon Inc</i> Dr. Sunil Badwe <i>6K</i>	ROUNDTABLE What is Industrial 3D Printing? An Interactive Discussion Todd Grimm <i>T.A. Grimm & Associates</i>	1:30pm-2:00pm Unbundled Carbon Nanotubes Unlock AM Materials' Potential Steven Lowder Dr. Clive Bosnyak <i>MechNANO</i> 2:00pm-2:30pm Industrial Inkjet in Additive Manufacturing - Including High Viscosity Inkjet Gareth Neal, <i>Xaar</i>	Platinum Sponsor: DyeMansion Creating the New Standard for High-Value End-Use Parts Michael Schorr <i>DyeMansion</i>	Platinum Sponsor: GF Metal Additive Workflow Romain Dubreuil <i>GF Machining Solutions</i>	
2:30pm-3:00pm	BREAK							
ROOM	Continental A Lobby Level	Continental B Lobby Level	Continental C Lobby Level	International Ballroom 2nd Floor	PDR 2 3rd Floor	Joliet Room 3rd Floor	Astoria Room 3rd Floor	
TRACK	Aerospace/Transportation	AM Metal Technologies	Materials	Education & Training	Casting	PLATINUM SESSIONS	PLATINUM SESSIONS	
3:00pm-4:00pm	Interstellar's Liquid Rocket Engine Injector Brock Dennison <i>Interstellar Technologies</i>	3:00pm-3:30pm Case Study: Real-Time Melt Pool Analytics to Improve Productivity in Serial AM Production Ron Fisher, <i>Sigma Labs</i> 3:30pm-4:00pm Efficient Process Parameter Optimization Using Machine Learning Stefanus Stahl, <i>BMW</i> Annie Wang, <i>Servol</i>	3:00pm-3:30pm Enhancing the Use and Re-Use of Metal Powders for Additive Manufacturing John Yin <i>Freeman Technology</i> 3:30pm-4:00pm Does Humidity Influence the Flow Properties of Additive Manufacturing Powders? Filip Francqui <i>GranuTools</i>	ASTM and ISO Standardization Update Lauralyn McDaniel, <i>ASTM</i> Leonhard Klein, <i>ISO</i>	WORKSHOP 3:00pm-5:30pm Foundry In a Box, Pouring of Molten Metal Into Sand and Ceramic David Rittmeyer <i>Hoosier Pattern</i> Jack Ziemba <i>Aristo-Cast</i>	Platinum Sponsor: Makerbot Enabling High Performance Materials in Accessible Additive Manufacturing Dave Veisz <i>Makerbot</i>	Platinum Sponsor: Arburg System ARBURG Plastic Freeforming (APF) - Using the Prototyping Showcase of Procter & Gamble Devices Lukas Pawelczyk, <i>ARBURG</i> Franziska Kaut <i>iPMT- Innovative Prototype and Molding Technologies P&G Service GmbH</i>	
4:00pm-4:30pm	transition							
4:30pm-5:30pm	TBA	AM Metals Safety, Let's All Go Home in One Piece Every Night Paul Bates <i>UL</i>	Additive Manufacturing Options for Copper Using Lasers Melanie Lang, <i>FormAlloy</i>	REPEAT WORKSHOP Cast Urethane Workshop Susan Witt, <i>EWI</i>		Platinum Sponsor: Shining 3D Practical Applications in Metal Printing with Shining 3D Grant Michel, <i>Shining3D Technology</i>	closed	
5:30pm-6:00pm	ALL SESSIONS CLOSED							
6:00pm-10:00pm	Family Dinner and Closing Location: Grand Ballroom, Normandie and Boulevard, 2nd Floor							

Keynote Speaker

9:00am-10:00am

Jonathan Morris, M.D.
Co-Director, 3D Printing/Anatomic Modeling Laboratory
Mayo Clinic



