

**NAMRC 51 | MSEC 2023 |  
LEM&P 2023**

**June 12-16, 2023  
New Brunswick, New Jersey**

# MSEC 2023 FINAL SYMPOSIUM LIST

**Technical Chairs:**

Binil Starly, Arizona State University

Chinedum Okwudire, University of Michigan

This final list of Symposium is approved by the ASME MED Committee.

MSEC 2023 invites all high-quality advanced manufacturing research papers, even if they may not directly fit into one of these symposia. We ask authors to find the closest related symposium to place papers into. Technical Chairs and the Symposium Organizers will coordinate review of these submitted papers.

<b>ADDITIVE MANUFACTURING</b>		
AdM1_1	<a href="#">Advances in Qualification and Certification for Additive Manufacturing</a>	Dr. Zhaohui Geng, The University of Texas Rio Grande Valley; zhaohui.geng@utrgv.edu
		Dr. Jianzhi James Li, The University of Texas Rio Grande Valley; jianzhi.li@utrgv.edu
		Dr. Dongchun Mary Qiao, ABS Corporate Technology; mqiao@eagle.org
AdM1-2	<a href="#">Smart Additive Manufacturing</a>	Dr. Chinedum Okwudire, University of Michigan, Ann Arbor, MI, USA, okwudire@umich.edu
		Dr. Prahalada Rao, Virginia Tech, VA, USA, prahalad.k.rao@vt.edu
		Dr. Azadeh Haghighi, University of Illinois Chicago, IL, USA, ahaghi3@uic.edu
		Dr. Subhrajit Roychowdhury, General Electric Global Research Center, Niskayuna, NY, USA,
AdM1-3	<a href="#">Advances in Metal Additive Manufacturing Processes</a>	Dr. Wenchao Zhou, University of Arkansas; zhouw@uark.edu
		Dr. Dong Lin, Kansas State University; dongl@ksu.edu
		Dr. Ho Yeung, NIST; ho.yeung@nist.gov
AdM1-4	<a href="#">Advances in Additive Manufacturing of Polymers and Composites</a>	Prof. Kenan Song, Arizona State University; <a href="mailto:kenan.song@asu.edu">kenan.song@asu.edu</a>
		Prof. Kun (Kelvin) Fu, University of Delaware; <a href="mailto:kfu@udel.edu">kfu@udel.edu</a>
		Prof. Erina Joyee, University of North Carolina, Charlotte, NC, US, 704-687-8930; <a href="mailto:ejoyee@uncc.edu">ejoyee@uncc.edu</a>
		Prof. Jena McCollum, University of Colorado; <a href="mailto:jmccollu@uccs.edu">jmccollu@uccs.edu</a>
AdM1-5	<a href="#">In Situ Monitoring and Non-Destructive Testing of Additive Manufacturing Processes</a>	Dr. Sarah Wolff, The Ohio State University; wolff.357@osu.edu
		Dr. Thomas Feldhausen, Oak Ridge National Laboratory, feldhausenta@ornl.gov
		Dr. Gerardo Ortiz, 3D in Metal; gerardo.ortiz@innofactoringsolutions.com
<b>ADVANCED MATERIALS MANUFACTURING</b>		
AMM2_1	<a href="#">Advances in Processing of Polymers and Polymer Composites</a>	Dr. Felicia Stan, Dunarea de Jos University of Galati; felicia.stan@ugal.ro
		Dr. Kenan Song, Arizona State University; kenan.song@asu.edu
		Dr. Fabrizio Quadrini, University of Rome Tor Vergata; fabrizio.quadrini@uniroma2.it
AMM2_2	<a href="#">Convergent Manufacturing Systems for Advanced Materials</a>	Dr. Saeed Farahani, Cleveland State University; farahani@csuohio.edu

\* The conference is collocated with NAMRI/SME's 51<sup>st</sup> North American Manufacturing Research Conference (NAMRC51), which will have separate call-for-papers. Please note that submissions of the same paper to more than one conference are not permitted.

		Dr. Mihaela Banu, University of Michigan; mbanu@umich.edu
		Dr. Hantang Qin, University of Wisconsin; hqin52@wisc.edu
<b>BIOMANUFACTURING</b>		
BioM3_1	<a href="#">Additive Manufacturing of Functional Devices and Bioinspired Materials and Structures</a>	Dr. Cindy (Xiangjia) Li, Arizona State University; xiangjia.li@asu.edu
		Dr. Yang Yang, San Diego State University; yyang10@sdsu.edu
		Dr. Erina Joyee, University of North Carolina at Charlotte; ejoyee@uncc.edu
BioM3_2	<a href="#">Advances in Design, Manufacturing, Analysis, and Development of Biomedical Devices</a>	Dr. Lei Chen, University of Massachusetts Lowell; Lei_Chen@uml.edu
		Dr. Yi Wang, University of Missouri; yiwang@missouri.edu
		Dr. Yang Liu, Shanghai Jiao Tong University; yang.liu1@sjtu.edu.cn
BioM3_3	<a href="#">Advances in Biomanufacturing of Tissue-Engineered Scaffolds and Organs</a>	Dr. Yifei Jin, University of Nevada; yifeij@unr.edu
		Dr. Jun Yin, Zhejiang University; junyin@zju.edu.cn
		Dr. Zhengyi Zhang, Huazhong University of Science and Technology; zhengyizhang@hust.edu.cn
<b>LIFECYCLE ENGINEERING</b>		
LCE4_1	<a href="#">Advances in Sustainable Manufacturing for a Circular Economy</a>	Dr. Nehika Mathur, National Institute of Standards & Technology; nehika.mathur@nist.gov
		Dr. Buddhika Hapuwatte, University of Maryland; buddhika@umd.edu
		Dr. Nancy Diaz-Elsayed, University of South Florida; nancyd1@usf.edu
<b>MANUFACTURING EQUIPMENT &amp; AUTOMATION</b>		
MEA5_1	<a href="#">Innovations in Equipment Design, Control and Automation</a>	Dr. Chandra Nath, Majiker Corp; chandra.nath@majiker.com
		Dr. Lei Zhou, The University of Texas at Austin; lzhou@utexas.edu
		Dr. Martin Jun, Purdue University, mbgjun@purdue.edu
<b>MANUFACTURING PROCESSES</b>		
MP6_1	<a href="#">Advances in Clean Energy Manufacturing</a>	Dr. Lei Chen, University of Michigan-Dearborn, Dearborn; leichn@umich.edu
		Dr. Chris Yuan, Case Western Reserve University; chris.yuan@case.edu
		Dr. Kevin Guo, Ford Ion Park; gguo1@ford.com

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MP6_2	<a href="#">Advances in Nontraditional Machining Processes</a>	Dr. Murali Sundaram, University of Cincinnati, Cincinnati, OH, USA. murali.sundaram@uc.edu
		Dr. Yuefeng Luo, Savannah River National Laboratory, yuefeng.luo@srl.doe.gov
		Dr. Muhammad P. Jahan, Miami University, Oxford, jahanmp@miamioh.edu
		Dr. Meng Zhang, Kansas State University, meng@ksu.edu
MP6_3	<a href="#">Advances in Lightweight and Dissimilar Materials Joining</a>	Dr. Yongbing Li, Shanghai Jiao Tong University; yongbinglee@sjtu.edu.cn
		Dr. Xun Liu, The Ohio State University; liu.7054@osu.edu
		Dr. Yunwu Ma, Shanghai Platform for Smart Manufacturing; mayw@spsm.net.cn
MP6_4	<a href="#">Advances in Surface Engineering: Process, Metrology, and Property/Performance</a>	Dr. Yiliang (Leon) Liao, Iowa State University; leonl@iastate.edu
		Dr. Beiwen Li, Iowa State University; beiwen@iastate.edu
		Dr. ChaBum Lee, Texas A&M University, College Station, TX, USA. +1-979-458-8121, cblee@tamu.edu
MP6_5	<a href="#">Advances in Assisted and Augmented Manufacturing Processes</a>	Dr. Meng Zhang, Kansas State University; meng@ksu.edu
		Dr. Weilong Cong, Texas Tech University, Lubbock, TX; weilong.cong@ttu.edu
		Dr. Fuda Ning, State University of New York at Binghamton; fning@binghamton.edu
MP6_6	<a href="#">Physics-Informed Data-Driven (PIDD) models for Advanced Manufacturing Processes</a>	Dr. Ankit Agarwal, Clemson University; agarwa3@clemson.edu
		Dr. Kaushal A. Desai, Indian Institute of Technology; kadesai@iitj.ac.in
		Dr. Gregory W. Vogl, National Institute of Standards and Technology; gvogl@nist.gov
		Dr. Yongzhi Qu, University of Minnesota Duluth; yongzhi@umn.edu
MP6_7	<a href="#">Converging Manufacturing Techniques with Hybrid Manufacturing</a>	Dr. Thomas Feldhausen, Oak Ridge National Laboratory, Oak Ridge; feldhausenta@ornl.gov
		Dr. Jason Jones, Hybrid Manufacturing Technologies; jj@hybridmanutech.com
		Dr. Christopher Saldana, Georgia Institute of Technology; christopher.saldana@me.gatech.edu
<b>MANUFACTURING SYSTEMS</b>		
MS7_1	<a href="#">Collaborative Robotic Manufacturing and Assembly</a>	Dr. Azadeh Haghighi, University of Illinois Chicago, IL, USA; ahaghi3@uic.edu

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		Dr. Yunbo “Will” Zhang, Rochester Institute of Technology; ywzeie@rit.edu
		Dr. Rui Liu, Rochester Institute of Technology, <a href="mailto:rleme@rit.edu">rleme@rit.edu</a>
		Dr. Chinedum Okwudire, University of Michigan, Ann Arbor; okwudire@umich.edu
		Dr. Vinh Nguyen, Michigan Technological University, MI, USA; vinhn@mtu.edu
MS7_2	<a href="#">Prognostics and Health Management (PHM) of Manufacturing Systems</a>	Dr. Chenhui Shao, University of Illinois at Urbana-Champaign; chshao@illinois.edu
		<a href="#">Dr. Shenghan Guo, Arizona State University; shenghan.guo@asu.edu</a>
		Dr. Yujie Chen, Caterpillar Inc.; chenyuji711@gmail.com
MS7_3	<a href="#">Networked Manufacturing towards an Intelligent, Agile and Resilient Industry</a>	Dr. Yuqian Lu, The University of Auckland yuqian.lu@auckland.ac.nz
		Dr. Yujie Chen, Caterpillar Inc; chenyuji711@gmail.com
		Dr. Xi (Vincent) Wang, KTH Royal Institute of Technology; wangxi@kth.se
MS7_4	<a href="#">Frontiers of Data Analytics- and Simulation-Enabled Digital Twins for Advanced Manufacturing Metaverse</a>	Dr. Shaw Feng, Engineering Laboratory (EL), NIST; shaw.feng@nist.gov
		Dr. Gordon Shao, EL, NIST; gshao@nist.gov;
		Dr. Albert Jones, EL, NIST; jonesa@nist.gov;
		Dr. Paul Witherell, EL NIST, paul.witherell@nist.gov;
		Dr. Young-Jun Son, Purdue University; <a href="mailto:yjson@purdue.edu">yjson@purdue.edu</a>
<b>NANO/MICRO/MESO MANUFACTURING</b>		
NMM8_1	<a href="#">Advances in Micro and Nano Manufacturing</a>	Dr. Soham Mujumdar, IIT Bombay; sohammujumdar@iitb.ac.in
		Dr. Erina Joyee, University of North Carolina Charlotte (UNCC); ejoyee@uncc.edu
		Dr. Chandra Nath, Majiker Corp., chandra.nath@majiker.com
NMM8_2	<a href="#">Advances in Micro- and Nano-scale Additive Manufacturing</a>	Dr. Sourabh Saha, Georgia Institute of Technology; ssaha8@gatech.edu
		Dr. Nilabh Roy, Canon Nanotechnologies, <a href="mailto:nroy@cnt.canon.com">nroy@cnt.canon.com</a>
		Dr. Bruno Azeredo, Arizona State University; Bruno.Azeredo@asu.edu
NMM8_3	<a href="#">Low-Dimensional Nanostructures and Porous Materials:</a>	Dr. Mostafa Bedewy, University of Pittsburgh, <a href="mailto:mbedewy@pitt.edu">mbedewy@pitt.edu</a>
		Dr. Michael Cai Wang, University of South Florida, <a href="mailto:mcwang@usf.edu">mcwang@usf.edu</a>

