



Department of Defense Manufacturing Technology Program

Welcome to the Department of Defense Manufacturing Technology (ManTech) newsletter for the second quarter of 2023! As we take a moment to reflect on the past quarter, we are thrilled to acknowledge the strides we've made in our pursuit of collaboration and enhanced interagency contracting. Throughout this newsletter, we share stories that highlight our endeavors and successes, showing the power of collaboration and the positive impact it has on our projects.

Promoting domestic advanced manufacturing growth to support the national defense and economic prosperity

Notable Events:

- NDIA/ETI Emerging Technologies Conference
Washington, DC
28-30 Aug
- Accelerating Advanced Materials and Manufacturing Exchange
Detroit, MI
17-18 Oct
- Defense Manufacturing Conference
Nashville, TN
11-14 Dec

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DoD ManTech Pentagon Day Highlights Innovation

On June 21, the DOD ManTech Program filled two Pentagon annexes with displays and demonstrations of more than 80 technologies from across its five Component programs; Army, Navy, Air Force, Defense Logistics Agency, Missile Defense Agency, its Manufacturing Science and Technology Program, and nine DOD Manufacturing Innovation Institutes.

Hundreds of Pentagon employees and visitors stopped by to learn about innovative, defense-relevant technologies like a lightweight hydrogen fuel cell; bands made from rubber derived from dandelions; a jointless, additively manufactured ship's hull; a portable deep-hole drill; and a decellularized pig heart, prepared as a scaffold to grow personalized human heart tissue.

Among the highlights of the event were visits from Under Secretary of Defense for Research and Engineering Heidi Shyu and Deputy Under Secretary Dr. David Honey. USD Shyu interacted with one of the most compelling demonstrations of the day, a body scanner from the Joint Clothing and Textile Manufacturing Initiative, a Manufacturing Science and Technology Program-funded project. The JCTMI supports evolving requirements for military uniforms, including operating under global climate conditions, by



implementing digital engineering that utilizes data analytics, including a scale, mat, camera, and mapping software. The program leads told USD Shyu how their efforts are creating organizational agility, enhancing mission/supply chain readiness, and addressing sustainability in a rapidly changing environment.

The Department of the Air Force ManTech Program, along with its industrial partner ThermAvant Technologies, was delighted to demonstrate its oscillating heat pipe technology to USD Shyu, showing its ability to more rapidly change temperature compared to the solid heat sink next to it. A brief discussion followed about how the technology is being applied to power-dense, size-limited DOD platforms – and how Air Force ManTech is making it more affordable and available for our warfighters.

"The ManTech Program supports manufacturing technologies and processes that we need, scaling up technologies we invest in and create, to get them to production. That's the link to getting technology from our labs and inventions out to the warfighter." Tracy Frost, Director, Manufacturing Technology Program

Dr. Honey caught up on advancements in several of the Manufacturing Innovation Institute technologies that featured in last year's Pentagon Day. At the AIM Photonics table, he singled out the functional photonics integrated circuit-based LiDAR system built by Analog Photonics. Dr. Honey had seen an earlier prototype and was impressed by how far the technology had evolved. The LiDAR exemplifies the broad range of defense

applications for the technology, such as autonomous navigation and threat detection.

The functional prototype also demonstrates how AIM Photonics provides fabrication capabilities to small and medium businesses. AIM's state-of-the-art PICs and novel system technologies enable SMMs to advance their own technologies created with those components. Since this system was developed as a government-sponsored project through Defense Advanced Research Projects Agency (DARPA), it showcases how other Federal agencies are utilizing the public-private capabilities of AIM Photonics to develop technologies that were out of reach before OUSD launched the institute in 2015.

In addition to new systems and materials developed specifically for military applications, innovative technologies demonstrated by MIIs at the event also included a wide array of next-generation high-tech wearables, superbrewed foods and other ingredients made from biologically derived nanoparticles, lightweight and durable textiles and fabrics made using renewable resources, and advancements in cell-generated tissues that can be used to cure chronic disease and treat traumatic injury.



