Future Challenges in Additive Manufacturing

Session co-chairs: Thomas Feldhausen (Oak Ridge National Laboratory) and Mihaela Ulmeanu (National University of Science and Technology POLITEHNICA Bucharest)

Abstract
Additive manufacturing (AM) is transforming the design, manufacture, and function of many components and products. It has found applications in various fields, including aerospace, automotive, and healthcare. However, challenges in AM have slowed its adoption in industry. This slowed growth can be attributed to high feedstock and equipment costs coupled with an increased level of complexity in processing. This session will discuss these, and other challenges associated with AM, and highlight areas for future growth.

First, Dr. Christopher Hovanec from the U.S. Department of Defense will discuss how additive manufacturing enables a clean and decarbonized economy. He will focus on how policy and investments have accelerated foundational, cross-cutting clean energy materials and manufacturing. By investing in AM, Dr. Hovanec will go into how to make an industrial impact towards the adoption of AM technology.

Then, Dr. Serena Graziosi from Politecnico Di Milano will talk towards design for additive manufacturing (DFAM) and how AM is transforming how products are designed and manufactured. From the biomedical sector to jewelry making, Dr. Graziosi will discuss how DFAM is an important consideration in the future of AM.

Following is Dr. Connor Myant from Imperial College London will address various types of bioprinting technologies, including inkjet printing, extrusion-based printing, and laser-assisted printing, and more recently vat-polymerization. Dr. Myant will speak on the importance of bioprinting which has already shown promising results for applications in medicine by providing a new way to manufacture tissues for regenerative medicine, three-dimensional cell cultures for rapid pharmaceutical screening, micro-organism cultivation structures, geometrically tailored to optimize activity.

Finally, Dr. Jason Jones from Hybrid Manufacturing Technologies will review post-processing for AM. He will discuss how integrated additive, subtractive, and inspection techniques streamlines the entire manufacturing process. In many cases, AM still requires some form of post-processing, which is often overlooked and is critical to the successful adoption of AM technologies.

Speakers

Additive Manufacturing: Enabling Security and Prosperity
Christopher Hovanec, Senior Scientific Technical Manager, U.S. Department of Defense
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Design for Additive Manufacturing – New Frontiers and Challenges
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Additive Manufacturing Processes – What Do We Expect from Bioprinting?
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Unfinished Business: What 3D Printing Needs to Deliver its Full Potential
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