		Dr. Sei Jin Park, Lawrence Livermore National Laboratory, park39@llnl.gov
<b>QUALITY &amp; RELIABILITY</b>		
QR9_1	<a href="#">Advances in statistical learning for quality and reliability in smart manufacturing</a>	Dr. Ashif Iquebal, Arizona State University; aiquebal@asu.edu
		Dr. Yinan Wang, Rensselaer Polytechnic Institute; wangy88@rpi.edu
		Dr. Xiaowei Yue, Virginia Tech; xwy@vt.edu
QR9_2	<a href="#">Bridging Academic Advances and Industrial Practices on Machine Learning for Quality and Reliability</a>	Dr. Peng (Edward) Wang, University of Kentucky; edward.wang@uky.edu
		Dr. Xiaowei Yue, Virginia Tech; xwy@vt.edu
		Dr. Hantang Qin, University of Wisconsin-Madison; hqin52@wisc.edu
		Dr. Shaopeng Liu, GE; sliu@ge.com

# — Call for Papers —

A Symposium on

## Advances in Qualification and Certification for Additive Manufacturing

Sponsored by the ASME Manufacturing Engineering Division's  
*Additive Manufacturing Technical Committee*  
2023 ASME International Manufacturing Science & Engineering Conference (MSEC)  
June 12 – June 16<sup>th</sup>, 2023  
New Brunswick, New Jersey, USA  
Hosted by Rutgers University, College of Engineering

### Technical Focus

The fast growth of additive manufacturing (AM) technologies has provided unique opportunities in producing parts rapidly in small batches, supporting highly customized designs and with complex features and intricate structures. However, the AM processes and the resulting parts must be qualified and certified to ensure the functional specifications, meet the design requirements, and be verified and validated by the technical authorities, especially for mission-critical applications such as defense, marine, aerospace, healthcare, etc. Nonetheless, for AM technologies to be more widely adopted by the industry, investigations of more efficient and effective qualification and certification processes are necessary. Considering the wide streams of penitential applications of AM, these qualification processes shall also be adaptive to various applications. With the recent advanced in measurement science and artificial intelligence/machine learning (AI/ML) algorithms, novel tools have been developed to provide new solutions for AM qualification and certification. This symposium will focus on research advances in the area of measurement science and rapid qualification frameworks to qualify and certify the AM processes and their resulting parts. Such qualification and certification techniques will have significant industrial impacts by achieving a higher AM part quality. Specific topics of interest include, but not limited to:

- Qualification and certification of materials, processes, and products;
- Advanced measurement methods and tools;
- Technical innovations pertinent to in-situ monitoring and data analytical tools in defects identification and property prediction;
- The development of AI/ML algorithms in rapid qualification and certification;
- Digital qualification and certification for AM;
- The use of model-based qualification and certification technologies;
- Statistical-based qualification and certification procedures;
- AM process monitoring and control to improve quality;
- Standards, protocols, and regulatory developments;
- The development of general or transferable qualification and certification procedures for various AM applications.

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract and full manuscript for review by Oct 23, 2022 and **November 1, 2022 respectively**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

- Invite a high-profile keynote speaker
- Organize a special issue in the ASME Journal of Manufacturing Science and Engineering or ASME Journal of Computing and Information Science in Engineering

### Organizers

Dr. Zhaohui Geng, The University of Texas Rio Grande Valley, Edinburg, TX, USA. (412) 944-7917; [zhaohui.geng@utrgv.edu](mailto:zhaohui.geng@utrgv.edu)  
Dr. Jianzhi James Li, The University of Texas Rio Grande Valley, Edinburg, TX, USA. (956) 279-0906; [jianzhi.li@utrgv.edu](mailto:jianzhi.li@utrgv.edu)  
Dr. Dongchun Mary Qiao, ABS Corporate Technology, Spring, TX, USA. (281) 877-5734; [mqiao@eagle.org](mailto:mqiao@eagle.org)

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# — Call for Papers —

A Symposium on

## Smart Additive Manufacturing

Sponsored by the ASME Manufacturing Engineering Division's  
*Additive Manufacturing Technical Committee*  
*Manufacturing Systems Technical Committee*  
*Quality & Reliability Technical Committee*

2023 ASME International Manufacturing Science & Engineering Conference (MSEC)  
June 12 – June 16<sup>th</sup>, 2023  
New Brunswick, New Jersey, USA  
Hosted by Rutgers University, College of Engineering

### Technical Focus

There is a lot of excitement about the potential of smart manufacturing (involving the use of information, automation, computation, software, sensing, and networking technologies) to revolutionize the manufacturing industry, e.g., by boosting manufacturing quality and productivity at low cost. An excellent application for such “smart” technologies is additive manufacturing (AM), another area of manufacturing that is gaining a lot of traction but is plagued by quality, productivity, and cost issues. This symposium will focus on research aimed at leveraging advances in sensing, automation, computation, software, networking, big data analytics, machine learning, control, etc., to reduce trial and error, and enhance the quality, productivity, scalability, cost-effectiveness and functionality of AM. Specific topics of interest include, but are not limited to:

- Data-driven predictive modeling of AM processes
- Data-driven predictive maintenance of AM equipment
- Physics and/or data-driven part design
- In-process and post-built defect detection, characterization, and analysis
- Multi-physics modeling of AM processes
- Digital twin of AM process and equipment
- New sensing modalities and data fusion techniques for AM process monitoring and control
- In-situ monitoring and control techniques for AM
- Applications of machine learning (e.g., physics-guided) in any phase of AM, including design and materials.
- New AM equipment and automation technology development; hybrid AM technology
- Use of cloud/edge and high-performance computing to advance AM
- Embedded sensors and integrated functionalities using AM
- Industrial Internet of Things (IIoT) applications in AM
- Novel applications of commercial software in AM

### Paper Submission (Dates are subject to change.)

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### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

Invite speakers and organize a panel of thought leaders in AM to discuss the role of smart technologies in AM

Collate fast-tracked journal papers from this symposium into a special issue on Smart Additive Manufacturing in ASME Journal of Manufacturing Science and Engineering.

### Organizers

Dr. Chinedum Okwudire, University of Michigan, Ann Arbor, MI, USA, [okwudire@umich.edu](mailto:okwudire@umich.edu)

Dr. Prahalada Rao, Virginia Tech, VA, USA, [prahalad.k.rao@vt.edu](mailto:prahalad.k.rao@vt.edu)

Dr. Azadeh Haghighi, University of Illinois Chicago, IL, USA, [ahaghi3@uic.edu](mailto:ahaghi3@uic.edu)

Dr. Subhrajit Roychowdhury, General Electric Global Research Center, Niskayuna, NY, USA, [subhrajit.roychowdhury@ge.com](mailto:subhrajit.roychowdhury@ge.com)

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# — Call for Papers —

A Symposium on

## Advances in Metal Additive Manufacturing Processes

Sponsored by the ASME Manufacturing Engineering Division's  
*Additive Manufacturing Technical Committee*

*Manufacturing Processes Technical Committee*

2023 ASME International Manufacturing Science & Engineering Conference (MSEC)

June 12 – June 16<sup>th</sup>, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

Metal Additive Manufacturing (AM), listed as one of the top 10 Breakthrough Technologies by MIT Technology Review, has been gaining momentum in a wide range of industrial applications, such as aerospace, defense, tooling, and healthcare. Metal AM delivers complex metal structures with excellent physical properties using a wide range of industrial materials, such as titanium, stainless steel, Inconel, and other metal superalloys. However, the lack of fundamental understanding of the metal AM processes has made it challenging to control the quality of the product and thus thwarted the progress in the adoption of metal AM. This symposium will report the latest progress in all aspects of metal AM, such as new metal AM processes and systems, process control and development, in-situ process monitoring, process optimization, characterization and qualification of AM products, process-structure-property relationships, numerical tools and related simulation and modeling. Authors are encouraged to submit drafts related to metal AM that may contribute to improving the product quality, reducing the cost and risk of adopting metal AM, or new applications of metal AM. People from government, academia and industries are all encouraged to participate. A panel discussion may be organized. Specific topics of interest include, but are not limited to:

- Development of metal AM processes and/or systems.
- AM material characterizations: morphological, size distribution, composition, and thermal properties of the materials.
- AM process: scan path planning, speed/power synchronization, feedforward/ feedback strategies, etc., and their effects on part quality/performance.
- Real-time monitoring techniques: such as high speed camera observation, *in-situ* X-ray detection, and so on for fundamental AM process understanding and part defects prediction (qualify as build).
- Simulation and modeling on metal AM process and process-structure-property relationships, and related experimental prediction and validation.
- Post-process characterization and qualification of metal AM: such as microstructure, mechanical properties, fatigue, and non-destructive testing.

### Paper Submission (Dates are subject to change.)

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### Additional Symposium Activities

Based on the submitted papers, symposium organizers will make an effort to:

- Attract a high-profile international keynote speaker

### Organizers

- Dr. Wenchao Zhou, University of Arkansas, Fayetteville, AR, USA. 479-575-7250; zhouw@uark.edu
- Dr. Dong Lin, Kansas State University, Manhattan, KS, USA. 785-532-3728; dongl@ksu.edu
- Dr. Ho Yeung, NIST, Washington DC, USA, 301-975-2786; ho.yeung@nist.gov

# — Call for Papers —

A Symposium on

## Advances in Additive Manufacturing of Polymers and Composites

Sponsored by the ASME Manufacturing Engineering Division's

*Additive Manufacturing Technical Committee*

2023 ASME International Manufacturing Science and Engineering Conference (MSEC 2023)\*

June 12-June 16, 2023

New Brunswick, NJ, USA

Hosted by Rutgers University-New Brunswick, College of Engineering

### Technical Focus

Additive manufacturing (AM) or 3D printing with potential benefits of automation, low cost, rapid prototyping, and customizability can significantly outperform conventional polymer and composite manufacturing technologies that suffer from time-consuming and labor-intensive problems during operation. Furthermore, recent novel AM technologies and rapidly developed polymer materials/chemistry have emphasized their combinations for constructing complicated architectures and realizing structurally and functionally customized designs, offering an excellent opportunity for structural and functional applications that transcend current manufacturing and outperform existing material process-property-structure relations. This symposium will focus on research advances in the areas of additive manufacturing of polymers and polymer-based composites, including polymer materials discovery and development, manufacturing strategy and modifications, composite architectures and constructions, mechanical analysis and characterizations, modeling and simulation, machine learning and emerging cloud technology-assisted AM, and functional devices design and applications. Specific topics of interest include, but are not limited to:

- Advances in additive manufacturing of multi-scale and multi-material components and structures (e.g., multi-scale 3D printing, multi-material 3D printing, hierarchical structures, and architected materials)
- Advances in polymer and composite additive manufacturing techniques (e.g., FDM/FFF, SLA, DLP, 2PP, MPP, SLS, DIW, and Hybrid AM)
- Advances in characterization and analysis of polymer and composite additive manufacturing processes
- Emerging cloud technology (e.g., machine learning, VR/AR) in polymer and composite additive manufacturing
- Additive manufacturing of polymer and composite in structural applications (e.g., light-weight, energy-absorbing)
- Additive manufacturing of polymer and composite in functional applications (e.g., bio-applications, energy, environment, electronics, medical models and devices, robotics)
- New materials, new techniques, and emerging applications in polymer and composite additive manufacturing

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### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

- work to attract a high-profile international keynote speaker
- organize a special issue in the *ASME Journal of Manufacturing Science and Engineering* or *Journal of Manufacturing Processes*
- organize a state-of-the-art paper that will be the lead article in the special issue

### Organizers:

Prof. Kenan Song, Arizona State University, Tempe, AZ, US. 480-727-2720; [kenan.song@asu.edu](mailto:kenan.song@asu.edu) Prof.