BREAKOUT SESSIONS BEGIN								
	DIAMOND SPONSOR PROGRAM			TRAINING LAB DIAMOND SPONSOR TRAINING SESSIONS				
ROOM	Waldorf 3rd Floor	Williford A/B 3rd Floor	Williford C 3rd Floor	Marquette Room 3rd Floor	Lake Ontario 8th Floor	Lake Michigan 8th Floor	Lake Huron 8th Floor	Lake Erie 8th Floor
10:30am-11:00am	Diamond Sponsor: DMG MORI	Diamond Sponsor: 3YOURMIND	Diamond Sponsor: Dyndrite	Diamond Sponsor: SLM Solutions	Diamond Sponsor: EOS	Diamond Sponsor: BASF 10:30am-11:00am	Diamond Sponsor: GE Additive	
11:00am-11:30am	Improving Quality in Hybrid Manufacturing Processes Nitin Chaphalkar DMG MORI	How will Erpro Optimize 17,000,000 Part Production? Quality Control and Machine Connectivity Marie Thiebault 3YOURMIND	Enable Your Purpose with Dyndrite Harshil Goel Shawn Hopwood Dyndrite	SLM Solutions Machine Productivity: Addressing Overlaps in Multi-Laser Systems Michael Wais SLM Solutions	AM Quality Workshop Fabian Alefeld Anja Loesser EOS	Cost Effective Printing with BASF Metal Filament at L3HARRIS Mark Holthaus, L3HARRIS 11:00am - 11:30am Affordable, Accurate Photopolymer Production - Highlighting Dental and Medical Arnaud Guedou, BASF Oleksandra Korotchuk, BASF	Effects of Additive Parameter Development on Material Behavior Lyndsay Kibler GE Additive	Break area
11:30am-12:00pm	CLOSED							
12:00pm-1:15pm	NETWORKING LUNCH Location: Lower Level, Salon A, C, D, Lower Level						Salon A/D, Lower Level	
	DIAMOND SPONSOR PROGRAM			TRAINING LAB DIAMOND SPONSOR TRAINING SESSIONS				
ROOM	Waldorf 3rd Floor	Williford A/B 3rd Floor	Williford C 3rd Floor	Marquette Room 3rd Floor	Lake Ontario 8th Floor	Lake Michigan 8th Floor	Lake Huron 8th Floor	Lake Erie 8th Floor
1:30pm-2:30pm	Diamond Sponsor: Essentium	Diamond Sponsor: Nexa3D	Diamond Sponsor: CATI	Diamond Sponsor: Stratasy	Diamond Sponsor: HP 1:30pm-2:00pm	Diamond Sponsor: DSM	Diamond Sponsor: Formlabs	
	Using a Digital Workflow to Unlock the O&P Industry: Insights From Vorum Garrett Harmon Essentium Chris Handford Vorum	The Making of Nexa3D's LSPc Technology Izhar Dror Medalsy Nexa3D	Taking Full Advantage of Photo-Realistic Color 3D Printing Simonas Indrele CATI	Hands-On: Using Polymer 3D Printing for Large Composite Structure Manufacturing in Space Blaine Baker Northrop Grumman Space is limited	From Concept to Final Part - HP 3D Printing Design Process of Bluetooth Speaker Aaron DeLong, HP 2:00pm-2:30pm The Right 3D Process for the Right 3D Design: The Importance of Dimensional Tolerances and Value of Statistical Process Control Edward Davis, HP	Increasing Stereolithography Operation Efficiency and Resin Life John Schaefer DSM	New Additive Manufacturing Solutions with Hybrid Workflows Kevin Gautier Formlabs	Break area
2:30pm-3:00pm	BREAK							
3:00pm-4:00pm	closed	closed	closed	Diamond Sponsor: 3D Systems AM Production of Large Scale, High Precision Investment Casting Patterns for Metal Parts Evan Kuester 3D Systems	Diamond Sponsor: Renishaw Practical Melting and Solidification Mechanics for Multi-laser AM Systems John Laureto Renishaw	Diamond Sponsor: Carbon How to Successfully Select Applications for Carbon® Digital Light Synthesis™ Brittany Hancock Carbon	Diamond Sponsor: ExOne 3:00pm-3:30pm Ceramic Materials with Binder Jet Additive Manufacturing Jesse Blacker ExOne 3:30pm - 4:00pm ExOne User Group - closed session ExOne	Break area
4:00pm-4:30pm	transition							
4:30pm-5:30pm	ALL SESSIONS CLOSED							
5:30pm-6:00pm								
6:00pm-10:00pm	Family Dinner and Closing Location: Grand Ballroom, Normandie and Boulevard, 2nd Floor							

