https://www.clemson.edu/cecas/namrc-msec/index.html

MSEC 2025 SYMPOSIUM CALL FOR PAPERS

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

MSEC 2025 invites **ALL** high-quality advanced manufacturing research papers, even if they may not directly fit into one of these symposia. We ask authors to find the closest related symposium to place papers into. Technical Chairs and the Symposium Organizers will coordinate review of these submitted papers.

Technical Chairs:

Guha Manogharan, Pennsylvania State University (gum53@psu.edu)

Ping Guo, Northwestern University (ping.guo@northwestern.edu)

Key Dates

- Abstract submission (abstract must be submitted before uploading paper): November 4, 2024
- Full manuscript submission deadline: November 12, 2024
- Submission of revised papers for review: March 3, 2025
- Notification of acceptance of revised papers: March 17, 2025
- Copyright transfer form submission deadline: March 28, 2025
- Final revised manuscript submission deadline: March 31, 2025
- Presenting author registration deadline: April 10, 2025

Submissions will only be accepted via the ASME website: https://event.asme.org/MSEC/. No papers may be submitted to the organizers by email.

MSEC 2025 Paper Types

The following paper types may be submitted to any symposium in response to this call:

Full Papers

Full papers undergo full peer review and are published in the conference proceedings. A full paper is 7-10 pages long. It reports technically original research that is of major and archival value to the manufacturing community. An accepted full paper is accompanied by a 25-minute oral presentation (including Q&A) at the conference. A full paper is eligible for the best paper award and, if deemed to be of journal quality, may be channeled to an appropriate ASME journal for fast-tracked review and publication.

Brief Papers

Brief papers undergo full peer review and are published in the conference proceedings, in the same manner as full papers. A brief paper is 4-5 pages long. It reports technically original research that is of significant and archival value to the engineering community. A brief paper may contain preliminary work that has not yet been fully developed. An accepted brief paper is accompanied by a 15-minute oral presentation (including Q&A) at the conference and a poster presentation during the poster session. The expectation is that the authors will use the oral and poster presentations of a brief paper as an opportunity to get feedback from the engineering community leading to a full-length conference or journal paper in the near future. A brief paper is NOT eligible for the best paper award nor can it be fast-tracked for journal publication. However, the accompanying poster is eligible for the best poster award.

Presentation-only Papers

Presentation-only papers require only an abstract submission. They do not undergo peer review and are not published in the proceedings. A journal paper published in the *ASME Journal of Manufacturing Science and Engineering* or the *ASME Journal of Micro and Nano Manufacturing* between March 2024 and February 2025 may be submitted as a presentation-only paper by its corresponding author. A presentation-only paper may also be submitted by industry participants, if all the co-authors of the paper are from industry. An accepted presentation-only paper is accompanied by a 15-minute oral presentation (including Q&A) and an optional poster presentation during the poster session. A presentation-only paper is NOT eligible for the best paper award nor can it be fast-tracked for journal publication. However, the accompanying poster (where applicable) is eligible for the best poster award.

Note that there are ***separate templates*** to submit full and brief papers, and posters. Visit https://msec.secure-platform.com/a/page/author_resources/information_and_templates for more information about the paper types and to download the appropriate templates.

— Call for Papers —

A Symposium on

Smart Additive Manufacturing

Sponsored by the ASME Manufacturing Engineering Division's
Additive Manufacturing Technical Committee
2025 ASME International Manufacturing Science & Engineering Conference (MSEC)
June 23rd – June 27th, 2025
Greenville, South Carolina, USA
Hosted by Clemson University

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, proprieties, 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

Paper Submission (Dates are subject to change.)

Submission of abstract for review (mandatory)..... November 4, 2024
Submission of full manuscripts for review..... November 12, 2024
Submission of revised papers for review..... March 3, 2025
Notification of acceptance for revised papers..... March 17, 2025
Submission of Copyright Form..... March 28, 2025
Submission of final paper..... March 31, 2025

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- **High quality MSEC 2025 papers will be channeled to an ASME journal for fast-tracked review and publication.**
- Accepted papers can be submitted for review to any ASME journal, such as the prestigious *ASME Journal of ManufacturingScience and Engineering* or the *ASME Journal of Micro and Nano Manufacturing*

Additional Symposium Activities

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

- Work to promote high-quality submissions

Organizers

Dr. Azadeh Haghighi, University of Illinois Chicago, Chicago, IL, USA, ahaghi3@uic.edu
Dr. Prahalada Rao, Virginia Tech, VA, USA, prahalad@vt.edu
Dr. Molong Duan, Hong Kong University of Science and Technology, Hong Kong SAR, China, duan@ust.hk
Dr. Uduak Inyang-Udoh, University of Michigan, Ann Arbor, MI, USA, udinyang@umich.edu
Dr. Tuhin Mukherjee, Iowa State University, Ames, IA, USA, tuhinm@iastate.edu

The conference is collocated with NAMRI/SME's 53rd North American Manufacturing Research Conference (NAMRC53), which will have a separate call-for-papers. Please note that submission of the same paper to more than one conference is not permitted.

— Call for Papers —

A Symposium on

Multi-Material Processing in Additive Manufacturing

Sponsored by the ASME Manufacturing Engineering Division's
Additive Manufacturing Technical Committee
2025 ASME International Manufacturing Science & Engineering Conference (MSEC)
June 23rd – June 27th, 2025
Greenville, South Carolina, USA
Hosted by Clemson University

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.

