

Complex Materials Design (*CoManD*) for Hybrid Additive Processing: Materials, Methods, Models, and Testing

Additive Manufacturing has advanced considerably over the last four decades. Originating from investigations in automated welding, the technology is now capable of fabricating complete devices and resolutions on the order of tens of nanometers. These capabilities promise to significantly reduce the costs, time, and complexity of fabricating devices out of a wide range of materials, including metals, polymers, ceramics, and even living cells. Applications for additive manufacturing include rapid prototyping; microfluidics and lab-on-a-chip systems; stretchable electronics; bio-scaffolding and medical/health care; metamaterials and optoelectronics; and more.

Due to the breadth of materials, processes, and applications of additive manufacturing, the set of physics, chemistries, biology involved with additive manufacturing continues to expand at an increasing rate. Session will be dedicated to the latest advances in novel additive manufacturing technologies, including nano-scale printing, printable electronics, and bio-applications. Additionally, the symposium will incorporate topics in designing for additive manufacturing, the reliability of materials printed using these techniques, and STEM outreach opportunities for 3D printing.

Topics will include:

- Micro- and nano-scale additive manufacturing
- Biological and bio-inspired applications of additive manufacturing
- Device fabrication with additive manufacturing
- Design optimization: computation/simulation, strategies, challenges, and scaling
- Novel polymeric materials and their self-assembly for 3D printing
- Advances in polymer printing
- Printable electronics
- Reliability of printed materials
- 3D printing and the classroom: STEM and beyond