COMPANY	BOOTH	COMPANY	BOOTH	COMPANY	BOOTH	COMPANY	BOOTH
3D Systems	D8	Elementum 3D	27	Metal Powder Industries Federation	48	Sintratec	14
3DCERAM SINTO INC	11	EnvisionTEC, Inc.	P13	MET-L-FLO Inc	37	SLM Solutions Americas	D24
3Degrees	22	EOS	D1	Midwest Prototyping, LLC	71	SPEE3D Inc.	56
3YOURMIND	D6	Essentium, Inc.	D11	Mimaki USA	80	STEREO LITHOGRAPHY ASSOCIATES SALES COMPANY	58
6K Additive	67	EWI	63	Nabertherm, Inc.	17	Stratasys	D13
AddUp Inc	P3	ExOne	D15	Nexa3d, Inc.	D5	Tekna	P10
Aerojet Rocketdyne	24	Fabrisonic LLC	6	Next Manufacturing	16	Tethon 3D	72
Air Force Rapid Sustainment Office	D17	FARSOON AMERICAS CORP.	45	Nikon Metrology	38	Teton Simulation	75
AlphaSTAR Corporation	53	Fast Radius, Inc.	46	North Star Imaging	43	TIGER-VAC INC.	36
Ansys, Inc.	P4	FLOW-3D AM	42	nTopology	50	Titan Robotics, Ltd.	P15
ARBURG GmbH + Co KG	P12	Formalloy	89	Ophir/ A Division of MKS Instruments	33	trinckle 3D GmbH	51
Arkema Inc.	P16	Formetrix Metals	8	Paxis LLC	70	TRUMPF Inc.	78
ASM International	49	Formlabs	D4	Photocentric	90	Ultimaker	P21
ASTM International Additive Manufacturing Center of Excellence	41	Fortify	65	Pivot AM Service	47	University of Louisville	55
Aurora Labs	68	GE Additive	D14	Plural Additive Manufacturing	P6	VacuCoat Technologies, Inc.	29
Authentise	76	GEFERTEC	10	polySpectra	87	VAC-U-MAX	74
BASF 3D Printing Solutions	D3	GF Machining Solutions	P1	PostProcess Technologies	P18	VELO3D	D7
BeAM Machines Inc	P2	GKN Additive	P26	Praxair Surface Technologies	P19	Vigor Tech USA LLC	30
Bel Air Finishing Supply	34	Global Advanced Metals	35	Pressure Technology, Inc.	23	Vorti-Siv	73
BigRep	P24	GoProto, Inc.	85	PRODWAYS	54	voxeljet America Inc.	39
Bluestreak I Bright AM	60	GPI Prototype & Manufacturing Services	40	Quintus Technologies LLC	86	Xact Metal	P14
BRAYN CONSULTING LLC	4	GRANUTOOLS	12	Raise3d Technologies, Inc.	81	XYZprinting, Inc.	13
Carbon	D2	H.C. Starck Solutions	32	Ramco Equipment	59	ZEISS Industrial Quality Solutions	5
CBG Biotech	9	Hexagon MSC Software	P20	Rapid Prototyping Services	66		
CIDEAS Inc.	69	HK Technologies	31	Rapidia Tech Inc.	62		
Cimquest, Inc	82	Hoganas AB	61	Renishaw, Inc.	D23		
Colorado Photopolymer Solutions	26	HP Inc	D22	RePliForm	79		
Computer Aided Technology (CATI)	D18	IMR Test Labs	1	RIZE INC.	88		
Covestro, LLC	P7	INTAMSYS	57	RP America	64		
Curtiss-Wright Surface Technologies	2	Keynote Photonics	28	RPS - Industrial 3D Printing Systems	83		
Dassault Systemes	15	Kimya - Additive Manufacturing by ARMOR	P11	Ruwac USA	7		
Desktop Metal	P22	kittyhawk	25	Sandvik Additive Manufacturing	19		
Dinsmore Inc.	P5	LINK3D, Inc.	20	Sciaky, Inc.	52		
DMG MORI	D9	Lithoz America, LLC	21	SEAM Group	3		
DSM Additive Manufacturing	D12	MakerBot	P25	Senvol	77		
DyeMansion	P9	Markforged	18	SHINING 3D	P8		
Dyndrite Corporation	D10	Materialise	P17	Siemens Digital Industries Software	P23		
		MatterHackers	84	Sigma Labs Inc.	44		