Supporting the S&T Strategy: The Value of Collaboration

The Office of the Secretary of Defense ManTech Program and its DOD Manufacturing Innovation Institutes are spearheading a collaborative revolution in defense manufacturing. The OSD-led MIIs represent nine distinct advanced manufacturing technology domains, including additive manufacturing, integrated photonics, biomanufacturing, robotics, and others. These public-private partnerships are unique vehicles for the Department to work with industry on dual-use technology development projects. Over the last 10 years, DOD has created a portfolio of over 1,000 projects, representing over \$1.6 billion in federal investment, with \$2.1 billion in industry cost share. Recently, DOD has focused the activities of the institutes on specific defense challenges, including warfighter needs in contested logistics and organic industrial base modernization. Through their ability to build bridges across Commercial-defense boundaries and work at the system level, the MIIs are proving that their sum is greater than their parts when solving challenges in support of DOD enterprise needs.

The National Defense Science and Technology Strategy rests on three pillars: mission focus, foundation building, and success through teamwork. By working together, the DOD ManTech enterprise prioritizes delivery of solutions that align with the strategy across all our advanced manufacturing technology investments.

Leveraging their strong industry engagement and cross-institute collaborations, MIIs achieve high efficiency, speed to scale, and interoperability, unlocking new possibilities for advancement. For instance, when the Advanced Regenerative Manufacturing Institute (ARMI) BioFabUSA program was evaluating in-process measurement capability for its tissue foundry, the AIM Photonics MII suggested utilizing a photonic solution, developed with prior investment under the CARES Act funding for virus detection, illustrating the power of cross-institute collaboration and leveraging prior investment. Advanced Functional Fabrics of America and America Makes are exploring joint efforts with the Department of Energy's (DOE's) REMADE, the Circular Economy institute, on projects that address climate change and sustainable manufacturing.

"The MIIs play a crucial role in the modernization of the defense sector," said Tracy Frost, director of DOD ManTech. "Their ability to integrate technologies and drive collaboration across agencies and industries is transforming the landscape of defense manufacturing."

The OSD-led MIIs facilitate cooperation between "single technology" ecosystems by harnessing existing contracting mechanisms and promoting the sharing of intellectual property and fabrication facilities. By efficiently leveraging resources, OSD ManTech works to establish a process to improve interagency contracting, an identified challenge, to facilitate these and future collaboration efforts. This program drives innovation and ensures supply chain security, fosters commercialization, and cultivates growth for small businesses. It also seeks to modernize the organic industrial base with tailored outcomes that directly impact the needs of the warfighter.

With a commitment to accelerating technology transition and adoption, growing and supporting advanced manufacturing ecosystems, securing supply chains, training a skilled workforce, and fostering opportunities for small businesses, the MIIs contribute to the long-term sustainability and success of the industry.

"As we focus on the joint mission, we are bridging the valleys of death in defense innovation through collaboration and the integration of technologies across platforms and systems," said Ms. Frost. "The OSD ManTech programs and partnerships reflect the principles outlined in the National Defense Science and Technology Strategy. By harnessing the full scope of the innovation ecosystem, we are sharpening our nation's competitive edge and building an enduring advantage."



"If we can't make it, the warfighter can't have it."

Interagency Meeting Seeks Workforce Development Solutions at a National Level

On May 24, 2023, the Manufacturing Education Workforce and Development team partnered with Manufacturing USA to host an in-person network meeting with the Manufacturing Innovation Institutes and government representatives.

The meeting was convened as a forum to learn about education, workforce, and development in today's advanced manufacturing industry and collaborate on solutions. In particular, the agenda included an in-depth roadmapping session to outline the current issues in manufacturing technology, such as workforce retention, workforce recruitment, and the lack of preparation and skills for future advanced manufacturing. During the session, attendees discussed ideas for initiatives and actions that can address these issues on a national level. Speaking to the forum, Dr. Michele Wolff,



former director of The Shriver Center at University of Maryland, Baltimore County, emphasized the significance of integrating diversity, equity, inclusion, and accessibility within organizations, broaching such topics as neurodiversity. Her call to action sparked a discussion among attendees on how to become more proactive in incorporating DEIA initiatives in organizational processes, procedures, and policies so the manufacturing workforce feels included, heard, and respected.

The Manufacturing Education Workforce and Development team plays an integral role as a bridge-builder between technology innovators and those who are training and educating the current and future manufacturing workforce. Post-event survey results showed that many participants valued the National Roadmapping Working Session as a basis for implementing lessons learned across the network and identifying critical technology tracks and stakeholders, along with learning how to incorporate DEIA strategies within educational programs and the workplace. With the success of the interagency meeting, participants are looking forward to frequent collaboration meetings to continue increasing productivity and developing activities to invest in the future of the American workforce.

Check This Out!

The official website of DoD ManTech has a new look! We invite you to visit the revamped site and explore the latest program news, successes, and breakthroughs in advanced manufacturing.