Kun (Kelvin) Fu, University of Delaware, Newark, DE, US. 302-831-2008; [kfu@udel.edu](mailto:kfu@udel.edu)

Prof. Erina Joyee, North Carolina State University, Charlotte, NC, US, 704-687-8930; [ejoyee@uncc.edu](mailto:ejoyee@uncc.edu)

Prof. Jena McCollum, University of Colorado, Colorado Springs, CO, US 80918 7192553323; [jmccollu@uccs.edu](mailto:jmccollu@uccs.edu)

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A Symposium on

## In Situ Monitoring and Non-Destructive Testing of Additive Manufacturing Processes

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Hosted by Rutgers University, College of Engineering

### Technical Focus

Key bottlenecks in additive manufacturing (AM) processes are the certification and qualification of AM parts for industrial use, especially for applications in aerospace or in biomedical sectors. Much of the understanding of the final AM occur during ex situ characterization – for example, slicing parts, polishing cross-sections, and investigating microstructure and porosity with microscopy. Challenges in this approach show that measurements of an AM part's characteristics, including defects, structure, geometry (which can change with warping), and properties can be time-consuming and cost-prohibitive, requiring many builds and many hours of testing and characterization. However, in situ monitoring techniques and non-destructive testing of AM parts show promise in not only reducing processing and testing time, but also in more rapid certification and qualification in several ways: prediction of any defects or properties of the final AM part, closed-loop control of the AM process, and finally better understanding of the process physics, which can drive data-driven or modeling approaches. Specific topics of interest include, but are not limited to:

- Operando and custom, open-architecture manufacturing machines and instrumentation.
- Sensor-based closed-loop control during the manufacturing process.
- In situ imaging during manufacturing processing, including thermal and optical.
- In situ methods such as X-ray or neutron diffraction, spectroscopy, thermocouple, and ultrasonic methods.
- Surface-based methods to detect for melt pool size or ripples for metal additive manufacturing.
- Data-driven techniques to consolidate monitoring data for prediction and control.
- Defect or anomaly detection during in situ monitoring.
- Non-destructive characterization after the process for porosity or stress states.
- Coupled simulation and experiments to predict for defects or anomalies.

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract and full manuscript for review by Oct 23, 2022 and **November 1, 2022 respectively**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

- Work to attract a high profile international keynote speaker
- Organize a special issue in the ASME Journal of Manufacturing Science and Engineering or ASME Journal of Micro and Nano-Manufacturing
- Organize a state-of-the-art paper that will be the lead article in the special issue

### Organizers

Dr. Sarah Wolff, The Ohio State University, Columbus, OH, USA. 847-529-7607; [wolff.357@osu.edu](mailto:wolff.357@osu.edu)

Dr. Thomas Feldhausen, Oak Ridge National Laboratory, Oak Ridge, TN, USA. [feldhausenta@ornl.gov](mailto:feldhausenta@ornl.gov)

Dr. Gerardo Ortiz, 3D in Metal, Houston, TX, USA. [gerardo.ortiz@innofactorysolutions.com](mailto:gerardo.ortiz@innofactorysolutions.com)

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\* The conference is collocated with NAMRI/SME's 51<sup>st</sup> North American Manufacturing Research Conference (NAMRC51), which will have separate call-for-papers. Please note that submissions of the same paper to more than one conference are not permitted.

# — Call for Papers —

A Symposium on

## Advances in Processing of Polymers and Polymer Composites

Sponsored by the ASME Manufacturing Engineering Division's

*Manufacturing Processes Technical Committee*

*Advanced Materials Manufacturing Technical Committee*

2023 ASME International Manufacturing Science & Engineering Conference (MSEC)\*

June 12 - June 16, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

The processing of polymers and polymer composites has rapidly evolved into a multidisciplinary field through technological developments and fundamental understanding in the areas of rheology, heat transfer and material behavior. Innovative contributions in processing from industry and academia have enabled polymers and their composites to widen their reach from products made with traditional processing to many areas of modern technologies. They are widely used in areas such as flexible wearable electronics, nanocomposites, life sciences, membrane and filtration, superabsorber, energy storage and harvesting, scaffolds, drug delivery vehicles, shape-memory materials, high damping materials, and others. In addition, the development of mass-production capable manufacturing processes containing fillers (fibers, nanotubes or graphene), textile-based processes, and other non-traditional processes for polymeric materials is highly demanded. This symposium will provide a platform for interdisciplinary discussion on recent development in polymer processing and manufacturing.

Specific topics include, but are not limited to:

- Liquid molding and casting, thermoplastic/ thermoset molding, injection molding, overmolding processes
- Fiber spinning processes, cast and blown film extrusion, stretching forming processes
- Materials removal/ablation processes
- Welding of polymers and interface mechanics
- 3D printing of polymers and polymer composites: Processing considerations and applications
- Precision instrumentation and tooling for injection molding/extrusion/fiber spinning/thermoforming
- Devices made of polymers/composites
- Sustainability of polymer and composite processes, recycling processes and properties of recycled materials
- SMART polymers, foams and composites for Earth and Space environment
- Polymers for medical applications and medical devices
- Process dynamics and modeling in polymer processing
- Processing-structure-property relationships in polymers and polymer composites

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract and full manuscript for review by October 23, 2022 and **November 1, 2022 respectively**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

- Work to attract a high-profile international keynote speaker in the area of polymer processing.
- Organize a state-of-the-art paper that will be the lead article in the special issue.

### Organizers

Dr. Felicia Stan, Dunarea de Jos University of Galati, GL, Romania. +40-742-947-501; felicia.stan@ugal.ro

Dr. Kenan Song, Arizona State University, Mesa, AZ, USA. 480-727-2720; kenan.song@asu.edu

Dr. Fabrizio Quadrini, University of Rome Tor Vergata, Rome, Italy. +39-06-7259-7167; fabrizio.quadrini@uniroma2.it

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\* The conference is collocated with NAMRI/SME's 51<sup>st</sup> North American Manufacturing Research Conference (NAMRC51), which will have separate call-for-papers. Please note that submissions of the same paper to more than one conference are not permitted.

# — Call for Papers —

A Symposium on

## Convergent Manufacturing Systems for Advanced Materials

Sponsored by the ASME Manufacturing Engineering Division's  
*Advanced Materials Manufacturing Technical Committee*

2023 ASME International Manufacturing Science & Engineering Conference (MSEC)

June 12 – June 16<sup>th</sup>, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

The changing global environment, production economics, and consumer demands determine paradigm shifts in product designing by considering the materials not a constraint but a variable. Thus a product becomes an integrative system that needs to be designed considering the interactions between multiple systems: electric, mechanic, communication, and functionality. One promising pathway towards realization of these needs is through convergent manufacturing - the concept of integrating multiple technologies and/or crosslinking different fields of science to overcome the limitations of conventional manufacturing or create new capabilities by identifying synergies. Convergent production systems often involve the combination of multiple materials and/or structures, thus enabling diverse functionalities of the final product. The aim of this symposium is to provide a forum for researchers and practitioners to share and review the recent developments in the area of convergent manufacturing systems for the use of advanced materials in the production of multi-functional products. Relevant topics include one or more of the following areas, but are not limited to:

- Integration of additive manufacturing with conventional processes in a single manufacturing operation/system
- Hybrid manufacturing processes for multi-functional products, such as flexible and in-mold electronics
- Product design using Integrated Computational Materials Engineering (ICME)
- Integrative system design approaches to reduce CO2 emissions (during manufacturing)
- Recycling of materials and remanufacturing of products to extend product lifecycle and reduce CO2 emissions
- Digital twins, modeling and simulation of production systems for advanced materials
- Data-driven tools, machine learning, deep learning, and transferring learning tools that used for convergent manufacturing systems to improve system performance
- Accelerated validation methods for integrated systems including advanced materials
- Uncertainty quantification in designing and manufacturing advanced products

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract and full manuscript for review by Oct 23, 2022 and **November 1, 2022 respectively**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

- Work to attract a high-profile international keynote speaker
- Work to promote high-quality submissions
- Organize a special issue in the ASME Journal of Manufacturing Science and Engineering

### Organizers

Dr. Saeed Farahani, Cleveland State University, Cleveland, OH, USA, Ph:+1 216 687-2575; [s.farahani@csuohio.edu](mailto:s.farahani@csuohio.edu)

Dr. Mihaela Banu, University of Michigan, Ann Arbor, MI, USA, Ph: +1 734 936-0378, [mbanu@umich.edu](mailto:mbanu@umich.edu)

Dr. Hantang Qin, University of Wisconsin, Madison, WI, USA, Ph: +1 919 961-9602, [hqin52@wisc.edu](mailto:hqin52@wisc.edu)

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\* The conference is collocated with NAMRI/SME's 51<sup>st</sup> North American Manufacturing Research Conference (NAMRC51), which will have separate call-for-papers. Please note that submissions of the same paper to more than one conference are not permitted.



# — Call for Papers —

A Symposium on

## Additive Manufacturing of Functional Devices and Bioinspired Materials and Structures

Sponsored by the ASME Manufacturing Engineering Division's  
*Manufacturing Processes Technical Committee*

*Additive Manufacturing Technical Committee*

2023 ASME International Manufacturing Science & Engineering Conference (MSEC)

June 12 – June 16<sup>th</sup>, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

Additive manufacturing has shown great contributions to the design and fabrication of functional devices, including energy-related devices, robots, electronics, optics, thermal structures, as well as metamaterial devices. Various novel 3D printing technologies have been developed for the fabrication of functional devices. In addition to the engineering design strategies, nature has developed high-performance materials and structures over millions of years of evolution, providing valuable inspiration for the design of next-generation functional structures and materials. Bioinspired additive manufacturing promotes possibilities in manipulating and mimicking the multi-scale, multi-material, and multi-functional biomimetic materials and structures with excellent acoustic, optical, electrical, thermal, mechanical, and hydrodynamic properties. Understanding natural structures and replicating them by additive manufacturing for various engineering applications will lead us to drive the biomimicry field forward. Meanwhile, the fabrication challenges presented by biomimicry will lead to more novel additive manufacturing processes. This symposium will focus on research advances in the areas of additive manufacturing of functional devices and bioinspired material and structures for future engineering systems. The growth of bioinspired additive manufacturing technology will open intriguing perspectives for developing bioinspired materials and structures on the basis of novel additive manufacturing processes together with new computer-aided design and simulation methods. Specific topics of interest include, but are not limited to:

Design, modeling and simulation of bioinspired structures and material systems for 3D printing.

Field (electric, magnetic, acoustic, optical, shear force, thermal, etc.) assisted 3D printing.

Templating (gas, ice, salt, sugar, etc.) based 3D printing.

Innovative 3D printing processes for bioinspired material and structures fabrication.

3D/4D printing of bioinspired actuators, robots, metamaterials and metastructures.

3D printing of electronic devices (circuits, sensors, antennas, piezoelectrics, thermoelectrics, optoelectronics, etc.).

3D printing of energy harvest, storage and conversion devices (batteries, supercapacitors, solar cell, fuel cell, etc.).

3D printing of bioinspired functional interfaces (hydrophobic, oleophobic, hydrodynamic, microfluidic, etc.).

Advanced applications of bioinspired 3D printing in mechanics, optics and thermal physics.