pass between Salon D and A

Freight Area

Freight/Service Area

ELEVATORS

LOWER LEVEL

OFFICE A

OFFICE B

JUSTICE ROOM

MOBILITY ROOM

PARCEL CENTER

RED OAK TECHNOLOGY CENTER

Info Desk

Scholarship / Tech Comp Lounge

Media Lounge

Basia Hair Design

Salon B

Salon A

Salon D

Salon C

Salon E

Salon F

Salon G

Salon H

Salon I

Salon J

Salon K

Salon L

Salon M

Salon N

Salon O

Salon P

Salon Q

Salon R

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Salon IX

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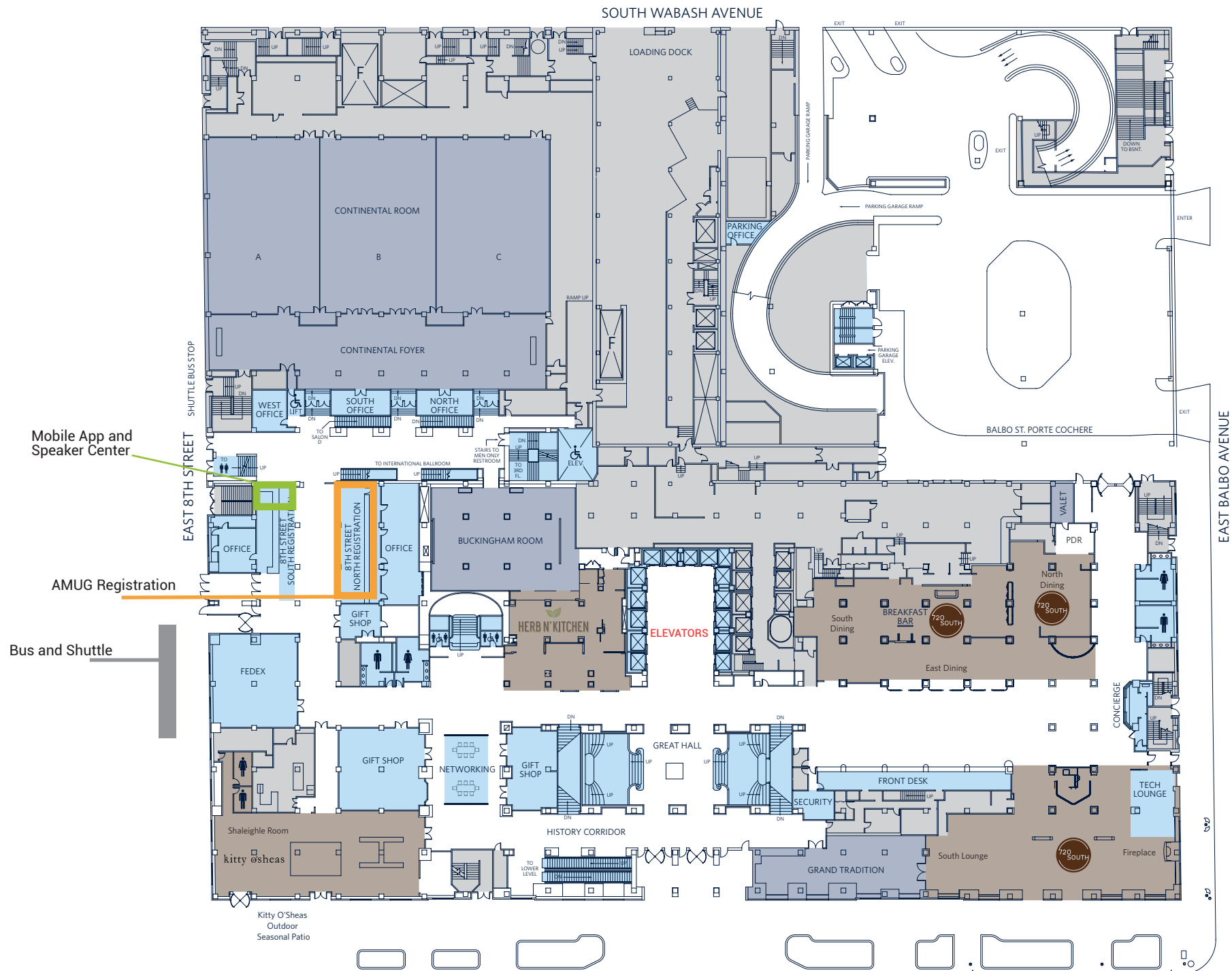
Salon JY