Stay connected with DoD ManTech for the latest updates and discover cutting-edge technologies, innovative partnerships, and impactful initiatives that are shaping the future of defense advanced manufacturing.

www.dodmantech.mil



Manufacturing USA Network Explores New Collaboration and Long-term Strategy at Annual Meeting



Over 100 participants gathered for the Manufacturing USA Network meeting at the Ronald Reagan Building and International Trade Center on May 25, 2023. With nine interactive sessions and keynotes from White House leaders, the meeting served as a platform for discussions on the importance of interagency collaboration and concerted planning in driving the nation's industrial strategy forward.

Ms. Justina Gallegos, deputy director for industrial innovation at the White House Office of Science and Technology Policy, and Dr. Monica Gorman, special assistant to the President for manufacturing and industrial policy at the National Economic Council, described current and planned initiatives relevant to the 16 Manufacturing Innovation Institutes. Gallegos highlighted the Administration's commitment to growing the American economy from the bottom up and middle out. She emphasized the significance of collaboration across the U.S. government, drawing from recommendations derived from the first White House Manufacturing USA Summit in October.

Gorman provided an overview of the Modern American Industrial Strategy and how its goals to increase competitiveness, facilitate transition of scalable capabilities, promote development of a skilled workforce, and increase community and regional engagements are being borne out through elements passed in the Bipartisan Infrastructure Law, Inflation Reduction Act, and the CHIPS & Science Act. Gorman also emphasized the need for a cohesive Manufacturing USA network over the next decade to maximize the impact of public investments. "Manufacturing USA Institutes are an integral part of achieving our vision in a modern America industrial strategy," said Gorman.



Sessions included MFG USA: 10 Year Vision, Federal Funding Showcase, CHIPS and Science Act – MFG USA Opportunities, National Workforce Strategy, Manufacturing Technology Scale-up and Deployment, and a Directors' Dialogue. Highlights from the sessions include:

- Institute and agency representatives affirmed the need for a future vision of the Manufacturing USA Network. Crowd-sourced responses to six questions generated ideas on improving network functionality, maximizing funding opportunities, expanding workforce development programs, and delivering technology. These ideas will inform the development of near- and long-term strategies for the network.
- The next 10 years will see a new era of public investment in innovation, advanced manufacturing, and advanced manufacturing workforce. The institutes will serve as focal points for ensuring these public investments have maximum impact.
- The Federal Funding Showcase articulated current priorities and relevant opportunities with Economic Development Agency, National Science Foundation, NASA, Department of Energy Office of Manufacturing and Energy Supply Chains, and National Institute of Standards and Technology's Manufacturing Extension Partnerships.

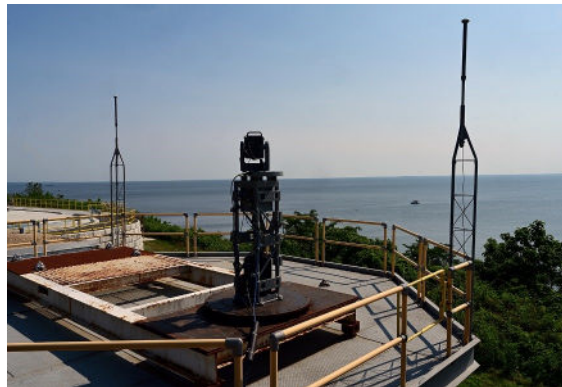
Revolutionizing Communications: MSTP Demonstrates TALON FSO Capabilities

The OSD Manufacturing Science and Technology Program sponsored a live demonstration of the Tactical Line of Sight Communications Network (TALON) Free Space Optics (FSO) capability at the Naval Research Laboratory's Chesapeake Bay Detachment on June 15, 2023. The technology demonstrated in partnership with the Navy Research Lab and Defense Advanced Research Projects Agency featured the TALON FSO land-based and shipboard TALON FSO communication prototypes, exchanging high-bandwidth data and command and control signals from fixed and ship-mobile sites.

The demonstration consisted of operationally representative applications streaming simultaneously over relay network and FSO fieldable prototypes, which were on static display at the recent Technology Readiness Experimentation Prototype Technology Display, sponsored by the Mission Capabilities office in the Office of the Under Secretary of Defense for Research and Engineering. Under TALON HAYABUSA and TALON KITSUNE, NRL and L3Harris developed 30 prototypes specifically to provide a resilient non-radio frequency communications capability that can reliably operate in harsh tactical environments.

