— Call for Papers —

A Symposium on

Symposia by Technical Committee

ADDITIVE MANUFACTURING

1. Smart Additive Manufacturing
2. Multi-Material Processing in Additive Manufacturing
3. Multi-Modal Sensor Fusion for In-Situ Monitoring and Control of Additive, Hybrid, and Convergent Manufacturing
4. Advances in Solid-state Additive Manufacturing
5. Advances in Metal Additive and Hybrid Manufacturing

ADVANCED MATERIALS MANUFACTURING

6. Advanced Manufacturing of Flexible Electronics for Wearable Intelligence
7. Advances in Manufacturing and Processing of Polymers and Composites
8. Advances in Post-Processing of Metal, Composite, and Polymer AMed Parts
9. Manufacturing Advanced Materials for Next-Generation Energy Systems
10. Semiconductor Manufacturing: Advanced Microelectronics Packaging, Interconnection Technologies, and AI-Enabled Process Monitoring

BIOMANUFACTURING

11. Advances in Development and Analysis of Biomedical Devices and Their Interactions with Biological Materials
12. AI/ML-Enabled 3D Bioprinting: New Technology and Novel Bioink Development

LIFE CYCLE ENGINEERING

13. Advancing Circular Manufacturing Through Systems Engineering and Technological Innovation
14. Securing Critical Material Supply Chains

MANUFACTURING EQUIPMENT AND AUTOMATION

15. Machine Tools, Industrial Robots, and Controllers: Programming, Control, and Autonomous Operation with Generative and Agentic AI
16. Advancing In-Space Manufacturing: Capabilities, Infrastructure, and Applications
17. Collaborative Robot-Empowered Human-Centric Manufacturing Automation in the Context of Industry 5.0
18. AI-Assisted Inspection and Predictive Maintenance for Manufacturing Automation
19. Analytics, Control, and Automation for Equipment and Manufacturing Processes

MANUFACTURING PROCESSES

20. Advanced Manufacturing Processes for Surface Quality Control
21. Laser-Based Advanced Manufacturing and Material Processing
22. Advanced Manufacturing of Energy Technologies
23. Advances in Material Forming Processes
24. Advances in Manufacturing of Functional Devices and Bioinspired Structures
25. Manufacturing of Continuous Fiber-Reinforced Composite (FRC) Structures
26. Advanced Machining and Deformation Processes

MANUFACTURING SYSTEMS

27. Spatial Intelligence for Next-Generation Manufacturing Systems
28. Robotics and Automation in Smart Manufacturing Systems
29. Integrated Design-to-Manufacturing Hybrid Processes – System Level Approach
30. AI, Generative AI, and Agentic AI in Manufacturing Systems
31. Physical AI for Advanced Manufacturing: From Digital Integration to Real-World Deployment

NANO/MICRO/MESO MANUFACTURING

32. Advances in Meso, Micro, and Nano Subtractive and Formative Manufacturing
33. Advances in Ceramic Machining and Manufacturing: Integrating Experiments, Modeling, and Simulations Across Multiple Length Scales
34. Microelectronics Metrology and Health Monitoring for Manufacturing and Packaging

QUALITY AND RELIABILITY

35. Trustworthy and Data-Driven Quality Assurance for Smart Manufacturing
36. Advances in AI-Enabled Process Monitoring and Product Quality Assurance
37. Bridging ML Model Development in the Laboratory and Deployment on the Floor for Advanced Manufacturing

The conference is collocated with NAMRI/SME's 55th North American Manufacturing Research Conference (NAMRC55) and the JSME International Conference on Leading Edge Manufacturing/Materials & Processing (LEM&P), each of which will have a separate call for papers. Submission of the same paper to more than one conference is not permitted.

— Call for Papers —

A Symposium on

Smart Additive Manufacturing

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

Smart manufacturing, i.e., involving the use of information, automation, computation, software, sensing, and networking technologies, has the potential to revolutionize the manufacturing industry. An excellent application for smart manufacturing is additive manufacturing (AM) – due to the urgent need for quality assurance.

This symposium will focus on research aimed at leveraging advances in sensing, automation, computation, software, networking, big data analytics, machine learning, process modeling, and process control, amongst others, 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:

- Feedforward and feedback process control
- Data-driven predictive modeling of AM processes
- Physics and/or data-driven part design
- In-process sensing and post-built defect detection, characterization, and analysis
- 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
- Prediction of microstructure, properties, and functionality
- Physics-based machine learning and process-aware machine learning
- 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

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

Submission of abstract for review	**October 16, 2026**
Submission of full manuscripts for review	**October 30, 2026**
(Possible extension of the full manuscript deadline)	**November 13, 2026**
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- Accepted papers can later be submitted for review to any ASME journal, such as the ASME Journal of Manufacturing Science and Engineering

ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Work to promote high-quality submissions

ORGANIZERS

Dr. Prahalada Rao, Virginia Tech, VA, USA, prahalad@vt.edu
Dr. Azadeh Haghighi, University of Illinois Chicago, Chicago, IL, USA, ahaghi3@uic.edu
Dr. Tuhin Mukherjee, Iowa State University, Ames, IA, USA, tuhinm@iastate.edu
Dr. Sneha Prabha Narra, Carnegie Mellon University, Pittsburgh, PA, USA, snarra@andrew.cmu.edu
Dr. Yash Pareikh, EOS North America, Pflugerville, TX, USA, yash.parikh @eos-na.com

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— Call for Papers —

A Symposium on

Multi-Material Processing in Additive Manufacturing

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

As additive manufacturing (AM) technologies evolve, there is more desire to locally tune properties within a 3D printed structure. Although locally varying composition enables control in overall function, there are many knowledge gaps such as how multi-material AM processing affects interfacial properties, how precisely composition can be tuned during a multi-material AM process, how to assess the quality of functionally graded structures, etc. In addition, combining dissimilar materials in-situ (e.g., electronic chips with polymers or ceramic coatings on metals) requires understanding of how multiple AM or manufacturing processes affect interfacial quality. Although there are many existing demonstrations of multi-material AM, this session focuses on research that advances knowledge of how multi-material AM processes control interfacial or local properties and how new and advanced characterization strategies can assess the properties of multi-material structures. This session will include a variety of AM methods used to produce metals, polymers, ceramics, electronics, etc. Specific topics of interest include, but are not limited to:

- Modeling and simulation of multi-material interfacial properties and surface structures
- Functional hybrid/composite materials design and synthesis for additive manufacturing
- Experimental techniques to assess multi-material interfaces
- Measurement and qualification techniques to assess compositional/functional gradients
- Machine/software control advances that improve multi-material additive manufacturing processing
- Computational design of multi-materials for functional improvement
- Rough/Finish machining of multi-material additive manufacturing components
- In-situ sensing and control techniques for optimizing multi-material additive manufacturing process performance
- Machine learning/data-driven methods to improve multi-material AM quality and guide process refinement

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ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Work to arrange presentations from Industry and invited speakers
- Nominate papers for Symposium Best Paper Award

ORGANIZERS

Dr. Muyue Han, North Carolina A&T State University, Greensboro, NC, USA, mhan@ncat.edu
Dr. Guoying Dong, University of Colorado Denver, Denver, CO, USA, guoying.dong@ucdenver.edu
Dr. Monique McClain, Purdue University, West Lafayette, IN, USA, mcclain5@purdue.edu
Dr. Akash Tiwari, Oak Ridge National Laboratories, Oak Ridge, TN, USA, jagprasada@ornl.gov
Dr. Mostafa Yourdkhani, Arizona State University, Mesa, AZ, USA, Mostafa.Yourdkhani@asu.edu

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— Call for Papers —

A Symposium on

Multi-Modal Sensor Fusion for In-Situ Monitoring and Control of Additive, Hybrid, and Convergent Manufacturing

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

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TECHNICAL FOCUS

Real-time process understanding in modern manufacturing increasingly relies on integrating multiple sensor streams rather than relying on a single monitoring modality. While this presents challenges within individual manufacturing processes, the complexity is amplified in hybrid and convergent manufacturing systems. Hybrid manufacturing refers to platforms that combine additive manufacturing with complementary processes, such as machining or surface treatment, within a single production cycle. Convergent manufacturing refers to the integration of distinct process classes, such as additive, subtractive, thermomechanical processing, and inspection, into a single coordinated production cycle. This symposium emphasizes low-cost, data-efficient sensing and data fusion strategies that reduce reliance on large labeled datasets while remaining readily deployable on existing manufacturing equipment. Topics of interest include algorithms, data architectures, and uncertainty quantification methods for integrating heterogeneous, multi-rate sensor streams into a unified representation of process state across both single-process and multi-process manufacturing systems. Contributions are invited across the entire sensing and analytics pipeline, including sensor selection and in-situ data acquisition, multi-source data alignment and fusion, physics-informed and AI/ML-based data interpretation, digital twins, and closed-loop monitoring and control. Specific topics of interest include, but are not limited to:

- Multi-modal sensor fusion algorithms for additive, hybrid, and convergent manufacturing, including classical and deep-learning-based approaches for combining heterogeneous, multi-rate sensor streams
- Digital twin architectures and AI/ML models built on fused, multi-modal sensor data for closed-loop control, anomaly detection, and defect prediction in single- and multi-process manufacturing systems
- Fusion strategies combining inexpensive or off-the-shelf sensors and retrofit-friendly architectures for legacy or non-instrumented machines, supporting adoption by small and mid-sized manufacturers and resource-constrained operations
- Data infrastructure, standards, and interoperability for multi-sensor fusion pipelines
- Uncertainty quantification and confidence propagation in fused, multi-source sensor data
- Fusion-informed process qualification and certification, particularly for critical applications

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ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Include an industry talk from One Off robotics, a robotics integrator, on their current approach to sensor integration and real-time process monitoring, and their perspective on industry state-of-the-art and near-term challenges.

ORGANIZERS

Dr. Shramana Ghosh, Oak Ridge National Laboratory, Oak Ridge, TN USA. ghoshs2@ornl.gov
Dr. Thomas Feldhausen, University of Texas El Paso, TX, USA, tafeldhausen@utep.edu
Mr. Nick Johnson, One Off Robotics, nick@oneoffrobotics.com

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— Call for Papers —

A Symposium on

Advances in Solid-state Additive Manufacturing

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

Solid-state additive manufacturing (SSAM) technologies such as friction stir AM, cold spray AM, and ultrasonic AM are reshaping the field of metal AM by enabling unique mechanical performance, material flexibility, and process sustainability. Unlike fusion-based AM processes, SSAM operates without melting, offering distinct advantages, including reduced heat-affected-zones and the ability to process dissimilar and/or heat-sensitive materials. Additionally, lower temperatures result in favorable microstructures, lower residual stress, and improved energy efficiency, yielding components with enhanced mechanical properties and a reduced risk of distortion or cracking. Therefore, SSAM presents compelling solutions for high-performance applications in aerospace, defense, automotive, and energy sectors where reliability, material integrity, and sustainability are of critical importance. Moreover, machining of SSAM components for hybrid manufacturing is more predictable due to their relatively homogeneous and wrought material-like mechanical properties, enabling fabrication and delivery of functional components at the point of need. Wide range adoption of SSAM, however, faces several challenges such as strain-hardening, solid-phase transformations, delamination, as well as machine tool reliability and maintenance difficulties. This symposium aims to highlight the latest developments in SSAM, with an emphasis on process innovation, hybrid manufacturing, and application-driven solutions. Specific topics of interest include, but are not limited to:

- Intelligent toolpath generation for complex builds in SSAM.
- In-situ monitoring, characterization, metrology, and quality control during SSAM.
- Advances in feedstock materials, microstructural evolution, and phase transformations during SSAM.
- Hybrid SSAM processes and system design.
- Functional performance, durability, and reliability of SSAM components.
- Multi-material deposition and alloying using SSAM.
- Sustainable repair, reuse, and remanufacturing via SSAM.
- Physics-based and data-driven modeling and simulation of SSAM.
- Applications across aerospace, defense, energy, and biomedical sectors.
- Qualification, certification, and standards development for SSAM.
- Reviews of the current state-of-the-art in SSA

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ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Invite keynote speaker(s) for the symposium