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract and full manuscript for review by Oct 23, 2022 and **November 1, 2022 respectively**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

Work to attract a high-profile international keynote speaker

Organize a state-of-the-art paper that will be the lead article in the special issue

### Organizers

Dr. Cindy (Xiangjia) Li, Arizona State University, Tempe, AZ, USA. 480-727-8612; [xiangjia.li@asu.edu](mailto:xiangjia.li@asu.edu)

Dr. Yang Yang, San Diego State University, San Diego, CA, USA. 619-594-3145; [yyang10@sdsu.edu](mailto:yyang10@sdsu.edu)

Dr. Erina Joyee, University of North Carolina at Charlotte, Charlotte, NC. USA. 704-687-8930; [ejoyee@uncc.edu](mailto:ejoyee@uncc.edu)

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# — Call for Papers —

A Symposium on

## Advances in Design, Manufacturing, Analysis, and Development of Biomedical Devices

Sponsored by the ASME Manufacturing Engineering Division's  
*Biomanufacturing Technical Committee*

2023 ASME International Manufacturing Science & Engineering Conference (MSEC)  
June 12<sup>th</sup> – June 16<sup>th</sup>, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

The characteristics, use, and performance of materials, structures, and devices for biomedical applications entail unique requirements for biomedical manufacturing. The better understanding of biomedical manufacturing processes can lead to safer, smarter, and environment-friendly biomedical devices, and thus reducing healthcare costs and complications. In addition to the continual improvement of generic devices, there are also emerging technologies, such as additive manufacturing, sensing, machine learning, and robotics, which have created novel ideas and new tools for research and development in biomedical devices and applications. These applications include manufacturing of soft materials, patient specific medical or assistive devices, novel surgical tools, medical and surgical robots, intraoperative monitoring and feedback, and so on. This symposium aims to identify the constraints imposed on manufacturing processes by the requirements of biomedical materials and products, present forefront research results, highlight needs and solutions in biomedical device manufacturing, development, and analysis, and point to new paths for conceiving, designing, and operating biomedical manufacturing processes. Original contributions are invited in, but not limited to the following areas:

Analysis of biological tissue manipulation processes and modeling/experimentation of clinical procedures.

Design, manufacturing, and analysis of advanced medical devices and tools for clinical procedures.

Characterization and modeling of biomedical and biological materials and related manufacturing processes.

Novel manufacturing processes, equipment, and materials for biomedical manufacturing and applications.

Advances in process validation and verification in biomedical manufacturing.

Devices, processes, controls, and systems in medical robotics.

Design and manufacturing of medical simulation tools and systems.

Machine learning and artificial intelligence in biomedical manufacturing and devices.

Reviews of the state-of-the-art knowledge, technology, and research needs in biomedical manufacturing and development of biomedical devices.

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract and full manuscript for review by Oct 23, 2022 and **November 1, 2022 respectively**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

Work to attract a high-profile international keynote speaker

Organize a discussion session on the latest advances and future directions in biomedical manufacturing

Work to organize a paper on state-of-the-art biomedical manufacturing and/or certain biomedical devices

### Organizers

Dr. Lei Chen, University of Massachusetts Lowell, Lowell, MA, USA. 978-934-2994; [Lei\\_Chen@uml.edu](mailto:Lei_Chen@uml.edu)

Dr. Yi Wang, University of Missouri, Columbia, MO, USA. 573-882-2340; [yiwang@missouri.edu](mailto:yiwang@missouri.edu)

Dr. Yang Liu, Shanghai Jiao Tong University, Shanghai, China. (+86) 21-34206045; [yang.liu1@sjtu.edu.cn](mailto:yang.liu1@sjtu.edu.cn)

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# — Call for Papers —

A Symposium on

## Advances in Biomanufacturing of Tissue-Engineered Scaffolds and Organs

Sponsored by the ASME Manufacturing Engineering Division's  
*Manufacturing Processes Technical Committee*

2023 ASME International Manufacturing Science & Engineering Conference (MSEC) June 12  
– June 16<sup>th</sup>, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

Three-dimensional (3D) bioprinting is driving major innovations in tissue engineering and regenerative medicine, in which bioinks composed of cells and extracellular matrix (ECM) materials are printed into complex 3D functional constructs to mimic living tissues and organs using various additive manufacturing approaches. Such engineered tissues and organs are envisioned to be used for the replacement of damaged or injured human tissues and organs, providing a promising solution to the challenge of tissue and organ donor shortage. The common 3D bioprinting techniques include inkjet printing, extrusion printing, laser-assisted printing, and stereolithography. The typical bioprinting process of 3D tissues and organs are composed of three key steps: 3D bioprinting of cellular constructs, tissue fusion, and tissue maturation. This highly interdisciplinary topic requires integration of manufacturing, materials science, biology, and biomedical engineering. The associated challenges and complexities include biomaterial selection, interaction between cells and ECM materials, manufacturing challenges related to the printability of bioinks and sensitivities of living cells, and design and optimization of tissue and organ constructions, to name a few. This symposium will focus on the cutting-edge research advances in the area of 3D bioprinting of tissue-engineered scaffolds and organs. The resulting understanding will couple the manufacturing and materials science with biomedical applications for more efficient and effective fabrication of 3D living tissues and organs. Specific topics of interest include, but are not limited to:

Bioinks and biomaterials:

- Development of new bioinks and biomaterials.
- Modeling and analysis of biomanufacturing process.
- Innovation of new 3D bioprinting or biomanufacturing approaches.
- Engineering 2D/3D cellular microenvironments.
- Design, fabrication and characterization of biomedical devices.
- 3D bioprinting of complex tissues and organs.

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract and full manuscript for review by Oct 23, 2022 and **November 1, 2022 respectively**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

Work to attract a high reputation keynote speaker to introduce the cutting-edge techniques in biomanufacturing

Work to organize a review paper to summarize the state-of-the-art that will be published in one of the ASME journals

### Organizers

Dr. Yifei Jin, University of Nevada, Reno, Reno, NV, USA. (775) 784-1412; [yifeij@unr.edu](mailto:yifeij@unr.edu)

Dr. Jun Yin, Zhejiang University, Hangzhou, Zhejiang, China. +86 (571) 8795-1035; [junyin@zju.edu.cn](mailto:junyin@zju.edu.cn)

Dr. Zhengyi Zhang, Huazhong University of Science and Technology, Wuhan, Hubei, China. +86 (027) 8754-3158; [zhengyizhang@hust.edu.cn](mailto:zhengyizhang@hust.edu.cn)

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\* The conference is collocated with NAMRI/SME's 51<sup>st</sup> North American Manufacturing Research Conference (NAMRC51), which will have separate call-for-papers. Please note that submissions of the same paper to more than one conference are not permitted.

# — Call for Papers —

A Symposium on

## Advances in Sustainable Manufacturing for a Circular Economy

Sponsored by the ASME Manufacturing Engineering Division's

*Life Cycle Engineering Technical Committee*

2023 ASME International Manufacturing Science and Engineering Conference (MSEC)\*

June 12–16, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

This symposium will explore recent developments in manufacturing processes and systems to advance development and deployment of a Circular Economy (CE). The CE paradigm addresses growing concerns around the earth's rapidly depleting resources. The paradigm moves society away from the traditional linear 'take, make, use, dispose' model to a consumption model that reduces our dependence on natural resources and mitigates waste generation by ensuring the materials remain in the economy for as long as possible through continuous use. The manufacturing sector is particularly resource intensive and society's ability to produce products quickly to meet growing demands has inadvertently resulted in deleterious impacts on the environment and society. A manufacturing CE model aims to address these concerns via the implementation of sustainable practices that are preemptive as opposed to remedial. Implementing CE practices involves addressing complex and multi-faceted challenges using a systems thinking approach. Identifying, tracking and recording critical information flows will facilitate greater collaborations between stakeholders and support the development CE standards. Specific topics of interest include, but are not limited to:

- Industrial ecology approaches and social-ecological systems modeling
- Quantification of impacts and trade-offs in the context of Environment, Economy, and Society
- Resiliency of supply chains with respect to material flows
- Industrial waste mitigation strategies via closed and open loop end-of-use recovery
- Innovative, novel, and sustainable manufacturing processes and planning systems
- Digital twins and product life cycle thinking in the context of innovative CE business models
- Sustainability and circularity assessment methods/ tools
- Development and harmonization of CE-centric metrics, indicators, and standards
- Digital thread to enable CE via critical information and material flows
- Ontologies and process model-based representation of CE flows for manufacturing systems
- Machine learning, big data, and IoT for modeling and developing sustainable manufacturing systems
- Integrated sustainability decision-making models based on systems thinking and the balancing of the three pillars of sustainability (environment, economy, and society)
- Sustainability challenges and developments in electronics, plastics, and low-carbon technology sectors

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit a full manuscript for review by **November 15, 2022**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only the industry presenters have the option to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023**, or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To engage the community, symposium organizers will work to attract a high-profile industrial keynote speaker.

### Organizers

Dr. Nehika Mathur, National Institute of Standards & Technology, Gaithersburg, MD, USA. 765-775-8216;

[nehika.mathur@nist.gov](mailto:nehika.mathur@nist.gov)

Dr. Buddhika Hapuwatte, University of Maryland, College Park, MD, USA. 859-447-6762; [buddhika@umd.edu](mailto:buddhika@umd.edu)

Dr. Nancy Diaz-Elsayed, University of South Florida, Tampa, FL, USA. 813-974-2280; [nancyd1@usf.edu](mailto:nancyd1@usf.edu)

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\*The conference is collocated with NAMRI/SME's 51<sup>st</sup> North American Manufacturing Research Conference (NAMRC51), which will have separate call-for-papers. Please note that submissions of the same paper to more than one conference are not permitted.

# — Call for Papers —

A Symposium on

## Innovations in Equipment Design, Control and Automation

Sponsored by the ASME Manufacturing Engineering Division's  
*Manufacturing Equipment and Automation Technical Committee*

2023 ASME International Manufacturing Science and Engineering Conference (MSEC)\*

June 12–16, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

Advances in manufacturing technologies need to be aided by innovations in manufacturing equipment, tooling, and control/automation for effective deployment and commercialization. Most often, innovations in equipment/tooling design or control/automation are inspired by the requirements of a new manufacturing technology or the need to improve existing manufacturing processes. This symposium focuses on such demonstrated innovations in the design and control of equipment or components that enable new or improve existing manufacturing technologies. Specific topics of interest include, but are not limited to:

- Machine tools, industrial robots, and other machines in manufacturing
- Modeling, monitoring, and control of manufacturing processes (machining, joining, forming, and so on)
- Design and control of additive manufacturing machines, metrology systems, or hybrid machine systems
- Advances in sensors, actuators, motion command algorithms for positioning systems
- Data-driven machine tool/process automation and control
- Design and control of novel precision positioning systems (e.g., lithography, deposition, micro-machining)
- Sensor-assisted manufacturing (e.g., sensor assisted 3D printing or machining)
- Artificial intelligence and machine learning for process monitoring, predictive maintenance, autonomous operation, and smart manufacturing
- Novel tool holder design, tool path planning (e.g., in machining), and tool design (e.g., in forming)
- Automation in metrology systems and processes
- Novel multi-axis machine structures and controllers

Papers must demonstrate the testing of the new design or control methods to improve a manufacturing process. Contributions from the industry in this area are particularly encouraged. With a lead article on state-of-the art in this field, **high quality papers** will be recommended to be included in a **special issue** in the **ASME Journal of Manufacturing Science and Engineering**. A high-profile international keynote speaker will be invited by the symposium organizers.

