

# Spring 2026 Colloquium

## Materials Department

**LJ Holmes**

Executive Director of Research & Engineering

Harrisburg University of Science &  
Technology

Friday, May 29, 2026

11:00 am | ESB 1001



### **From Motorsport to Monolithic Hulls: A Career in Advanced Manufacturing**

The lecture will highlight a few signature engineering programs from the speaker's career. The first is the Jointless Hull Project, conceived and led by the speaker at ASTRO America. Since the Vietnam War, the majority of military vehicle losses have been attributed to underbody blast events (mines, IEDs, and roadside bombs) with structural failures occurring predominantly at joints, welds, and bonding sites. The Army's long-sought solution has been a monolithic, jointless vehicle hull. While large-scale castings and forgings have been explored, they impose significant material and geometric constraints. The Jointless Hull Project addresses this by applying hybrid manufacturing, integrating additive and subtractive processes, to achieve design freedoms not possible through conventional means. The speaker conceived the project concept, secured congressional funding, and served as lead engineer and program manager from inception through delivery. The resulting machine has been in active use by the Army for four years, producing novel and replacement hulls for both ground and rotorcraft platforms.

The second project, Automated Manufacturing of Autonomous Systems Solutions (AMASS), addresses the opposite end of the manufacturing spectrum: fully attritable, mission-configurable autonomous ground vehicles fabricated in under 24 hours for under \$2,000 per unit. Using a single manufacturing cell incorporating additive manufacturing, subtractive machining, pick-and-place assembly, surface scanning, and circuit printing, the speaker demonstrated the rapid production of pre-programmed autonomous ground drones tailored to specific mission profiles. AMASS illustrates how the convergence of advanced manufacturing modalities can redefine the economics and agility of defense systems production.

Together, these projects illustrate the breadth of modern manufacturing research, from large-scale structural solutions protecting warfighters to agile, low-cost autonomous platforms enabling new mission capabilities. The lecture will offer students and faculty a candid look at how academic preparation, federal research, and industry collaboration converge in high-impact engineering work.

### **Bio**

Mr. Larry (LJ) R. Holmes Jr. is the Executive Director of Research and Engineering at Harrisburg University of Science and Technology, where he leads the development and operation of an Advanced Manufacturing Research Institute, known as STORMWERX. The mission of this academic institute is to create an interdisciplinary forum for bringing materials, processing, and manufacturing together by digital design and innovative manufacturing methods. Mr. Holmes left federal service in 2018 after 15 years at the U.S. Army Research Laboratory (ARL). His final posting at ARL was the Principal Investigator and Team Lead for ARL's Hybrid Manufacturing Research Portfolio, including the management of materials and manufacturing science programs related to multi-material processing technologies for functional/multi-

functional devices. He was also the Director of Research Partnerships and Communication for the ARL Center for Agile Materials Manufacturing Science (CAMMS). In addition to his academic and research pursuits, Mr. Holmes is the Director of Government Relations at nScript in Orlando, FL. nScript designs and manufactures high-precision micro-dispensing and direct digital manufacturing equipment with unmatched accuracy and flexibility. Mr. Holmes is also a Manufacturing Fellow at the Applied Science Technology and Research Organization of America (ASTRO America). ASTRO America is a non-profit, non-partisan research institute and think tank dedicated to advancing public interest through manufacturing and technology.

<https://www.materials.ucsb.edu/events/lj-holmes-harrisburg-university-science-and-technology>

Hosted by Daniel Oropeza.