ORGANIZERS

Dr. James Nowak, MIT Lincoln Laboratory, Lexington, MA, USA. 781-981-4247, james.nowak@ll.mit.edu
Dr. Ritin Mathews, MDF, Oak Ridge National Lab, Oak Ridge, TN, USA. 516-373-8653, mathewsr@ornl.gov
Dr. Sarvesha Rajashekara, University of Kentucky, Lexington, KY, USA, sarvesha@uky.edu
Dr. David Garcia, Pacific Northwest National Laboratory, Richland, WA, USA, 509-372-5984, david.garcia@pnnl.gov

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A Symposium on

Advances in Metal Additive and Hybrid Manufacturing

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TECHNICAL FOCUS

Metal additive manufacturing (AM) and hybrid manufacturing (HM) enable the fabrication and repair of complex metal components with tailored structures and properties. However, broader industrial adoption remains limited by process variability, defects, incomplete process–structure–property understanding, and costly qualification. Recent advances in programmable beam profiles, multi-material processing, in-situ sensing, artificial intelligence, digital twins, and closed-loop control are transforming metal AM from empirical processing toward intelligent and qualification-aware manufacturing. Emerging approaches, including multi-axis deposition, solid-state AM, and hybrid additive–subtractive processing, further expand its capabilities and applications. This symposium will highlight fundamental and applied advances across the metal AM and HM lifecycle—from feedstock and process development to characterization, performance, and qualification. Contributions are invited from academia, industry, national laboratories, and government agencies, particularly studies that improve process understanding, quality, productivity, repeatability, and qualification; reduce cost and risk; or enable new materials, structures, and applications. Specific topics of interest include, but are not limited to:

- Emerging metal AM and HM processes and systems: metal AM, HM, repair, and remanufacturing.
- Modeling: analytical, computational, and multiscale models; thermal-fluid, microstructure, stress, and distortion prediction.
- In-situ sensing, monitoring, and metrology: optical, thermal, acoustic, X-ray, and multimodal sensing; sensor fusion; defect detection; data registration; measurement uncertainty; and correlations between process signatures and final-part quality.
- Process planning and control: scan-path and toolpath planning, laser power–speed coordination, multi-laser synchronization, thermal-history management, layerwise control, closed-loop control, and integrated additive–subtractive process planning.
- Beam shaping and advanced energy delivery: spatial and temporal beam modulation, programmable beam profiles, beam-size control, multi-beam strategies, energy-source synchronization, process modeling, implementation, sensing, and control.
- Post-processing and characterization: heat treatment, hot isostatic pressing, surface finishing, machining, and hybrid post-processing; microstructure, mechanical behavior, fatigue, fracture, creep, corrosion, and elevated-temperature performance.
- Qualification, certification, and nondestructive evaluation: XCT, ultrasonic, thermographic, and other NDE methods; process qualification; part acceptance; repeatability and reproducibility; machine-to-machine variability; and qualification of repair.
- Productivity, sustainability, and industrialization: high-throughput and large-scale AM, cost and life-cycle assessment, energy and material efficiency, powder recycling, supply-chain resilience, cybersecurity, and digital traceability.

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ADDITIONAL SYMPOSIUM ACTIVITIES

- To highlight advancements in this technical area, symposium organizers will organize a review paper for the symposium.

ORGANIZERS

Dr. Rongxuan Wang, Auburn University, Auburn, AL, USA, rzw0090@auburn.edu
Dr. Hector Siller, University of North Texas, Denton, TX, USA, hector.siller@unt.edu
Dr. Chaoran Dou, University of Missouri, Columbia, MO, USA, chaorandou@missouri.edu
Dr. Yash Parikh, EOS North America, Pflugerville, TX, USA, yash.parikh@eos-na.com

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A Symposium on

Advanced Manufacturing of Flexible Electronics for Wearable Intelligence

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TECHNICAL FOCUS

As wearable intelligence, personalized healthcare, human-machine interfaces, and the Internet of Things continue to advance, flexible electronics have emerged as a transformative technology enabling the integration of sensing, computation, communication, and actuation into conformal and stretchable platforms. These systems are driving innovations in wearable health monitoring, digital medicine, electronic skin, implantable devices, and intelligent human-centered technologies. The convergence of advanced manufacturing, functional materials, artificial intelligence, and bioelectronics is enabling next-generation wearable intelligent systems with integrated sensing, computation, and communication capabilities.

This symposium aims to bring together researchers from academia, industry, and government laboratories to discuss the latest advances in the science and engineering of manufacturing, materials, devices, and applications of flexible electronics for wearable intelligence. The symposium will highlight fundamental understanding, emerging manufacturing technologies, process innovations, process-structure-property-performance relationships, reliability, scalability, and commercialization of flexible electronic systems. Contributions addressing both fundamental research and industrial translation are highly encouraged. Specific topics of interest include, but are not limited to:

- Advanced manufacturing technologies, including additive manufacturing, printed electronics, aerosol jet printing, inkjet printing.
- Flexible sensors, wearable biosensors, electronic skin, implantable electronics, soft bioelectronics, and human-machine interfaces.
- Flexible electronics integrating sensing, energy harvesting/storage, wireless communication, computation, and artificial intelligence.
- Process characterization, process monitoring, quality control, reliability, durability, and manufacturability of flexible electronic systems.
- Digital twins, machine learning, and process-structure-property-performance relationships in flexible electronics manufacturing.
- Manufacturing of intelligent wearable systems for healthcare, rehabilitation, environmental monitoring, and industrial applications.
- Scalable manufacturing, sustainability, supply chain considerations, standardization, qualification, and commercialization.

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ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Invite keynote speaker(s) for the symposium
- Organize a review paper for the symposium

ORGANIZERS

Dr. Shiren Wang, Texas A&M University, USA, s.wang@tamu.edu
Dr. Roozbeh Ghaffari, Northwestern University, USA, rooz@northwestern.edu
Dr. Jenny Qiu, Texas A&M University, USA, jennyqiu@tamu.edu
Dr. Jenna Kim, Los Alamos National Laboratory, USA, jhkim@lanl.gov

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A Symposium on

Advances in Manufacturing and Processing of Polymers and Composites

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TECHNICAL FOCUS

This symposium will provide a platform for interdisciplinary discussion on recent development in polymer processing and manufacturing, including polymer-based materials discovery and development, ceramic-polymer composites, manufacturing strategy and modifications, composite architectures and constructions, mechanical analysis and characterizations, modeling and simulation, machine learning and emerging cloud technology-assisted polymer processing and manufacturing, polymer recycling and upcycling, and functional devices design and applications. Specific topics include, but are not limited to:

- Liquid molding and casting, thermoplastic and thermoset molding, injection molding, over molding processes
- Fiber spinning processes, cast and blown film extrusion, stretching forming processes
- Advances in polymer and composite additive manufacturing techniques (e.g., FDM, SLA, DLP, SLS, DIW, and Hybrid AM)
- Advances in manufacturing of multi-scale and multi-material components and structures
- Reactive processing and functional additives
- Materials removal and ablation processes
- Joining and welding of polymers and composites and interface mechanics
- Precision instrumentation and tooling for injection molding/extrusion/fiber spinning/thermoforming
- Sustainability of polymer and composite processes, recycling processes and properties of recycled materials
- SMART polymers, self-healing materials, foams and composites for Earth and Space environment
- Polymers and composites for biosystems, biomedical devices and energy and electronic devices
- Process dynamics, rheology and modeling in polymer processing
- Advanced characterization, monitoring and control of polymers and polymer composites
- Machine learning and AI in polymer processing and advance manufacturing

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Organize a state-of-the-art paper that will be the lead article in the special issue
- Work to organize a special issue in an ASME Journal.
- Nominate papers for Symposium Best Paper Award.

ORGANIZERS

Dr. Erina Joyee, University of North Carolina at Charlotte, NC, U.S. 704-687-8930; ejoyee@charlotte.edu
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The conference is collocated with NAMRI/SME's 55th North American Manufacturing Research Conference (NAMRC55) and the JSME International Conference on Leading Edge Manufacturing/Materials & Processing (LEM&P), each of which will have a separate call for papers. Submission of the same paper to more than one conference is not permitted.

— Call for Papers —

A Symposium on

Advances in Post-Processing of Metal, Composite, and Polymer AMed Parts

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

Additive Manufacturing (AM) technology has become very popular due to its unprecedent flexibility in realization of objects of variety of materials, having complex geometry. Based on the type of AM technology, materials, and part complexity, various kinds of internal and external defects, dimensional inaccuracy, and unacceptable surface roughness can be obtained in AMed parts. As a result, post-processing of AMed parts has become an important research and development area for both academia and industry. Post-processing can be primary with a focus on support structure removal or secondary with a focus on improving surface finish, dimensional accuracy, material and surface properties, and so on. A wide variety of post-processing techniques have been reported in the literature for parts fabricated using metal, polymer, and composite-based AM technologies. Post-processing of AMed parts is a highly relevant, timely, and important topic that has not been adequately addressed in recent symposia. Therefore, this symposium focuses on advances in the post-processing of AMed parts for both metallic and polymeric/composite-based AM processes. This symposium welcomes contributions on both experimental and theoretical aspects of various post-processing techniques using mechanical, chemical, thermal, electro-chemical, electro-thermal, and abrasive-based processes. A particular interest will be in application-oriented novel post-processing techniques and equipment. Papers from the industry are strongly encouraged, as they provide valuable insights into real-world challenges and solutions. Specific topics of interest include, but are not limited to:

- Post-processing of AMed metal parts by various AM processes, i.e., laser powder bed fusion (LPBF), direct energy deposition (DED), selected laser melting (SLM), wire arc additive manufacturing (WAAM), etc.
- Machining of metallic AMed parts, i.e., milling, turning, grinding, and other finishing processes
- Abrasive-based post-processing, i.e., abrasive flow machining, shot peening, abrasive or sandblasting, etc.
- Laser polishing, finish machining, Electrochemical (ECM) or electro-discharge (EDM) polishing of metallic AMed parts
- Post-processing of AMed polymeric and fiber-reinforced polymer (FRP) composites
- Machining of AMed carbon fiber reinforced polymer (CFRP) composites
- Heat treatment of metallic and polymeric AMed parts
- Chemical treatment and chemical post-processing of polymeric AMed parts
- Hot isotropic pressing as a post-processing technique for polymeric AMed parts
- Laser finishing of polymeric and composite AMed parts
- Process monitoring and control, process and system characterization, modeling, and simulation

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

Submission of abstract for review	**October 16, 2026**
Submission of full manuscripts for review	**October 30, 2026**
(Possible extension of the full manuscript deadline)	**November 13, 2026**
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Early-bird registration	**March 30, 2027**
Author registration deadline	**April 16, 2027**

- Submissions will only be accepted via the conference website: https://event.asme.org/MSEC/.
- We accept full papers (7-10 pages), brief papers (4-5 pages), and abstract only presentations (industry presenters only).
- The presenting author must register by April 16, 2027, or the paper will be withdrawn from the conference proceedings.
- High quality MSEC 2027 papers will be channeled to an ASME journal for fast-tracked review and publication.
- Accepted papers can be later submitted for review to any ASME journal, such as ASME Journal of Manufacturing Science and Engineering or the ASME Journal of Micro and Nano Science and Engineering.

ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Organize a state-of-the-art paper that will be the lead article in the special issue
- Work to organize a special issue in an ASME Journal.
- Nominate papers for Symposium Best Paper Award.

ORGANIZERS

Dr. Muhammad Pervej Jahan, Miami University, Oxford, OH, USA, jahanmp@miamioh.edu
Dr. Abdul Sayeed Khan, Oak Ridge National Laboratory (ORNL), khana1@ornl.gov
Dr. Jianfeng Ma, Saint Louis University, Saint Louis, USA, jeff.ma@slu.edu

The conference is collocated with NAMRI/SME's 55th North American Manufacturing Research Conference (NAMRC55) and the JSME International Conference on Leading Edge Manufacturing/Materials & Processing (LEM&P), each of which will have a separate call for papers. Submission of the same paper to more than one conference is not permitted.

