



## PROGRAM AND ABSTRACTS

### **12 noon – 1:30 pm: Lunch Panel Discussion: The AMT Additive Working Group**

#### **Panelists:**

*Andy Snow - EOS NA*

*Ed Morris - America Makes*

*Bhaskar Dutta - DM3D*

*Shane Collins - Oxford Performance Materials*

AMT's Additive Working Group will be discussing the business opportunities that Additive Manufacturing has enabled as well as some of the challenges of engaging and educating customers. Hear from equipment providers, distributors and technology accelerators as to what today and the near future hold for Additive / 3D Printing as manufacturing technologies.

### **1:30 – 2:00 pm: Latest Developments in Additive Manufacturing at Oak Ridge National Laboratory**

*Craig Blue, Director of Energy, Office of Energy Efficiency and Advanced Manufacturing,  
Oak Ridge National Laboratory*

Additive manufacturing creates components directly from a 3D computer model, adding material layer upon layer only where needed, which means unlimited design flexibility, decreased energy consumption, and reduced time to market. The various types of equipment and their operation, strengths and weaknesses will be discussed, including Directed Energy Deposition Metal, Powder Bed Infusion, etc., and various application of this technology to the energy industry will be reviewed.

The impact to the economy will be examined, including sales figures for Industrial Additive Manufacturing Systems, as well as the low-cost desktop options, and how these changes will drive industrial applications in the future. This presentation will show that additive manufacturing is rapidly gaining mainstream application, and the process technology will evolve to eliminate many current limitations. It is proposed that energy industry applications will unfold from intense aerospace interest, making this a tremendous opportunity over the next decade.

### **2:00 – 2:30 pm: How to Effectively Implement Additive Manufacturing in a Job Shop**

*Jon Baklund, President, Baklund R&D*

Jon will present the reason why companies & individuals should be involved in additive machining. During his presentation, he'll cover the following topics:

- Additive vs Subtractive
- Pros and cons about additive Machining
- How a small machining company can benefit by having in house additive machining
- Myths
- Misconceptions
- Truths

## **2:30 – 3:00 pm: Industrial 3D Printing via Direct Metal Laser Sintering (DMLS™)**

*Andy Snow, Director, EOS*

Direct Metal Laser Sintering is used for industrial 3D printing applications for various industries including aerospace, medical, industrial, tooling, consumer, educational, automotive, and so on.

The process provides efficient, flexible and cost-effective parts directly from 3D CAD data and enables design-driven manufacturing as opposed to manufacturing-driven design while offering various advantages including:

- Freedom of Design: Light weighting, complex geometry components, bionic structures
- Cost Advantages: Integrated functionality without assembly
- Customization: Customer-specific or mass-customization adaptations
- Time-to-Market: Fast feasibility feedback of proof of concepts

## **3:20 – 3:50 pm: Additive Manufacturing for Mold Making**

*Lou Young, New Business Development Director - Tooling & Manufacturing, Linear Mold & Engineering*

As an early adopter of 3D Metal Printing, Linear Mold & Engineering has developed a niche of building conformal cooling lines to complement its mold manufacturing business. Linear has developed an expertise in the design and build of tooling inserts with conformal cooling channels. With demand from OEMs and Tier 1 and Tier 2 suppliers increasing for reduced cycle times and better quality while controlling costs to manufacture, Linear continues increasing its capacity in 3D Metal Printing to provide solutions. Conformal water lines address the limitations of traditional machining. This technology excels in cases in which part designs have varying wall thicknesses, tight dimensional tolerances and challenging mold geometry. This permits even cooling and prevents warp, sinks and other quality problems. Benefits of 3D Metal Printing and conformal cooling include greater flexibility in creating water lines, better access to hard-to-reach areas and significant cycle-time reductions.

## **3:50 – 4:20 pm: Polymeric Additive Manufacturing in Aerospace – Today and Tomorrow**

*Michael Hayes, Principle Design Engineer for Additive Mfg R&D, Boeing Research & Technology*

Additive Manufacturing (AM) has been increasingly marketed as the future of manufacturing, but is it all hype or is there truth to the claims? This presentation will describe the application of polymeric AM processes as used throughout The Boeing Company enterprise in today's environment and the near term potential. While AM cannot solve all manufacturing problems, it can make significant improvements when the current limitations of the technologies are understood. There are areas within aerospace manufacturing when AM makes sense and areas where it does not. Education of the technology to the upstream engineers plays a key role in establishing AM processes onto the shop floor and enabling organic growth for benefit of cost and/or schedule.

## **4:20 – 5:00 pm: Questions and Answers with Additive Manufacturing Expert**

*Greg Morris, GE Aviation, Additive Technologies Leader, NPI Value Stream*

Join one of the most well-known and respected leaders in Additive Manufacturing for a question and answer session that lets you control the content. As one of the founders of Morris Technologies, which was recently acquired by GE Aviation, Greg has been finding manufacturing solutions through AM since the early 90's. Tap into his vast knowledge and experience during this fast-paced session.

## **5:00 – 7:00 pm: Networking Reception**

Attendees of the AM Workshop are invited to a special networking event that will include speakers from the AM Workshop and TRAM, as well as some selected VIP's from the industry. It will be a great opportunity to mingle with other show owners, industry experts, suppliers and media personnel. Please join us in the Advanced Manufacturing Center booth, W-10.