FOR IMMEDIATE RELEASE
July 20, 2020

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America Makes and Air Force Research Laboratory Announce Awardees of the Additive Manufacturing Modeling Challenge Series

AFRL AM Challenge Series Improved Understanding of the Internal Structure and Resultant Performance of Metallic Components Produced by AM

Youngstown, Ohio — July 20, 2020. America Makes and Air Force Research Laboratory, Materials & Manufacturing Directorate Structural Materials, Metals Branch (AFRL/RXCM), proudly announce the awardees of the additive manufacturing (AM) Modeling Challenge Series with $235K to be divided among the awardees.

Launched in November 2019 and comprised of four individual challenges, the AFRL AM Modeling Challenge Series represented another innovative approach America Makes and AFRL are taking to advance the AM industry. The goal of the Challenge Series was to improve the accuracy of model predictions for metal AM, using INCONEL® nickel-chromium alloy 625 (IN625). Challenge participants were provided high-pedigree calibration and validation data sets needed to develop new models as it directly related to predicting the internal structure and resultant performance of AM metallic components.

"Going into the AFRL AM Modeling Challenge Series, we knew that the outcomes would potentially lead to significantly improved predictability and accuracy of models and simulations, and the qualification of AM process and materials," said America Makes Executive Director John Wilczynski. "The awardees of these four challenges certainly made solid contributions. They improved our understanding of the micro- and macro-structure level variability that was needed to advance the accuracy of modeling and simulation for AM metal. We thank all those who participated and extend our congratulations to the awardees."

The AFRL AM Modeling Challenge Series project team awardees are:

Challenge 1: Macro-scale Process-to-Structure Predictions
Dassault Systems Government Solutions Corp.

Challenge 2: Micro-scale Process-to-Structure Predictions
The Wing Kam Liu Group at Northwestern University

Challenge 3: Macro-scale Structure-to-Properties Predictions
Questek Innovations, LLC

Challenge 4: Micro-scale Structure-to-Properties Predictions
University of Utah, Carnegie Mellon University, and Los Alamos National Laboratory

For more information about America Makes or how to become a member, please visit the America Makes Web site at americamakes.us. Follow us on Twitter @AmericaMakes.

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About America Makes
Driven by the National Center for Defense Manufacturing and Machining (NCDMM), America Makes is the National Additive Manufacturing Innovation Institute. As the national accelerator for additive manufacturing (AM) based in Youngstown, Ohio, America Makes is the nation's leading and collaborative partner in AM and 3DP technology research, discovery, creation, and innovation. Comprised of member organizations from industry, academia, government, non-government agencies, and workforce and economic development resources, the America Makes membership community is working together to innovate and accelerate AM to increase our nation's global manufacturing competitiveness. America Makes is the first of eight Manufacturing Innovation

Institutes established and program managed by the U.S. Department of Defense as public-private partnerships. America Makes is also a member of the Manufacturing USA® network, which seeks to secure U.S. global leadership in advanced manufacturing. For more information about America Makes, visit americamakes.us and follow @AmericaMakes on Twitter.

About NCDMM
NCDMM delivers innovative and collaborative manufacturing solutions that enhance our nation's workforce and economic competitiveness. NCDMM has extensive knowledge and depth in manufacturing areas—both commercial and defense—to continually innovate, improve, and advance manufacturing technologies and methodologies. Our experienced team specializes in identifying the needs, the players, the technologies, and processes to attain optimal solutions for our customers. We connect the dots. That's the NCDMM methodology. NCDMM also manages the national accelerator for additive manufacturing (AM) and 3D printing (3DP), America Makes—the National Additive Manufacturing Innovation Institute. For additional information, visit the NCDMM at ncdmm.org and follow @NCDMMnews on Twitter.

About Air Force Research Laboratory (AFRL)
AFRL leads the discovery, development and delivery of warfighting technologies for our air, space and cyberspace forces. AFRL is headquartered at Wright-Patterson Air Force Base in Ohio, home to the Wright brothers and recognized as the birth place of aviation. AFRL is comprised of Technology Directorates, Functional Directorates, 711th Human Performance Wing and the Air Force Office of Scientific Research. For more information about AFRL, visit afresearchlab.com.

About AFRL Materials and Manufacturing Directorate
Materials and Manufacturing Directorate develops materials, processes, and advanced manufacturing technologies for aircraft, spacecraft, missiles, rockets, and ground-based systems and their structural, electronic and optical components. Air Force product centers, logistic centers, and operating commands rely on the directorate's expertise in materials, nondestructive inspection, systems support, and advanced manufacturing methods to solve system, expeditionary deployment, and operational challenges.

AFRL/RXC - Structural Materials Division
The Structural Materials Division plans, conducts, and directs in-house and extramural research and development of materials technologies with an emphasis on structural applications. The division works collaboratively with other divisions and external organizations to develop, mature and transition the highest priority products needed by the Air Force. It works to transition functional materials to legacy, developmental and future Air Force system components to provide increased system performance and efficiency, reduce cost, and accelerate manufacture.

AFRL/RXCM - Metals Branch
The Metals Branch plans, conducts, and directs in-house and extramural research and development of metallic materials technologies for legacy, developmental and future Air Force system components. It maintains the directorate's competency to understand and connect the processing, structure, property, and performance paradigm needed for metallic materials development.