- Modeling and simulation of multi-material interfacial adhesion
- Functional hybrid/composite materials design and synthesis for additive manufacturing
- Experimental techniques to assess multi-material interfaces
- Measurement techniques to assess compositional gradients
- Machine/software control advances that improve multi-material additive manufacturing processing

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Additional Symposium Activities

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

- Work to attract a high profile keynote speaker

Organizers

Dr. Monique McClain, Purdue University, West Lafayette, IN, USA. 765-494-5114; mcclain5@purdue.edu
Dr. Mostafa Yourdkhani, Colorado State University, Fort Collins, CO, USA. 970-491-1896; mostafa.yourdkhani@colostate.edu
Dr. Jay Park, University of Massachusetts Lowell, Lowell, MA, USA. 978-934-2897; Jay_Park@uml.edu
Dr. Elham Mirkoohi, Auburn University, Auburn, AL, USA.; elham.mirkoohi@auburn.edu

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— Call for Papers —

A Symposium on

Advances in Metal Additive Manufacturing Processes

ASME – Manufacturing Engineering Division
Additive Manufacturing Technical Committee
2025 ASME International Manufacturing Science & Engineering Conference (MSEC)
June 23rd – June 27th, 2025
Greenville, South Carolina, USA
Hosted by Clemson University

Technical Focus

As technology advances and becomes more cost-effective, metal additive manufacturing (AM), is likely to play an increasingly important role in various industries including aerospace, automotive, medical, defense, and more. Metal AM delivers complex metal structures with excellent physical properties using a wide range of industrial materials, such as titanium, stainless steel, Inconel, superalloys, and refractory metals. However, the lack of fundamental understanding of the metal AM processes has made it challenging to control the quality of the product and thus thwarted the progress in the adoption of metal AM. Recent advancements in metal AM expanded the processes' capabilities to fabricate AM materials by hybrid techniques, 4-D AM of functional metal alloys, 5-D AM, and beyond. This symposium will report the latest progress in all aspects of metal AM, such as new metal AM processes and systems, process control and development, characterization, process-structure-property relationships of AM, numerical tools, related simulation, and modeling. This symposium expands beyond the traditional 3-D AM techniques to new metal AM processes and systems of functional materials and structures using AM and hybrid manufacturing processes that enable metal fabrication beyond 3-D. Authors are encouraged to submit drafts related to metal AM that may contribute to improving the product quality, reducing the cost and risk of adopting metal AM, or new applications of metal AM. Authors from government, academia, and industries are all encouraged to participate. Specific topics of interest include, but are not limited to:

- Development of metal AM processes, materials, systems, or hybrid processes: 3-D, 4-D, 5-D, and beyond.
- AM material and mechanical characterizations: morphological, size distribution, composition, and thermal properties of metals including structural, functional, refractory, and superalloys.
- Simulation, modeling, and process-structure-property relationships using experimental and/or computational approaches and related validation.
- AM process planning: scan path planning, speed/power synchronization, material reduction, scanning strategies, heat-assisted fabrication, etc., and their effects on part quality/performance.
- Post-process characterization of metal AM: such as microstructure, mechanical properties, fatigue, elevated temperature testing, and non-destructive testing.

Important Dates (tentative and subject to change)

Submission of abstract for review (mandatory)	November 4, 2024
Submission of full manuscripts for review	November 12, 2024
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Additional Symposium Activities

Based on the submitted papers, symposium organizers will make an effort to attract a high-profile keynote speaker from industry or federally funded labs.

Organizers

- Dr. Ala Qattawi, University of Toledo, Toledo, OH, USA. 419-530-3140; ala.qattawi@utoledo.edu
- Dr. Dong Lin, Oregon State University, Corvallis, OR, USA. 541-737-7074; dong.lin@oregonstate.edu
- Dr. Ho Yeung, NIST, Washington DC, USA, 301-975-2786; ho.yeung@nist.gov
- Dr. Hector Siller, University of North Texas, Denton, TX, USA. 940-565-2362 hector.siller@unt.edu
- Dr. Elham Mirkoohi, Auburn University, Auburn, Al, USA. 334- 844-2308; ezm0095@auburn.edu

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— Call for Papers —

A Symposium on

In Situ Monitoring, Non-Destructive Evaluation, and Qualification for Additive Manufacturing

Sponsored by the ASME Manufacturing Engineering Division's
Additive Manufacturing Technical Committee
2025 ASME International Manufacturing Science & Engineering Conference (MSEC)
June 23rd – June 27th, 2025
Greenville, South Carolina, USA
Hosted by Clemson University

Technical Focus

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

- Qualification and certification of materials, processes, and products;
- Operando and custom, open-architecture manufacturing machines and instrumentation;
- In situ imaging during manufacturing processing, including thermal and optical;
- In situ methods such as X-ray or neutron diffraction, spectroscopy, thermocouple, and ultrasonic methods;
- Surface-based methods to detect for melt pool size or ripples for metal additive manufacturing;
- Data-driven techniques to consolidate monitoring data for prediction and control;
- Defect or anomaly modeling and detection during in situ monitoring;
- Non-destructive characterization after the process for porosity or stress states;
- Coupled simulation and experiments to predict for defects or anomalies;
- Data analytics that incorporate in situ and/or non-destructive measurements to qualify parts

Paper Submission (Dates are subject to change.)

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Additional Symposium Activities

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

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

Organizers

Dr. Zhaoyan Fan, Oregon State University, zhaoyan.fan@oregonstate.edu
Dr. Sarah Wolff, The Ohio State University, wolff.357@osu.edu
Dr. Arvind Shankar Raman, Applied Materials Inc., arvind.shankarraman@gmail.com

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— Call for Papers —

A Symposium on

Advances in Manufacturing and Processing of Polymers and Composites

Sponsored by the ASME Manufacturing Engineering Division's
Advanced Materials Manufacturing Technical Committee
2025 ASME International Manufacturing Science & Engineering Conference (MSEC2025)
June 23 – June 27, 2025
Greenville, South Carolina, USA
Hosted by the Clemson University

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, 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

Paper Submission (Dates are subject to change.)

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Additional Symposium Activities

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

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

Organizers

Dr. Erina Joyee, University of North Carolina at Charlotte, NC, US. 704-687-8930; mailto:ejoyee@charlotte.edu
Dr. Felicia Stan, Dunarea de Jos University of Galati, GL, Romania. +40-742-947-501; mailto:felicia.stan@ugal.ro
Dr. Kenan Song, Arizona State University, Tempe, AZ, US. 480-727-2720; mailto:Kenan.Song@uga.edu
Dr. Zipeng Guo, Rochester Institute of Technology, NY, US. 585-475-2632; mailto:zxgeie@rit.edu

— Call for Papers —

A Symposium on

Laser-based Advanced Manufacturing and Material Processing

Sponsored by the ASME Manufacturing Engineering Division's
Advanced Materials Manufacturing Technical Committee
2025 ASME International Manufacturing Science & Engineering Conference (MSEC)
June 23rd – June 27th, 2025
Greenville, South Carolina, USA
Hosted by Clemson University

Technical Focus

The recent advance of high-power/ultrafast lasers has considerably broadened the capability of lasers in advanced manufacturing and material processing. Depending on the power level and the mode (continuous, long/short/ultrashort pulsed), the irradiated materials can be heated, melted, evaporated, and even ionized, and hence the microstructure, geometry, morphology, properties, and/or appearance of the materials will be modified. Complex phenomena taking places during these processes include laser-matter interaction, heat/mass transfer, fluid mechanics, solid mechanics, plastic deformation, phase and microstructure change, etc. All these phenomena can have significant effects on the properties and performance of the materials to be processed. This symposium focuses on the recent advance in the applications of high energy laser beams in advanced manufacturing and material processing. Both fundamental and applied studies are of interest. These include experimental observation, analytical modeling and numerical simulation. Specific topics of interest 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.