Salon JZ

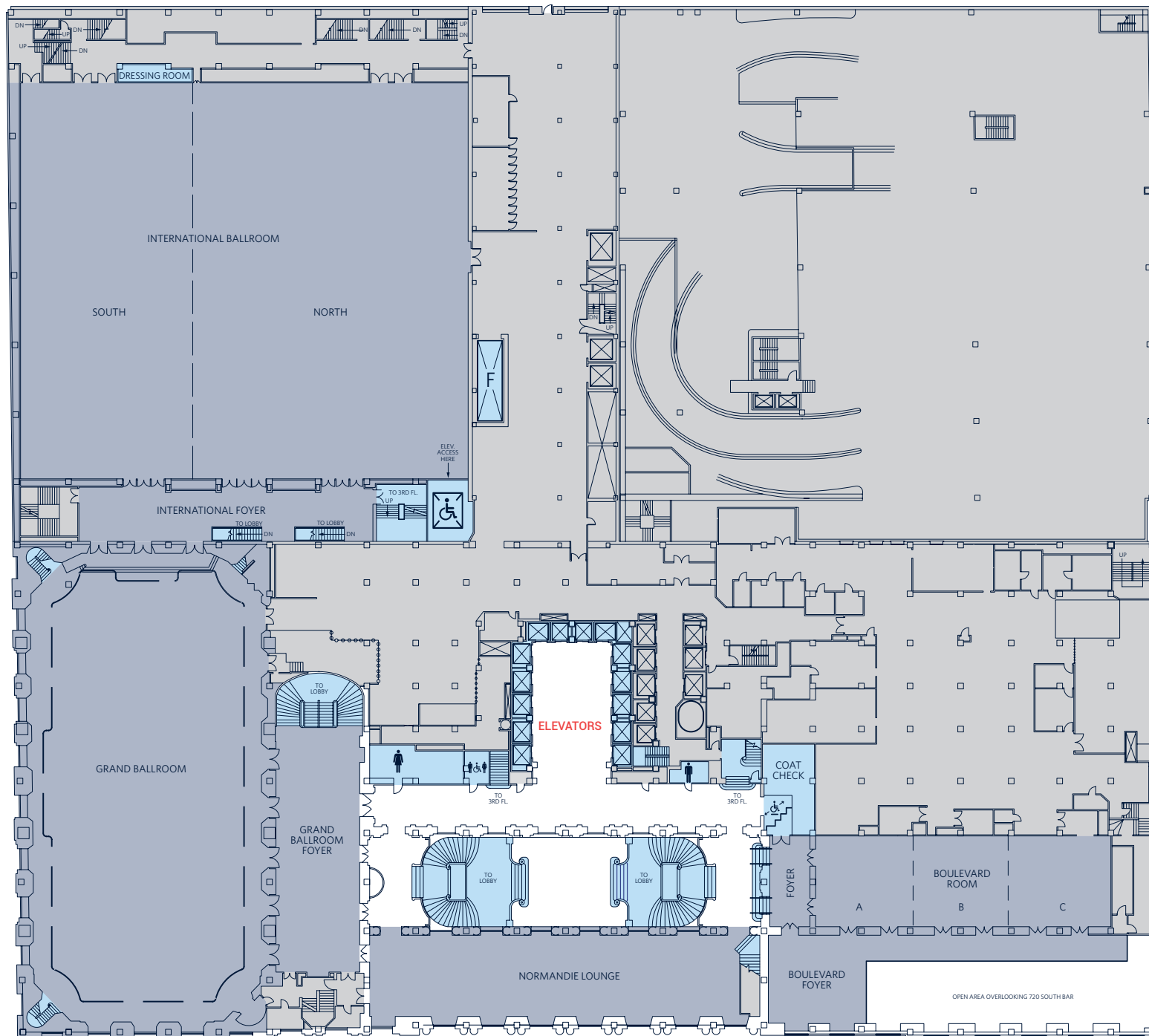
Salon KA

Salon KB

Technical Competition Area
Monday, March 23
6:00pm-10:00pm