— Call for Papers —

A Symposium on

Manufacturing Advanced Materials for Next-Generation Energy Systems

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

The rapid growth of AI and data centers is driving unprecedented electricity demand and renewed global investment in nuclear power, fuel cells, hydrogen production, and energy storage technologies. Deployment of these next-generation energy systems is limited less by system design than by our ability to manufacture the advanced materials they require. These materials, including nuclear fuels and cladding, ceramic electrolytes, refractory alloys, and functional composites, must perform reliably under extreme temperatures, irradiation, and corrosive environments, which places stringent demands on processing, quality, and qualification. Bridging the gap between materials innovation and scalable, cost-effective manufacturing is therefore a central challenge for the energy transition. This symposium aims to bring together researchers from academia, industry, and government labs to address this challenge. We invite contributions on manufacturing science and technology for materials serving current and emerging energy systems. Specific topics of interest include, but are not limited to:

- Advanced manufacturing and processing of nuclear materials, including fuels, cladding, SiC composites, and refractory alloys for Small Modular Reactors (SMRs) and microreactors
- Manufacturing of fuel cell and electrolyzer components, such as electrodes, bipolar plates, ceramic electrolytes, interconnects, and single cell devices
- Ceramic and composite processing for extreme energy environments, including powder processing, conventional and unconventional sintering, laser-based and additive manufacturing (e.g., direct ink writing), roll-to-roll manufacturing and the fabrication of functional materials
- AI-driven materials discovery and autonomous experimentation platforms for closed-loop fabrication, characterization, and testing of energy materials
- Critical materials, recycling, and supply chain resilience for energy materials manufacturing
- In-situ monitoring, Non-Destructive Evaluation (NDE), and qualification pathways for safety-critical energy components
- Manufacturing for thermal management and waste heat recovery in power generation and data centers
- Battery and energy storage materials manufacturing

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Invite keynote speaker(s) for the symposium

ORGANIZERS

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Dr. Peng Xu, Idaho National Laboratory, Idaho Falls, ID, USA, peng.xu@inl.gov
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The conference is collocated with NAMRI/SME's 55th North American Manufacturing Research Conference (NAMRC55) and the JSME International Conference on Leading Edge Manufacturing/Materials & Processing (LEM&P), each of which will have a separate call for papers. Submission of the same paper to more than one conference is not permitted.

— Call for Papers —

A Symposium on

Semiconductor Manufacturing: Advanced Microelectronics Packaging, Interconnection Technologies, and AI-Enabled Process Monitoring

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

Semiconductor manufacturing is rapidly evolving toward heterogeneous integration, chiplet architectures, high-reliability power electronics, advanced packaging, and increasingly data-intensive production environments. These trends create important manufacturing challenges in packaging materials, interconnection technologies, package-level integration, process control, inspection, reliability, and failure analysis. This symposium will provide a focused academic and industry platform for researchers working on semiconductor manufacturing, with emphasis on advanced microelectronics packaging, electronic interconnects, power and module-level packaging, bonding and joining processes, reliability assessment, quality control, and emerging AI-enabled manufacturing methods. The symposium is intended to build on the successful MSEC 2026 Semiconductor Manufacturing Symposium and continue developing a sustained research community in this area within ASME MSEC. Authors from academia, industry, and government laboratories are encouraged to submit papers that advance fundamental understanding, manufacturing processes, materials integration, reliability, inspection, or data-driven decision-making for semiconductor systems and packages. Specific topics of interest include, but are not limited to:

- Advanced semiconductor packaging and integration: 2.5D/3D, wafer-level/fan-out, chiplets, heterogeneous and photonic integration, power/RF modules.
- Interconnect and bonding technologies: Pb-free solders, microbumps, TSVs, Cu-to-Cu/hybrid bonding, Ag/Cu sintering, wire/ribbon bonding, and conductive adhesives.
- Packaging materials, thermal management, and interfaces: substrates, underfills, molding compounds, TIMs, SiC/AlN/diamond, interface reactions, microstructure, and thermomechanical integrity.
- Reliability, testing, inspection, and failure analysis: power cycling, electromigration/thermomigration/stress migration, fatigue, corrosion, whiskers, defect detection, and quality assurance.
- AI-enabled and advanced manufacturing methods: process monitoring/anomaly detection, virtual metrology, yield analytics, predictive maintenance, APC/optimization, additive manufacturing, modeling, simulation, and characterization.

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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ORGANIZERS

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— Call for Papers —

A Symposium on

Advances in Development and Analysis of Biomedical Devices and Their Interactions with Biological Materials

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

Biomedical manufacturing enables next-generation materials, devices, and systems that safely and effectively interact with biological materials. A better understanding of biomedical materials, manufacturing processes, and systems can lead to safer, smarter, and more cost-effective biomedical devices and procedures, thereby advancing both fundamental biological research and healthcare. In addition to the continual improvement of generic devices, new technologies, such as artificial intelligence (AI), advanced materials, novel manufacturing technologies, sensing and robotics, have been emerging to foster innovative ideas and tools for the research and development of next-generation biomedical devices, as well as novel manufacturing processes and systems for the medical devices' interactions with biological materials. Examples include advanced biomedical device design and manufacturing, device–biomaterial interaction analysis, biological tissue manipulation and procedure modeling, novel manufacturing processes and systems, AI-enabled biomedical manufacturing and diagnostics, and emerging technologies in biomedical robotics, biosensors, personalized devices, and human–machine interfaces. This symposium aims to identify the constraints imposed on manufacturing processes and systems by the unique requirements of biological materials and biomedical devices, present forefront research advances, highlight emerging needs and solutions in biomedical device development, manufacturing, and analysis, and define new directions for conceiving, designing, and operating enabling manufacturing processes and systems that optimize device–biomaterial interactions. Original contributions are invited in, but not limited to, the following areas:

- AI-enabled biomedical manufacturing, digital diagnostics, medical devices, and healthcare systems
- Biofabrication, bioprinting, biomaterial processing, and regenerative manufacturing
- Advanced biomedical device design, manufacturing, characterization, and device–biomaterial interactions
- Personalized, patient-specific, wearable, implantable, and custom biomedical devices
- Biomedical robotics, surgical systems, human–machine interfaces, and procedure automation
- Biological tissue manipulation, biomedical procedure modeling, simulation, and experimental validation
- Biological material characterization, modeling, and integration with manufacturing processes
- Process modeling, quality assurance, regulatory science, and translational validation for biomedical manufacturing

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Invite keynote speaker(s) from academia or industry for the symposium

ORGANIZERS

Dr. Yi Wang, University of Missouri, Columbia, MO, USA, yiwang@missouri.edu
Dr. Lei Chen, University of Massachusetts Lowell, Lowell, MA, USA, Lei_Chen@uml.edu
Dr. Yang Cao, Montana State University, Bozeman, MT, USA, yang.cao1@montana.edu

The conference is collocated with NAMRI/SME's 55th North American Manufacturing Research Conference (NAMRC55) and the JSME International Conference on Leading Edge Manufacturing/Materials & Processing (LEM&P), each of which will have a separate call for papers. Submission of the same paper to more than one conference is not permitted.

— Call for Papers —

A Symposium on

AI/ML-Enabled 3D Bioprinting: New Technology and Novel Bioink Development

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

Artificial intelligence and machine learning (AI/ML) are rapidly transforming 3D bioprinting, moving the field beyond trial-and-error process development toward data-driven design of hardware, bioinks, fabrication strategies, and process optimization. This symposium explores how AI/ML can accelerate the discovery of novel bioink formulations, guide real-time process control, monitoring, and defect detection, and enable predictive, generative, and physics-informed models that link printing parameters to construct fidelity, mechanical performance, and cell viability. New bioprinting platforms increasingly pair affordable, accessible hardware with intelligent, closed-loop control, while machine-learning-guided material discovery is expanding the design space for bioinks that support cell activity, print accuracy, and functional tissue development. Advances in sensing, computer vision, digital twins, and autonomous decision-making are also creating new opportunities for adaptive and scalable biomanufacturing. Bringing together engineers, data scientists, biologists, and biomaterials researchers, this symposium provides a forum to share advances at the intersection of AI/ML and bioprinting hardware/bioink innovation, and to discuss pathways for translating these data-driven tools into robust, reproducible, scalable, and clinically relevant biofabrication practice. Specific topics of interest include, but are not limited to:

- Machine Learning for Novel Bioink Discovery, Formulation, and Functionalization.
- AI/ML-Driven Design and Process Automation of Bioprinting Platforms.
- Data-Driven Computational Modeling, Simulation, and Process Optimization.
- AI-Enabled In-Situ Monitoring and Real-Time Feedback Control for Print Quality and Cell Viability.
- Machine Learning for Validation, Characterization, and Translation to Practice.
- Generative AI and Digital Twins for Bioprinting Process and Bioink Design.
- Hybrid Biofabrication Techniques Enhanced by AI/ML (extrusion, inkjet, laser-assisted).
- AI-Assisted Multi-Scale Bioprinting for Vascularization and Innervation.
- Standardization, Regulatory Pathways, and Data Infrastructure for AI-Enabled Biofabrication.
- Ethics, Sustainability, and Responsible AI in Biofabrication and Biomanufacturing.

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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ADDITIONAL SYMPOSIUM ACTIVITIES

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- Invite keynote speaker(s) for the symposium
- Organize a review paper for the symposium

ORGANIZERS

Dr. Ahasan Habib, Rochester Institute of Technology, mahmet@rit.edu
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Dr. Mohammad Khondoker, University of Regina, mohammad.khondoker@uregina.ca

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— Call for Papers —

A Symposium on

Advancing Circular Manufacturing Through Systems Engineering and Technological Innovation

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

The circular economy (CE) has become increasingly important in manufacturing as it helps reduce resource consumption, minimize waste, enhance value recovery from end-of-life products, and support broader sustainability goals. Due to growing pressures associated with resource scarcity, supply chain disruptions, climate change, and increasing expectations for responsible production, the transition from linear to circular manufacturing systems has become more urgent than ever. Manufacturing sectors are being challenged not only to improve efficiency, but also to redesign products, processes, and supply chains to retain material value over multiple life cycles. However, implementing CE in manufacturing remains challenging due to the need for stakeholder coordination, integrated design and recovery decisions, and enabling technologies for information and material flow management. These challenges are further complicated by trade-offs among environmental, economic, and operational objectives, as well as by uncertainty in product returns, material quality, and market conditions. As a result, there is a growing need for research that combines systems-level thinking with technological innovation to support effective and scalable CE implementation. This symposium invites contributions on systems-oriented methods and technological innovations that support the transition toward CE. Example topics are listed below, but all relevant contributions are welcome.

- Systems modeling and analysis for CE, including system dynamics, agent-based modeling, network analysis, and optimization
- Product and process design for circularity, including disassembly, recovery, reuse, remanufacturing, and recycling
- Closed-loop supply chains, reverse logistics, and stakeholder coordination in manufacturing
- Sustainability assessment and trade-off analysis of CE strategies
- Decision-making frameworks for CE policy, planning, and implementation
- Recovery technologies and innovations in recycling, remanufacturing, repair, and resource utilization
- Data-driven and digital approaches for CE
- Resilience and adaptability of circular supply chains and manufacturing systems
- Industrial ecology and systems engineering approaches for CE implementation

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Invite keynote speaker(s) for the symposium
- Organize a review paper for the symposium

ORGANIZERS

Dr. Neha Shakelly, Research Associate, Argonne National Laboratory, Lemont, IL nshakelly@anl.gov
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— Call for Papers —

A Symposium on

Securing Critical Material Supply Chains

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

Critical materials (e.g., lithium, uranium, and rare earth elements) form the foundation of many emerging and rapidly growing technologies that are essential to economic growth and national security. From artificial intelligence and quantum computing to advanced energy systems, the widespread adoption of these technologies depends on a secure and reliable supply of critical materials. Unfortunately, the production of critical materials is vulnerable to geopolitical disruptions, creating significant supply chain risks. These challenges can be mitigated by expanding primary sources, developing material substitutes, and unlocking secondary supplies. Toward this end, life-cycle engineering (LCE) enables a holistic assessment of the benefits, tradeoffs, and unintended consequences associated with these strategies. Life-cycle-based methods, such as life cycle assessment (LCA) and techno-economic analysis (TEA), integrate knowledge across disciplinary boundaries to address technical, environmental, economic, and regulatory bottlenecks. Beyond challenges associated with upstream material production, LCE also supports downstream manufacturing decisions related to process selection, material circularity, energy efficiency, and cost reduction. More broadly, in an increasingly resource-constrained world, LCE approaches show promise in addressing the paradox of sustainability-driven innovation, i.e., humanity's pursuit of resource efficiency through resource-intensive production. This symposium aims to explore cutting-edge LCE-based research applied to critical material acquisition, processing, manufacturing, and end-use applications. Specific topics of interest include, but are not limited to:

- Digital twins of critical material supply chains
- Supply Chain Uncertainty Quantification and Resilience Planning
- Digital threads, product passports, and material traceability
- Machine learning and AI for material discovery, substitution, and supply chain risk prediction
- Development and harmonization of suitable metrics, indicators, and technical standards
- Recovery, recycling, and remanufacturing of critical materials from end-of-life products
- Manufacturing process innovation for reduced critical material intensity
- Product design for disassembly, recyclability, and material recovery

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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ORGANIZERS

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— Call for Papers —

A Symposium on

Machine Tools, Industrial Robots, and Controllers: Programming, Control, and Autonomous Operation with Generative and Agentic AI

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

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June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

Advances in generative artificial intelligence (GenAI), including large language models (LLMs), vision-language models (VLMs), vision-language-action models (VLAs), and agentic AI systems, are opening a new frontier in how CNC machine tools, industrial and collaborative robots, additive manufacturing systems, metrology equipment, and their controllers (CNC, PLC, robot, and motion controllers) are programmed, operated, and maintained. While conventional automation relies on manually engineered programs and interfaces, AI-driven approaches enable equipment to be programmed through natural language, engineering drawings, CAD models, and demonstrations while autonomously generating, verifying, and adapting control programs. Deploying these capabilities on manufacturing equipment raises fundamental questions of reliability, verification, safety, and human-machine interaction. This symposium is deliberately scoped at the equipment and controller level: the machine tool, the robot, the controller, and the operator interface. Factory- and systems-level applications of AI, such as production scheduling, planning, and supply-chain management, fall outside its scope. Specific topics of interest include, but are not limited to:

- LLM/VLM/VLA- and foundation-model-based interfaces for machine tools, robots, CNC, and AM equipment: natural-language programming, programming from CAD models, automated G-code/toolpath generation, and robot/PLC code synthesis
- Agentic AI for autonomous manufacturing equipment operation including setup planning, tool and fixture selection, process parameter optimization, and self-correcting execution
- Physical and embodied AI for manufacturing: vision-language-action (VLA) and robot foundation models, skill learning from demonstration, and autonomous machine tending, material handling, and assembly
- GenAI-assisted CAD/CAM-to-machine workflows and automated equipment-aware process planning
- Integration of foundation models with digital twins of manufacturing equipment for simulation and control
- VLMs for in-process operator-facing explanations of industrial automation and manufacturing equipment
- Human-machine collaboration: natural-language HMIs, operator copilots, AI-generated training and troubleshooting content
- Safety, trustworthiness, cybersecurity, verification, and guardrails for AI-generated equipment programs and AI-driven control
- Edge and on-controller deployment of generative models; retrofitting legacy equipment with AI-enabled automation
- Benchmarks, datasets, and open testbeds for evaluating GenAI-enabled equipment automation
- Industrial case studies and lessons learned from deploying GenAI on the shop floor

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

Submission of abstract for review	**October 16, 2026**
Submission of full manuscripts for review	**October 30, 2026**
(Possible extension of the full manuscript deadline)	**November 13, 2026**
Notification of paper acceptance	**January 29, 2027**
Submission of revised papers for review	**February 19, 2027**
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Final paper submission	**March 26, 2027**
Early-bird registration	**March 30, 2027**
Author registration deadline	**April 16, 2027**

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- High-quality MSEC 2027 papers will be channeled to an ASME journal for fast-tracked review and publication.
- Accepted papers can later be submitted for review to any ASME journal, such as the ASME Journal of Manufacturing Science and Engineering or the ASME Journal of Micro and Nano Science and Engineering.

ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Invite keynote speaker(s) for the symposium & Organize a review paper for the symposium

ORGANIZERS

Dr. Nevzat Bircan Bugdayci, Michigan State University, East Lansing, MI, USA, bugdayci@msu.edu
Hasan Sinan Bank, Colorado State University, Fort Collins, CO, USA, sinan.bank@colostate.edu
Dr. Vinh Nguyen, Michigan Technological University, Houghton, MI, USA, vinhn@mtu.edu
Dr. Kaveh Berenji, Caterpillar Inc., San Antonio, TX, USA, kaveh.r.berenji@cat.com

The conference is collocated with NAMRI/SME's 55th North American Manufacturing Research Conference (NAMRC55) and the JSME International Conference on Leading Edge Manufacturing/Materials & Processing (LEM&P), each of which will have a separate call for papers. Submission of the same paper to more than one conference is not permitted.

— Call for Papers —

A Symposium on

Advancing In-Space Manufacturing: Capabilities, Infrastructure, and Applications

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

The space sector is rapidly transitioning from demonstration missions to the deployment of operational in-space capabilities that support commercial, civil, scientific, and national security objectives. This NAMRC/MSEC symposium on 'In-Space Servicing, Assembly, and Manufacturing' (ISAM) invites contributions that advance the science, engineering, and operationalization of ISAM technologies and infrastructure. The symposium seeks cutting-edge research, technology demonstrations, payload concepts, and application-driven case studies that address the challenges and opportunities associated with creating scalable, resilient, autonomous, and economically viable space infrastructure. Particular emphasis will be placed on the convergence of advanced manufacturing, intelligent robotic systems, digital engineering, space logistics, and payload design and implementation partnerships. The symposium expects active participation of authors from academia, industry, and government to foster interdisciplinary collaboration and accelerate the realization of ISAM capabilities. Specific topics of interest include, but are not limited to:

- Robotics, automation, and autonomy for ISAM
- Digital twins, simulation frameworks, and artificial intelligence (AI) strategies for supporting ISAM
- Payload design, mission implementation, system integration, and user-driven applications for ISAM
- Testbeds, platforms, and experimental infrastructure to support ISAM
- Advanced manufacturing processes in microgravity environments
- In-situ resource utilization (ISRU) for sustainable operations
- Qualification and certification of ISAM-fabricated components
- Application case studies: ISAM for space-based and terrestrial benefits
- Education, training, and workforce development for the ISAM ecosystem

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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Submission of full manuscripts for review	**October 30, 2026**
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ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Invite keynote speaker(s) for the symposium
- Attract and focus on a mini-session involving industry presentations from the ISAM ecosystem and implementation partners

ORGANIZERS

Dr. Salil Bapat, Purdue University, West Lafayette, IN, USA, bapat0@purdue.edu
Dr. Semih Akin, Rensselaer Polytechnic Institute, Troy, NY, USA, akins@rpi.edu
Dr. Christoph Lotz, Leibniz University Hannover, Hanover, Germany, christoph.lotz@ita.uni-hannover.de
Dr. Uchechukwu Agwu, The Aerospace Corporation, El Segundo, CA, USA, uchechukwu.agwu@aero.org

The conference is collocated with NAMRI/SME's 55th North American Manufacturing Research Conference (NAMRC55) and the JSME International Conference on Leading Edge Manufacturing/Materials & Processing (LEM&P), each of which will have a separate call for papers. Submission of the same paper to more than one conference is not permitted.

— Call for Papers —

A Symposium on

Collaborative Robot-Empowered Human-Centric Manufacturing Automation in the Context of Industry 5.0

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

Collaborative robots play a pivotal role in the Industry 5.0 paradigm by supporting human-centric manufacturing automation at both informational and physical levels. Rather than diminishing the role of humans, the collaboration between humans and robots highlights their irreplaceable strengths, including advanced problem-solving capabilities and the ability to generate creative and innovative solutions beyond the reach of robots. Consequently, effective human-robot collaboration in human-centric manufacturing automation creates new opportunities to optimize production processes, enhance efficiency, improve task quality, strengthen workplace safety, and increase workforce flexibility across industrial sectors. Industry 5.0 further advances the nature of human-robot partnerships by emphasizing human well-being, fostering individual talents and diversity, and expanding societal value. Within this context, human-robot collaboration amplifies human expertise and creativity, enhances manufacturing process transparency, and improves manufacturing trustworthiness and reliability. In both academia and industry, a range of new interdependent and cross-disciplinary research issues, opportunities, and challenges have emerged that should be addressed to make human-robot teams more productive, ergonomic, and effective in human-centric manufacturing automation in the context of Industry 5.0. This symposium aims to bring together researchers, scientists, engineers, and managers engaged in cutting-edge research and technologies in robotics, automation, manufacturing, intelligent equipment, artificial intelligence, human factors, and cyber-physical systems to explore, discuss, and address open questions in the field of human-centric manufacturing automation. Specific topics of interest include, but are not limited to:

- Human-robot collaboration for human-centric manufacturing automation
- Intelligent manufacturing equipment and system design and development for human-centric manufacturing
- Learning from demonstrations and human intention reasoning/prediction for human-robot collaborative manufacturing
- Smart sensory systems for human-centric manufacturing
- Task scheduling and optimization in human-centric manufacturing and remanufacturing
- Modeling of manufacturing reliability in the context of human-robot collaboration
- Characterization and modeling of human factors in human-centric collaborative manufacturing
- Advanced robot motion/action planning algorithms for human-robot collaboration and manufacturing automation
- Virtual reality/augmented reality/extended reality for human-centric manufacturing equipment and automation

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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ADDITIONAL SYMPOSIUM ACTIVITIES

To highlight advancements in this technical area, symposium organizers will invite keynote speakers for the symposium.

ORGANIZERS

Dr. Weitian Wang, Montclair State University, Montclair, NJ, USA, wangw@montclair.edu
Dr. Mengchu Zhou, New Jersey Institute of Technology, Newark, NJ, USA, mengchu.zhou@njit.edu
Dr. Qing (Cindy) Chang, University of Virginia, Charlottesville, VA, USA, qc9nq@virginia.edu

The conference is collocated with NAMRI/SME's 55th North American Manufacturing Research Conference (NAMRC55) and the JSME International Conference on Leading Edge Manufacturing/Materials & Processing (LEM&P), each of which will have a separate call for papers. Submission of the same paper to more than one conference is not permitted.

— Call for Papers —

A Symposium on

AI-Assisted Inspection and Predictive Maintenance for Manufacturing Automation

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

As manufacturing systems become increasingly autonomous and complex, ensuring product quality and equipment reliability through effective inspection and predictive maintenance is critical. The rapid advancement of artificial intelligence (AI) has created unprecedented opportunities to improve manufacturing inspection, equipment health assessment, and maintenance practices. However, practical deployment remains challenging because of limited labeled failure data, changing operating conditions, multimodal data integration, and the need for interpretable and reliable decisions. Integrating AI models with existing sensing, data acquisition, and maintenance workflows while ensuring consistent performance presents an additional challenge. This symposium focuses on AI-assisted methods for manufacturing inspection, condition monitoring, fault diagnosis, prognostics, and predictive maintenance. It seeks contributions that translate sensor, process, quality, and maintenance data into actionable information for quality assurance and equipment health management. Emphasis is placed on methodological advances and practical implementations that improve detection, diagnosis, prediction, and maintenance decision support, including their validation and deployment in real-world manufacturing environments. Authors from academia, industry, and government are highly encouraged to submit their work. Specific topics of interest include, but are not limited to:

- AI-assisted inspection, condition monitoring, and predictive maintenance for robotic and automated manufacturing
- Multimodal sensing and data fusion for manufacturing quality and equipment health assessment
- Digital twins and cyber-physical systems for condition monitoring, health-state estimation, and predictive maintenance
- Physics-informed, explainable, and robust AI for anomaly detection, fault diagnosis, prognostics, and equipment reliability
- Transfer learning and data-efficient AI for limited labeled data and changing operating conditions
- Large language models (LLMs) and generative AI (GenAI) for inspection and maintenance knowledge extraction, decision support in inspection, diagnosis, and maintenance
- AI-assisted maintenance planning and lifecycle management using operational, quality, and maintenance data

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Invite keynote speaker(s) for the symposium
- Organize state-of-the-art papers for the symposium

ORGANIZERS

Dr. Eunseob Kim, Wayne State University, Detroit, MI, USA, eskim@wayne.edu
Dr. Seokpum "Pum" Kim, Oak Ridge National Lab., Oak Ridge, TN, USA, kimsp@ornl.gov
Dr. Jiho Lee, University of North Texas, Denton, TX, USA, jiho.lee@unt.edu
Dr. Nanzhu Zhao, Nissan North America, Farmington Hills, MI, USA, nanzhu.zhao@nissan-usa.com

The conference is collocated with NAMRI/SME's 55th North American Manufacturing Research Conference (NAMRC55) and the JSME International Conference on Leading Edge Manufacturing/Materials & Processing (LEM&P), each of which will have a separate call for papers. Submission of the same paper to more than one conference is not permitted.