Paper Submission (Dates are subject to change.)

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Additional Symposium Activities

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

- Work to attract a high-profile international keynote speaker

Organizers

Dr. Chang Ye, Huazhong University of S&T, Wuhan, China. +86-27-87559416; cye@hust.edu.cn
Dr. Wenda Tan, The University of Michigan, Ann Arbor, MI, USA. 801-556-8643; wendatan@umich.edu
Dr. Qiong (Eric) Nian, Arizona State University, Tempe, AZ. 480-965-4543; Qiong.Nian@asu.edu
Dr. Xin Zhao, Clemson University, Clemson, SC, USA. 864-656-2151; xzhao5@clemson.edu

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— Call for Papers —

A Symposium on

Smart, Innovative, and Low-cost Tooling Systems for Advanced Materials Manufacturing

Sponsored by the ASME Manufacturing Engineering Division's
Advanced Materials Manufacturing Technical Committee
2025 ASME International Manufacturing Science & Engineering Conference (MSEC)
June 23rd – June 27th, 2025
Greenville, South Carolina, USA
Hosted by Clemson University

Technical Focus

The use of additive manufacturing (AM) and other rapid prototyping has not significantly penetrated in sectors like automotive manufacturing due to their high production rate requirements. A paradigm shift from direct production of the final parts to manufacturing tooling systems, like molds and dies, can unlock potential economic benefits. Utilizing AM and new hybrid techniques for creating tools in transformative tool-based processes can lead to reduced tooling costs, shorter lead times, and optimized weight, strength, and thermal management. The journey from concept to mass production for lightweight components, such as advanced high-strength sheet metals, fiber-reinforced composites, or hybrid parts, involves rigorous prototyping. These prototypes need to manufacture with materials and processes similar to the final products, leading to substantial cost of prototyping tools. The rise of digital manufacturing has fostered innovations in tool fabrication, active sensing, and data analytics. Tools have evolved with Industry 4.0, becoming pivotal linchpins in product transformation, providing real-time data and efficiency. This symposium invites papers that address theoretical, implementation, and applied aspects of the following topics:

- Low-cost tooling leveraging advancements in AM (metal and plastics) and hybrid technologies
- AI-enabled tooling design, manufacturing, characterization, and quality assurance
- Development and application of new tooling materials
- Integrating sensors, vision-based systems, or self-adjusting actuators in tooling
- Data-driven real-time process optimization and quality monitoring using data from tooling systems
- Developing soft sensors for tooling applications
- Customization of products through innovative tooling systems
- Coating, surface finishing, and functionalization for tooling enhancement
- Application of control and robotics in tooling systems
- Recyclability, reusability, and life-cycle analysis of tooling

Paper Submission (Dates are subject to change.)

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Additional Symposium Activities

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

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

Organizers

Dr. Saeed Farahani, Clemson University, Greenville, SC, USA, sfaraha@clemson.edu
Dr. Thomas Feldhausen, Oak Ridge National Laboratory, Oak Ridge, TN, USA, feldhausenta@ornl.gov
Dr. Kazi Md Masum Billah, University of Houston-Clear Lake, TX, USA, billah@uhcl.edu
Dr. Hamed Dardaei Joghan, Technical University Dortmund, Dortmund, Germany, Hamed.Dardaei@iul.tu-dortmund.de
Mr. Curtis Krick, Kistler Instrument Corp., Novi, MI, USA, curtis.krick@kistler.com

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— Call for Papers —

A Symposium on

Bio-Manufacturing of Engineered Living Materials

Sponsored by the ASME Manufacturing Engineering Division's
Biomanufacturing Technical Committee
2025 ASME International Manufacturing Science & Engineering Conference (MSEC)
June 23rd – June 27th, 2025
Greenville, South Carolina, USA
Hosted by Clemson University

Technical Focus

Recent advances in synthetic biology and materials science have given rise to a new form of materials, namely engineered living materials, which combine the structural properties of traditional materials with attributes of living systems, such as natural/engineered cells, multicellular modules, microbial consortia, nanobiohybrids, plants, and protists, etc. Engineered living materials are capable of performing tasks that are not accessible to existing engineered systems, such as self-replication, self-regulation, self-healing, and environmental responsiveness, etc. Such an emerging field requires a convergence approach that engages engineers and scientists with complementary expertise to tackle challenging problems and thus necessitates a platform to share knowledge and build collaborations. In this symposium, the general principles to be applied when designing and manufacturing engineered living materials, the main challenges on the journey from prototype to commercial product, the associated ethical, legal, and social implications of using living systems as building blocks and components for next-generation sustainable processes, products, and technologies, and the future directions of this emerging interdisciplinary field will be discussed. Specific topics of interest include, but not limited to:

- Design and modeling of engineered living materials
- Property testing of engineered living materials
- Fabrication and manufacturing of engineered living materials
- Prototype and commercialization of engineered living materials
- Ethical, legal, and social implications of using living systems as building blocks and components for next-generation sustainable processes, products, and technologies

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- The presenting author Nomust register by **April 10, 2025** or the paper will be withdrawn from the conference proceedings.
- **High quality MSEC 2025 papers will be channeled to an ASME journal for fast-tracked review and publication.** Acceptedpapers can be submitted for review to any ASME journal, such as the prestigious *ASME Journal of Manufacturing Science and Engineering* or the *ASME Journal of Micro and Nano Manufacturing*.

