Registration Hours

Monday, May 8	7:00 AM - 4:30 PM
Tuesday, May 9	7:00 AM - 5:00 PM
Wednesday, May 10	7:00 AM - 5:00 PM
Thursday, May 11	7:00 AM - 1:00 PM

Exhibit Hours

Tuesday, May 9	10:00 AM - 6:00 PM
Wednesday, May 10	10:00 AM - 6:00 PM
Thursday, May 11	10:00 AM - 2:00 PM

rapid + tct | medical manufacturing MMI innovations series

May 8 - 11, 2017 | David L. Lawrence Convention Center | Pittsburgh, Pennsylvania USA

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Monday, May 8

7:00 AM - 4:30 PM — Registration

8:00 AM - Noon
Facility Tours

All morning programming runs concurrently
Choose Only One

8:00 AM - 1:00 PM
Workshops and Review Course

- Facility Tour — Arconic (Alcoa)
- Facility Tour — ExOne
- Casting Processes and Materials — Room: 310/311 — Zayna Connor PhD — American Foundry Society
- Bioprinting Fundamentals — Room: 321 — Roger Narayan, UNC/NCSU Joint Department of Biomedical Engineering; Phil Campbell, Carnegie Mellon University; Prashant Kumta, University of Pittsburgh; Adam Feinberg, Carnegie Mellon University; Ken Church, nScrypt
- Realizing Value with Additive Manufacturing — Room: 317/318 — Mark Cotteleer; Jim Joyce; Kelly Marchese; Mark Vitale; Brenna Sniderman — Deloitte LLP
- Regulatory & Quality System Considerations for 3D Printed Medical Devices — Room: 319 — Matthew DiPrima, Food & Drug Administration; Kim Torluemke, 3D Systems; Janelle Schrot & Jenny Jones, Materialise; Beatrice Ogembo, American Preclinical Services; Gilbert Cortes, Johnson & Johnson
- 3D Printing in Hospitals: What You Need to Know320 — Room: 320 — Jonathan Morris MD, Mayo Clinic; Jane Matsumoto MD, Mayo Clinic; Andy Christensen, LimbForge; Amy Alexander, Mayo Clinic; Nicole Wake, New York University; Adam Jakus, Northwestern University
- Fundamentals of Additive Manufacturing — Room: 301/302 — Graham Tromans — GP Tromans Associates
- Fundamentals of 3D Scanning and 3D Modeling — Room: 304/305 — Giles Gaskell — Wenzel America Ltd
- Metal Part Fabrication Using Additive Manufacturing Technologies — Room: 315/316 — Frank Medina PhD, EWI
- Additive Manufacturing with Metals & Its Impact on Plastic Injection Molding — Room: 306/307
- Additive Manufacturing Certification Review Course — Room: 334

Kickoff
1:30 PM - 5:00 PM

Spirit of Pittsburgh Ballroom

- SME Additive Manufacturing Community Awards — Dick Aubin Distinguished Paper Award; Direct Digital Competition Award; Industry Achievement Award
- State of America Makes — Rob Gorham, Director of Operations
- KEYNOTE — Networked Matter and the Nature of Things — Mikey McManus — Chairman, MAYA and Research Fellow Office of CTO/Future of Learning Autodesk
- What's New: Roundup of the Latest 3D Printing and 3D Scanning Products — Todd Grimm — President — T.A.Grimm & Associates Inc
- PANEL — Transformation of Manufacturing — Vyomesh Joshi, President & Chief Executive Officer, 3D Systems; Stephen Nigro, President-3D Printing, HP; Greg Morris, Additive Technologies Leader, GE Aviation; Fried Vancraen, Founder & CEO, Materialise

Tuesday, May 9 - morning

7:00 AM - 5:00 PM	Registration
8:00 AM - 9:45 AM **Spirit of Pittsburgh Ballroom**	PANEL New Frontiers in Metal 3D Printing Ric Fulop, CEO, Desktop Metal Kyle Nel, Founder & Executive Director, Lowe's Innovation Labs, Lowe's Companies Inc Don Jones, Director, Global Aftermarket Parts Strategy and Transformation, Caterpillar Inc KEYNOTE Brilliant Factory: A New Era of Manufacturing Phillippe Cochet, Executive Vice President, GE sponsored by: Desktop Metal
9:00 AM - 2:00 PM	Student Summit
10:00 AM - 6:00 PM	Show Open
10:00 AM - 5:00 PM	3D Playground Activities America Makes ACADEMI ADX ToolingU-SME Manufacturing Challenge

Concurrent AM Sessions 10:15 AM - 12:15 PM

3D Imaging / Scanning: CT Scanning
Room: 301/302

10:15 AM - 10:40 AM
Dynamic Industrial CT: Its Benefits Within Manufacturing and Inspection (Intermediate)
Alex Doukas
Kinetic Vision

10:45 AM - 11:10 AM
New Advances in Computed Tomography Helping Accelerate Development & Quality of Additive Manufacturing Products & Processes (Intermediate)
Brett A. Muehlhauser
North Star Imaging

11:15 AM - 11:40 AM
High Resolution to High Volume: Keys to Controlling Industrial Processes (Intermediate)
Leah L. Lavery PhD & Luke Hunter
Carl Zeiss X-ray Microscopy Inc

11:45 AM - 12:10 PM
Assessing the Internal Features of Additive Manufactured Parts (Expert)
Herminso Villarraga-Gómez
Nikon Metrology Inc

Digital Thread & Standards Power Up
Room: 310/311

10:15 AM - 10:25 AM
Additive Manufacturing Standards Development Roadmap (Intermediate)
Lauralyn McDaniel, SME and Jim Williams, All Points Additive

10:30 AM - 10:40 AM
Framework for Developing Additive Manufacturing Standards (Expert)
Mohsen Seifi PhD
ASTM International

10:45 AM - 10:55 AM
American Welding Society D20 Committee Development of a Metal Additive Manufacturing Standard (Intermediate)
Jessica Coughlin
Naval Nuclear Laboratory

11:00 AM - 11:10 AM
An Open Material Database for Additive Manufacturing (Novice)
Yan Lu
National Institute of Standards and Technology