— Call for Papers —

A Symposium on

Analytics, Control, and Automation for Equipment and Manufacturing Processes

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

Advances in manufacturing technologies are being driven by innovations in equipment, process-based tooling, sensing, modeling, and control/automation enabling higher levels of efficiency, flexibility, adaptability and commercial deployment. By integrating advanced sensing technologies, data analytics, dynamic modeling, and AI-driven decision-making, manufacturers can achieve real-time adaptation to changing conditions, better resource utilization, and improved process consistency.

This symposium highlights innovations that combine sensing, modeling, control and automation to improve manufacturing performance, enable reconfigurable systems, and support emerging technologies such as robotics and additive manufacturing. It is designed for researchers and engineers interested in how these capabilities can directly impact on manufacturing to enable smarter, more sustainable productions. Contributions are invited that demonstrate real-world applications, emerging techniques, and lessons learned at the intersection of manufacturing equipment and processes, sensing technologies, modeling and analytics, and control and automation strategies. This session will encourage discussion on new opportunities and challenges in bringing intelligent, learning-enabled automation into mainstream equipment design and manufacturing practice. Specific topics of interest include, but are not limited to:

- Machine tools, industrial robots, sensors, and novel mechatronic structures and controllers for manufacturing equipment
- Physics-based, physics-informed and data-driven modeling to better predict and control manufacturing processes
- Robotics for flexible and reconfigurable manufacturing, including model predictive control and hierarchical control strategies
- Process monitoring, anomaly detection, and predictive maintenance enabled by analytics
- AI- and learning-based control, including iterative learning control (ILC) for adaptive and autonomous operation
- Advanced sensing technologies and sensor integration for manufacturing equipment and processes
- Data acquisition methods and data-driven machine tool/process automation and control
- Data-driven optimization tools for improving process efficiency, quality, and sustainability
- Digital twins, remote data collection, and cloud-based data storage and accessibility for smart equipment control
- Design and control of additive manufacturing and positioning, metrology, and hybrid machine systems

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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ADDITIONAL SYMPOSIUM ACTIVITIES

- Invite a high-profile international keynote speaker.
- Organize a review paper for the symposium.

ORGANIZERS

Dr. Chandra Nath, Purdue University, West Lafayette, IN, USA, Ph: +1-217-607-3029, nathc@purdue.edu
Dr. Nazanin Farjam, Texas A&M University, College Sation, TX, USA, nfarjam@tamu.edu
Dr. Huitaek Yun, Korea Advanced Institute of Sci & Tech (KAIST), Daejeon, S. Korea, +82-42-350-3011, htyun@kaist.ac.kr
Dr. Chinedum Okwudire, University oof Michigan, Ann Arbor, MI, USA, okwudire@umich.edu

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— Call for Papers —

A Symposium on

Advanced Manufacturing Processes for Surface Quality Control

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

As manufacturing technologies continue to advance and become increasingly customized, manufactured components are exhibiting greater geometric and dimensional complexity. Emerging technologies such as additive manufacturing (AM), hybrid manufacturing, and smart manufacturing are further accelerating this trend. Consequently, surface quality can no longer be regarded as a secondary consideration but must instead be treated as a primary requirement. However, the increasing complexity of component geometries creates surface features that are often inaccessible to conventional manufacturing processes, making surface quality control one of the most critical factors governing component qualification in aerospace, biomedical, nuclear, and other high-performance applications. To address these challenges, there is an urgent need to develop novel, process-compatible, and application-driven approaches for surface quality control; to deepen the fundamental understanding of the underlying mechanisms for improved process integration and innovation; and to educate the next generation of manufacturing professionals capable of supporting a robust industrial ecosystem that can meet current and future surface engineering challenges. This symposium will highlight the latest advances in manufacturing processes for surface quality control, including traditional, non-traditional and hybrid manufacturing processes, surface characterization, process–structure–property relationships governing surface evolution, surface evaluation under oxidation, wear, and corrosion conditions, post-processing and surface treatment strategies, and workforce development initiatives. The scope of the symposium extends beyond treating surface quality control as an isolated manufacturing step. Authors are encouraged to submit contributions that address manufacturing processes for surface quality control within the broader context of application-driven requirements, industrial needs, life-cycle process integration, and related emerging topics. Authors from government, academia, and industry are all encouraged to participate. Specific topics of interest include, but not limited to:

- Development of novel surface quality control manufacturing processes and beyond.
- Integration of advanced manufacturing concepts, including additive manufacturing, traditional and non-traditional manufacturing, hybrid manufacturing, etc., for surface quality control.
- Application-oriented surface quality design and manufacturing strategies.
- Post-processing and surface treatment approaches to deliver surface quality requirements.
- Simulation, modeling, and process-structure-property relationships for surface evolution and performance outcomes.
- Education, workforce development, and industrial eco-system for revitalizing surface processing and quality control capacities.

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Invite keynote speaker(s) for the symposium

ORGANIZERS

Dr. Shuaihang Pan, University of Utah, Salt Lake City, UT, USA, Shuaihang.Pan@utah.edu
Dr. Hitomi Yamaguchi, University of Florida, Gainesville, FL, USA, hitomiy@ufl.edu
Dr. Daniel Hooks, Los Alamos National Lab, Los Alamos, NM, USA, dhooks@lanl.gov

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— Call for Papers —

A Symposium on

Laser-Based Advanced Manufacturing and Material Processing

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

Recent advances in high-power, ultrafast, and precisely controlled lasers have broadened their capabilities in advanced manufacturing and material processing. Depending on laser power, wavelength, temporal mode, and beam profile, irradiated materials may be heated, melted, vaporized, or ionized, thereby changing their geometry, surface condition, microstructure, properties, and performance. The underlying processes involve coupled laser–matter interaction, heat and mass transfer, fluid mechanics, solid mechanics, plastic deformation, and phase and microstructure evolution. This symposium focuses on recent advances in the application of laser beams to manufacturing and material processing and welcomes both fundamental and applied studies using experimental observation, analytical modeling, and numerical simulation. As one topic within this broad scope, the symposium will also feature emerging non-traditional laser sources and beam-control strategies, including short-wavelength lasers, ultrafast or temporally modulated operation, adjustable beam profiles, ring and multi-spot beams, and multi-wavelength systems. Specific topics include, but are not limited to:

- Laser-based surface modification processes, including laser shock peening, laser hardening, laser nitriding, laser coating, laser cladding, laser cleaning, etc.
- Laser-based material processing techniques, including laser sintering, laser-assisted deposition, laser recrystallization, laser annealing, laser bending/forming, etc.
- Laser-based machining processes, including laser ablation, laser cutting/drilling, etc.
- Laser-based welding/soldering/brazing processes.
- Laser-based micro-/nano-fabrication processes.
- Numerical modeling of laser–matter interaction and laser material processing.
- Emerging laser sources and wavelength-control strategies, including blue and green lasers, multi-wavelength systems, and temporally modulated laser sources.
- Advanced beam shaping and delivery strategies, including adjustable or dynamic beam profiles, ring beams, multi-spot beams, and programmable beam control.

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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ADDITIONAL SYMPOSIUM ACTIVITIES

To broaden participation and highlight emerging directions, symposium organizers will:

- Invite an internationally recognized keynote speaker for the symposium.
- Organize an academia–industry panel on future directions in laser-based manufacturing and material processing
- Solicit abstract-only industry presentations to showcase emerging laser technologies, manufacturing applications, and opportunities for academia–industry collaboration.

ORGANIZERS

Dr. Qilin Guo, University of Nebraska–Lincoln, Lincoln, NE, USA. 573-578-8576; qilin.guo@unl.edu
Dr. Qiong (Eric) Nian, Arizona State University, Tempe, AZ, USA. 480-965-4543; Qiong.Nian@asu.edu
Dr. Xin Zhao, Clemson University, Clemson, SC, USA. 864-656-2151; xzhao5@clemson.edu

The conference is collocated with NAMRI/SME's 55th North American Manufacturing Research Conference (NAMRC55) and the JSME International Conference on Leading Edge Manufacturing/Materials & Processing (LEM&P), each of which will have a separate call for papers. Submission of the same paper to more than one conference is not permitted.

— Call for Papers —

A Symposium on

Advanced Manufacturing of Energy Technologies

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

The growing energy demand in modern society is a major driving force behind the advancement of diverse energy technologies, including batteries, fuel cells, solar cells, wind, hydropower, and nuclear energy, alongside traditional fossil fuels. Among these developments, electro-mobility has emerged as a globally recognized paradigm, referring to the use of electric energy to power a wide range of vehicles, from motorcycles and scooters to cars and buses. The integration of advanced energy technologies, particularly batteries and fuel cells, into modern vehicles has spurred the rapid evolution of specialized manufacturing processes. These processes must accommodate high-volume production, minimize waste, and offer the flexibility needed to keep pace with the continual innovations defining this disruptive industrial landscape. As such, manufacturing has become a focal point in the push for diverse energy-adoption efforts, given its significant impact on cost, material waste, and carbon emissions. This symposium highlights recent research and technological advancements in manufacturing processes for emerging energy technologies and their components, with a particular emphasis on electro-mobility and other critical applications. Specific topics of interest include, but are not limited to:

- Novel manufacturing technologies and methods for energy technologies.
- Joining, cutting, and texturing for production of battery electrodes, cells, and packs.
- Additive manufacturing processes to produce advanced housing and highly electro-conductive materials.
- Manufacturing process and system design and optimization.
- In-situ monitoring and sensing of the manufacturing process for energy technologies.
- Computational modeling and simulation for manufacturing processes of energy technologies.
- Artificial intelligence in advanced manufacturing of energy technologies.
- Manufacturing equipment, facilities, and infrastructure for energy technologies.
- Sustainability and scalability of manufacturing technologies.

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

Submission of abstract for review	**October 16, 2026**
Submission of full manuscripts for review	**October 30, 2026**
(Possible extension of the full manuscript deadline)	**November 13, 2026**
Notification of paper acceptance	**January 29, 2027**
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Notification of acceptance for revised papers	**February 26, 2027**
Final paper submission	**March 26, 2027**
Early-bird registration	**March 30, 2027**
Author registration deadline	**April 16, 2027**

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- High quality MSEC 2027 papers will be channeled to an ASME journal for fast-tracked review and publication.
- Accepted papers can later be submitted for review to any ASME journal, such as ASME Journal of Manufacturing Science and Engineering or the ASME Journal of Micro and Nano Science and Engineering.

ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Invite keynote speaker(s) for the symposium
- Organize a review paper for the symposium
- Attract members in energy manufacturing to broaden the manufacturing community

ORGANIZERS

Dr. Jianlin Li, Argonne National Laboratory, Lemont, IL, USA. 630-252-4051; jianlin.li@anl.gov
Dr. Lei Chen, University of Michigan-Dearborn, Dearborn, MI, USA. 313-593-5122; leichn@umich.edu
Dr. Wayne Cai, General Motors, Warren, MI, USA. 248-807-3949; wayne.cai@gm.com
Dr. Wilhelm Pfleging, Karlsruhe Institute of Technology, Karlsruhe, Germany. +49 721 608 22889; wilhelm.pfleging@kit.edu
Dr. Congrui Jin, Texas A&M University, College Station, TX, USA. 979-458-4509; jincongrui@tamu.edu

The conference is collocated with NAMRI/SME's 55th North American Manufacturing Research Conference (NAMRC55) and the JSME International Conference on Leading Edge Manufacturing/Materials & Processing (LEM&P), each of which will have a separate call for papers. Submission of the same paper to more than one conference is not permitted.