Additional Symposium Activities

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

- Work to attract high-profile international keynote speakers
- Work to promote high-quality submissions

Organizers

Dr. Congrui Grace Jin, Texas A&M University, jincongrui@tamu.edu
Dr. Chenglin Wu, Texas A&M University, chenglinwu@tamu.edu
Mr. Miles Adams, Myco Industries Group L.L.C., miles@mycoindustriesgroup.com
Dr. Weinan Xu, University of Akron, weinanxu@uakron.edu
Dr. Hongyu Nick Zhou, University of Tennessee at Knoxville, hzhou8@utk.edu
Dr. Qiming Wang, University of Southern California, qimingw@usc.edu

* The conference is collocated with NAMRI/SME's 53rd North American Manufacturing Research Conference (NAMRC53), which will have a separate call-for-papers. Please note that submission of the same paper to more than one conference is not permitted.

— Call for Papers —

A Symposium on

Advanced Manufacturing of Functional Devices and Bioinspired Structures

Sponsored by the ASME Manufacturing Engineering Division's
Biomanufacturing Technical Committee
2025 ASME International Manufacturing Science & Engineering Conference (MSEC)
June 23rd – June 27th, 2025
Greenville, South Carolina, USA
Hosted by Clemson University

Technical Focus

Advanced manufacturing (e.g. 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, and metamaterial devices. Various novel nano and microscale 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 nano/micro-scales manufacturing from process development to function-focused applications is taking place recently. Bioinspired manufacturing promotes possibilities in manipulating and mimicking the multiscale, multimaterial, and multifunctional biomimetic structures with excellent acoustic, optical, electrical, thermal, mechanical, and hydrodynamic properties. Understanding natural structures and replicating them by advanced 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 manufacturing processes. This symposium will focus on research advances in the areas of advanced multiscale and multi-material manufacturing of functional devices and bioinspired structures design for future applications. The growth of bioinspired manufacturing technology will open intriguing perspectives for developing bioinspired materials and structures on the basis of novel multiscale and multimaterial manufacturing processes together with new computer-aided design and simulation methods. Specific topics include, but are not limited to:

- Field-assisted (electric, magnetic, acoustic, optics, shear force, thermal) and Templating based (gas, ice, sugar, salt, etc.) nano- and micro-scales additive manufacturing
- Multimaterial and multiscale hybrid and advanced manufacturing
- Nano- and micro-scales manufacturing of bioinspired materials and structures for various applications (e.g. mechanical/surface&interface/optics/electrics/nano/micro robots)
- Sustainable circular manufacturing
- Bioinspired manufacturing of multifunctional autonomous devices (4D printing of active materials)
- 3D/2D printing of electronics (actuators, antennas, sensors, piezoelectrics, thermoelectrics, etc.), energy storage and conversion devices
- Design, modeling and simulation of bioinspired structure and material systems.
- Advanced applications of bioinspired nano-and micro manufacturing.

Paper Submission (Dates are subject to change.)

Submission of abstract for review (mandatory)..... November 4, 2024
Submission of full manuscripts for review..... November 12, 2024
Submission of revised papers for review..... March 3, 2025
Notification of acceptance for revised papers..... March 17, 2025
Submission of Copyright Form..... March 28, 2025
Submission of final paper..... March 31, 2025

- ***Submissions will only beaccepted via the conference website: https://event.asme.org/MSEC/***.
- No papers are to be submitted to the organizers.
- **Only industry presenters are allowed to present without a paper**.
- The presenting author must register by **April 10, 2025** or the paper will be withdrawn from the conference proceedings.
- **High quality MSEC 2025 papers will be channeled to an ASME journal for fast-tracked review and publication.** Accepted papers can be submitted for review to any ASME journal, such as the prestigious *ASME Journal of ManufacturingScience and Engineering* or the *ASME Journal of Micro and Nano Manufacturing*.

Additional Symposium Activities

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

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

Organizers

Dr. Xiangjia 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.619-594-3145; yyang10@@sdsu.edu
Dr. Ketki Lichade, University at Buffalo-SUNY, Buffalo, NY. USA. 716-645-9346; ketkilic@buffalo.edu
Dr. Zipeng Guo, Rochester Institute of Technology, Rochester, NY, 585-475-2632, zxgeie@rit.edu

* The conference is collocated with NAMRI/SME's 53rd North American Manufacturing Research Conference (NAMRC53), which will have aseparate call-for-papers. Please note that submission of the same paper to more than one conference is not permitted.

— Call for Papers —

A Symposium on

Advances in Manufacturing Towards Sustainability

Sponsored by the ASME Manufacturing Engineering Division's
Life Cycle Engineering Committee
2025 ASME International Manufacturing Science & Engineering Conference (MSEC)
June 23rd – June 27th, 2025
Greenville, South Carolina, USA
Hosted by Clemson University

Technical Focus

Technological innovations drive significant growth in manufacturing to meet escalating global demands. However, the complex and interconnected nature of modern manufacturing systems necessitates systemic study for ensuring resource- and cost-effective system integration and resilience. Global resource scarcity further amplifies challenges related to resource management and allocation, waste reduction, and value retrieval throughout the entire product life cycle, accelerating the pace of sustainability transformation in manufacturing. A holistic approach is critical for sustainable use of resources, enhancing adaptability to disruptions, and improving overall efficiency of a manufacturing system. Meanwhile, system-level integration and planning enable proactive measures for more resilient and sustainable manufacturing practices. Methods that integrate manufacturing operations into the product life cycle are encouraging for addressing underlying principles and overcoming critical bottlenecks in practical manufacturing settings. This symposium explores innovative methods for manufacturing system analysis, addressing the challenges in effective supply chain management, sustainable manufacturing practices, ensuring system resilience, and optimizing resource allocation to enhance efficiency and productivity. Specific topics of interest include, but are not limited to:

- Novel tools and methods for sustainability-aware manufacturing system integration and optimization.
- Supply chain integrated comprehensive sustainability assessment considering multiple stakeholders.
- Methods to assess and control the environmental impacts and economic viability in manufacturing systems.
- Design and optimization of closed-loop manufacturing systems.
- Advances in recovery processes and technologies for improved resource utilization.
- Decision-making approaches and practical implications for efficient disassembly planning and scheduling.
- Modeling for decision support and enhanced performance of manufacturing systems.
- Innovative strategies for integrating renewable energy sources into manufacturing systems.

Paper Submission (Dates are subject to change.)