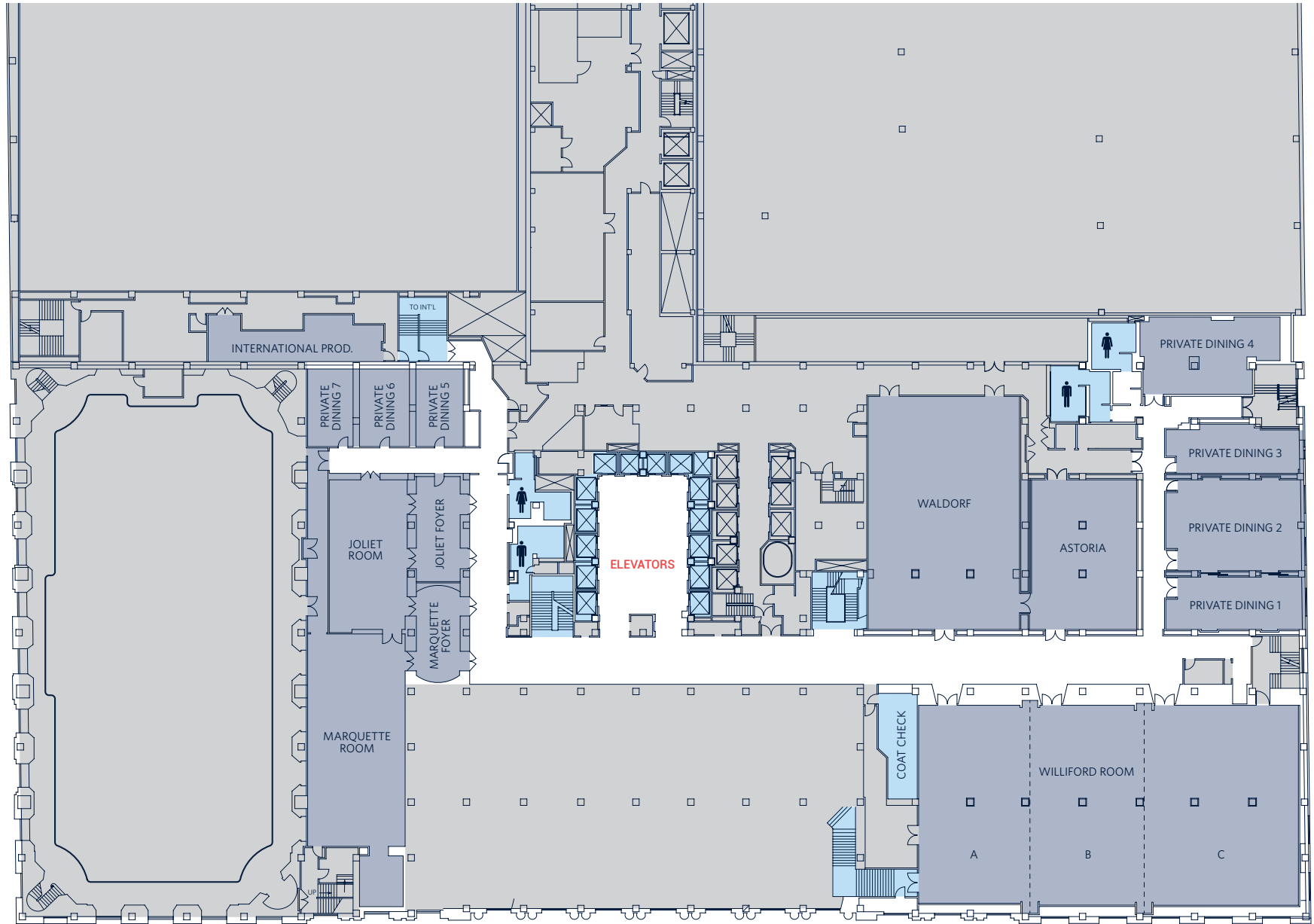


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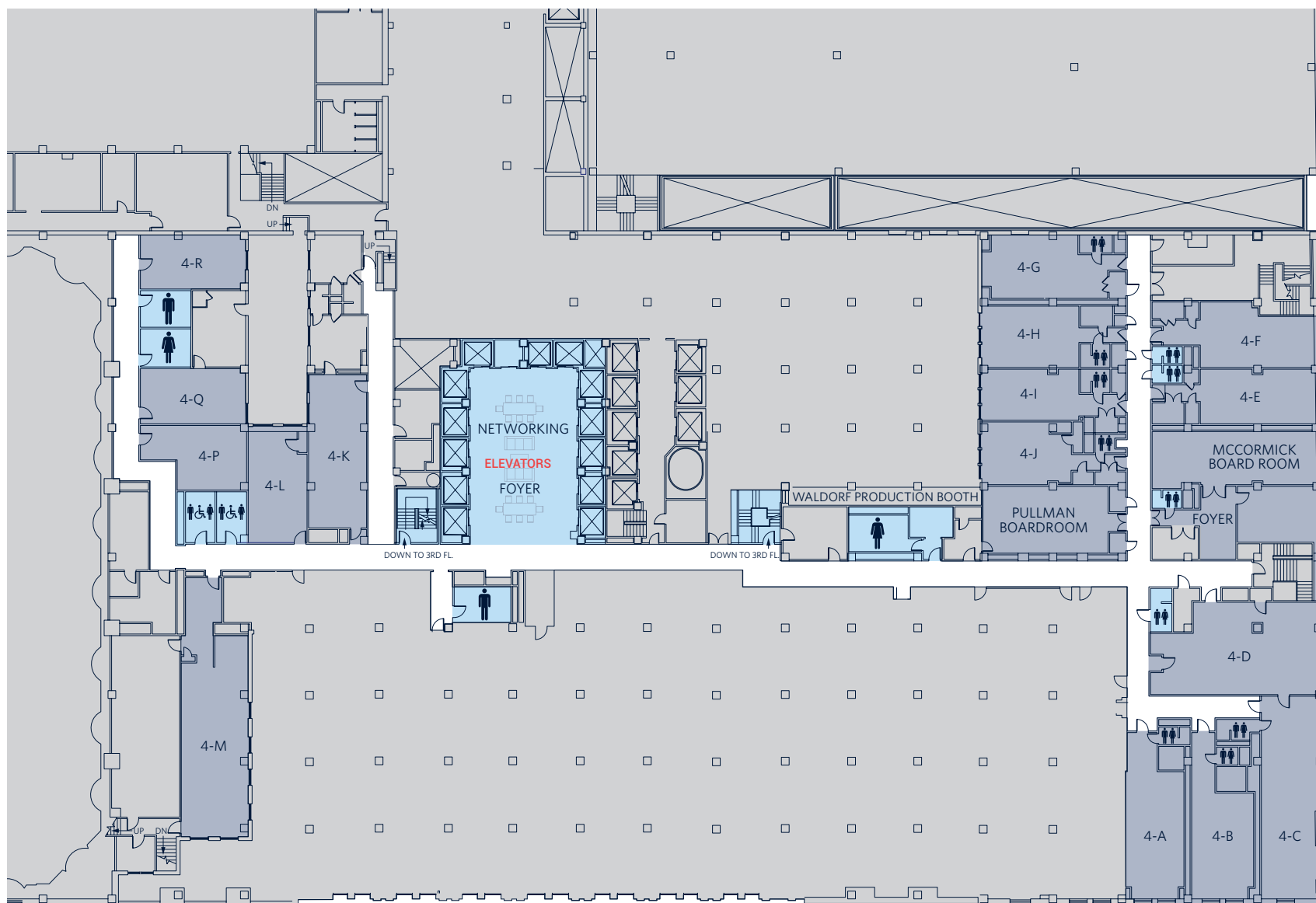