11:15 AM - 11:25 AM
Cybersecurity Risks in Additive Manufacturing (Intermediate)
Kelly K. Marchese
Deloitte Consulting and Gregg Schmidtetter
Deloitte & Touche LLP

11:30 AM - 11:40 AM
A Copyright Protection Technology for 3D Printing Models (Novice)
John Choi PhD
MarkAny

11:45 AM - 11:55 AM
The Intersection of 3D Printing and Intellectual Property (Novice)
Christopher Higgins & Vann Pearce
Orrick Herrington & Sutcliffe LLP

Noon - 12:10 PM
Covert Fingerprints for Intellectual Property Protection of Metal 3D Printing (Novice)
Sharon Flank PhD
InfraTrac

Post Processing I
Room: 304/305

10:15 AM - 10:40 AM
3D Printing: The Impact of Post-processing (Novice)
Frank Marangell
Rize Inc

10:45 AM - 11:10 AM
Post-processing - The Untold Story Regarding Industrial Resin Based 3D Printing (Novice)
Edward T. Graham
ProtoCAM

11:15 AM - 11:40 AM
Automation of Post-Processing Through Energy Optimization
Daniel Hutchinson & Michael Frauens
PostProcess Technologies

11:45 AM - 12:10 PM
Integration of PAAW and Digital Workholding for Post-processing Additive Manufactured Parts (Expert)
Chip Potter
Advanced Simulation Technology Inc and
Edward C. De Meter PhD
Pennsylvania State University

Casting I
Room: 303

10:15 AM - 11:40 AM
MetalCasting Seminar - Integrating Design Efficiency with Additive Manufacturing to Improve Time to Market (Novice)
Zayna Connor PhD
American Foundry Society

11:45 AM - 12:10 PM
Beyond Prototyping: The Future of Printed Patterns in Investment Casting (Novice)
Thomas J. Mueller
Mueller AMS

Applications
Room: 317/318

10:15 AM - 10:40 AM
SLM-Optimization of Aero-Engine Components: SLM Bleed Valve (Intermediate)
Scott P. Lathrope
Meggitt Control Systems

10:45 AM - 11:10 AM
Direct Digital Manufacturing of Flight Hardware for Unmanned Aircraft Systems (Intermediate)
Shayne A. Kondor & Warren Lee
Georgia Tech Research Institute

11:15 AM - 11:40 AM
3D Scanning/Printing for the Automotive Restoration and Customization Industry (Novice)
Paul A. Vorbach & William R. Vorbach
HV3Dworks LLC

11:45 AM - 12:10 PM
Development of Additive Manufactured Production Parts at Caterpillar (Intermediate)
Paul A. Zwart
Caterpillar Inc

Materials I
Room: 319/320/321

10:15 AM - 10:40 AM
The Value of Traditional Manufacturing Materials in the Age of Digital Fabrication (Intermediate)
Graham Bredemeyer
Collider

10:45 AM - 11:10 AM
Effect of 3D Printing Process Parameters on Electrical & Mechanical Properties of Nylon/PEEK-CNT Composite (Intermediate)
Yan Shao PhD
Eaton

11:15 AM - 11:40 AM
From Desktop 3D Printing to Large Area Additive Manufacturing - The Challenges of Polymer Development (Intermediate)
Kevin Cable PhD & Ed Ferber
Eastman Chemical Company

11:45 AM - 12:10 PM
The Impact of 3D Printing on Part Performance (Intermediate)
Thomas Fabian PhD & Melissa Albrecht
UL

Business & Economic Considerations - Execution I
Room: 315/316

10:15 AM - 10:40 AM
A 73 Year-Old Machine Shop's Journey into Metal Additive Manufacturing (Novice)
Wesley J. Hart & Christian G. Joest
Imperial Machine & Tool Co

10:45 AM - 11:10 AM
Additive Manufacturing - From Fiction to Factory (Novice)
John Dulchinos
Jabil

11:15 AM - 11:40 AM
Adaptive Manufacturing with Universal Metrology Automation (Intermediate)
Paul M. Oberle
3D Infotech

11:45 AM - 12:10 PM
Improving Industrial 3D Printing with MRP Integration, Big-O Analysis, and Generative Geometry (Intermediate)
Michael Crockett PE
HP

MMI: Clinical Applications I
Room: 306/307

10:15 AM - 10:25 AM
Low Cost and Equipment Methods to Create Flexible Anatomical Models (Novice)
Joseph P. Higgins
Cardiovascular Systems Inc

10:25 AM - 10:45 AM
Development of Low Cost Hand Prostheses by Additive Manufacturing (Expert)
Jorge Lino Alves PhD & Daniel Sousa Ferreira
University of Porto / Faculty of Engineering

10:45 AM - 10:55 AM
Additive Manufacturing of Silicone Prosthetic Implants with Heterogeneous Properties (Intermediate)
Farzad Liravi & Ehsan Toyserkani PhD
University of Waterloo

10:55 AM - 11:05 AM
Development of a Custom Ankle-Foot Orthothis (Novice)
Arif Sirinterlikci PhD & April Krivoniak
Robert Morris University

11:05 AM - 11:15 AM
Simulation of Coronary Atrial Intervention Challenges, Learnings, and Final Methods (Intermediate)
Joseph P. Higgins
Cardiovascular Systems Inc

11:15 AM - 11:40 AM
Using 3D Printing (Additive Manufacturing) to Produce Low Cost Simulation Models for Medical Training (Novice)
Peter C. Liacouras PhD
Walter Reed National Military Medical Center, Department of Radiology

Show Floor Theater
Booth 2321

10:30 AM – 11:30 AM
Tech Briefing: Fundamentals of 3D Scanning

11:30 AM – 12:30 PM
Why TECH-BELT?
America Makes and the Youngstown Business Incubator are presenting a series of short presentations from various regional Additive Manufacturing organizations. Each presenter will focus on "Why the Cleveland to Pittsburgh TECH-BELT Corridor is the nation's hub for 3D Printing and Additive Manufacturing". A panel discussion will follow to allow for questions.