### Paper Submission

Authors are encouraged to submit an abstract and full manuscript for review by **October 23 and November 01, 2022, respectively**. **Submissions will only be accepted via the conference website:** <https://event.asme.org/MSEC/>. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023**, or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Organizers

Dr. Chandra Nath, Maijker Corp., West Lafayette, IN, USA, Ph: +1-217-607-3029, [chandra.nath@maijker.com](mailto:chandra.nath@maijker.com)

Dr. Lei Zhou, The University of Texas at Austin, TX, USA, Ph: 1-512-232-8334, [lzhou@utexas.edu](mailto:lzhou@utexas.edu)

Dr. Martin Jun, Purdue University, West Lafayette, IN, USA, +1-765-491-2793, [mbqjun@purdue.edu](mailto:mbqjun@purdue.edu)

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# — Call for Papers —

A Symposium on

## Advances in Clean Energy Manufacturing

Sponsored by the ASME Manufacturing Engineering Division's  
*Manufacturing Processes Technical Committee*

*Lifecycle Engineering Technical Committee*

2023 ASME International Manufacturing Science & Engineering Conference (MSEC)

June 12 – June 16<sup>th</sup>, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

Carbon neutrality is being a major driving force for the development of renewable clean energy, e.g., solar cells, Li-ion batteries, fuel cells, etc., to replace the traditional fossil fuel and petroleum-based energy. Conventional wisdom is that wide commercialization of clean energy in ground transportation, electric grid and other national infrastructure relies closely on the energy characteristics, e.g., energy density, power density and safety. Recently, the manufacturing aspect for clean energy attracts increasing attention since the manufacturing cost, waste and carbon emissions play a significant role in the adoption of clean energy. The manufacturing sector is becoming more engaged in supporting the energy framework of the nation and making a significant impact. This symposium will focus on research advances in the improvement of traditional manufacturing methods, the development of novel manufacturing technologies, and the hybrid for renewable clean energy, and “state-of-the-art” characterization techniques as well as computational simulations for the fundamental understanding of these manufacturing processes. Such manufacturing technologies will have industrial impact by achieving lower cost, lower waste and carbon emissions that facilitate the large scale-up for the manufacturing of the clean energy. Specific topics of interest include, but are not limited to:

- Advanced manufacturing technologies and methods for clean energy
- Development of manufacturing facility and equipment for clean energy
- In-situ monitoring and sensing the manufacturing process for clean energy
- Computational modeling and simulation for manufacturing process of clean energy.
- Manufacturing process optimization and design to reduce the cost, waste, and carbon emissions
- Scale-up of the manufacturing process for clean energy
- Sustainability of manufacturing technologies for clean energy

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract and full manuscript for review by Oct 23, 2022 and **November 1, 2022 respectively**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

- Work to attract a high-profile international keynote speaker
- Work to attract the members in clean energy manufacturing to broaden the manufacturing community
- Organize a special issue in the ASME Journal of Manufacturing Science and Engineering or ASME Journal of Micro and Nano-Manufacturing
- Organize a state-of-the-art paper that will be the lead article in the special issue

### Organizers

Dr. Lei Chen, University of Michigan-Dearborn, Dearborn, MI, USA. 313-593-5122; [leichn@umich.edu](mailto:leichn@umich.edu)

Dr. Chris Yuan, Case Western Reserve University, Cleveland, OH, USA. 216-368-5191; [chris.yuan@case.edu](mailto:chris.yuan@case.edu)

Dr. Kevin Guo, Ford Ion Park, Dearborn, MI, USA. 734-945-1587; [gguo1@ford.com](mailto:gguo1@ford.com)

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\* The conference is collocated with NAMRI/SME's 51<sup>st</sup> North American Manufacturing Research Conference (NAMRC51), which will have separate call-for-papers. Please note that submissions of the same paper to more than one conference are not permitted.

# — Call for Papers —

A Symposium on

## Advances in Nontraditional Machining Processes

Sponsored by the ASME Manufacturing Engineering Division's

*Manufacturing Processes Technical Committee*

2023 ASME International Manufacturing Science & Engineering Conference (MSEC)

June 12 – June 16<sup>th</sup>, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

Nontraditional machining (NTM) processes provide attractive alternatives for machining complex geometry in the advanced, high-strength and temperature-resistant materials being used in industry today. NTM processes rely on mechanisms other than direct mechanical contact between the cutting tool and workpiece, and their application creates a unique set of technical problems to be solved. This symposium will focus on state-of-the-art research on Meso/Micro/Nano-NTM processes and their applications. It will provide an excellent platform for researchers, practitioners, and educators to present and discuss the most recent innovations, trends, and practical challenges encountered and solutions adopted in the fields of nontraditional manufacturing. Research of interest includes: new NTM process development; analytical, mechanistic, and numerical modeling; experimental studies; and process monitoring and control. Specific topics of interest include, but are not limited to:

- Thermo-Electrical NTM Operations and Machine Tools, e.g., EDM, EBM, LBM
- Mechanical NTM Operations and Machine Tools, e.g., USM, RUM, WJM, AWJM
- Chemical and Electrochemical NTM Operations and Machine Tools, e.g., CHM, ECM
- Hybrid and other assisted machining processes
- Applications of NTM in Additive Manufacturing Post-Processing, e.g., WEDM/EDM, Ultrasonic Vibration-Assisted Machining, Micro-Blasting, Chemical-Mechanical Polishing
- Applications of Machine Learning and Intelligent Decision Model in NTM
- Accuracy and Surface Integrity Realized by NTM
- Environmental and Safety Issues in NTM

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract and full manuscript for review by Oct 23, 2022 and **November 1, 2022 respectively**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

- Work to attract a high profile international keynote speaker
- Organize a special issue in the ASME Journal of Manufacturing Science and Engineering or ASME Journal of Micro and Nano-Manufacturing
- Organize a state-of-the-art paper that will be the lead article in the special issue

### Organizers

Dr. Murali Sundaram, University of Cincinnati, Cincinnati, OH, USA. (513)-556-2791, [murali.sundaram@uc.edu](mailto:murali.sundaram@uc.edu)

Dr. Yuefeng Luo, Savannah River National Laboratory, Aiken, SC, 29808, USA. 803)725-7169, [yuefeng.luo@srl.doe.gov](mailto:yuefeng.luo@srl.doe.gov)

Dr. Muhammad P. Jahan, Miami University, Oxford, OH, USA. (513)-529-0349, [jahanmp@miamioh.edu](mailto:jahanmp@miamioh.edu)

Dr. Meng Zhang, Kansas State University, Manhattan, KS, USA. (785)-532-5606; [meng@ksu.edu](mailto:meng@ksu.edu)

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\* The conference is collocated with NAMRI/SME's 51<sup>st</sup> North American Manufacturing Research Conference (NAMRC51), which will have separate call-for-papers. Please note that submissions of the same paper to more than one conference are not permitted.



# — Call for Papers —

A Symposium on

## Advances in Lightweight and Dissimilar Materials Joining

Sponsored by the ASME Manufacturing Engineering Division's  
*Manufacturing Processes Technical Committee*

2023 ASME International Manufacturing Science & Engineering Conference (MSEC)

June 12 – June 16<sup>th</sup>, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

Joining is an essential element in manufacturing complex structures and products - from custom products such as aircrafts, ships and medical devices to high volume products such as automobiles, appliances and microelectronics devices. Current trends in product design saw increased usage of lightweight and dissimilar materials, including metal alloys, metal matrix nanocomposites, carbon fiber composites and high entropy alloys etc.. We are hence inviting researchers from academia, government and industry to share the advances and innovations in the field of joining of lightweight and dissimilar materials. The symposium consists of paper presentations. Specific topics of interest include, but are not limited to:

- Advanced fusion welding technologies, such as high energy beam welding, and high-efficiency digital arc welding;
- Novel solid-state joining technologies, such as friction-based welding, impact welding, and ultrasonic welding etc.;
- Novel mechanical joining methods such as non-prehole riveting, single-sided riveting, and high-efficiency interference fit riveting etc.;
- Multi-energy field hybrid joining assisted by magnetic field, ultrasonic vibration, friction, and/or Joule heating etc.;
- Joining process and joint performance modeling with advanced computational methods such as multi-scale, multi-phase, and meshfree methods;
- On-line joining process monitoring, quality prediction and adaptive control using artificial intelligence etc.;
- Non-destructive joint structure evaluation using advanced observation techniques such as neutron diffraction, CT, and ultrasonic etc..

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract and full manuscript for review by Oct 23, 2022 and **November 1, 2022 respectively**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

- Work to attract a high-profile international keynote speaker
- Organize a special issue in the ASME Journal of Manufacturing Science and Engineering
- Organize a state-of-the-art paper that will be the lead article in the special issue

### Organizers

Dr. Yongbing Li, Shanghai Jiao Tong University, Shanghai, China, phone: (86)(21)34206305, email: [yongbinglee@sjtu.edu.cn](mailto:yongbinglee@sjtu.edu.cn)

Dr. Xun Liu, The Ohio State University, Columbus, OH, USA, phone: (614)2928915, email: [liu.7054@osu.edu](mailto:liu.7054@osu.edu)

Dr. Yunwu Ma, Shanghai Platform for Smart Manufacturing, Shanghai, China, phone: (86)(21)68286971, email:

[mayw@spsm.net.cn](mailto:mayw@spsm.net.cn)

# — Call for Papers —

A Symposium on

## Advances in Surface Engineering: Process, Metrology, and Property/Performance

Sponsored by the ASME Manufacturing Engineering Division's  
*Manufacturing Processes Technical Committee*

2023 ASME International Manufacturing Science & Engineering Conference (MSEC)

June 12 – June 16<sup>th</sup>, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

Surface quality and integrity play critical roles on determining the functionality and durability of a large variety of manufactured products. Advances in surface engineering techniques, particularly novel processing approaches, advanced metrology/inspection methods, and analytical methodologies, will lead to the design and manufacturing of high-performance surfaces at various length scales. This symposium will focus on the research advances in the field of surface science and engineering, with emphases on manufacturing process innovation, dimensional metrology, surface inspection/characterization, and properties/performance testing. Such surface engineering techniques will have industrial impact by achieving better dimensional or process accuracy, better understanding of factors affecting the specific manufacturing process, and, ultimately, reduction of manufacturing costs through improved control and reduced process development time. Specific topics of interest include, but are not limited to:

- Surface processing processes: coating/deposition, finishing, patterning, cleaning, peening, hardening, etc.
- Surface quality of components fabricated by machining, casting, welding, additive manufacturing, etc.
- Advanced functional surfaces/coatings: nanotechnology, energy conversion/storage, biomaterials and biodevices, etc.
- Surface science of catalysis, electrocatalysis, photocatalysis, photoelectrochemical devices, etc.
- Dimensional metrology: metrology system design and fabrication, 3D/4D metrology methods, precision calibration techniques, machine-learning/deep-learning based metrology, etc.
- Surface inspection/characterization: surface profilometry in manufacturing processes, characterization of surface topography, trustworthiness of 3D surface topography data, surface data analytics, etc.
- Surface properties: tribology, corrosion and oxidation resistance, hydrophilicity/hydrophobicity, contact/bending fatigue.
- Multifunctional performance of advanced surface designs for energy, biomedical, environmental applications.
- Semiconductor (wafer, photomask, pellicle, etc.) surface/defect metrology and inspection

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract and full manuscript for review by Oct 23, 2022 and **November 1, 2022 respectively**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

- Work to attract a high profile international keynote speaker
- Organize a special issue in the ASME Journal of Manufacturing Science and Engineering or ASME Journal of Micro and Nano-Manufacturing
- Organize a state-of-the-art paper that will be the lead article in the special issue
- Promote a partnering platform connecting university research with industry R&D for successful partnerships

### Organizers

Dr. Yiliang (Leon) Liao, Iowa State University, Ames, IA, USA. +1-515-294-1325; [leonl@iastate.edu](mailto:leonl@iastate.edu) Dr.

Beiwen Li, Iowa State University, Ames, IA, USA, +1-515-294-9226, [beiwen@iastate.edu](mailto:beiwen@iastate.edu)

Dr. ChaBum Lee, Texas A&M University, College Station, TX, USA. +1-979-458-8121, [cblee@tamu.edu](mailto:cblee@tamu.edu)

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\* The conference is collocated with NAMRI/SME's 51<sup>st</sup> North American Manufacturing Research Conference (NAMRC51), which will have separate call-for-papers. Please note that submissions of the same paper to more than one conference are not permitted.