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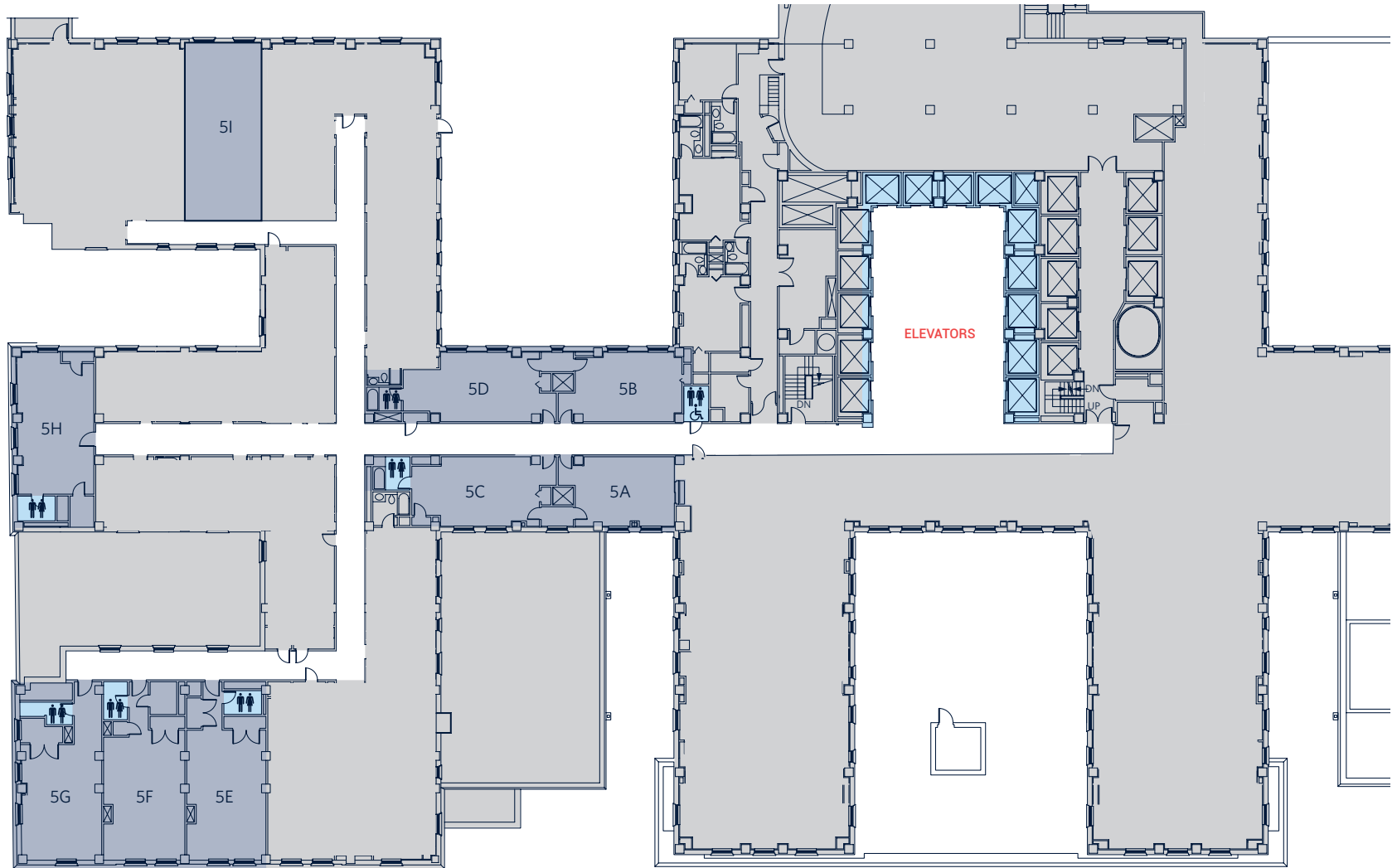