— Call for Papers —

A Symposium on

Advances in Material Forming Processes

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

This symposium provides a forum for presenting recent advances in the science, engineering, and technology of metal and polymer forming processes. The symposium welcomes contributions addressing fundamental deformation mechanisms, material constitutive behavior, process modeling and simulation, microstructure and property evolution, process monitoring and control, tooling and die design, and emerging forming technologies. Topics of interest include conventional and advanced forming processes, forming of lightweight and high-performance materials, multi-material and hybrid manufacturing, data-driven and AI-enabled process optimization, digital manufacturing, and suitable forming practices. Experimental, computational, and theoretical studies that advance the understanding, design, and implementation of material forming processes are encouraged, with an emphasis on innovations that prove manufacturing efficiency, product quality, and industrial competitiveness. Specific topics of interest include, but are not limited to:

- Sheet, bulk, tube, and profile forming
- Polymer processing and polymer forming technologies
- Novel processes, including agile, hybrid, and incremental forming methods
- Qualification and certification of formed components
- Metal forming, plasticity, and deformation mechanics
- Thermoforming, injection molding, extrusion, and blow molding
- Hot, warm, and cold forming processes
- Forming of lightweight, high-strength, advanced, composite, and multi-material engineering materials
- Additive-assisted, hybrid, and near-net-shape manufacturing
- Constitutive modeling and material characterization
- Multiscale modeling and finite element simulation of forming processes
- Artificial intelligence, machine learning, and data-driven manufacturing
- Process monitoring, sensing, and closed-loop control
- Tooling, die design, and manufacturing systems integration
- Microstructure evolution and process-structure-property relationships
- Sustainable and energy-efficient manufacturing
- Industrial applications, case studies, and emerging forming technologies

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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- Accepted papers can later be submitted for review to any ASME journal, such as the ASME Journal of Manufacturing Science and Engineering or the ASME Journal of Micro and Nano Science and Engineering.

ORGANIZERS

Dr. Elizabeth Mamros, Bucknell University, Lewisburg, PA, USA, emm047@bucknell.edu
Dr. David Hoelzle, The Ohio State University, Columbus, OH, USA, hoelzle.1@osu.edu
Dr. Glenn Daehn, The Ohio State University, Columbus, OH, USA, daehn.1@osu.edu
Dr. Derek Shaffer, Phoenix Laser Solutions, Meadville, PA, USA, derek.shaffer@phoenixlaser.com

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— Call for Papers —

A Symposium on

Advances in Manufacturing of Functional Devices and Bioinspired Structures

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

Additive manufacturing (three-dimensional (3D) printing) has shown great contributions in the design and fabrication of functional devices, including smart structures, energy related devices, electronic devices, batteries, optical devices, 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 structural materials. A paradigm shift in additive manufacturing from geometry-centered prototype to function-focused applications is taking place recently. Bioinspired additive manufacturing promotes possibilities in manipulating and mimicking the multiscale, multi-material, and multifunctional biomimetic 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 biomimetic additive manufacturing processes. This symposium will focus on research advances in the areas of additive manufacturing of functional devices and bioinspired 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 include, but are not limited to:

- Field-assisted ((electric, magnetic, acoustic, optics, shear force, thermal etc.) and Templating based (gas, ice,
- sugar, salt, etc.) advanced manufacturing
- Multi-material and multi-scale advanced manufacturing
- Advanced manufacturing of bioinspired structures for mechanical/surface & interface/optics/electrics applications
- Advanced Manufacturing of multifunctional autonomous devices and 4D printing of active materials
- Bioinspired design and additive manufacturing of bioinspired multifunctional material
- Advanced Manufacturing of electronics (actuators, antennas, sensors, piezo-electrics, thermoelectric, etc.),energy storage and conversion devices
- Design, modeling and simulation of bioinspired structure and material systems.
- Advanced applications of bioinspired additive manufacturing (mechanical/optical/thermal/electrical applications)

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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ORGANIZERS

Dr. Xiangjia (Cindy) Li, Arizona State University, Tempe, AZ, USA. 480-727-8612; xiangjia.li@asu.edu
Dr. Yang Yang, San Diego State University, San Diego, CA, USA. 626-265-5206; yyang10@@sdsu.edu
Dr. Ketki Lichade, University at Buffalo-SUNY, Buffalo, NY. USA. 716-645-9346; ketkilic@buffalo.edu
Dr. Dylan Joralmon, LIDG3D LLC, Chandler, AZ, USA. 480-707-2839, dylan.joralmon@lidg3d.com

The conference is collocated with NAMRI/SME's 55th North American Manufacturing Research Conference (NAMRC55) and the JSME International Conference on Leading Edge Manufacturing/Materials & Processing (LEM&P), each of which will have a separate call for papers. Submission of the same paper to more than one conference is not permitted.

— Call for Papers —

A Symposium on

Manufacturing of Continuous Fiber-Reinforced Composite (FRC) Structures

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

Fiber-reinforced composite (FRC) materials offer exceptional strength-to-weight ratios, making them vital for lightweight structures in aerospace, transportation, and wind energy. Among FRCs, the ones with continuous fibers provide the highest load-bearing capacity by maintaining uninterrupted load-transfer paths. However, manufacturing these continuous FRCs into 3D structures with actual engineering application value presents significant bottlenecks. Specifically, the fabrication remains challenging due to the high stiffness and strong anisotropy of continuous fibers, which require precise directional patterning. Furthermore, matrix materials undergo complex thermal or chemical phase transformation during forming. Current advanced methods, such as automated fiber placement (AFP), filament winding, prepreg compression molding and resin transfer molding, still rely heavily on manual intervention to meet strict industrial quality standard. Some high-end components even depend entirely on manual layup by skilled technicians, leading to low production rates and prohibitive costs. While additive manufacturing (AM) has matured for short-fiber and particle-reinforced composites, extrusion-based AM for continuous FRCs suffers from process-induced defects such as tow twisting and fiber separation, limiting its real-world viability. To overcome these manufacturing barriers for continuous FRC structures, urgent breakthroughs are essential in efficient, reliable and automated processing. This symposium provides a multidisciplinary platform for researchers from academia, industry and government to share pioneering advancements in continuous FRC structure manufacturing. The session bridges the gap between traditional mechanics-focused composite research and manufacturing systems engineering, highlighting new processes, automation and multifunctional composite fabrication. Authors are encouraged to submit papers that contribute to improving product quality, reducing cycle time and cost, or introducing novel fabrication methods. Specific topics include, but are not limited to:

- Advanced Processing Technology: Innovations in existing processing technology frameworks, such as AFP, filament winding, pultrusion, compression/resin molding and AM for continuous FRCs.
- Next-Generation Systems: Unconventional processing mechanisms and the integration of embodied intelligence or robotics.
- In-Process Quality Assurance: Defect monitoring, real-time control, and repair technology during fabrication.
- Material Characterization: Evaluation of manufacturing-related properties of the composites under processing conditions.
- Integrated Computational Materials Engineering (ICME): Multi-scale modeling of manufacturing processes and their direct impact on subsequent structural and service performance of the continuous FRC structures.

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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ADDITIONAL SYMPOSIUM ACTIVITIES

To highlight advancements in this technical area, symposium organizers will invite keynote speaker(s) for the symposium.

ORGANIZERS

Dr. Weizhao Zhang, The Chinese University of Hong Kong, Hong Kong, China, weizhaozhang@cuhk.edu.hk
Dr. Wan Shou, University of Arkansas, Fayetteville, AR, USA, wshou@uark.edu
Dr. Kun (Kelvin) Fu, University of Delaware, Newark, DE, USA, kfu@udel.edu
Dr. Jonathan Belnoue, University of Bristol, Bristol, UK, Jonathan.Belnoue@bristol.ac.uk
Dr. Jie Lu, ExxonMobil, Spring, TX, USA, jie.lu@exxonmobil.com

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— Call for Papers —

A Symposium on

Advanced Machining and Deformation Processes

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

This symposium will discuss recent advances in machining and deformation processes. Despite being traditional areas, technologies related to these processes continue to evolve to improve the part quality, handle new materials, and reduce energy consumption and environmental impacts. New developments in hybrid manufacturing and smart manufacturing in the past few years have also led to new advancements in this field, both in terms of hardware and software development. This symposium aims to provide a common platform for both applied and fundamental research related to machining and deformation processes. A broad array of scientific investigations from experimental to modeling falls under this call. Specific topics of interest include, but are not limited to:

- Advances in machining processes: cutting, abrasive machining, EDM, ultra-precision machining, etc.
- Advances in cutting tools, coatings, cutting-tool condition monitoring and machine-tool health monitoring
- Deformation processes including bulk and sheet metal forming and solid-state additive processes
- In-situ sensing, measurements and diagnostics
- Modeling and simulations of machining and deformation processes at multiple scales
- Modeling and experimental studies in machining dynamics
- Lubrication, tribology and wear aspects of machining and deformation processes
- Machining of difficult-to-process materials, such as new alloys, ceramics, or composites
- Constitutive material models for machining
- Smart machining with sensor fusion and machine learning
- Machining aspects of hybrid manufacturing
- Sustainability issues and solutions
- Automation and control of machining and deformation processes
- Part surface integrity and geometric distortion in machining

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Invite keynote speaker(s) for the symposium
- Organize a review paper for the symposium

ORGANIZERS

Dr. Dinakar Sagapuram, Texas A&M University, College Station, TX, dinakar@tamu.edu
Dr. Xiaoliang Jin, University of British Columbia, Vancouver, BC, Canada, xjin@mech.ubc.ca
Dr. Yang Guo, Michigan State University, East Lansing, MI, yguo@msu.edu
Dr. Bruce L. Tai, Texas A&M University, College Station, TX, btai@tamu.edu

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— Call for Papers —

A Symposium on

Spatial Intelligence for Next-Generation Manufacturing Systems

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

The rapid advancement of sensing and computing technologies has led to an unprecedented growth in the availability of spatial data in manufacturing, including images, videos, meshes, and point clouds. Such data carry rich information about manufacturing systems, such as product quality, process dynamics, system configurations, and human-machine interactions. As a result, spatial intelligence, defined as the ability to perceive, understand, reason about, and make decisions from spatial information, is emerging as a fundamental capability for next-generation manufacturing systems. By integrating advances in spatial perception, artificial intelligence, robotics, and digital twins, spatial intelligence transforms raw spatial data into actionable information that supports process monitoring and quality control, robot perception and path planning, facility layout optimization, human-robot collaboration, as well as immersive AR/VR-assisted manufacturing. It also provides the foundation for digital representations of manufacturing systems that enable predictive analysis, autonomous decision-making, and adaptive control. Despite these opportunities, spatial data are inherently high-dimensional, heterogeneous, multimodal, and often unstructured, posing significant challenges in representation, fusion, interpretation/reasoning, and decision-making. This symposium aims to bring together researchers and industry practitioners to present the latest advances in spatial intelligence and its applications toward intelligent, autonomous, and resilient manufacturing systems. Specific topics of interest include, but are not limited to:

- Geometric data analytics for process monitoring and anomaly detection
- GenAI and machine learning for spatial data analysis and decision-making
- Spatial foundation models and world models for manufacturing
- New 3D sensing technologies and their applications in manufacturing
- Embodied AI for manufacturing and Agentic AI for spatial intelligence
- Design optimization and shape reconstruction in manufacturing systems
- AR/VR/MR and spatial computing in manufacturing
- Digital twins and cyber-physical manufacturing
- Robots/Cobots path planning and control, and machine tool planning
- Facility layout optimization and manufacturing logistics

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Invite keynote speaker(s) for the symposium.
- Organize a review paper for the symposium.

ORGANIZERS

Dr. Chen Kan, The University of Texas at Arlington, Arlington, TX, USA; 817-272-3092; chen.kan@uta.edu
Dr. Chenang Liu, Oklahoma State University, Stillwater, OK, USA; 405-744-6055; chenang.liu@okstate.edu
Dr. Gregory W. Vogl, National Institute of Standards and Technology (NIST), Gaithersburg, MD, USA; gregory.vogl@nist.gov

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— Call for Papers —

A Symposium on

Robotics and Automation in Smart Manufacturing Systems

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

Robotics is a key enabler of smart manufacturing systems. The integration of robotic technologies with advanced sensing, artificial intelligence (AI), digital twin, and automation is transforming manufacturing operations toward greater autonomy, adaptability, efficiency, and resilience. From collaborative robots (cobots) to mobile and reconfigurable platforms, robotics in modern manufacturing now extends beyond traditional automation to include flexible task execution, real-time decision-making, and intelligent human-machine interaction. This symposium aims to provide a forum for researchers and practitioners to exchange knowledge on methodologies that enable robots to interact with complex production environments, support adaptive production, and collaborate with human operators safely, efficiently, and effectively. The goal is to highlight the role of robotics and modern automation as a central pillar of the smart manufacturing transformation. Specific topics of interest include but are not limited to:

- AI-enhanced robot perception, planning, and control
- Mobile robots and intralogistics in smart factories
- Robotics-enabled manufacturing processes and systems
- Robotics for flexible and high-precision assembly
- Robotics for metrology and dimensional inspection
- Cobots and human-robot collaboration
- Robotics for in-line inspection, quality assurance, and process adaptation
- Robotics-enabled reconfigurable manufacturing systems and production lines
- Computer vision for robotic systems and automation
- Digital twins and simulation tools for design, operation, and maintenance of robotic systems
- Multimodal data fusion for robotic perception and decision-making
- Real-time adaptive control in robotic manufacturing
- Cyber-physical systems for integrated robotic manufacturing systems
- Multi-robot coordination and task allocation
- Other intelligent automation technologies in manufacturing systems
- Industrial case studies of robotic integration in smart manufacturing environments

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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ADDITIONAL SYMPOSIUM ACTIVITIES

To highlight advancements in this technical area, symposium organizers will organize an industry-academia discussion panel.