# — Call for Papers —

A Symposium on

## Advances in Assisted and Augmented Manufacturing Processes

Sponsored by the ASME Manufacturing Engineering Division's

*Manufacturing Processes Technical Committee*

2023 ASME International Manufacturing Science & Engineering Conference (MSEC)

June 12 – June 16<sup>th</sup>, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

Manufacturing of materials can be a challenging task, particularly due to the targets of cost and time minimization at maximum quality. When manufacturing process parameters cannot be compromised further due to process constraints to achieve required targets, auxiliary systems can provide significant aid in improving results. These auxiliary systems can be merely assisting the process to overcome capability restrictions in the short term, or augmenting the process to create new solutions in the long term. In many cases, a single manufacturing process cannot fulfill all the requirements of product performance, due to the limitation of that individual process. Combining two processes sequentially or simultaneously can overcome the difficulty of a single process by leveraging each other's strengths. This symposium will focus on the advances on assisted or augmented processes, as well as sequential and hybrid manufacturing processes for further improvement and optimization of manufacturing processes. Papers from both academia and industry are strongly encouraged. More specifically, this symposium is focused on applications where a manufacturing process performance is extended or improved through the addition of a complimentary process. All manufacturing processes (subtractive, additive, deformation, consolidation, and casting) enhanced by a complimentary process are welcomed. Topics of interest include, but are not limited to:

- Vibration-Assisted Manufacturing Processes
- Laser-Assisted Manufacturing Processes
- Electrically-Assisted Manufacturing Processes
- Thermally-Assisted Manufacturing Processes
- Magnetic-Assisted Manufacturing Processes
- Multiscale and Multiphysics Modeling for Assisted and Augmented Manufacturing Processes
- Assisted Manufacturing Process Monitoring and Control
- Industrial Applications of Assisted Manufacturing Processes

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract and full manuscript for review by Oct 23, 2022 and **November 1, 2022 respectively**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

Work to attract a high-profile international keynote speaker and outstanding researchers from industry

Organize a state-of-the-art paper that will be included in ASME journals

Facilitate networking and connection building via organizing discussions between junior researchers and senior experts and using messaging tools and the event feed

### Organizers

Dr. Meng Zhang, Kansas State University, Manhattan, KS 66506, 785-532-5606; [meng@ksu.edu](mailto:meng@ksu.edu)

Dr. Weilong Cong, Texas Tech University, Lubbock, TX 79409, 806-834-6178; [weilong.cong@ttu.edu](mailto:weilong.cong@ttu.edu)

Dr. Fuda Ning, State University of New York at Binghamton, Binghamton, NY 13902, 607-777-4793; [fning@binghamton.edu](mailto:fning@binghamton.edu)

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\* The conference is collocated with NAMRI/SME's 51<sup>st</sup> North American Manufacturing Research Conference (NAMRC51), which will have separate call-for-papers. Please note that submissions of the same paper to more than one conference are not permitted.

# — Call for Papers —

A Symposium on

## Physics-Informed Data-Driven (PIDD) Models for Advanced Manufacturing Processes and Systems

Sponsored by the ASME Manufacturing Engineering Division's  
*Manufacturing Processes Technical Committee*  
*Manufacturing Systems Technical Committee*

2023 ASME International Manufacturing Science and Engineering Conference (MSEC)\*

June 12 - June 16, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, School of Engineering

### Technical Focus

Manufacturing industries are experiencing significant transformations due to increasing needs for fabricating high-quality components at lower costs accompanied by smartness and connectivity in factory operations. With increasing data streaming from manufacturing processes, manufacturers can leverage the data to help understand, model, and predict complex spatio-temporal behaviors of manufacturing processes at micro-, meso-, and macro- scales. The industries aim to develop the digital replica of manufacturing processes or equipment that evaluates the operation status and/or adjusts the parameters in real-time via sensor data analysis. Physics-based numerical or analytical approaches are typically robust and interpretable but are unable to find complex structures and relationships in the data. In contrast, data-driven approaches have shown promising results in recent years for enhancing the prediction, design, and control abilities of advanced manufacturing operations. However, data-driven approaches suffer from shortcomings such as the non-availability of quality training data, limited generalization to unseen samples, and lack of interpretability. Thus, manufacturers need data-driven methods that combine known physics and measurement data to make decisions and optimize manufacturing parameters. Physics-Informed data-driven (PIDD) models consider embedding the knowledge derived from physics-based models into data-driven approaches for improving generalization, data requirements, and explainability. The symposium focuses on the research advancements in developing PIDD models for enhanced prediction accuracy, robustness, interpretability, and scalability of the models compared to conventional standalone data-driven and physics-based approaches. The specific topics of interest for the symposium include, but are not limited to:

- Machine learning and physics-informed approaches for manufacturing
- Models for various manufacturing processes – casting, joining, machining, forming, additive manufacturing, etc.
- Issues associated with the generation and labelling of datasets
- Monitoring, optimization, and control of manufacturing processes and systems
- Models for predictive maintenance of systems involved in a manufacturing process
- Computational and implementation issues with PIDD models
- Verification and validation of high-fidelity data-driven models

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract by Oct. 24 and **full manuscripts for review by November 1, 2022**. **Submissions will only be accepted via the conference website:** <https://msec-namrc2023.rutgers.edu>. Only industry presenters have the option to present without a paper. **Final revised manuscripts and the copyright transfer form** must be submitted by **March 20, 2023**. The presenting author must **register** by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

- Work to attract a high-profile international keynote speaker
- Organize a discussion session on recent advancements and future directions in PIDD models

### Organizers:

Dr. Ankit Agarwal, Clemson University, Greenville, SC, USA. +1 864 990 8230; [agarwa3@clemson.edu](mailto:agarwa3@clemson.edu)

Dr. Gregory W. Vogl, National Institute of Standards and Technology, MD, USA. +1 301-975-3198; [gvogl@nist.gov](mailto:gvogl@nist.gov)

Dr. Kaushal A. Desai, Indian Institute of Technology Jodhpur, India. +91 707 347 5302; [kadesai@iitj.ac.in](mailto:kadesai@iitj.ac.in)

Dr. Yongzhi Qu, University of Minnesota Duluth, Duluth, MN, USA. +1 218-726-8803; [yongzhi@umn.edu](mailto:yongzhi@umn.edu)

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\* The conference is collocated with NAMRI/SME's 51<sup>st</sup> North American Manufacturing Research Conference (NAMRC51), which will have separate call-for-papers. Please note that submissions of the same paper to more than one conference are not permitted.

# — Call for Papers —

A Symposium on

## Converging Manufacturing Techniques with Hybrid Manufacturing

Sponsored by the ASME Manufacturing Engineering Division's  
Manufacturing Processes Technical Committee  
Manufacturing Systems Technical Committee  
Additive Manufacturing Technical Committee

2023 ASME International Manufacturing Science and Engineering Conference (MSEC)\*  
June 12 – June 16, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

The convergence of multiple manufacturing techniques and processing domains has enabled new uses of existing manufacturing equipment in novel workflows. For example, integration of additive, subtractive, and inspection techniques by means of hybrid manufacturing has enabled manufacturers to reduce labor and material costs by mitigating disjointed processing. However, hybrid manufacturing presents many challenges due to the complexity and inherently multi-dimensional nature of processing. This call provides an opportunity for the research community to present findings and review recent developments in hybrid manufacturing involving the convergence of multiple manufacturing techniques. Papers are welcome to include process planning, process/system development, material property analysis of resulting components, and novel experimental approaches with applications in aerospace, automotive, tooling, repair, renewable energy, etc. This symposium invites papers from academia, national laboratories, and industry to present findings in topic areas including, but not limited to:

- Modeling, analysis, control, and optimization of hybrid manufacturing
- Process planning and simulation for multi-process manufacturing workflows
- Next generation hybrid manufacturing systems
- Convergence of robotic and traditional manufacturing processes
- Design for hybrid manufacturing
- Multi-scale or multi-physics processing
- In-situ process monitoring and control for multi-process workflows
- Development of industrial applications for hybrid manufacturing
- CAD/CAM process modeling, development, and optimization for multi-process manufacturing

### Paper Submission (Dates are subject to change)

Authors are encouraged to submit an abstract and full manuscript for review by **Oct 23, 2022** and **November 1, 2022** respectively. Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings.

**All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

- Work to attract high profile international keynote speakers, one each from academia, national lab, industry
- Organize a special issue in the ASME Journal of Manufacturing Science and Engineering
- Organize a state-of-the-art paper that will be the lead article in the special issue

### Organizers:

Dr. Thomas Feldhausen, Oak Ridge National Laboratory, Oak Ridge, TN USA, +1.865.341.0169, [feldhausenta@ornl.gov](mailto:feldhausenta@ornl.gov)

Dr. Jason Jones, Hybrid Manufacturing Technologies, McKinney, TX USA, +1.214.530.2334,

[jj@hybridmanutech.com](mailto:jj@hybridmanutech.com)

Dr. Christopher Saldana, Georgia Institute of Technology, Atlanta, GA USA, +1.404.385.3735,

[christopher.saldana@me.gatech.edu](mailto:christopher.saldana@me.gatech.edu)

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# — Call for Papers —

A Symposium on

## Human-Automation Collaboration and Assembly in Advanced Manufacturing

Sponsored by the ASME Manufacturing Engineering Division's

*Manufacturing Systems Technical Committee*

*Manufacturing Processes Technical Committee*

2023 ASME International Manufacturing Science & Engineering Conference (MSEC)

June 12 – June 16<sup>th</sup>, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

Automation in manufacturing is progressing rapidly through the adoption of techniques including Collaborative Robotics (Cobots), Cyber Physical Systems, Advanced Sensing and Instruments, Simulation, Data Analytics, and Artificial Intelligence (AI). However, the significantly increased complexity of manufacturing automation causes difficulty for operators to collaborate with machines that currently lack the appropriate human-computer/machine/robot coordination, safety, and planning tools. Furthermore, experienced workers are retiring steadily, and their experience cannot be captured and transferred to new generations effectively and efficiently. This symposium will focus on research advances in the areas of planning, monitoring, development, performance, and control of human-automation collaborative platforms for advancing the quality, efficiency, sustainability, agility, safety, and flexibility of manufacturing processes/systems under various human involvement levels. Specific topics of interest include, but are not limited to:

- Advanced technological devices for physical support and interfacing with human-automation production technologies
- Human-centered AI and data analytics
- Cyber-physical systems and digital twin of collaborative human-automation systems and processes
- Virtual/augmented reality in collaborative manufacturing
- Risk assessment, safety, and workplace ergonomics of collaborative human-automation systems
- Process planning challenges in collaborative manufacturing involving additive/subtractive/forming/hybrid processes
- Access and inclusion in manufacturing
- Novel impedance control techniques for collaborative robots
- Relationship between man, work environment, physical and cognitive conditions
- Cyber-security in collaborative manufacturing processes/systems

### Paper Submission (Dates are subject to change)

Authors are encouraged to submit an abstract and full manuscript for review by Oct 23, 2022 and **November 1, 2022 respectively**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

- Work to promote high-quality submissions and attract a high-profile keynote speaker
- Organize a special issue on collaborative robots in the ASME Journal of Manufacturing Science and Engineering

### Organizers

Dr. Azadeh Haghghi, University of Illinois Chicago, IL, USA; [ahaghi3@uic.edu](mailto:ahaghi3@uic.edu)

Dr. Yunbo “Will” Zhang, Rochester Institute of Technology, Rochester, NY, USA. 585-475-5571; [ywzeie@rit.edu](mailto:ywzeie@rit.edu)

Dr. Rui Liu, Rochester Institute of Technology, Rochester, NY, USA. 585-475-6819; [rleme@rit.edu](mailto:rleme@rit.edu)

Dr. Chinedum Okwudire, University of Michigan, Ann Arbor, MI, USA; [okwudire@umich.edu](mailto:okwudire@umich.edu)

Dr. Vinh Nguyen, Michigan Technological University, MI, USA; [vinhn@mtu.edu](mailto:vinhn@mtu.edu)

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# — Call for Papers —

A Symposium on

## Prognostics and Health Management (PHM) of Manufacturing Systems

Sponsored by the ASME Manufacturing Engineering Division's  
*Manufacturing Systems Technical Committee*

2023 ASME International Manufacturing Science & Engineering Conference (MSEC)

June 12 – June 16<sup>th</sup>, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

Engineering modeling and analytics deal with quantitative modeling and analytical characterization of engineering systems using physical or mathematical representation of a phenomenon or process within a manufacturing system. In modern manufacturing factories, the deployment of advanced sensing, communication, and computation technologies have resulted in a data-rich environment and provided opportunities of augmenting manufacturing intelligence through physics-informed data-driven decision making. By integrating big data analytics that use data from sensors, controllers, metrology systems, and factory databases with engineering models, we can make effective use of data for diagnostic and prognostic modeling, process control, product quality inspection, etc., thereby enhancing system self-awareness, productivity, quality, resilience, and the overall manufacturing performance. This symposium focuses on PHM of manufacturing systems through data analytics and AI based methods. Topics of interest include but are not limited to:

- Big data analytics for predictive decision-making in manufacturing systems
- Physics-guided machine learning and statistics for detecting and analyzing manufacturing failures and defects
- Anomaly detection, diagnostics, and prognostics for manufacturing machinery and equipment
- Remaining Useful Life (RUL) prediction
- Data mining and machine learning enabling smart decision-making in manufacturing systems
- Sensing, measurement, and visualization of manufacturing data
- Computer vision and signal/image processing for PHM
- Sensor-based monitoring, control, and optimization for failure-prone systems
- Multi-sensor multimodal data fusion for machine health estimation, fault diagnosis, and defect detection
- Modeling and control of complex quality issues and defects in non-traditional manufacturing processes
- Statistics and machine learning for uncertainty quantification in PHM
- Data-efficient decision-making using transfer learning, federated learning, and sampling design (or active learning)
- PHM of manufacturing systems in cloud manufacturing and Industrial Internet of Things (IIoT)

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract and full manuscript for review by Oct 23, 2022 and **November 1, 2022 respectively**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

- work to attract a high profile international keynote speaker
- work to organize a Special Panel on “Emerging Topics in Data Analytics for Manufacturing.”

