

— **Call for Papers** —
A Symposium on
Bio-/Nano-Materials and Self-Organizing Smart Structures

Sponsored by the ASME Manufacturing Engineering Division's
Nano/Micro/Meso Manufacturing Technical Committee
Bio manufacturing Technical Committee
2020 ASME International Manufacturing Science and Engineering Conference (MSEC)*
June 22 – 26, 2020
Cincinnati, Ohio
Hosted by the University of Cincinnati, College of Engineering and Applied Science

Technical Focus

Recent advances in bottom-up synthesis and self-assembly of nanomaterials as well as biomimetic and bioinspired designs and processes underlie a revolution in advanced manufacturing. Multiscale hierarchically architected structures are ubiquitous in nature enabling the wide variety of impressive mechanical, thermal, optical, and other properties observed among natural materials, such as nacre and silk, or biological surfaces, such as butterfly wings and shark skin. In particular, ordered nanoscale and mesoscale building blocks give rise to unique collective properties that are not only dependent on the properties of the individual building blocks, but also on their spatial arrangement in one, two, or three dimensions. Combining this organization with stimuli-responsive and active materials opens the door for creating smart structures, actuators, sensors, etc. that were previously impossible. Moreover, leveraging the concepts of origami and kirigami have been shown to be promising fabrication strategies for emerging applications in energy and healthcare. This symposium brings together interdisciplinary research efforts from academia, national labs, and industry focused on developing new fabrication strategies for advanced bio-/nano-materials and self-organizing structures. Specific topics include, but are not limited to the following:

- Bottom-up synthesis of nanomaterials (e.g. nanoparticles, nanotubes, and nanowires)
- Chemical vapor deposition of carbon nanotubes, graphene, and other nanocarbon forms
- Post-synthesis processing and functionalization of nanomaterials
- Nanopatterning, lithography, and self-assembly of 0D/1D/2D/3D nano-/micro-structures
- Processing of protein-based materials and composites including silk
- Folding and assembly of biological oligomers and polymers (DNA, RNA, polysaccharide, etc.) including cellulose
- Design and fabrication of biomimetic and bio-inspired materials
- Engineering materials for flexible substrates, transparent films, and transient electronics
- Origami- and kirigami-based fabrication of multifunctional structures
- 3D fabrication of complex structures by engineered folding of 2D sheets
- Design and fabrication of stimuli responsive materials for multifunctional devices
- Fabrication of metamaterials and cellular structures for tailored mechanical, acoustic and/or optical properties

Paper Submission

Authors are encouraged to submit an abstract and full manuscript for review by **November 15, 2019** via the conference website. Final revised manuscripts must be submitted by **March 26, 2020**. The copyright transfer form must be filled out by March 19, 2020 and the presenting author must pre-register by **April 15, 2020** or the paper will be withdrawn from the conference. **No papers are to be submitted to the organizers; submissions will only be accepted via the conference website at <https://event.asme.org/MSEC/>**. All papers accepted by MSEC2020 can be further submitted to any ASME journals, such as the highly prestigious Journal of Manufacturing Science and Engineering, for consideration of archival publication. In addition, high quality MSEC2020 papers will be automatically channeled to relevant ASME journals for fast-tracked publications.

Additional Symposium Activities

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

Organizers:

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* The conference is collocated with NAMRI/SME's 48th North American Manufacturing Research Conference (NAMRC48) and LEM&P (Leading Edge Manufacturing / Materials and Processing) by The Japan Society of Mechanical Engineers (JSME), which will have a separate call-for-papers. Please note that submissions of the same paper to more than one conferences are not permitted.