



SUBMIT AN ABSTRACT FOR THE FOLLOWING SYMPOSIUM

ELECTRONIC, MAGNETIC, AND ENERGY MATERIALS

Printed Electronics and Additive Manufacturing of Advanced Functional Materials and Devices—From Processing Concepts to Applications

Additive manufacturing and direct-write printed technologies employing metal, dielectric, semiconductor, polymer, and ceramic materials have the potential to enable new products and markets. Accordingly, many emerging applications in sensing, energy harvesting and storage, robotics, wearables, healthcare, aerospace, and communication necessitate electronic materials of novel form factors and unique processing approaches. The proposed symposium will concentrate on the emerging additive manufacturing concepts and printing techniques for the processing of functional thin films, low-dimensional materials, 3D architectures, and composite structures. Technical sessions will focus on fabrication methods and characterization of active and passive functional components on technological substrates as well as integrated into engineered geometries. Topics related to patterning and processing 1D/2D/3D material systems for functional applications are within scope, including advances in materials, processing technologies, or device development. Invited and contributed papers will discuss both the fundamental aspects underlying materials and process development, the correlation of material and device design and functionality, and the particular challenges and opportunities related to scalability, reliability, and sustainability.

Research fields of interest are related but not necessarily limited to the following topics:

- Direct-write printing and additive manufacturing of functional 1D/2D/3D structures and geometries: Materials, Processes, and Characterization
- Nanomaterials, inks, and substrates for direct-write printing and additive manufacturing
- Nanostructured materials for energy generation and storage devices (e.g., batteries and supercapacitors)
- Low thermal budget processing and characterization of functional inks and 1D/2D/3D materials
- Flexible/stretchable devices enabled by printed electronics (e.g., robotics, wearables, and healthcare)
- Methods and materials for printing on porous, biodegradable and water-soluble substrates
- Design and fabrication of multimaterial and multifunctional structures and devices
- Testing and quality control for qualification and standardization of printed flexible and hybrid electronics

- Hybrid electronics: Merging printed electronics and additive manufacturing (materials and process integration to realize active/passive sensors, detectors, optical and photonic devices, TFTs, antennas, PVs, batteries, supercapacitors, and large area electronics)
- Computational modeling/learning methods for predictive understanding of ink formulation, print process control and design

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