Submission of abstract for review (mandatory) ..... November 4, 2024
Submission of full manuscripts for review..... November 12, 2024
Submission of revised papers for review ..... March 3, 2025
Notification of acceptance for revised papers..... March 17, 2025
Submission of Copyright Form ..... March 28, 2025
Submission of final paper ..... March 31, 2025

- ***Submissions will only beaccepted via the conference website: https://event.asme.org/MSEC/***.
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Additional Symposium Activities

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

- Work to set up a panel discussion with SE and CE experts or invite a high-profile keynote speaker
- Work on organizing a special issue in an ASME Journal

Organizers

Dr. Jing (Julia) Zhao, Penn State University, The Behrend College, Erie, PA, USA. jqz5665@psu.edu
Dr. Muyue (Margret) Han, North Carolina A&T State University, Greensboro, NC, USA. mhan@ncat.edu
Dr. Jesús Pérez-Cardona, University of Puerto Rico–Mayagüez Campus, Mayagüez, PR. jesus.perez18@upr.edu

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— Call for Papers —

A Symposium on

Semiconductor Manufacturing: Metrology, Inspection, Equipment, and Processes

Sponsored by the ASME Manufacturing Engineering Division's
Manufacturing Equipment and Automation Technical Committee
2025 ASME International Manufacturing Science & Engineering Conference (MSEC)
June 23rd – June 27th, 2025
Greenville, South Carolina, USA
Hosted by Clemson University

Technical Focus

Semiconductors are integral components of computers, tablets, cell phones and personal devices, and semiconductor manufacturing technology significantly drives the evolution of commercial products because the performance of semiconductor manufacturing equipment directly contributes to productivity and manufacturability. There is a need for new technology to meet the constant everchanging demands of the semiconductor market, but unfortunately there are few university-level investigations into semiconductor equipment and machines because industry leads that competitive research. Therefore, there are only a limited number of research and education opportunities for students to gain knowledge and hands-on experience in semiconductor manufacturing. The goals of this symposium are to form an academy-level semiconductor manufacturing research community, responding to the CHIPS and Science Act initiatives, and to extend semiconductor research capabilities that are transformative to industrial adaption. Specific topics of interest include, but are not limited to:

- Semiconductor processes: etching, deposition, coating, lithography, cleaning, chemical-mechanical polishing (CMP), etc.
- Lithography and patterning technologies
- Semiconductor packaging technologies: wafer bonding, heterogeneous integration, etc.
- Metrology, inspection, testing, and instrumentation technology for advancing semiconductor manufacturing.
- Surface engineering and critical dimension (CD) characterization by destructive/nondestructive techniques
- Calibration techniques and data analytics
- Automatic inspection feature extraction and recognition
- Approaches to machine-learning/deep-learning based metrology.
- Semiconductor manufacturing system design and development
- Semiconductor device design and fabrication
- Semiconductor workforce development and case studies

Paper Submission (Dates are subject to change.)

Submission of abstract for review (mandatory) ..... November 4, 2024
Submission of full manuscripts for review..... November 12, 2024
Submission of revised papers for review ..... March 3, 2025
Notification of acceptance for revised papers..... March 17, 2025
Submission of Copyright Form ..... March 28, 2025
Submission of final paper ..... March 31, 2025

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Additional Symposium Activities

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

- Plan the review papers (semiconductor manufacturing) with the symposium participants.
- Organize a special issue in the ASME journals.
- Discuss funding opportunities to promote semiconductor manufacturing research.

Organizers

Dr. ChaBum Lee, Texas A&M University, College Station, TX, IA, USA. +1-979-458-8121 cblee@tamu.edu
Dr. Xiangyu Guo, Arizona State University, Mesa, AZ, USA. +1-520-331-3290 xiangyu.g@asu.edu
Dr. Jiyong Park, Korea Institute of Industrial Technology, Songdo, S. Korea, +82-32-850-0288, j.park@kitech.re.kr

— Call for Papers —

A Symposium on

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

Sponsored by the ASME Manufacturing Engineering Division's
Manufacturing Processes Technical Committee
2025 ASME International Manufacturing Science & Engineering Conference (MSEC)
June 23rd – June 27th, 2025
Greenville, South Carolina, USA
Hosted by Clemson University

Technical Focus

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

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

Paper Submission (Dates are subject to change.)

Submission of abstract for review (mandatory) ..... November 4, 2024
Submission of full manuscripts for review ..... November 12, 2024
Submission of revised papers for review ..... March 3, 2025
Notification of acceptance for revised papers ..... March 17, 2025
Submission of Copyright Form ..... March 28, 2025
Submission of final paper ..... March 31, 2025

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Additional Symposium Activities

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

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

Organizers

Dr. Yiliang (Leon) Liao, Iowa State University, Ames, IA, USA. +1-515-294-1325; leonl@iastate.edu
Dr. Beiwen Li, University of Georgia, Athens, GA, USA, +1-515-441-6288, Beiwen.Li@uga.edu
Dr. Avik Samanta, University of South Florida, Tampa, FL, USA. +1-813-974-5623, aviksamanta@usf.edu

* The conference is collocated with NAMRI/SME's 53rd North American Manufacturing Research Conference (NAMRC53), which will have a separate call-for-papers. Please note that submission of the same paper to more than one conference is not permitted.

— Call for Papers —

A Symposium on

Advances in Clean Energy and E-Mobility Manufacturing

Sponsored by the ASME Manufacturing Engineering Division's
Manufacturing Processes Technical Committee
2025 ASME International Manufacturing Science & Engineering Conference (MSEC)
June 23rd – June 27th, 2025
Greenville, South Carolina, USA
Hosted by the Clemson University

Technical Focus

Carbon neutrality is a major driving force for the development of renewable clean energy, e.g., batteries, fuel cells, solar cells, wind, hydropower, nuclear, etc., to replace the traditional fossil fuel and petroleum-based energy. Electro-mobility has become a world-wide recognized definition related to the use of electric energy to propel several types of vehicles: from motorcycles to cars, from scooters to buses. The introduction of clean energy (batteries and/or fuel cells) in modern vehicles has determined the rapid adoption of dedicated manufacturing processes that should be able to deal with massive production, low waste and high flexibility to face the continuous improvements characterizing this new disruptive industrial scenario. The manufacturing aspect for clean energy attracts increasing attention since the manufacturing cost, waste and carbon emissions play a significant role in the adoption of clean energy. This symposium focuses on research advances concerning manufacturing processes to produce clean energy and related components in electro-mobility and other decarbonization applications. Specific topics of interest include, but are not limited to:

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

Paper Submission (Dates are subject to change)

Submission of abstract for review (mandatory) ..... November 4, 2024
Submission of full manuscripts for review ..... November 12, 2024
Submission of revised papers for review..... March 3, 2025
Notification of acceptance for revised papers..... March 17, 2025
Submission of Copyright Form ..... March 28, 2025
Submission of final paper..... March 31, 2025

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Additional Symposium Activities

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

- Work to attract a high-profile international keynote speaker.
- Work to attract the members in clean energy and E-Mobility manufacturing to broaden the manufacturing community.