12:30 PM – 1:30 PM
Innovation Auditions

1:30 PM – 2:30 PM
ITEAM Launch

10:30 AM - 11:30 AM	Attendee Show Floor Tour
12:15 PM - 2:15 PM	Lunch on Exhibit Floor

as of 5/5/2017

Tuesday, May 9 - afternoon

2:00 PM - 3:00 PM — Attendee Show Floor Tour: Metal Additive Manufacturing

Concurrent PM Sessions 2:15 PM - 4:15 PM

3D Imaging / Scanning: Surface Scanning
Room: 301/302

2:15 PM-2:40 PM
Longer Range Point Cloud Scanning and 3D Printers Used in the Production and Sale of Large Mining Haul Truck Components (Intermediate)
LeRoy G. Hagenbuch PE & Quinton Burcar
Philippi-Hagenbuch Inc

2:45 PM-3:10 PM
Techniques and Methods for 3D Scanning Internal Geometry with Replicating Rubber (Novice)
Steven B. Lelinski
Advanced Simulation Technology Inc

3:15 PM-3:40 PM
Non-Contact Methds for Validating Industrial and Additive Manufacturing Parts
Ryan Timboe
Industrial Inspection & Analysis Inc

3:45 PM-4:10 PM
3D Scanning Accuracy vs Resolution: Why it Matters and What it Means (Intermediate)
Mike Formica
threeRivers 3D

Direct Write Printed Materials / Electronics
Room: 317/318

2:15 PM - 2:40 PM
Fabrication of Multifunctional 3D Printed Devices via a Multitechnology Hybrid Printer (Intermediate)
David Espalin, W.M. Keck Center for 3D Innovation / UTEP

2:45 PM - 3:10 PM
3D Printing of Soft Electronics & Functional Microfluidics via Liquid Metal Direct-Writing (Intermediate)
Dishit P. Parekh
North Carolina State University

3:15 PM - 3:40 PM
3D Printed Devices Employing Sculpted Dielectrics (Advanced)
Raymond C. Rumpf PhD
University of Texas at El Paso

3:45 PM - 4:10 PM
Powdered Metals - What to Expect When You Build Metal Additively (Intermediate)
Himanshu Sahasrabudhe PhD
Optomec Inc

Post Processing II
Room: 304/305

2:15 PM - 2:40 PM
Multiscale Post-processing of Metal Additive Manufactured Parts by Electro-polishing Technology (Intermediate)
Lucas Hof
Concordia University

2:45 PM - 3:10 PM
CoolPulse Technology for Finishing of 3D Printed Parts (Intermediate)
Patrick Matt
Extrude Hone

3:15 PM - 3:40 PM
Surface Finish Control of Additive Manufactured-Inconel 625 Components Using Combined Chemical-abrasive Polishing (Intermediate)
Neda Mohammadian
Polytechnique de Montreal and Sylvain Turenne PhD
Ecole Polytechnique de Montreal

3:45 PM - 4:10 PM
Improving Mechanical Performance of Additive Manufactured Components by Chemical Accelerated Vibratory Finishing (Intermediate)
Agustin Diaz PhD
REM Surface Engineering

Casting II
Room: 303

2:15 PM - 2:40 PM
3D Printing - The Pattern Makers Friend (Novice)
Steven R. Murray
Hoosier Pattern Inc

2:45 PM - 3:10 PM
Ceramic Additive Manufacturing for Complex Precision Castings (Intermediate)
Dan Z. Sokol
Renaissance Services Inc and Ben Rampulla
PCC Structurals

3:15 PM - 3:40 PM
Multifunctional Composite Lattice Structures by Embedding in 3D Printed Sand Molds (Intermediate)
Christopher Williams PhD & Alan Druschitz
Virginia Tech

3:45 PM - 4:10 PM
Prototype Castings, Shorter Lead Times for Less Money (Intermediate)
David W. Rittmeyer
Hoosier Pattern Inc

Design Considerations
Room: 315/316

2:15 PM - 2:40 PM
A Computer-Aided Design System for Additive Manufacturing (Intermediate)
David W. Rosen PhD
Georgia Institute of Technology and Suraj Musuvathy PhD
Siemens Corporate Technology

2:45 PM - 3:10 PM
An Additive Design Revolution (Expert)
Ted D. Blacker PhD
Sandia National Laboratories

3:15 PM - 3:40 PM
A Topology Optimization Paradigm for Additive Manufacturing (Intermediate)
Ahmad Barari PhD PEng & Amirali Lalehpour
University of Ontario Institute of Technology

3:45 PM - 4:10 PM
Hollow Metal Additive Manufacturing versus Conformal Cooling (Intermediate)
Scott Kraemer
PTI Engineered Plastics

Material Properties I
Room: 319/320/321

2:15 PM - 2:40 PM
Metallographic Characterization Techniques for Additive Manufacturing Powders and Parts (Novice)
Thomas F. Murphy
Hoeganaes Specialty Metal Powders LLC

2:45 PM - 3:10 PM
Z-axis Anisotropy Study of Additively Manufactured Components (Expert)
Ravi Kunju
solidThinking Inc

3:15 PM - 3:40 PM
Fracture Mechanics of Additively Manufactured Plastic Parts (Intermediate)
Devendra Bajaj PhD & Peter Johnson PhD
SABIC

3:45 PM - 4:10 PM
Fatigue Life Prediction for AlSi10Mg Parts Produced by Selective Laser Melting (Intermediate)
Ming Tang & Petrus Pistorius PhD
Carnegie Mellon University

Additive Manufacturing Standardization Forum
Room: 310/311

2:00 PM – 5:00 PM
Additive Manufacturing Standardization Forum: Accelerating Standards & Specs Development

Welcome
Debbie Holton, SME & Ed Morris, America Makes

Additive Manufacturing Standards Collaborative Overview: Jim McCabe, ANSI

Panel 1: Moderated by Jim Williams, All Points Additive and AMSC Chair

Pat Picariello, ASTM Intl; Jennifer Herron, Action Engineering, Chair of the ASME Y14 Subcommittee; Laura Feix, SAE International