Stakeholders in attendance were able to see the system in action, ask questions of technical experts, and observe firsthand how TALON FSO will provide secure high-bandwidth, high-speed capability for spectrum-diverse information transport and integration in multidomain warfighting architectures. The ground and shipboard prototypes have been used for expeditionary and unmanned surface vessel experimentation throughout the world over the last four years under an ongoing Interim Authority to Test. Experimentation has demonstrated enhanced resilience in command and control, fires, and contested logistics mission vignettes.

Click [HERE](#) to learn more about MSTP



Teamwork Makes the Dream Work: Manufacturing Science and Technology Program Hosts Management Review

The OSD Manufacturing Science and Technology Program recently conducted a semi-annual program management review at the Naval Undersea Warfare Center in Newport, Rhode Island. The review provided progress updates on how each MSTP joint funded project is addressing the technology/capability gaps of the DOD community while creating a collaborative space for all the projects within the MSTP investment portfolio.

Justin McRoberts, MSTP program manager, attributed the success of the program to collaboration, stating, "It quickly becomes apparent when observing briefings that each project's individual updates help the entirety of the portfolio. Where one effort has contracting delays, another has answers on best practices or contacts to support them. Instead of seeing each effort as its own contained effort, the portfolio really becomes a cohesive team regardless of the differences in technology."



LIFT Hosts Spring All-Hands Meeting of the Joint Defense Manufacturing Technology Panel

The annual Spring All-Hands meeting of the Joint Defense Manufacturing Technology Panel was held at the LIFT Manufacturing Innovation Institute headquarters in Detroit. The JDMP consists of principals representing each of the DOD ManTech programs from the Army, Navy, Air Force, Defense Logistics Agency, and OSD. The panel serves to ensure coordination and collaboration across the DOD ManTech Program.

This dynamic was evident as the principals came together to align their efforts with the DOD ManTech Strategic Plan and provide updates on how each Service/Agency is collectively addressing the needs of the Department. The subpanels and technical working groups also briefed principals on performance updates, including their FY 2023 new starts broken down by each Joint Technology Pursuit Area.

Attendees also toured the facilities at LIFT, along with the co-located Institute for Advanced Composites Manufacturing Innovation research facility and the Army's Ground Vehicle Systems Center. These tours provided a tangible reminder of the value of joint efforts, effectively showcasing the power of collaboration in advancing defense manufacturing technology.

Learn more about JDMP [here](#).

Midwest Hypersonics Showcase: Fireside Chat with Dr. Weber

In April, OSD ManTech Program Deputy Director Keith DeVries helped moderate a fireside chat with Dr. James W. Weber, associate director for hypersonics in the Office of the Under Secretary of Defense for Research and Engineering, at the Midwest Hypersonics Showcase in Indianapolis. Dr. Weber discussed OUSD(R&E)'s priorities and plans for meeting the challenges of global competition in producing hypersonic weapons at scale to overcome the gaps in current technologies and develop the needed skilled workforce to answer demand. Other speakers at the event contributed perspectives on how the Midwest is home to many critical capabilities required for advanced manufacturing and recommended ways to enhance public-private collaborations.

Speakers at the event representing OSD ManTech, the Joint Hypersonic Transition Office, and the Manufacturing Innovation Institutes included:

- Dr. James W. Weber - Associate Director for Hypersonics, OUSD(R&E)
- Dr. Sarah Armstrong - Director, JHTO Systems Engineering Field Activity, NSWC Crane
- Pete Francis - Chief Engineer for Advanced Hypersonic Weapons, Raytheon
- Nigel Francis - Chief Executive Officer, ALMMII LIFT
- Jay Douglass - Chief Executive Officer, Advanced Robotics for Manufacturing
- Dr. Brandon Ribic - Technology Director, America Makes



Manufacturing Innovation Institutes Program Director Leads Panel on Developing Technologies and Workforce to Support Small Businesses

OSD Manufacturing Innovation Institutes attended the OSD Office of Small Business Programs' "Small Business Training Week" in Baltimore, Maryland, on June 20-23. The event was co-hosted with the Small Business Administration and featured sessions on enhanced acquisition strategies, legislative and regulatory updates, and rebuilding the defense industrial base utilizing critical HUBZone, Small Disadvantaged Businesses, and Women-owned Small Business programs, as well as the Manufacturing USA program. Steve Luckowski, the government program manager for the DOD MIIs, led a panel discussion with two institutes, NextFlex and LIFT. The panel discussed how the MIIs have supported small businesses in technology and workforce development activities, highlighting successes from each institute and laying out future opportunities leveraging mentor-protégé relationships.