Organizers

Dr. Alessandro Ascari, University of Bologna, Bologna, Italy; a.ascari@unibo.it
Dr. Lei Chen, University of Michigan-Dearborn, Dearborn, MI, USA. 313-593-5122; leichn@umich.edu
Dr. Jianlin Li, Argonne National Laboratory, Lemont, IL, USA. 630-252-4051; jianlin.li@anl.gov
Dr. Erica Liverani, University of Bologna, Bologna, Italy; erica.liverani2@unibo.it
Dr. Wayne Cai, General Motors, Warren, MI, USA. 248-807-3949; wayne.cai@gm.com

* The conference is collocated with NAMRI/SME's 53nd North American Manufacturing Research Conference (NAMRC53), which will have a separate call-for-papers. Please note that submission of the same paper to more than one conference is not permitted.

— Call for Papers —

A Symposium on

Advanced Machining and Deformation Processes

Sponsored by the ASME Manufacturing Engineering Division's

Manufacturing Processes Technical Committee

2025 ASME International Manufacturing Science & Engineering Conference (MSEC)

June 23rd – June 27th, 2025

Greenville, South Carolina, USA

Hosted by Clemson University

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 analytical to computational fall under this call. Specific topics may include, but are not limited to:

- Advances in machine tools, cutting/abrasive tools, coatings, and tooling
- Advances in machining processes: cutting, abrasive machining, polishing, EDM, ultra-precision machining, etc.
- Deformation processes including bulk and sheet metal forming and other solid-state processes
- In-situ sensing, measurement and diagnostics
- Modeling and simulations of machining and deformation processes at multiple scales
- Modeling and experimental studies in machining dynamics
- Lubrication, tribology and wear in machining and deformation processes
- Machining of difficult-to-process materials, such as new alloys, ceramics, or composites
- Material models for machining and deformation processes
- Smart machining and deformation processes with sensor fusion and machine learning
- Machining aspects of hybrid manufacturing
- Sustainability issues and solutions
- Advances in metrology, measurement instruments and uncertainty evaluation
- Microstructure evolution and related effects on processes
- Automation and control of machining and deformation processes
- Process planning for multi-axis and multi-tasking machining operations
- Part surface integrity in machining
- Part geometric distortion and its control in machining and related processes

Paper Submission (dates are subject to change.)

Submission of abstract for review (mandatory).....November 4, 2024
Submission of full manuscripts for review.....November 12, 2024
Submission of revised papers for review.....March 3, 2025
Notification of acceptance for revised papers.....March 17, 2025
Submission of Copyright Form.....March 28, 2025
Submission of final paper.....March 31, 2025

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Additional Symposium Activities

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

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

Organizers

Dr. 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
Dr. David Yan, San Jose State University, San Jose, CA, david.yan@sjsu.edu

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— Call for Papers —

A Symposium on

Innovative Welding and Joining Processes of Advanced Materials and Structures

Sponsored by the ASME Manufacturing Engineering Division's
Manufacturing Processes Technical Committee
2025 ASME International Manufacturing Science & Engineering Conference (MSEC)
June 23 – June 27, 2025
Greenville, South Carolina, USA
Hosted by Clemson University

Technical Focus

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

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

Paper Submission (Dates are subject to change.)

Submission of abstract for review (mandatory)	November 4, 2024
Submission of full manuscripts for review	November 12, 2024
Submission of revised papers for review	March 3, 2025
Notification of acceptance for revised papers	March 17, 2025
Submission of Copyright Form	March 28, 2025
Submission of final paper	March 31, 2025

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Additional Symposium Activities

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

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

Organizers

Dr. Xun Liu, The Ohio State University, Columbus, OH, USA, phone: (614)2928915, email: liu.7054@osu.edu
Dr. Yunwu Ma, Shanghai Platform for Smart Manufacturing, Shanghai, China, phone: (86)(21)68286971, email: mayw@spsm.net.cn
Dr. Yongbing Li, Shanghai Jiao Tong University, Shanghai, China, phone: (86)(21)34206305, email: yongbinglee@sjtu.edu.cn
Dr. Abdul Sayeed Khan, University of Michigan Ann Arbor, MI, USA, phone: (734)2721627, email: absk@umich.edu

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— Call for Papers —

A Symposium on

Innovations in Equipment Design, Control and Automation

Sponsored by the ASME Manufacturing Engineering Division's
Manufacturing Systems Technical Committee
2025 ASME International Manufacturing Science & Engineering Conference (MSEC)
June 23rd – June 27th, 2025
Greenville, South Carolina, USA
Hosted by Clemson University

Technical Focus

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

- Machine tools, industrial robots, and other equipment in manufacturing
- Modeling, monitoring, and control of manufacturing equipment (CNC machining, joining, forming, and so on)
- Design and control of additive manufacturing systems, metrology systems, or hybrid machine systems
- Advances in sensors, actuators, motion command algorithms for positioning systems
- Data acquisition methods and data-driven machine tool/process automation and control
- Design and control of novel precision positioning systems (e.g., lithography, deposition, micro-machining)
- Sensor systems and integration for manufacturing equipment (e.g., sensor assisted 3D printing or machining)
- Smart Manufacturing in automation: machine learning, deep learning, and digital twin for equipment control and autonomous operation
- Novel tool holder design, tool path planning (e.g., in machining), and tool design (e.g., in forming)
- Automation in metrology systems and processes
- Novel multi-axis machine structures and controllers
- Remote data collection and smart control of equipment, cloud data storage, accessibility, and processibility.

Papers must demonstrate the testing of the new design or control methods to improve a manufacturing process. Contributions from industry in this area are particularly encouraged.

Paper Submission (Dates are subject to change.)

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- **High quality MSEC 2025 papers will be channeled to an ASME journal for fast-tracked review and publication.** Accepted papers can be submitted for review to any ASME journal, such as the prestigious *ASME Journal of Manufacturing Science and Engineering* or the *ASME Journal of Micro and Nano Manufacturing*.