Panel 2: Moderated by Lauralyn McDaniel, SME and AMSC Vice Chair

Annette Alonso, AWS; Allan Noordvyk, McKesson Imaging, MITA, DICOME WG-17 Co-chair; Joe Lewelling, AAMI; Paul Tykodi, Tykodi Consulting, IEEE-ISTO Printer Working Group

Individual meetings with Standards Development Organizations

MMI: Clinical Applications II
Room: 306/307

2:15 PM - 2:40 PM
Retro Engineering the Feyh-Kastenbauer Retractor System for Transoral Robotic Surgery Using Surface Scanning & 3D Printing (Intermediate)
Jonathan Morris MD
Mayo Clinic

2:45 PM - 2:55 PM
3D Printed Wear Model to Simulate Tissue Ablation: Equipment, Materials, Technologies, and Tools Used by Interventionalists (Intermediate)
Jacob Draxler & Joseph P. Higgins
Cardiovascular Systems Inc

2:55 PM - 3:15 PM
Single Institution Experience in 3D Modeling of Congenital Heart Defects (Novice)
Robert Wesley
Nicklaus Children's Hospital

3:15 PM - 3:40 PM
Creation of Functional Finger Prostheses Combining 3D Printing with Traditional Materials (Intermediate)
Irene R. Healey
New Attitude Prosthetic Designs Inc

3:45 PM - 4:10 PM
Separating Conjoined Twins: Applying Virtual Surgical Planning and 3D Printing (Intermediate)
Hayeem L. Rudy
Albert Einstein College of Medicine and Katie Weimer
3D Systems - Healthcare

Show Floor Theater
Booth 2321

2:30 PM – 3:30 PM
Tech Briefing: Fundamentals of Additive Manufacturing

3:30 PM – 5:00 PM
Technology LaunchPad

6:00 PM - 8:00 PM — Welcome Event: Heinz Field

Wednesday, May 10 - morning

7:00 AM - 5:00 PM — Registration

8:00 AM - 9:45 AM
Spirit of Pittsburgh Ballroom

KEYNOTE
New Materials for 3D Printing in Medicine: What's Next is Closer than You Think
Ramille Shah PhD, Assistant Professor, Materials Science and Engineering, Assistant Professor, Surgery (Transplant Division), Northwestern University
Sue Jordan MD PhD, Chief Resident-Plastic and Reconstructive Surgery, Northwestern Memorial Hospital

PANEL
Medical 3D Printing Applications-Growth Beyond Surgical Guides
Ramille Shah PhD, Assistant Professor, Materials Science and Engineering, Assistant Professor, Surgery (Transplant Division), Northwestern University
Carlos Carvalho, Process & Materials Development, EnvisionTEC
William Wagner, Director, McGowan Institute for Regenerative Medicine, Professor of Surgery, Bioengineering and Chemical Engineering, University of Pittsburgh
Fried Vancraen, Founder & CEO, Materialise

sponsored by: materialise — innovators you can count on

9:00 AM - 2:00 PM — Student Summit

10:00 AM - 5:00 PM — 3D Playground Activities | America Makes ACADEMI ADX | ToolingU-SME Manufacturing Challenge

Concurrent AM Sessions 10:15 AM - 12:15 PM

Academic Research I
Room: 303

10:15 AM - 10:40 AM
Combinatorial Assessment of High Entropy Alloys: Micro-structure, Microhardness, and Magnetic Properties (Expert)
Tushar Borkar PhD
Cleveland State University and
Rajarshi Banerjee PhD
University of North Texas

10:45 AM - 11:10 AM
Microstructure Tailoring by Selective Laser Melting Pulse Optimization (Expert)
Mathieu Brochu PhD
McGill University

11:15 AM - 11:40 AM
Control of Solidification Microstructure Across Additive Alloy Systems (Expert)
Sneha Prabha Narra
Carnegie Mellon University

11:45 AM - 12:10 PM
Melt Pool Geometry and Thermal Emission Monitoring in Laser Powder Bed Fusion (Expert)
Brian A. Fisher & Jack Beuth PhD
Carnegie Mellon University

Applications Power Up
materialise — innovators you can count on
Room: 317/318

10:15 AM - 10:25 AM
Developing Teaching Aids for Blind Computer Science and Information Systems Students (Novice)
Arif Sirinterlikci PhD
Robert Morris University

10:30 AM - 10:40 AM
3D Printed Tooling and Fixtures for Assembly Operators with Disabilities (Novice)
George R. Allman
Liberty Electronics Inc

10:45 AM - 10:55 AM
Reducing Build Failures Through Predictive Simulation (Intermediate)
Brent Stucker, 3DSIM and
Tim Gornet
University of Louisville

11:00 AM - 11:10 AM
Will It Break? Putting an Additive Manufactured Optimized Design to the Test (Novice)
Adam Rivard
LAI International

11:15 AM - 11:25 AM
Integrated Additive Manufac-turing with MetlAFB1: Pushing 3D Printing into Industry for Full Functional Parts (Intermediate)
Ilko Bosman
Additive Industries

11:30 AM - 11:40 AM
Additive Manufacturing for Pattern Based Secondary Processes (Novice)
Carl Dekker, MET-L-FLO

11:45 AM - 11:55 AM
3D Printing for Large Aerospace Tooling (Novice)
Rick Neff
Cincinnati Incorporated

Noon - 12:10 PM
Geometrically Controlled Sound Dampening Using 3D Binder Jetting (Intermediate)
Brandon Cary & Tom Pasterik
The ExOne Company

Building Regional Leadership in Additive Manufacturing I
Room: 304/305

10:15 AM - 10:40 AM
Additive Manufacturing's Role in the TechBelt Region's Renewed Growth (Intermediate)
Ralph Resnick
America Makes
and
Petra Mitchell
Catalyst Connection

10:45 AM - 11:10 AM
Industry-inspired Additive Manufacturing Processing Research at Carnegie Mellon (Intermediate)
Jack Beuth PhD
Carnegie Mellon University

11:15 AM - 11:40 AM
Industry-inspired Additive Manufacturing Materials Research at Carnegie Mellon (Intermediate)
Anthony Rollett PhD
Carnegie Mellon University

