

# Defense-Wide Manufacturing Science & Technology (DMS&T) Program

## America Makes

### PROBLEM / OBJECTIVE

In March 2012, President Obama proposed the formation of up to 15 Institutes of Manufacturing Innovation and directed the use of existing funds to launch a pilot institute. By August 2012, the DMS&T program, in partnership with the Army, Air Force, DOE, NSF, and NASA, established the pilot Institute for the purpose of advancing Additive Manufacturing (AM), which is a suite of emerging technologies to fabricate metallic, plastic, ceramic, and electronic parts using a layer-by-layer technique, where material is placed precisely as directed from a 3D digital file.



### APPROACH / BENEFITS

#### **Objective**

- Create a public/private partnership to form a non-profit institute that will bridge the gap between basic research and technology adoption (TRL/MRL 4-7).

## ***Approach***

The Institute's focus is to accelerate the adoption of additive manufacturing technologies in the U.S. manufacturing sector and to increase domestic manufacturing competitiveness by:

- Serving as a national institute with regional and national impact on additive manufacturing capabilities by fostering a highly collaborative infrastructure (with over 80 member organizations) for the open exchange of additive manufacturing information and research.
- Facilitating the development, evaluation, and deployment of efficient and flexible additive manufacturing technologies, including the launch of six applied research projects:
  - Maturation of High-Temperature Selective Laser Sintering (SLS) Technologies and Infrastructure
  - Thermal Imaging for Process Monitoring and Control of Additive Manufacturing
  - Rapid Qualification Methods for Powder Bed Direct Metal Additive Manufacturing Processes
  - Sparse-Build Rapid Tooling by Fused Deposition Modeling (FDM) for Composite Manufacturing and Hydroforming
  - Qualification of Additive Manufacturing Processes and Procedures for Repurposing and Rejuvenation of Tooling
  - Maturation of Fused Depositing Modeling (FDM) Component Manufacturing
- Engaging with educational institutions to supply education and training in additive manufacturing technologies to create an adaptive, leading workforce.
- Linking and integrating U.S. companies with existing public, private or not-for-profit industrial and economic development resources, and business incubators, with an emphasis on assisting small- and medium-sized enterprises and early-stage companies (start-ups).

## ***Expected Benefits and Warfighter Impact***

- Additive manufacturing is an enabling technology for our military, allowing spare parts to be made in theater, enabling last-minute design adjustments to respond to mission changes, and building complex parts affordably.
- Better manufacturing: less waste, less energy, small lot production, no tools, more agile, lightweight structures.
- In the first year, the Institute created an organizational model; recruited key staff; opened an Innovation Factory with AM equipment entrusted by leading manufacturers; defined its technology investment strategy; used innovative and highly effective methods to engage the community at workshops and conferences; awarded initial R&D projects; and began developing a web-based environment for innovation and collaboration.

### **POINT OF CONTACT**

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