Tracy Frost Connects at IDGA Additive Manufacturing for Defense, Aerospace, and Space Summit 2023

On June 13 Tracy Frost, director of the OSD ManTech Program, spoke at the Institute for Defense and Government Advancement (IDGA) Additive Manufacturing for Defense, Aerospace, and Space Summit 2023 in Orlando, Florida. Ms. Frost described the pivotal role played by the ManTech office and, on a larger scale, the Office of the Under Secretary of Defense for Research and Engineering in supporting the adoption of additive manufacturing across the Department. An animated discussion followed that identified connection points among assembled space, cybersecurity, and additive manufacturing industry, academic, and defense communities, including NASA.


The summit provided participants with valuable insights and benefits, including:

- Updates on the U.S. domestic additive manufacturing market and its role in enhancing defense, aerospace, and space supply chains.
- Exploration of new applications and opportunities for additive manufacturing, such as hypersonics and spacecraft.
- Guidance from additive-focused cybersecurity experts on protecting products and projects from cyberattacks.






Highlights from MIIs

 Awarded \$250K in America Makes funding to the Colorado School of Mines by National Institute of Standards and Technology through a recent project call titled Methods for AM Cross-Platform Consistency, recognizing their excellence in the field. Results from this project will provide the industrial supply chain with the knowledge of cross-platform printing capability for broad implementation with data made available to America Makes members.


 AIM Photonics and Spark Photonics are joining forces to create a hands-on educational photonic integrated circuit chip. This collaborative effort aims to enhance the connection between academia and industry by providing a practical learning tool. The educational PIC chip opens new possibilities for training and innovation in the field of photonics.


 ARMI | BioFabUSA held its 2023 annual Meeting at The Millyard in Manchester, attracting nearly 400 attendees. The event provided a platform for sharing insights, discussing trends, and exploring the opportunities in the growing biomanufacturing industry.


 Held a series of webinars as part of Advanced Functional Fabrics of America's industry-led Technical Working Groups to share state-of-the-art analysis and draft five-year technical roadmaps created for three critical areas: Soft System Integration, Functional Fiber and Fabrics, and Flexible Power and Data. Elisabeth B. Reynolds, Ph.D., the former special assistant to the President for manufacturing and economic development on the National Economic Council, has joined the AFFOA board of directors.

 Announced the addition of job-matching functionality on its national workforce resource: RoboticsCareer.org. This new functionality connects workers and students to manufacturing jobs, apprenticeships, and internship opportunities. See video for more info. [View Video.](#)

 LIFT and the Department of Defense signed a new \$49 million agreement to continue advanced manufacturing technology and talent development.

 Welcomed Dr. Jocelyn M. Seng, retired Air Force major general (two-star) and mechanical engineer, to its board of directors.

 Will invest in state-of-the-art bioindustrial manufacturing infrastructure in Minnesota, following support of up to \$100 million from Governor Tim Walz and the Minnesota legislature in the 2023 legislative session. The forthcoming biomanufacturing infrastructure investments in Minnesota will be the start of a national network of critically needed pilot-scale biomanufacturing innovation facilities that will transform American manufacturing for the 21st century.

 Hosted the Spring 2023 Santa Clara County FlexFactor Finals. Five teams across three school districts competed for top honors on June 8. FlexFactor is a project-based learning program in which students are introduced to flexible hybrid electronics, then work in teams to research a problem area, conceptualize an advanced hardware device, create a business model, and give a pitch presentation to a panel of judges.

About the ManTech Program

The DoD ManTech Program, created in 1956, is composed of the Military Service and DoD Agency (or "Component") investment programs operated out of the Army, Navy, Air Force, Defense Logistics Agency (DLA), Missile Defense Agency (MDA), and Office of the Secretary of Defense (OSD). The OSD ManTech Office is responsible for administering the DoD ManTech Program by providing central guidance and direction to the Component ManTech Programs. Along with providing oversight to DoD ManTech, the OSD ManTech Office also manages two investment portfolios: the Manufacturing Science & Technology Program (OSD MSTP) and DoD Manufacturing Innovation Institutes (DoD MIIs).

The nine DoD MIIs are proud members of Manufacturing USA, the network of 16 institutes sponsored by the Departments of Commerce, Defense and Energy.

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