11:45 AM - 11:55 AM
Accelerating Industry Adoption of Additive Manufacturing: Perspectives from an Additive Manufacturing Demonstration Facility (Intermediate)
Timothy W. Simpson PhD
Penn State College of Engineering

Noon - 12:10 PM
Additive Manufacturing Research and Capabilities at the University of Pittsburgh (Intermediate)
Markus Chmielus
University of Pittsburgh

Process Monitoring, Control, and Qualification
Room: 310/311

10:15 AM - 10:40 AM
The Next Level of Additive Manufacturing Inspection and Control (Intermediate)
Dieter Ghysbrecht
Materialise

10:45 AM - 11:10 AM
Proactive Monitoring of Additive Builds Using Artificial Intelligence Based Optical Recognition (Expert)
Joseph M. Sinclair
Solid Innovations LLC and
Christian M. Joest
Imperial Machine & Tool Co

11:15 AM - 11:40 AM
In-Process Monitoring and Control of Selective Laser Melting Using a Low-Cost Sensor Fusion Approach (Intermediate)
John R. Middendorf
Universal Technology Corp and
Glen P. Perram PhD PE
Air Force Institute of Technology

11:45 AM - 12:10 PM
Additive Manufacturing Rocket Engine Qualification and Testing (Intermediate)
Alison M. Park
Aerojet Rocketdyne

DoD Additive Manufacturing Research & Applications I
NCMS
Room: 301/302

10:15 AM - 10:40 AM
Integrated Printed Electronics and Additive Manufacturing Solutions for the US Army (Intermediate)
James L. Zunino
US Army ARDEC

10:45 AM - 11:10 AM
High Strain Rate Testing of Gyroid Cellular Structures (Expert)
Miriam Dennis
University of Florida and
Amanda Schrand PhD
Air Force Research Laboratory

11:15 AM - 11:40 AM
US Navy Additive Manufacturing Applications at the Naval Surface Warfare Center-Philadelphia Division (Novice)
Philip Greiner & Scott A. Storms
Naval Surface Warfare Center - Philadelphia Division

11:45 AM - 12:10 PM
Additive Manufacturing of a Wind Tunnel Force Balance (Intermediate)
Devin Burns PhD
NASA Langley Research Center

Material Properties II
SLM SOLUTIONS
Room: 319/320/321

10:15 AM - 10:40 AM
Optimizing TiAl EBM Parameters for Aerospace Components (Intermediate)
Francisco Medina PhD, EWI
and
Andrew Heidloff PhD
Praxair Surface Technologies Inc

10:45 AM - 11:10 AM
Investigation of Minor Elements on Built Properties of C300 Maraging Steel Powder (Expert)
Satyajeet Sharma PhD &
Kumar Kandasamy PhD
Oerlikon

11:15 AM - 11:40 AM
The Influence of Powder Ageing Characteristics on 316L Steel Processed by Selective Laser Melting (Intermediate)
Keith Murray &
Mary Kate Johnston
Sandvik Osprey

11:45 AM - 12:10 PM
Effect of Compositional Variations in MetcoAdd HX-A Powder on Crack Susceptibility, Microstructure, and Mechanical Properties (Expert)
Kumar Kandasamy PhD &
Shawn Kelly PhD
Oerlikon

Business & Economic Considerations - Execution II
Markforged
Room: 315/316

10:15 AM - 10:40 AM
Utilizing Additive Manufac-turing in Sustainment of Fielded Systems (Novice)
Frederick J. Herman
SHEPRA Inc and
Jason Ray
Paperless Parts

10:45 AM - 11:10 AM
Digital Technical Data Package Business Models for Spare Parts Produced Using Additive Manufacturing (Intermediate)
Brett Conner PhD &
Ashley Martof
Youngstown State University

11:15 AM - 11:40 AM
Effective Ways to Manage the Combustible Dust Hazards Associated with Additive Manufacturing (Novice)
Jason P. Reason
Lewellyn Technology LLC

11:45 AM - 12:10 PM
Metal AM Process & Facility Safety. Are You Prepared? (Novice)
Paul Bates & Norman Lowe
UL

MMI: Biomaterials
envisionTEC
Room: 306/307

10:15 AM - 10:40 AM
Drug-eluting Polymeric Additive Manufacturing for Applications in Orthopaedics (Intermediate)
Martin J. Petrak PEng
Precision ADM / Orthopaedic Innovation Centre and
Trevor C. Gascoyne PEng
Orthopaedic Innovation Centre

10:45 AM - 10:55 AM
3D Printing Soft Polydimethylsiloxane (PDMS) Elastomer Toward Custom Fit Wearable Devices (Intermediate)
Sara Abdollahi &
Adam Feinberg PhD
Carnegie Mellon University

10:55 AM - 11:05 AM
3D Bioprinting Collagen Scaffolds for Engineering Human Cardiac Tissue (Intermediate)
Andrew Lee &
Adam Feinberg PhD
Carnegie Mellon University

11:05 AM - 11:15 AM
3D Printing Collagen Type I Using Freeform Reversible Embedding of Suspended Hydrogels (FRESH) (Intermediate)
Thomas J. Hinton &
Adam Feinberg PhD
Carnegie Mellon University

11:15 AM - 11:25 AM
Control of Gelatin Particle Size and Uniformity to Improve Fidelity Using FRESH 3D Bioprinting (Expert)
Andrew Hudson &
Adam Feinberg PhD
Carnegie Mellon University

11:25 AM - 11:45 AM
Additive Manufacturing of Biodegradable Photopolymers and Ceramics (Intermediate)
Johannes Benedikt PhD
Lithoz GmbH

11:45 AM - 12:10 PM
Additive Manufacturing of Polymeric Biosensors and Drug Delivery Devices (Intermediate)
Roger Narayan
UNC/NCSU Joint Department of Biomedical Engineering

Show Floor Theater
Booth 2321

10:30 AM – 11:30 AM
Tech Briefing: Fundamentals of Additive Manufacturing

11:30am – 12:30pm
Additive Manufacturing: Where To Next?
Moderator:
Professor Milan Brandt
Royal Melbourne Institute of Technology,
Monash University