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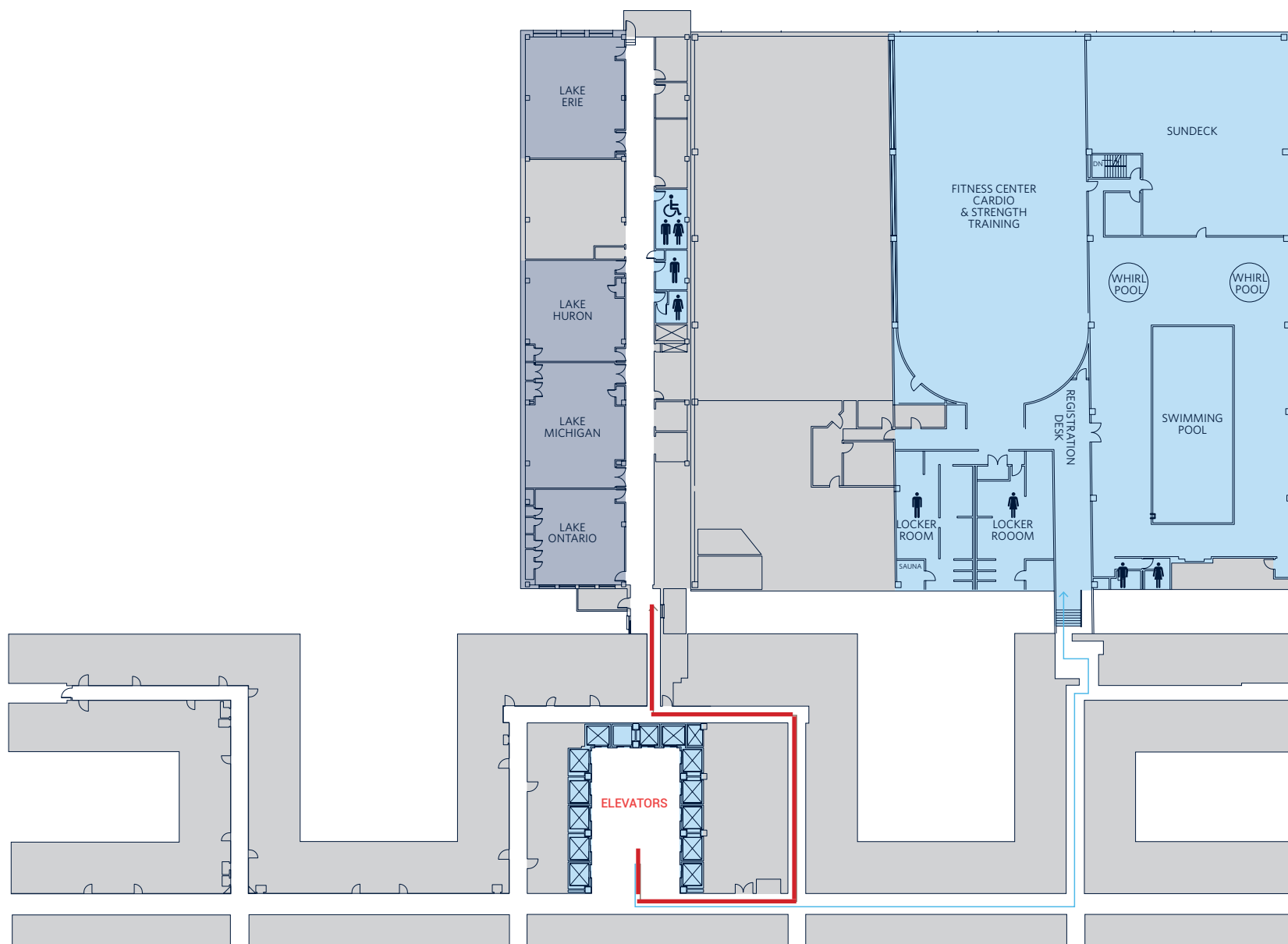
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