Additional Symposium Activities

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

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

Organizers

Dr. Chandra Nath, Purdue University, West Lafayette, IN, USA, Ph: +1-217-607-3029, nathc@purdue.edu
Dr. Huitaek Yun, Korea Advanced Institute of Sci & Tech (KAIST), Daejeon, S. Korea, +82-42-350-3011, htyun@kaist.ac.kr
Dr. Kyle Saleeby, Georgia Institute of Technology, Atlanta, GA, USA, +1- 404-384-0033, kylesaleeby@gatech.edu

* The conference is collocated with NAMRI/SME's 53rd North American Manufacturing Research Conference (NAMRC53), which will have a separate call-for-papers. Please note that submission of the same paper to more than one conference is not permitted.

— Call for Papers —

A symposium on

Human Integration to Smart Manufacturing Systems

Sponsored by the ASME Manufacturing Engineering Division's
Manufacturing Systems Technical Committee
2025 ASME International Manufacturing Science & Engineering Conference (MSEC)
June 23rd - June 27th, 2025
Greenville, South Carolina, USA
Hosted by Clemson University

Technical Focus

This symposium will focus on the principles of Industry 5.0 applied to manufacturing processes and systems to optimize production processes, enhance quality control, and improve overall system efficiency while delving into concepts such as human digital twins, human-smart tech interaction, and Operator 4.0. Additionally, it will encompass Human-Robot Interaction and Manufacturing Robotics Control, acknowledging their roles within the scope of human-centered Artificial Intelligence (AI) and robots in manufacturing. Specific topics of interest include, but are not limited to:

- Human-Centered AI to enhance decision-making, quality control, and process optimization.
- Operator 4.0 to improve efficiency and productivity of workers.
- Human Digital Twins to enhance training, safety, and operational efficiency.
- Human-Smart Technology Interaction to improve user experience and operational outcomes.
- Human-Robot Interaction to increase productivity and safety in manufacturing environments.
- Manufacturing Robotics Control to enhance automation and scalability in production systems.
- Integrating Large Language Models (LLMs), eXplainable AI (XAI) techniques, and Vision Transformers (ViTs) with human intelligence in manufacturing processes and systems.
- Addressing trust, transparency, ethical, social, and legal implications while deploying smart manufacturing systems.
- Human Integrated resilient and sustainable manufacturing systems and processes.

Paper Submission (Dates are subject to change)

Submission of abstract for review (mandatory) .....November 4, 2024
Submission of full manuscripts for review .....November 12, 2024
Submission of revised papers for review.....March 3, 2025
Notification of acceptance for revised papers.....March 17, 2025
Submission of Copyright Form .....March 28, 2025
Submission of final paper .....March 31, 2025

- ***Submissions will only beaccepted via the conference website: https://event.asme.org/MSEC/***.
- No papers are to be submitted to the organizers.
- **Only industry presenters are allowed to present without a paper**.
- The presenting author must register by **April 10, 2025** or the paper will be withdrawn from the conference proceedings.
- **High quality MSEC 2025 papers will be channeled to an ASME journal for fast-tracked review and publication.** Accepted papers can be submitted for review to any ASME journal, such as the prestigious *ASME Journal of ManufacturingScience and Engineering* or the *ASME Journal of Micro and Nano Manufacturing*.

Additional Symposium Activities

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

- Invite an internationally recognized industry speaker working in this specific area for a keynote.
- To encourage journal publication on this topic, we will organize a special issue in an ASME journal, preferably, The Journal of Computing and Information Science in Engineering (JCISE).

Organizers

Dr. Vinita Gangaram Jansari, Clemson University, SC, USA. 864-283-7220; vjansar@clemson.edu
Dr. Ankit Agarwal, Clemson University, SC, USA. 864-990-8230; agarwa3@clemson.edu
Dr. Thorsten Wuest, University of South Carolina, SC, USA. 310-869-4897 twuest@mailbox.sc.edu

* The conference is collocated with NAMRI/SME's 53rd North American Manufacturing Research Conference (NAMRC53), which will have a separate call-for-papers. Please note that submission of the same paper to more than one conference is not permitted.

— Call for Papers —

A Symposium on

Advances in Manufacturing of Thin Films and Coatings

Sponsored by the ASME Manufacturing Engineering Division's
Nano/Micro/Meso Manufacturing Technical Committee
2025 ASME International Manufacturing Science & Engineering Conference (MSEC)
June 23rd – June 27th, 2025
Greenville, South Carolina, USA
Hosted by Clemson University

Technical Focus

As the world embraces the era of the internet of things (IoT), sensor networks, 3-D printed electronics, electronic textiles, energy devices, and in-space manufacturing, the need for advanced surface structures has become crucial within these emerging fields. Particularly, the design and manufacturing of thin films and coatings have become pivotal to ensure high-performance surfaces across these emerging technologies. Advancements in thin films and coatings will propel the manufacturing of high-performance surfaces across diverse domains and scales. This symposium aims to explore the latest advancements and applications in thin films and coatings manufacturing, with a focus on surface engineering, innovative manufacturing processes, advanced characterization/testing methods, and application development. Specific topics of interest include, but are not limited to:

- Advances in materials for thin films and coatings
- Novel manufacturing techniques and process innovations for surface modification and coatings
- Multi-material/hybrid films and coatings for multifunctional and responsive surface structures
- Surface modification for self-healing, self-cleaning, corrosion-resistant, and wear-resistant surface technologies
- Emerging trends in biocompatible coatings for medical devices
- Smart surfaces for *in-situ* monitoring, sensing, and energy harvesting
- Characterization, metrology, and quality control of thin films and coatings
- Functional properties, durability, and performance evaluation of thin films and coatings
- Modeling and simulation of multi-scale surface deposition
- Machine learning and artificial intelligent in surface manufacturing
- Integration of thin films and coatings in IoT, electronics, e-textiles, energy conversion/storage, and space applications
- Reviews of the state-of-the-art knowledge and research needs in thin films and coatings manufacturing

Paper Submission (Dates are subject to change.)