Panelists:
John E. Barnes
Arconic

Richard Grylls
SLM Solutions NA, Inc

Gene Kulesha
Stryker

Kirk Rogers PhD
GE Center for Additive Technology Advancement (CATA)

Mihaela Vlasea
University of Waterloo

Today, additive manufacturing is playing an ever-increasing role in a range of industries globally such as the aerospace, automotive, medical and defense because of the many benefits it offers compared to traditional subtractive technologies. The first 3D printers were used in the 1980s to make plastic prototypes, so that the engineers and designers could see and touch a full-size model of what the actual device would look like. Since then, the field of 3D printing has exploded and transformed from prototyping into manufacturing. Today, there are arrays of different types of 3D printers working with plastics, metal and ceramic powders, biological and organic feedstock. The technology is evolving rapidly with new 3D concepts, machines and suppliers entering the market almost on a monthly basis. The recent acquisition by GE of Arcam and Concept Laser is said to further accelerate the growth and adoption of Additive Manufacturing technology globally.
A panel of experts will examine and explore current trends and future opportunities for AM technology globally.

10:30 AM - 11:30 AM — Attendee Show Floor Tour

12:15 PM - 2:15 PM — Lunch on Exhibit Floor

as of 5/5/2017

Wednesday, May 10 - afternoon

1:00 PM - 6:00 PM — Poster Session

2:00 PM - 3:00 PM — Attendee Show Floor Tour: MMI-New to Medical Applications

Concurrent PM Sessions 2:15 PM - 4:15 PM

Academic Research II	New Processes Power Up	Building Regional Leadership in Additive Manufacturing II	Quality and Inspection	DoD Additive Manufacturing Research & Applications II	Materials II	Workforce Development	MMI: Quality, Regulatory & Implants	Show Floor Theater
Room: 303	Room: 317/318	Room: 304/305	Room: 310/311	Room: 301/302	Room: 319/320/321	Room: 315/316	Room: 306/307	Booth 2321
2:15 PM - 2:40 PM Multimaterial Additive Manufacture of RF Structures and Connectors (Expert) Zachary Larimore University of Delaware	2:15 PM - 2:25 PM 3D Printing: Breaking Barriers and Expanding Full Speed into Manufacturing (Intermediate) Roger Kelesoglu Stratasys 2:30 PM - 2:40 PM Development of New Metal Additive Manufacturing Concepts for Large Parts Manufacturing (Intermediate) Filipe R. Coutinho & Tiago Faro ADIRA Metal Forming Solutions S.A.	2:15 PM - 2:40 PM Empowering Metal Additive Manufacturing Through ANSYS Tools (Intermediate) David Conover ANSYS	2:15 PM - 2:40 PM Agile Quality Control Process for FDM Parts (Intermediate) Tim Yewchuk 3D Print Western	2:15 PM - 2:40 PM Influence of Processing Parameters on the Development of Microstructure and Texture in EBM Ti-6Al-4V (Expert) Kevin J. Chaput PhD Air Force Research Laboratory	2:15 PM - 2:40 PM Magnetic Particle Alignment for 3D Printed Composites (Expert) Madhuparna Roy Florida State University	2:15 PM - 2:40 PM 3DP Education and Workforce Outreach: Delivering Impact (Intermediate) Leanne Gluck America Makes	2:15 PM - 2:40 PM Quality Strategy Approach for Additive Manufacturing (Intermediate) Gilbert A. Cortes Johnson & Johnson	12:30 PM -1:30 PM Medical Manufacturing Innovations Presentations MODERATOR: Lauralyn McDaniel, SME 12:30 PM -12:50 PM SME Medical Additive Manufacturing/3D Printing Workgroup: Addressing Challenges 12:50 PM – 1:03 PM Standards, Quality Metrics, and Innovation with the FDA / CDRH 1:03 PM – 1:16 PM 3D Printing in Medical Imaging Standards 1:16 PM – 1:30 PM Special Interest Group for 3D Printing within the Radiologic Society of North America to Advance Medical Applications 1:30 PM – 2:30 PM Crowdsourced Content 2:30 PM – 3:30 PM Tech Briefing: Fundamentals of 3D Scanning 3:30 PM – 5:00 PM Technology LaunchPad