ORGANIZERS

Dr. Chenhui Shao, University of Michigan, Ann Arbor; +1 (734) 615-6474; chshao@umich.edu
Dr. Haseung Chung, Michigan State University; +1 (517) 432-6583; chunghas@msu.edu
Dr. Guangze Li, General Motors R&D; +1 (313) 720-0156; guangze.li@gm.com
Dr. Gary Zhang, General Motors Autonomous Robotic Center; +1 (586) 487-2617; yubiao.zhang@gm.com

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— Call for Papers —

A Symposium on

Integrated Design-to-Manufacturing Hybrid Processes – System Level Approach

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

This symposium promotes interdisciplinary discussions on next-generation hybrid manufacturing systems that integrate material layer-wise fabrication, deposition, controlled deformation, and intelligent process coordination to enable the design and production of high-performance materials and components. The symposium will highlight advances in hybrid manufacturing, where additive processes such as cold spray, laser-directed energy deposition, and related deposition methods are integrated with thermomechanical and surface engineering techniques, including rolling, shot peening, and laser shock peening, within digitally connected manufacturing systems to enhance material performance, process robustness, and production efficiency. Particular emphasis will be placed on the fundamental science and enabling technologies governing process integration, manufacturing system coordination, microstructure evolution, residual stress control, process-structure-property relationships, and digital process integration. The goal is to understand how coupled deposition, deformation, sensing, modeling, and control can refine microstructures, improve interfacial bonding, mitigate defects, optimize mechanical performance, and enable intelligent hybrid manufacturing systems. Specific topics of interest include, but are not limited to:

- Hybrid additive manufacturing and integrated process chains
- Coupling additive methods with rolling, shot peening, laser shock peening, and other deformation-based processes
- Process integration, in-situ or interpass treatments, and manufacturing system optimization
- Influence of microstructure evolution, grain refinement, and texture control on mechanical behavior
- Residual stress engineering and distortion mitigation
- Multi-physics modeling, simulation, and process diagnostics
- Process monitoring, sensing, machine learning, and closed-loop control
- Surface integrity, fatigue performance, and damage tolerance

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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ADDITIONAL SYMPOSIUM ACTIVITIES

- The symposium will invite a keynote speaker expert in the domain: Dr. Verena Kräusel, Head of Business Unit Forming Technology, Fraunhofer Institute for Machine Tools and Forming Technology, Germany.
- The symposium will propose a State-of-the-Art paper proposal that will invite short presentations at MSEC 2027.

ORGANIZERS

Dr. Kavan Hazeli, University of California Riverside, CA, USA, kavan.hazeli@ucr.edu
Dr. Miki Banu, University of Michigan, Ann Arbor, USA, mbanu@umich.edu
Dr. S. Jack Hu, University of California, Riverside, CA, USA, jack.hu@ucr.edu
Dr. Changbai Tan, General Motors R&D, Warren, MI, USA, changbai.tan@gm.com

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— Call for Papers —

A Symposium on

AI, Generative AI, and Agentic AI in Manufacturing Systems

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

June 21 – June 25, 2027 • Hosted by Oregon State University, Corvallis, Oregon

TECHNICAL FOCUS

AI is increasingly transforming manufacturing by integrating human decision-making with data-driven operations. Recent advances in generative AI (GenAI) and agentic AI are further enhancing human-system interaction, semantic understanding, cross-task adaptability, and autonomous planning. Autonomous manufacturing emerges when perception, decision-making, execution, and human oversight are integrated. Key challenges remain, including determining appropriate AI authority level, coordinating software agents and manufacturing resources, ensuring trusted, verifiable autonomous behavior, and defining the evolving role of humans.

This symposium will focus on the latest advances in development and application of AI techniques, including neural networks, reinforcement learning, and emerging GenAI methods such as large language models (LLMs), vision-language models (VLMs), multimodal generative models, and domain-specific foundation models for autonomous reasoning, planning, and intelligent decision-making. The emphasis is on leveraging these technologies to enhance the design, operation, interaction, and continuous improvement of adaptive, sustainable, and resilient manufacturing systems. The symposium also welcomes research on agentic and physical AI approaches that connect intelligent reasoning and decision-making with digital twins, robots, machines, sensors, and cyber-physical manufacturing environments, at scales from single production cells to factories and production networks. Specific topics of interest include, but are not limited to:

- AI-enabled modeling, planning, control, optimization, and digital twins for cyber-physical manufacturing systems
- Data synthesis, augmentation, industrial knowledge graphs and infrastructures, and process planning support
- Sustainable product and manufacturing system design
- AI-enabled product design, engineering, and manufacturability assessment
- Human-in-the-loop and human-autonomy collaboration: supervision, delegation, shared control, and takeover
- Self-configuring, self-optimizing, and self-healing manufacturing systems for resilience and disruption handling
- Agentic and multi-agent AI for autonomous planning, decision-making, and execution in manufacturing systems
- Trustworthy AI for manufacturing: explainability, safety, verification, and benchmarking
- Domain-specific AI, foundation models, reinforcement learning, VLMs, and real-world industrial applications
- Execution of AI-driven decisions through intelligent automation, adaptive systems, and smart manufacturing

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

Submission of abstract for review	**October 16, 2026**
Submission of full manuscripts for review	**October 30, 2026**
(Possible extension of the full manuscript deadline)	**November 13, 2026**
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ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Work to attract a high-profile international invited speaker
- Organize a state-of-the-art review paper for the symposium

ORGANIZERS

Dr. Quan (Jason) Zhou, Hitachi America, Ltd., Novi, MI, USA. Quan.Zhou@hal.hitachi.com
Dr. Satyajit (Jit) Mojumder, Washington State University, Pullman, WA, USA. satyajit.mojumder@wsu.edu
Dr. Xinyao (Cynthia) Zhang, Florida State University, Tallahassee, FL, USA. xzhang@eng.famu.fsu.edu
Dr. Muhammad Waseem, University of Tennessee, Knoxville, TN, USA. Mwaseem2@utk.edu
Dr. Xingyu Li, Purdue University, West Lafayette, IN, USA. li4558@purdue.edu

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— Call for Papers —

A Symposium on

Physical AI for Advanced Manufacturing: From Digital Integration to Real-World Deployment

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TECHNICAL FOCUS

Recent advances in artificial intelligence, computing hardware, sensing, and manufacturing equipment, together with their integration into physical manufacturing systems, are transforming how processes are designed, monitored, controlled, and optimized. Modern manufacturing systems increasingly connect machines, robots, inspection and metrology platforms, human operators, and computing infrastructure, while digital workflows provide contextual information about products, processes, resources, and production requirements. Together, these developments are enabling physical AI systems in manufacturing – systems that perceive physical conditions, interpret digital and sensor information, support or formulate decisions, and influence actions in the production environment. Unlike AI confined to software domains, physical AI must operate reliably amid uncertainty in measurements, process behavior, model predictions, and physical outcomes. Advances in autonomous experimentation, explainable AI, and measurement science are further supporting systems that learn from observations, make trustworthy decisions, and adapt in real time. This symposium will highlight the foundations, enabling technologies, system architectures, and industrial applications of physical AI and digital manufacturing for adaptive, collaborative, and autonomous operation. Contributions may address individual capabilities or their integration across sensing, interpretation, decision-making, and physical action, including natural-language, voice, and multimodal human-AI interfaces. Work spanning manufacturing equipment, processes, and systems is encouraged, particularly approaches addressing real-time performance, interoperability, robustness, safety, trustworthiness, and uncertainty. Experimental validation, benchmarking, quantitative evaluation, deployment on physical systems, and validation against ground truth are especially encouraged. Specific topics of interest include, but are not limited to:

- Physical AI, generative AI, and agentic AI paradigms for integrated and autonomous manufacturing workflows.
- Multimodal sensor fusion for manufacturing state awareness and reasoning across heterogeneous process and part signals.
- Learning models for prediction, inference, planning, adaptation, and control of manufacturing equipment and processes.
- Digital manufacturing workflows and contextual intelligence for execution.
- Real-time edge and distributed computing, interoperability, and retrofit integration for legacy and reconfigurable equipment.
- Human–AI collaboration and decision support in unstructured or high-mix production.
- Metrology, uncertainty quantification, explainability, causal inference, and validation for trustworthy physical AI.
- Natural-language, voice, and multimodal interfaces, including generative and agentic AI for manufacturing systems and operations.
- Autonomous experimentation, benchmarking, safety, verification, and industrial deployment across manufacturing applications.

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ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Organize an industry-focused workshop emphasizing diverse real-world applications of AI-driven metrology.

ORGANIZERS

Dr. Akash Tiwari, Oak Ridge National Laboratory (ORNL), Oak Ridge, TN, USA, jagprasada@ornl.gov
Dr. Joseph (Yossi) Cohen, Rutgers University, New Brunswick, NJ, USA, jc3626@rutgers.edu
Dr. Davis McGregor, University of Maryland, College Park, MD, USA, mcgregor@umd.edu
Dr. Helen Qiao, National Institute of Standards and Technology (NIST), Gaithersburg, MD, USA, guixiu.qiao@nist.gov
Dr. Alan Burl, Flying Wire Inc., Atlanta, GA, USA aburl@flyingwire.io

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— Call for Papers —

A Symposium on

Advances in Meso, Micro, and Nano Subtractive and Formative Manufacturing

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

2027 ASME International Manufacturing Science & Engineering Conference (MSEC 2027)

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TECHNICAL FOCUS

Meso-, micro-, and nano-scale manufacturing is increasingly important due to the demand for miniaturization, functional integration, and customization. However, achieving high precision, repeatability, and quality at these scales remains challenging due to size effects, complex material behavior, and limited process observability. Advancements in process understanding, characterization, modeling, monitoring, and control are therefore essential. This symposium focuses on advances in meso-, micro-, and nano-scale manufacturing, particularly in subtractive and formative processes such as machining, forming, joining, and hybrid manufacturing. It also highlights intelligent manufacturing approaches, including in-situ sensing, data-driven and physics-informed modeling, process monitoring, quality prediction, adaptive control, digital twins, and AI-enabled metrology and equipment. We welcome both theoretical and experimental contributions. Industry contributions are strongly encouraged to provide insights into practical challenges and scalable solutions. Specific topics of interest include, but are not limited to:

1. Subtractive and Formative Processes and Technologies
- Machining (including both mechanical and non-traditional machining methods, e.g., laser, EDM, ECM, AWJM, USM)
- Forming, joining, and hybrid manufacturing processes
- Surface texturing, surface integrity, and process optimization

2. Materials Science and Engineering in Manufacturing
- Micro- and nanomaterials for manufacturing applications
- Manufacturing of micro- and nano-composites, ceramics, and other advanced materials
- Use of nano/micro additives and fluids to enhance manufacturing processes

3. Intelligent Process Characterization, Monitoring, Control, and Metrology
- Characterization, modeling, and simulation of manufacturing processes and systems.
- In-situ sensing, signal/image processing, and data fusion for process monitoring.
- Process monitoring, diagnosis, and control for precision manufacturing.
- Data-driven and physics-informed machine learning modeling for quality prediction and defect detection.
- Metrology and AI-enabled inspection for manufacturing precision.
- Monitoring of surface integrity, dimensional accuracy, tool wear, and process variation.