### Organizers

Dr. Chenhui Shao, University of Illinois at Urbana-Champaign; +1 (217) 300-4750; [chshao@illinois.edu](mailto:chshao@illinois.edu)

Dr. Shenghan Guo, Arizona State University; +1 (480) 727-5120; [shenghan.guo@asu.edu](mailto:shenghan.guo@asu.edu)

Dr. Yujie Chen, Caterpillar Inc., +1 (309) 494-3683; [chenyujie711@gmail.com](mailto:chenyujie711@gmail.com)

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\* The conference is collocated with NAMRI/SME's 51<sup>st</sup> North American Manufacturing Research Conference (NAMRC51), which will have separate call-for-papers. Please note that submissions of the same paper to more than one conference are not permitted.



# — Call for Papers —

A Symposium on

## Networked Manufacturing towards an Intelligent, Agile and Resilient Industry

Sponsored by the ASME Manufacturing Engineering Division's  
*Manufacturing Systems Technical Committee*

2023 ASME International Manufacturing Science & Engineering Conference (MSEC) June 12  
– June 16<sup>th</sup>, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

Manufacturers that can add intelligence, agility, and resilience in operations will become invulnerable to changing constraints and fluctuations in the future. These require manufacturing systems to be contextual-aware, self-configurable and adaptive across all system layers within a factory or inter-factories. Luckily, industrial connectivity technologies, cloud computing, advanced machine learning algorithms and innovative service-oriented architecture could collectively enable this change. We envision future manufacturing systems could become a self-organizing network of micro manufacturing services that can sense, think and react autonomously in changing environments. This self-organizing network can be deployed for a workstation, a production line, one factory or a manufacturing community. Therefore, we solicit original research work in the following topics, but not limited to:

- Cloud manufacturing
- Service-oriented and micro service architecture for provisioning manufacturing services
- Connectivity and communication technologies for manufacturing services
- Service scheduling, control and load balancing of manufacturing services
- Horizontal and vertical integration for flexible and robust manufacturing
- Self-x in manufacturing service networks
- Standards and data models in manufacturing services
- Security and privacy preservation in networked manufacturing
- Human-in-the-loop in networked manufacturing
- Supporting technologies for intelligent and resilient manufacturing

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract and full manuscript for review by Oct 23, 2022 and **November 1, 2022 respectively**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

- Work to attract a high-profile international keynote speaker
- Organize a special issue in the ASME Journal of Manufacturing Science and Engineering or another proper high-quality journal
- Organize a state-of-the-art paper that will be the lead article in the special issue

### Organizers

Dr. Yuqian Lu, The University of Auckland, New Zealand. 64 9 923 1584; [yuqian.lu@auckland.ac.nz](mailto:yuqian.lu@auckland.ac.nz)

Dr. Yujie Chen, Caterpillar Inc., Peoria, IL, USA. 940-536-4014; [chenyujie711@gmail.com](mailto:chenyujie711@gmail.com)

Dr. Xi (Vincent) Wang, KTH Royal Institute of Technology, Sweden. 46 8 790-9024; [wangxi@kth.se](mailto:wangxi@kth.se)

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\* The conference is collocated with NAMRI/SME's 51<sup>st</sup> North American Manufacturing Research Conference (NAMRC51), which will have separate call-for-papers. Please note that submissions of the same paper to more than one conference are not permitted.

# — Call for Papers —

A Symposium on

## Frontiers of Data Analytics- and Simulation-Enabled Digital Twins for Advanced Manufacturing Metaverse

Sponsored by the ASME Manufacturing Engineering Division's  
*Manufacturing Systems Technical Committee*

2023 ASME International Manufacturing Science & Engineering Conference (MSEC)  
June 12<sup>th</sup> – June 16<sup>th</sup>, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

Research about Metaverse Digital Twins (DTs) is becoming an increasingly important topic as advanced manufacturing is becoming the norm. Metaverse manufacturing, unlike its predecessor automated manufacturing, has humans playing key roles. Metaverse DTs not only include DTs of real manufacturing assets and processes but also includes Augmented Reality (AR) and Virtual Reality (VR) of human interactions. Additionally, Metaverse DTs allow for digital collaborations by sharing data and information across different software applications. As a result, there are fast growing demands across several industry sectors for qualified, frequently complex, DTs. These DTs can provide capabilities, such as in-process monitoring, part qualification, anomaly diagnosis, process control and optimization with data analytics and simulation models. Existing mathematical models can be improved using physics-informed artificial intelligence (AI) models in Metaverse DTs. Topics of interest include, but not limited to:

- Creation of advanced manufacturing metaverse.
- Advanced methods and tools for applying virtual and augmented realities in manufacturing.
- Technical innovations in software architectures, data requirements, and algorithms for Metaverse development.
- Data analytics and AI algorithms and models for Metaverse DTs.
- Metaverse DTs in the integration of the sensors and data in in-process monitoring.
- Machine learning AI applied to Metaverse DTs to solve the instability problem in manufacturing processes and quality issues in fabricated parts.
- Simulation-enabled DTs and their effect on cost reduction and quality improvement.
- Edge control strategies and execution using Metaverse DTs.
- Metaverse DT-enabled process development.
- Factory-level simulation and process flow optimization using Metaverse DTs.

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract and full manuscript for review by Oct 23, 2022 and **November 1, 2022 respectively**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

- Attract a high-profile international keynote speaker
- Organize a state-of-the-art paper that will be the lead article in a special issue

### Organizers

Dr. Shaw Feng, 301-975-3551; [shaw.feng@nist.gov](mailto:shaw.feng@nist.gov); Engineering Laboratory (EL), NIST, Gaithersburg, MD, USA.

Dr. Gordon Shao, 301-975-3625; [gshao@nist.gov](mailto:gshao@nist.gov); EL, NIST, Gaithersburg, MD, USA.

Dr. Albert Jones, 301-975-3554; [jonesa@nist.gov](mailto:jonesa@nist.gov); EL, NIST, Gaithersburg, MD USA.

Dr. Paul Witherell, 301-975- 3385; [paul.witherell@nist.gov](mailto:paul.witherell@nist.gov); EL, NIST, Gaithersburg, MD, USA.

Dr. Young-Jun Son, 765-496-2312; [yjson@purdue.edu](mailto:yjson@purdue.edu); School of Industrial Engineering, Purdue University, West Lafayette, IN

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\* The conference is collocated with NAMRI/SME's 51<sup>st</sup> North American Manufacturing Research Conference (NAMRC51), which will have separate call-for-papers. Please note that submissions of the same paper to more than one conference are not permitted.



# — Call for Papers —

A Symposium on

## Advances in Micro- and Nano-scale Additive Manufacturing

Sponsored by the ASME Manufacturing Engineering Division's  
*Nano/Micro/Meso Manufacturing Technical Committee*

2023 ASME International Manufacturing Science and Engineering Conference (MSEC)\*

June 12-June 16<sup>th</sup>, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

The ability to fabricate small-scale structures enables harnessing novel scale-dependent phenomena. For example, micro- and nano-scale structures that take advantage of subwavelength manipulation of light or strengthening of materials at small scales have led to optical and mechanical metamaterials with superior performance. The intersection of Additive manufacturing (AM) and scalable nanomanufacturing (SM) significantly expands the design space by enabling the control of geometry and material properties on the scale of the individual building blocks. Despite their advantages, micro- and nano-scale AM processes have remained a niche set with limited industrial-scale adoption due to poor manufacturing readiness. Factors that limit manufacturing readiness include low throughput, poor quality, small material set, limited process knowledge, and lack of tools and techniques for process monitoring and control. A set of mature micro- and nano-scale AM processes will unlock the novel scale-dependent properties for societal benefit. Specific topics of interest include, but are not limited to:

Integration of micro- and nano-scale AM processes with other manufacturing processes.

Assembly of additively manufactured micro- and nano-scale structures with macroscale objects.

Fabrication of functional devices using micro- and nano-scale AM, directed- or self-assembly processes.

Manufacturing scale up via high-throughput printing or defect-free printing over large areas or volumes.

In-situ process metrology for measurement of geometry, process conditions, or material properties.

Machine learning or data science based approaches for process modeling, prediction, monitoring, or control.

Design of manufacturing equipment or systems for micro- and nano-scale AM.

Novel materials, material design, and/or multi-material capabilities for micro- and nano-scale AM.

Novel AM processes with features smaller than 100  $\mu\text{m}$  and superior rate, quality, cost, or materials.

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract and full manuscript for review by Oct 23, 2022 and **November 1, 2022 respectively**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

- Work to attract a high profile international keynote speaker
- Organize a special issue in the ASME Journal of Manufacturing Science and Engineering or ASME Journal of Micro and Nano Manufacturing
- Organize a state-of-the-art paper that will be the lead article in the special issue

### Organizers

Dr. Sourabh Saha, Georgia Institute of Technology, Atlanta, GA, USA. 404-894-3622; [ssaha8@gatech.edu](mailto:ssaha8@gatech.edu)

Dr. Nilabh Roy, Canon Nanotechnologies, Austin, TX, USA. 512-363-2167; [nroy@cnt.canon.com](mailto:nroy@cnt.canon.com)

Dr. Bruno Azeredo, Arizona State University, Tempe, AZ, USA. 480-727-3974; [Bruno.Azeredo@asu.edu](mailto:Bruno.Azeredo@asu.edu)

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# — Call for Papers —

## A Symposium on **Advances in Micro and Nano Manufacturing**

Sponsored by the ASME Manufacturing Engineering Division's  
*Nano/Micro/Meso Manufacturing Technical Committee*  
*Manufacturing Process Technical Committee*

2023 ASME International Manufacturing Science and Engineering Conference (MSEC)\*

June 12-16, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

Micro- and nano-scale manufacturing is gaining more attention due to production miniaturization and customization. High precision and product quality are difficult to achieve at this length scale; thus, a deeper understanding of the processes, development of characterization methods, modeling and simulations, and monitoring are required for the improvement of product quality. Also, process and system technologies need to be advanced for scalable manufacturing. In addition, due to the size effects and difficulties in monitoring and control, simulation and prediction are particularly important at a small scale. Thus, digital or virtual manufacturing technology is becoming essential. This symposium will focus on advances in micro- and nano-scale manufacturing technologies that address the aforementioned requirements. Both theoretical and experimental contributions are welcome. Application-oriented novel manufacturing processes and systems are also of interest. Papers from the industrial sector are also strongly encouraged. Specific topics of interest at the micro- and nano-scale include, but are not limited to:

- Mechanical, nontraditional, additive, and hybrid manufacturing processes and systems
- Process and system characterization, modeling, and simulation
- Scalable micro and nanomanufacturing
- Micro and nanoscale digital or virtual manufacturing
- Surface texturing, surface integrity, and process improvement
- Process monitoring and control
- Measurement and metrology
- Novel product designs and assembly technologies
- Design and fabrication methods for micro-sensors
- Equipment for micro- and nano-scale manufacturing
- Tip-based manufacturing
- Manufacturing related to micro- and nano-composites
- Use of nano/micro additives and fluids for manufacturing

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract and full manuscript for review by Oct 23, 2022, and **November 1, 2022, respectively**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023**, or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

- work to attract a high-profile international keynote speaker
- organize a special issue in the ASME Journal of Micro and Nano-Manufacturing
- organize a state-of-the-art paper that will be the lead article in the special issue

### Organizers:

Dr. Soham Mujumdar, IIT Bombay, Mumbai, India, Ph: +91-9922900074, [sohammujumdar@iitb.ac.in](mailto:sohammujumdar@iitb.ac.in)

Dr. Erina Joyee, University of North Carolina Charlotte (UNCC), Charlotte, NC, USA, Ph: +1-704-687-8930, [ejoyee@uncc.edu](mailto:ejoyee@uncc.edu)

Dr. Chandra Nath, Majiker Corp., West Lafayette, IN, USA. Ph: +1-217-607-3029, [chandra.nath@majiker.com](mailto:chandra.nath@majiker.com)

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# — Call for Papers —

A Symposium on

## Low-Dimensional Nanostructures and Porous Materials: Synthesis, Self-Organization, and Printing

Sponsored by the ASME Manufacturing Engineering Division's  
*Nano/Micro/Meso Manufacturing Technical Committee*  
*Advanced Materials Manufacturing Technical Committee*

2023 ASME International Manufacturing Science & Engineering Conference (MSEC)\*

June 12 – June 16<sup>th</sup>, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### Technical Focus

Recent advances in bottom-up synthesis and self-assembly, as well as top-down printing and fabrication of low-dimensional nanostructures underlie a revolution in manufacturing, especially on flexible substrates, for many applications including energy storage, biomedical devices, and consumer electronics. Importantly, tuning the atomic structure, nanoscale morphology, and hierarchical architectures of these emerging 0D, 1D, and 2D materials enable a wide variety of impressive electrical, chemical, optical, magnetic, thermal, and other coupled properties. This includes multifunctionality of individual nanoscale building blocks, such as 0D metal nanoparticles, 1D carbon nanotubes, as well as 2D graphene, transition metal dichalcogenides, and MXenes. It also includes the collective behavior of ensembles of nanostructures and hierarchically architected materials, such as aligned nanofilaments, nanoporous materials, and metamaterials. In particular, ordered nanoscale and mesoscale building blocks give rise to unique collective and hierarchical properties that are not only dependent on the properties of the individual building blocks, but also on their spatial arrangement in one, two, or three dimensions. This symposium brings together interdisciplinary research efforts focused on developing new fabrication strategies for advanced low-dimensional materials. Specific topics include, but are not limited to the following:

- Synthesis of metal nanoparticles, carbon nanomaterials, and other nanostructured building blocks
- Synthesis of nano-/micro-porous materials with surface chemistry control and multiphase nanomaterials
- Post-synthesis processing and functionalization of 1D nanotubes/nanowires and 2D nanosheets
- Spatial control of morphology and properties, functionally graded materials, and composite structures
- Printing of functional nanoparticles, nanowires, nanocarbons and transition metal dichalcogenides
- Folding and assembly of complex 3D structures from 1D and 2D building blocks at different length scales
- Design and fabrication of biomimetic and bio-inspired surfaces and interfaces with engineered properties
- Integration of low-dimensional nanostructures into flexible devices, transparent films, and transient electronics
- Origami- and kirigami-based fabrication techniques for complex 2D and 3D multifunctional materials
- Fabrication of carbon metamaterials & cellular structures for tailored mechanical, acoustic, or optical properties

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract and full manuscript for review by **October 23, 2022** and **November 1, 2022** respectively. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>.** No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will (1) work to attract a high profile international keynote speaker, and (2) work on organizing a special issue in an ASME Journal with state-of-the-art paper to be lead article in the special issue.

### Organizers

Dr. Mostafa Bedewy, University of Pittsburgh, Pittsburgh, PA, USA. 412-624-2682; [mbedewy@pitt.edu](mailto:mbedewy@pitt.edu)

Dr. Michael Cai Wang, University of South Florida, FL, USA. 813-974-8586; [mawang@usf.edu](mailto:mawang@usf.edu)

Dr. Sei Jin Park, Lawrence Livermore National Laboratory, CA, USA. 925-422-8160; [park39@llnl.gov](mailto:park39@llnl.gov)

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\* The conference is collocated with NAMRI/SME's 51<sup>st</sup> North American Manufacturing Research Conference (NAMRC51), which will have separate call-for-papers. Please note that submissions of the same paper to more than one conference are not permitted.

# — Call for Papers —

A Symposium on

## **Bridging Academic Advances and Industrial Practices on Machine Learning for Quality and Reliability**

Sponsored by the ASME Manufacturing Engineering Division's  
*Quality & Reliability Technical Committee*

2023 ASME International Manufacturing Science & Engineering Conference (MSEC)\*

June 12 – June 16<sup>th</sup>, 2023

New Brunswick, New Jersey, USA

Hosted by Rutgers University, College of Engineering

### **Technical Focus**

Machine Learning (ML) techniques have demonstrated superior capabilities in big and complex data analytics, and have been enthusiastically embraced by manufacturers to enhance production visibility, planning, productivity, quality and reliability control. However, there are major gaps between academic advances in ML technique developments and industrial practices on ML deployment. Development of ML techniques that are deployable on the shop floor should consider challenges: 1) data collected from the shop floor are typically unstructured, unlabeled, and have an uncomprehensive coverage of machine operating and process conditions; 2) manufacturing conditions (e.g., materials, process settings) on the shop floor are dynamically changing and evolving; 3) the performance of ML techniques should comply with high production and automation standards; 4) trustworthy of data, protocols of data-sharing, and safety of manufacturing data/control in cyber environment all should be further investigated. Correspondingly, the deployable ML techniques are expected to be trainable on imperfect shop floor data, generalizable to varying manufacturing conditions, and integrable to existing manufacturing infrastructure. Realizing these expectations requires synthetic collaboration between academia and industry. This symposium will highlight recent academic works and industrial practices on moving ML deployment on the shop floor forward. Specific topics of interest include, but are not limited to:

- Big shop floor data characterization, feature extraction, and discrimination
- Advanced ML models on big data learning, semi- and self-supervised learning, and continual (life-long) learning
- The interplay of physical modeling and ML data-driven modeling
- Multi-modal sensing data fusion for machine condition and part quality evaluation
- Intelligent, closed-loop, adaptive process control and quality assurance
- Transfer learning and federated learning on improving ML generalizability and adaptivity
- Methods to advance measurement science, standards, and test methods that enable trustworthiness, reliability, safety, and security for smart manufacturing systems

### **Paper Submission (Dates are subject to change.)**

Authors are encouraged to submit an abstract and full manuscript for review by Oct 23, 2022 and **November 1, 2022 respectively**. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>**. No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be submitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### **Additional Symposium Activities**

To highlight advancements in this technical area, symposium organizers will:

- Invite high-profile keynote speaker(s) from the industry to share industrial needs and practices about development and deployment of ML techniques for quality evaluation and assurance
- Organize a special issue in the Journal of Manufacturing Science and Technology or other journals
- Work with MSEC technical committee on planning an Annual Big Manufacturing Data Challenge (to be started from 2024 or 2025)

### **Organizers**

Dr. Peng (Edward) Wang, University of Kentucky, Lexington, KY, USA. 859-562-2415; edward.wang@uky.edu

Dr. Xiaowei Yue, Virginia Tech, Blacksburg, VA, USA. 540-231-9081; xwy@vt.edu

Dr. Hantang Qin, University of Wisconsin-Madison, Madison, WI, USA. 919-961-9602; hqin52@wisc.edu

Dr. Shaopeng Liu, General Electric, Niskayuna, NY, USA. sliu@ge.com

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\* The conference is collocated with NAMRI/SME's 51<sup>st</sup> North American Manufacturing Research Conference (NAMRC51), which will have separate call-for-papers. Please note that submissions of the same paper to more than one conference are not permitted.

# — Call for Papers —

A Symposium on

## Advances in statistical learning for quality and reliability in smart manufacturing

Sponsored by the ASME Manufacturing Engineering Division's  
Quality and Reliability Technical Committee  
2023 ASME International Manufacturing Science & Engineering Conference (MSEC)  
June 12 – June 16th, 2023  
New Brunswick, New Jersey, USA  
Hosted by Rutgers University, College of Engineering

### Technical Focus

Advent of various sensing technologies has allowed monitoring and measurement of advanced manufacturing processes both in-situ and ex-situ via various sensing technologies such as acoustic emissions, vibrations, infrared, and high-speed imaging. Availability of complex multi-modal datasets create unique venues for tracking and monitoring of advanced manufacturing processes in real-time, process optimization and prognostics, robust quality control, reliability engineering, and process-structure-property predictions. However, data collected from advanced manufacturing processes are high-dimensional, nonlinear and non-stationary, noisy, and exhibit higher order correlations. This symposium will bring together researchers that develop novel methodologies to extract useful information from complex data structures to enable robust monitoring and control, process optimization, accelerated qualification and characterization, and accurate prognostics. Advancing research in these areas will be critical to wider adoption of emerging manufacturing processes such as additive manufacturing. Specific topics of interest include but are not limited to:

- Advanced methods and tools for predictive modeling and process monitoring.
- Inference about relationships among process variables, quality and reliability
- Inverse problems to estimate process physics or predict physical properties from indirect measurements.
- Real-time monitoring and control for system intelligence.
- Fusing physics-driven and data-enabled models for advanced manufacturing.
- Active learning and optimal experimental design.
- Uncertainty quantification and system optimization for advanced manufacturing.
- Statistical learning for cybermanufacturing.
- Quality, reliability, and robustness of data and model for IIoT.
- Novel methods for data augmentation in advanced manufacturing.

### Paper Submission (Dates are subject to change.)

Authors are encouraged to submit an abstract and full manuscript for review by Oct 23, 2022 and **November 1, 2022** respectively. **Submissions will only be accepted via the conference website: <https://event.asme.org/MSEC/>.** No papers are to be submitted to the organizers. Only industry presenters are allowed to present without a paper. Final revised manuscripts must be resubmitted by **March 20, 2023**. The copyright transfer form must be completed by **March 20, 2023**. The presenting author must register by **April 10, 2023** or the paper will be withdrawn from the conference proceedings. **All submissions to MSEC cannot be submitted to any other (including ASME) conferences/journals at the same time. However, MSEC Scientific Committee will fast track selected few submissions to ASME Journal of Manufacturing Science and Engineering or Journal of Micro Nano-Manufacturing for publication, in which case the same submissions will be removed from MSEC proceedings.**

### Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

- Invite a high-profile keynote speaker to share the role of quality and reliability in smart manufacturing
- Organize a joint session between ASME-Manufacturing Engineering Division, IISE Quality Control and Reliability Engineering Division, and INFORMS- Quality, Statistics, and Reliability Section.

### Organizers

Dr. Ashif Iquebal, Arizona State University, Tempe, AZ, USA. 979-739-2685; [aiquebal@asu.edu](mailto:aiquebal@asu.edu)

Dr. Yinan Wang, Rensselaer Polytechnic Institute, Troy, NY, USA. 917-797-8840; [wangy88@rpi.edu](mailto:wangy88@rpi.edu)

Dr. Xiaowei Yue, Virginia Tech, Blacksburg, VA, USA. 540-231-9081; [xwy@vt.edu](mailto:xwy@vt.edu)

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