2:45 PM - 3:10 PM A Curvature-Based Direct Slicing Algorithm for Precision Additive Manufacturing Using Milne-Simpson Multistep Method (Expert) Ahmad Barari PhD PEng & Hossein Gohari, Univ of Ontario Institute of Technology (UOIT)	2:45 PM - 2:55 PM What the Next Generation of Hybrid CNCs Brings to Additive (Intermediate) Jason Jones PhD Hybrid Manufacturing Technologies 3:00 PM - 3:10 PM NanoParticle Jetting Technology - Redefining Metal Additive Manufacturing (Novice) Dror Danai, Xjet Ltd	2:45 PM - 3:10 PM GE CATA & SW PA – Mutually Assured Economic Success (Intermediate) Kirk Rogers PhD GE Center for Additive Technology Advancement (CATA)	2:45 PM - 3:10 PM Surface Metrology of Additive Manufacturing Components: Understanding the Complex Texture of Powder Bed-Based Surfaces (Intermediate) Agustin Diaz PhD REM Surface Engineering	2:45 PM - 3:10 PM Feature Based Fatigue Characterization for Powder Bed Fusion and Small Scale Propulsion Components (Intermediate) Onome E. Scott-Emuakpor PhD US Air Force Research Laboratory	2:45 PM - 3:10 PM Creating Highly Dense Copper Components via Binder Jetting (Intermediate) Yun Bai & Christopher Williams PhD Virginia Tech	2:45 PM - 3:10 PM Is Your Workforce Ready for Additive Manufacturing? (Novice) Joseph W. Lampinen CMfgE KellyOCG	2:45 PM - 3:10 PM A Study on Removal of Additive Manufacturing Residue from Complex Parts Matthew DiPrima & James Coburn US Food and Drug Administration	
3:15 PM - 3:40 PM A Computationally Efficient Finite Element (FE) Framework to Predict Residual Stress Evolution in Parts During SLM (Expert) Ajit Achuthan Clarkson University	3:15 PM - 3:25 PM MagnetoJet Liquid Metal 3D Printing: Cutting the Costs Using a Drop-on-Demand Approach (Intermediate) Scott Vader Vader Systems LLC 3:30 PM - 3:40 PM Tailoring FFF Parts for Increased Strength Using Real 3D Printing (Intermediate) Natalie M. Rudolph Dr.-Ing. University of Wisconsin-Madison	3:15 PM - 3:40 PM Aerospace is Making a Future with Additive Manufacturing (Intermediate) John Barnes Arconic	3:15 PM - 3:40 PM Visual Identification, Error Detection, and Compensation for Additive Manufacturing Material Deposition Systems (Intermediate) Gijs van Houtum University of Waterloo / Eindhoven University of Technology	3:15 PM - 3:40 PM Enabling Expeditionary Battle-field Manufacturing Using Recycled, Reclaimed, and/or Indigenous Materials (Intermediate) Marc S. Pepi US Army Research Laboratory	3:15 PM - 3:40 PM Creation of an Affordable Aerospace Grade Aluminum Alloy via Computational Alloy Design Methods (Intermediate) Eric J. Fodran PhD & Eric Barnes Northrop Grumman	3:15 PM - 3:40 PM Training the Workforce for Future Fabrication (Intermediate) Sarah Boisvert Fab Lab Hub and Mike Adelstein CPA Potomac Photonics Inc	3:15 PM - 3:40 PM Addressing Challenges in Custom Orthopedic Implants Using Additive Manufacturing (Novice) Maryam Jahanzad & Guha Manogharan PhD Pennsylvania State University	
3:45 PM - 4:10 PM Constructing the DMLS Processing Window from Computational Modeling (Intermediate) Patcharapit Promoppatum & Shi-Chune Yao PhD Carnegie Mellon University	3:45 PM - 3:55 PM Three-Dimensional Metal Printing by Thixotropic Metal-based Paste Deposition (Intermediate) Michael R. Sullivan University at Buffalo The State University of New York 4:00 PM - 4:10 PM Electromagnetic Nozzle Technologies for Material Extrusion Additive Manufacturing (Intermediate) Charles B. Sweeney Essentium Materials	3:45 PM - 4:10 PM Powder Characterization and Development for Additive Manufacturing (Intermediate) Brian Morrison ATI Specialty Metals	3:45 PM - 4:10 PM Update on Quality Assurance for Additive Manufacturing (Novice) Jeremy Straub North Dakota State University	3:45 PM - 4:10 PM Additive Manufacturing and Its Effect on Hybrid Rocket Motor Performance (Intermediate) Michael G. Morales United States Naval Academy	3:45 PM - 4:10 PM Gas Atomized Powder Synthesis Improvements for Additive Manufacturing (Expert) Iver E. Anderson PhD & Emma M. White PhD Ames Laboratory of USDOE	3:45 PM - 4:10 PM Bridging Educational Excellence with Advanced Manufacturing: How to Cultivate Win-Win Partnerships in Your Community (Novice) Owen Schoeniger MakerGear LLC	3:45 PM - 4:10 PM Anisotropic Behaviors of 3D Printed Dental Jaw Bone Implants (Intermediate) Xiong Yu PhD PE & Russel Wang Case Western Reserve University	