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ADDITIONAL SYMPOSIUM ACTIVITIES

To highlight advancements in this technical area, symposium organizers will:
- Invite keynote speaker(s) for the symposium
- Organize a review paper for the symposium

ORGANIZERS

Dr. Shiqi Fang, Universitat Politècnica de Catalunya, Barcelona, Spain, shiqi.fang@upc.edu
Dr. Mengfei Chen, State University of New York at New Paltz, New Paltz, NY, USA, chenm30@newpaltz.edu

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— Call for Papers —

A Symposium on

Advances in Ceramic Machining and Manufacturing: Integrating Experiments, Modeling, and Simulations Across Multiple Length Scales

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

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TECHNICAL FOCUS

Advanced ceramic materials, including sapphire, silicon carbide, silicon nitride, zirconia, alumina, glass ceramics, and other hard and brittle materials, play a critical role in semiconductor manufacturing, precision optics, aerospace systems, biomedical devices, energy technologies, and emerging quantum applications. Their exceptional mechanical, thermal, optical, and chemical properties make them attractive for demanding environments; however, their high hardness, brittleness, and complex deformation and fracture behavior present significant challenges in manufacturing. These challenges include crack initiation and propagation, subsurface damage formation, residual stress generation, surface integrity degradation, rapid tool wear, and low material removal efficiency. Recent advances in machining and manufacturing technologies, together with developments in multiscale experiments, modeling, and simulations, have created new opportunities to improve process understanding, predictive capability, precision, productivity, and reliability in ceramic manufacturing. Progress has been enabled through the integration of advanced characterization techniques, in situ sensing and monitoring, data driven approaches, and computational methods spanning multiple length and time scales, from first principles density functional theory (DFT) calculations and atomistic molecular dynamics (MD) simulations to discrete element methods, crystal plasticity models, phase field approaches, finite element methods (FEM), digital twins, and machine learning based process optimization. This symposium will provide a forum for researchers and practitioners from academia, industry, and government laboratories to discuss recent advances in machining and manufacturing of advanced ceramic materials.

Specific topics of interest include, but are not limited to:

- Ultra-precision and hybrid manufacturing of ceramics, glasses, and hard/brittle materials, including grinding, polishing, lapping, diamond turning, micro/nano machining, and laser/ultrasonic/additive-assisted processes
- Material removal mechanisms, tool–material interactions, tribology, and the effects of microstructure, defects, and phase transformations on machinability and surface integrity
- Multiscale modeling of machining processes, from atomistic (DFT, MD) to mesoscale and continuum (phase-field, crystal plasticity, DEM, FEM), capturing deformation, damage, fracture, and residual stress evolution
- Integrated multiscale frameworks and digital twins combining experiments, simulations, sensing, in situ characterization, and process monitoring for predictive manufacturing
- AI/ML, physics-informed modeling, uncertainty quantification, and data-driven approaches for process optimization and intelligent manufacturing control
- Manufacturing and characterization of advanced ceramic components for optical, semiconductor, biomedical, aerospace, and energy applications

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ADDITIONAL SYMPOSIUM ACTIVITIES

Comprehensive review paper that summarizes the state of the art, identifies critical knowledge gaps, and outlines future research opportunities in ceramic machining and manufacturing.

ORGANIZERS

Dr. Sangkee Min, University of Wisconsin-Madison, Madison, WI, USA, sangkee.min@wisc.edu

Dr. Woo Kyun Kim, University of Cincinnati, Cincinnati, OH, USA, kimwu@ucmail.uc.edu

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— Call for Papers —

A Symposium on

Microelectronics Metrology and Health Monitoring for Manufacturing and Packaging

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TECHNICAL FOCUS

Microelectronics metrology encompasses measurement and monitoring technologies for wafers, semiconductor devices, chiplets, interposers, and package substrates throughout manufacturing and operational lifecycles. As microelectronics evolve toward heterogeneous integration and 2.5D/3D architectures, there is an increasing need for accurate, scalable, nondestructive, and in situ metrology to support process control, yield improvement, reliability assessment, and health monitoring. However, existing metrology techniques remain largely limited to individual fabrication processes or surface characterization and cannot provide rapid, high-resolution, volumetric characterization of densely integrated systems. Critical information including internal defects, residual stress, thermal gradients, interconnect degradation, and package deformation often remains inaccessible, limiting manufacturing optimization and predictive reliability. Addressing these challenges requires new measurement science that integrates three-dimensional sensing, real-time monitoring, and physics-informed data analytics to enable advanced manufacturing, packaging optimization, and lifetime health monitoring of next-generation microelectronic systems. Specific topics of interest of this symposium include, but are not limited to:

- Defect inspection, contamination detection, and dimensional metrology for microelectronics.
- Residual stress, strain, deformation, vibration, and temperature measurement for microelectronics.
- Metrology for chiplets, interposers, package substrates, TSVs, hybrid bonding, and other advanced interconnect technologies.
- In-line, in situ, and real-time process monitoring for semiconductor manufacturing and packaging.
- Health monitoring, reliability assessment, failure analysis, and predictive maintenance of microelectronic systems.
- AI technologies for microelectronics metrology, defect detection, and health monitoring.
- Signal processing, image processing, inverse modeling, and metrology data analysis.
- Emerging and non-traditional metrology techniques.

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ORGANIZERS

Dr. Fengfeng Zhou, Louisiana Tech University, Ruston, LA, USA, fzhou@latech.edu
Dr. Xiangyu Guo, Arizona State University, Tempe, AZ, USA, xiangyu.g@asu.edu
Dr. Arthur Chen, OmniMeasure Technology Inc., Hsinchu, Taiwan, artchen@mail.ntust.edu.tw

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— Call for Papers —

A Symposium on

Trustworthy and Data-Driven Quality Assurance for Smart Manufacturing

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

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TECHNICAL FOCUS

Smart manufacturing increasingly relies on machine learning (ML) and data-driven analytics to monitor processes, detect defects, and drive in-process decisions. Yet the central barrier to deploying these models on the factory floor is trust: data-driven predictions can fail silently when process conditions drift outside the training distribution, when sensor and image data are noisy or incomplete, and when models offer no calibrated measure of their own uncertainty. As ML moves from offline analysis toward closed-loop control of quality, the manufacturing community needs methods that are not only accurate but verifiable — quantifying uncertainty, flagging out-of-distribution conditions, providing statistical coverage guarantees, and preserving data privacy across distributed and multi-party production environments. This symposium convenes work at the intersection of manufacturing, quality engineering, statistical and machine learning, sensing and image analytics, and uncertainty quantification, with an emphasis on trustworthiness and verifiability rather than predictive accuracy alone. It builds on the strong reception of AI-enabled quality-assurance symposia at recent MSEC events while foregrounding the next frontier: methods whose reliability can be characterized, bounded, and defended. Contributions grounded in additive, subtractive, and hybrid processes are all welcome. Authors from government, academia, and industry are encouraged to participate. Specific topics of interest include, but are not limited to:

- In-process monitoring, defect detection, and quality assurance: from sensor, image, and multimodal data streams, including real-time and in-line analytics.
- Out-of-distribution, novelty, and anomaly detection: process/system monitoring with statistical coverage or false-alarm guarantees for process drift, novel defects, and unseen conditions.
- Trustworthy and verifiable AI: verification, validation, and assurance of ML models used in process control and quality decisions.
- Privacy-preserving analytics: federated and multi-party learning for quality analytics across distributed factories and supply chains.
- Data-driven modeling under uncertainty: process-structure-property and quality modeling under uncertainty using experimental and/or computational approaches.
- Industrial deployment and benchmarking: benchmarks, datasets, and reproducible case studies for trustworthy manufacturing analytics.

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

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ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Invite keynote speaker(s) for the symposium on trustworthy/verifiable AI for manufacturing quality.
- Organize a panel session of academic, industry, and government thought leaders on deploying verifiable ML in production.

ORGANIZERS

Dr. Wenmeng Tian, Oklahoma State University, Stillwater, OK, USA, wenmeng.tian@okstate.edu
Dr. Hongyue Sun, University of Georgia, Athens, GA, USA, hongyuesun@uga.edu
Dr. Guangze Li, General Motors R&D, Warren, MI, USA, guangze.li@gm.com

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A Symposium on

Advances in AI-Enabled Process Monitoring and Product Quality Assurance

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TECHNICAL FOCUS

Advances in artificial intelligence (AI) are reshaping the landscape of manufacturing quality assurance by enabling real-time insight into process behavior and product quality. Realizing this potential requires overcoming persistent challenges, including scarce and imbalanced defect data, heterogeneous and high-frequency data streams, limited model interpretability, insufficient generalization across products, processes and systems, and the need to verify, validate, and certify AI-driven decisions in production environments. This symposium focuses on AI-enabled process monitoring, product quality inspection, predictive quality analytics, defect prevention, and quality improvement for multi-stage manufacturing processes and systems. Submissions highlighting novel AI methods, practical implementations, validation studies, industrial case studies, and emerging frameworks for actionable process and product quality improvement are encouraged. Specific topics of interest include, but are not limited to:

- AI-enabled process and product monitoring for automated defect detection, prevention, reduction, and corrective action
- AI-enabled metrology, measurement uncertainty, and quality inspection
- Multi-modal sensor fusion, computer vision, thermal imaging, and machine data analytics for quality monitoring and inspection
- Explainable and trustworthy AI for transparent and reliable decision-making in manufacturing quality assurance
- Physics-informed and hybrid AI models integrating domain knowledge with data-driven approaches for quality prediction
- Digital twin and digital thread architectures for process monitoring, traceability, and certification
- Edge AI, cloud computing, and edge-to-cloud infrastructure for low-latency quality analytics
- Cybersecurity, data integrity, and data governance for AI-enabled process monitoring and quality assurance systems
- Benchmark datasets, synthetic data generation, and cross-domain generalization studies for quality and reliability research
- Foundation and vision-language models, LLM-supported root-cause analysis, agentic AI, and multi-agent systems
- Human-in-the-loop and human-AI collaboration frameworks for inspection, quality decisions, and risk mitigation
- Industrial case studies, pilot deployments, and validation frameworks for AI-enabled quality and reliability improvement

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ADDITIONAL SYMPOSIUM ACTIVITIES

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

- Invite a keynote speaker for the symposium
- Organize a special issue in an ASME Journal
- Organize a state-of-the-art review paper for the symposium

ORGANIZERS

Dr. Swarit Anand Singh, Clemson University, Greenville, SC, USA, swarits@clemson.edu
Dr. Purvee Bhatia, Miami University, Oxford, OH, USA, bhatiap3@MiamiOH.edu
Dr. Ankit Agarwal, University of North Carolina Charlotte, Charlotte, NC, USA, agarwal.ankit@charlotte.edu
Dr. Jiwei Zhou, Heliponix LLC, Evansville, IN, USA, jiwei.zhou@growanu.com

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— Call for Papers —

A Symposium on

Bridging ML Model Development in the Laboratory and Deployment on the Floor for Advanced Manufacturing

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TECHNICAL FOCUS

There are major gaps between machine learning (ML) technique developments in the laboratory and industrial practices on ML deployment in the plants. 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 uncomprehensive; 2) manufacturing conditions on the shop floor are dynamically changing and evolving; 3) the performance of ML techniques should comply with high production and automation standards; 4) trustworthiness of data, protocols of data-sharing, and system cybersecurity 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 close collaboration between academia and industry. This symposium will highlight recent academic works and industrial practices on moving ML deployment for advanced manufacturing. 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 system.

IMPORTANT DATES (TENTATIVE AND SUBJECT TO CHANGE)

Submission of abstract for review	**October 16, 2026**
Submission of full manuscripts for review	**October 30, 2026**
(Possible extension of the full manuscript deadline)	**November 13, 2026**
Notification of paper acceptance	**January 29, 2027**
Submission of revised papers for review	**February 19, 2027**
Notification of acceptance for revised papers	**February 26, 2027**
Final paper submission	**March 26, 2027**
Early-bird registration	**March 30, 2027**
Author registration deadline	**April 16, 2027**

- Submissions will only be accepted via the conference website: https://event.asme.org/MSEC/.
- We accept full papers (7-10 pages), brief papers (4-5 pages), and abstract-only presentations (industry presenters only).
- The presenting author must register by April 16, 2027, or the paper will be withdrawn from the conference proceedings.
- High-quality MSEC 2027 papers will be channeled to an ASME journal for fast-tracked review and publication.
- Accepted papers can later be submitted for review to any ASME journal, such as the ASME Journal of Manufacturing Science and Engineering or the ASME Journal of Micro and Nano Science and Engineering.

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
- Work with MSEC technical committee on planning an Annual Big Manufacturing Data Challenge (to be started from 2027)

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The conference is collocated with NAMRI/SME's 55th North American Manufacturing Research Conference (NAMRC55) and the JSME International Conference on Leading Edge Manufacturing/Materials & Processing (LEM&P), each of which will have a separate call for papers. Submission of the same paper to more than one conference is not permitted.