Submission of abstract for review (mandatory) ..... November 4, 2024
Submission of full manuscripts for review ..... November 12, 2024
Submission of revised papers for review ..... March 3, 2025
Notification of acceptance for revised papers ..... March 17, 2025
Submission of Copyright Form ..... March 28, 2025
Submission of final paper ..... March 31, 2025

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Additional Symposium Activities

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

- Work to attract a high-profile international keynote speaker
- Promote high-quality submissions

Organizers

Dr. Semih Akin, Rensselaer Polytechnic Institute, Troy, NY, USA, Ph: +1-518-276-3244, akins@rpi.edu
Dr. Chandra Nath, Purdue University, West Lafayette, IN, USA, Ph: +1-217-607-3029, nathc@purdue.edu
Dr. James Nowak, MIT Lincoln Laboratory, Lexington, MA, USA Ph: +1-781-981-4247, james.nowak@ll.mit.edu

* The conference is collocated with NAMRI/SME's 53rd North American Manufacturing Research Conference (NAMRC53), which will have a separate call-for-papers. Please note that submission of the same paper to more than one conference is not permitted.

— 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
2025 ASME International Manufacturing Science & Engineering Conference (MSEC)
June 23rd – June 27th, 2025
Greenville, South Carolina, USA
Hosted by Clemson University

Technical Focus

Meso-, Micro- and nano-scale manufacturing is gaining more attention due to production miniaturization and customization. High precision and product quality are difficult to achieve at this length scale; thus, a deeper understanding of the processes, development of characterization methods, modeling, simulations, and monitoring are required to improve product quality. Additionally, process and system technologies need to be advanced for scalable manufacturing. Due to the size effects and difficulties in monitoring and control, simulation and prediction are particularly important at a small scale. This symposium will focus on advances in micro- and nano-scale manufacturing technologies, specifically subtractive and formative processes such as machining, forming, and joining, that address the aforementioned requirements. We welcome both theoretical and experimental contributions, with a particular interest in application-oriented novel manufacturing processes and systems. Papers from the industrial sector are strongly encouraged, as they provide valuable insights into real-world challenges and solutions. Specific topics of interest at the Meso-, Micro- and Nano-scale include, but are not limited to:

- Machining (including both mechanical and non-traditional methods such as laser, EDM, ECM, ECDM, AWJM, USM, etc.), forming, joining, and hybrid manufacturing processes, systems, and technologies at the meso, micro, and nano scales.
- Process and system characterization, modeling, and simulation
- Micro and nanomaterials for manufacturing
- Scalable meso, micro and nanomanufacturing
- Surface texturing, surface integrity, and process improvement
- Process monitoring and control
- Measurement and metrology
- Novel product designs and assembly technologies
- Design and fabrication methods for micro-sensors
- Equipment for micro- and nano-scale manufacturing
- Manufacturing related to micro- and nano-composites, ceramics, and other novel materials
- Use of nano/micro additives and fluids for manufacturing

Paper Submission (Dates are subject to change.)

Submission of abstract for review (mandatory) ..... November 4, 2024
Submission of full manuscripts for review ..... November 12, 2024
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Notification of acceptance for revised papers ..... March 17, 2025
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Additional Symposium Activities

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

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

Organizers

Dr. Soham Mujumdar, IIT Bombay, Mumbai, India, Ph: +91-9922900074, sohammujumdar@iitb.ac.in
Dr. Sekhar Rakurty, The M.K. Morse Company, Canton, OH, USA, +1-801-889-5228, RakurtyS@mkmorse.com
Dr. Muhammad Pervej Jahan, Miami University, Oxford, OH, USA, Ph: +1-513-529-0347, jahanmp@MiamiOH.edu

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— Call for Papers —

A Symposium on

Explainable AI for Knowledge Discovery in Manufacturing Engineering

Sponsored by the ASME Manufacturing Engineering Division's
Quality and Reliability Technical Committee
2025 ASME International Manufacturing Science & Engineering Conference (MSEC)
June 23rd – June 27th, 2025
Greenville, South Carolina, USA
Hosted by Clemson University

Technical Focus

Data-driven artificial intelligence and machine learning techniques have recently become popular for smart manufacturing systems and processes. These techniques have unlocked potential for improved capabilities in areas such as quality diagnostics and prognostics and health management, anomaly detection, predictive maintenance, operations management, energy efficiency and sustainability, automation, and decision-making under uncertainty. However, the lack of explainability in deep learning and generative AI threatens widespread adoption and trust from the perspective of industrial stakeholders. To mitigate these concerns, explainable AI techniques have been proposed and implemented to promote a more transparent "glass box" understanding on how models arrive at predictions. This symposium will highlight recent research advances in explainable AI across manufacturing, with an emphasis on how these techniques have improved knowledge discovery for novel systems, processes, and decision-making. The symposium will be broadly inclusive of methods and applications, with the underlying theme of explainable and actionable AI approaches enabling the advancement of scientific domain knowledge. Contributions concerning high-dimensional and industrial applications are encouraged. Some topics of interest for this symposium include, but are not limited to:

- Pre-model, in-model, and/or post-hoc model explanation techniques for feature importance, attribution, and selection.
- Explanation quality, evaluation, and uncertainty analysis.
- Hypothesis generation and data-driven experimental design.
- Counterfactual explanations and causal inference AI for manufacturing engineering.
- Explainable AI for discovery of novel correlations and physics (e.g. in battery manufacturing).
- Explainable AI for sustainable manufacturing.
- Explainability in large language models for manufacturing.
- Case studies and real-world implementations demonstrating success of explainable AI in manufacturing workflows.
- Educational materials development for explainable AI in manufacturing.
- Considerations and frameworks for reliable, responsible, and trustworthy usage.

Paper Submission (Dates are subject to change.)

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Additional Symposium Activities

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

- Work to attract high-profile speakers from industry
- Work to attract a high-profile international keynote speaker
- Organize a special issue in the *ASME Journal of Manufacturing Science and Engineering*

Organizers

Dr. Joseph (Yossi) Cohen, Rutgers University, New Brunswick, NJ, USA. 513-766-6914; cohenyo@umich.edu
Dr. Weihong (Grace) Guo, Rutgers University, New Brunswick, NJ, USA. 848-445-8556; wg152@soe.rutgers.edu
Dr. Xi Gu, Rutgers University, New Brunswick, NJ, USA. 734-604-2218; xg107@soe.rutgers.edu
Dr. Devesh Upadhyay, Saab, Inc., East Syracuse, NY, USA. 734-377-0162; devesh.upadhyay@saab.com

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