4:45 PM - 6:30 PM — Show Floor Reception
Design Studio Fashion Show

reception sponsored by: NCP LEASING, INC. EQUIPMENT FINANCE

as of 5/5/2017

Thursday, May 11

7:00 AM - 1:00 PM — Registration

8:00 AM - 9:45 AM
Spirit of Pittsburgh Ballroom

PANEL
So Where Do We Go From Here?
Mark Cotteleer, Managing Director, Deloitte Services, LP
Todd Grimm, President, T.A.Grimm & Associates Inc
Graham Tromans, Owner and Principal Industry Consultant, GP Tromans Associates
Robin Wilson, Head of Manufacturing, Innovate UK

KEYNOTE
The Future of Additive Manufacturing and 3D Printing
Terry Wohlers
Principal Consultant and President
Wohlers Associates Inc

sponsored by: Deloitte.

9:00 AM - 2:00 PM — Student Summit

10:00 AM - 2:00 PM — Show Open

Concurrent AM Sessions 10:15 AM - 12:15 PM

Academic Research III	Innovative Applications Power Up (materialise)		Material Properties III (SLM Solutions)	Part / Product Certification	Materials III (EOS e-Manufacturing Solutions)	Business & Economic Considerations - Strategic Power Up (Markforged)	MMI: Metals (envisionTEC)	Show Floor Theater
Room: 303	Room: 317/318		Room: 301/302	Room: 310/311	Room: 319/320/321	Room: 315/316	Room: 306/307	Booth 2321
10:15 AM - 10:40 AM Filled Thermoconductive Plastics for Fused Filament Fabrication (Intermediate) Tom Mulholland Univ of Wisconsin - Madison	10:15 AM - 10:25 AM Realizing the Promise of Next Generation Manufacturing with Additive Manufacturing (Intermediate) Ryan DeHoff PhD Oak Ridge National Laboratory Bruce Bradshaw, Arcam AB		10:15 AM - 10:40 AM Microstructure Improvement of SS17-4PH Fabricated by Laser Powder Bed Fusion by Modified Heat Treatment (Expert) Sunil B. Badwe PhD North American Hoganas and Somayeh Pasebani PhD Oregon State University	10:15 AM - 10:40 AM When Risks Cannot Be Seen: Regulating Uncertainty in Emerging Technologies (Intermediate) Jaime Bonnin Roca & Parth Vaishnav PhD Carnegie Mellon University	10:15 AM - 10:40 AM How Advances in Powder Metallurgy are making 3D Printing Accessible to Every Engineer (Intermediate) A. John Hart PhD Desktop Metal	10:15 AM - 10:25 AM Advanced Economies Collaborative Initiatives in Advanced Manufacturing (Novice) Bart Pascoli Italian Trade Agency	10:15 AM - 10:40 AM Additive Manufacture of Stiffness Matched Skeletal Fixation Devices (Expert) David Dean PhD The Ohio State University	10:15 AM - 11:00 AM Tech Briefing: MMI 11:30 AM - 12:30 PM Technology LaunchPad
	10:30 AM - 10:40 AM Metal Additive Using Directed Energy Deposition and Hybrid Manufacturing (Novice) Jeffrey Crandall Connecticut Center for Advanced Technology, Inc.					10:30 AM - 10:40 AM 800,000 Additive Manufactured Parts Analysed: An Overview of the Usage & Performance of Additive Manufacturing Machines and Materials (Novice) Dan Grigoras 3D Hubs		
10:45 AM - 11:10 AM Capacitance-based Nondestructive Evaluation of Three-dimensionally Printed Polymer (Expert) Deborah D.L Chung PhD University at Buffalo The State University of New York	10:45 AM - 10:55 AM 3D Printing Kit for Technical Schools (Novice) Cristian Sandre INTI (National Institute of Industrial Technology) of Argentina		10:45 AM - 11:10 AM How Helium Improves Additive Manufacturing of Ti-6Al-4V and IN718 Parts (Expert) Grzegorz Moroz Linde LLC	10:45 AM - 11:10 AM Design to Certification - Additive Manufacturing for Aerospace Applications (Expert) Shaun Kroeger solidThinking Inc	10:45 AM - 11:10 AM Fracture Properties of Additively Manufactured Acrylonitrile-Butadiene-Styrene Materials Kevin R. Hart US Army Research Laboratory	10:45 AM - 10:55 AM How 3DP Can Create More Business and Create More Jobs (Novice) Steven R. Murray Hoosier Pattern Inc	10:45 AM - 11:10 AM Design Considerations and Capabilities for Implants Manufactured with Integrated Porous Structures (Intermediate) Oscar Hedin Arcam AB	
	11:00 AM - 11:10 AM Innovative Uses of Geometric Search to Advance Additive Manufacturing (Intermediate) Anusha Iyer & Andre Wagner Authentise					11:00 AM - 11:10 AM Developing a Strategy for Additive Manufacturing (Novice) Phill Dickens Added Scientific Limited		
11:15 AM - 11:40 AM Raster Printing for Fiber Encapsulation and Sensor Manufacturing (Intermediate) Jolie B. Frketic FAMU-FSU College of Engrg	11:15 AM - 11:25 AM Next Generation Heat Exchangers Realized Through Ultrasonic Additive Manufacturing (Intermediate) Mark Norfolk PE Fabrisonic		11:15 AM - 11:40 AM Additive Manufacturing of Ceramics and Composites: Microstructure, Properties, and Applications Examples (Intermediate) Prashant Karandikar PhD M Cubed Technologies Inc	11:15 AM - 11:40 AM Evaluation of Standard Metal Additive Manufacturing Test Articles (Intermediate) Trevor Hicks & Jessica Coughlin Naval Nuclear Laboratory	11:15 AM - 11:40 AM Crack Remediation in Difficult to Weld NiCr-alloys When Processed by Additive Manufacturing Using the Laser Powder Bed Process (Intermediate) William J. Jarosinski Praxair Surface Technologies Inc	11:15 AM - 11:25 AM Creative Disruption: How Additive Manufacturing Can Impact Traditional Supply Chain. Lessons Learned for the Media and Entertainment Industries (Intermediate) Stephan Thomas Identify3D	11:15 AM - 11:40 AM Different Metal Additive Manufacturing Laser Methods Compared to EBM for Serialized Production of Orthopedic Implants (Intermediate) Emanuele Magalini Eurocoating s.p.a.	
	11:30 AM - 11:40 AM Optimization of Additively-manufactured Metal Meshes Embedded in Phase Change Materials for Thermal/energy Applications (Expert) Lien Chin Wei Carnegie Mellon University					11:30 AM - 11:40 AM Secrets to Money Making in Metal Additive Manufacturing (Novice) Bob Henderson Linear AMS		
11:45 AM - 12:10 PM In-Situ Thermoplastic Impregnation of a Dry Composite Fiber Tow for Additive Manufacturing (Expert) Daniel F. Walczyk PhD PE & Daniel A. Kaczmarek Rensselaer Polytechnic Institute	11:45 AM - 11:55 AM Additive Manufacturing Techniques with Professional Championship Sports Rings (Novice) Anthony J. Maietta Herff Jones		11:45 AM - 12:10 PM Additive Manufacturing of Enhanced Alnico Magnets (Intermediate) Emma M. White PhD Ames Laboratory of USDOE	11:45 AM - 12:10 PM Qualifications Challenges in Printed Structures with Embedded Electronics (Intermediate) Nathan B. Crane PhD University of South Florida	11:45 AM - 12:10 PM Optimizing Metal Powder Chemistries for Use in Additive Manufacturing (Expert) Nathan Kistler LPW Technology Inc	11:45 AM - 11:55 AM Metal Additive Manufacturing: Cost Competitive Beyond Low Volumes (Intermediate) Ria Laureijs Carnegie Mellon University	11:45 AM - 12:10 PM Effect of Powder Morphology on Mechanical Properties of Cobalt-Chrome Alloy for the Dental Industry by Laser Powder Bed Fusion (Intermediate) Ivy Li CMfgE Material Technology Innovations Co Ltd	
	Noon - 12:10 PM Topologically Optimized & 3D Printed Component on Its Way to Space! (Intermediate) Ivan Madera Morf3D Inc					Noon - 12:10 PM The 5Ps of Additive Manufacturing at Lockheed Martin (Novice) Robert G. Ghobrial Lockheed Martin		

11:00 AM - Noon — Attendee Show Floor Tour: MMI-Advancements for Medical

11:00 AM - 1:00 PM — 3D Playground Activities | America Makes ACADEMI ADX | ToolingU-SME Manufacturing Challenge

12:15 PM - 2:15 PM — Lunch on the Exhibit Floor

1:00 PM - 5:00 PM
Facility Tours
Choose only one

Bally Design and MAYA Design	Arconic (Alcoa)

1:00 PM - 5:00 PM — SME Medical AM/3DP Workgroup Meeting (Room: 327)

1:00 PM - 4:30 PM — AM Certification Exam (Room: 334)