

EPSTEIN INSTITUTE SEMINAR ▪ ISE 651

Additive Manufacturing of Multifunctional Products via Tailored Materials and Topologies

ABSTRACT – The core function of Additive Manufacturing (AM) technologies – forming layers by the selective placement (or forming) of solid material – provides unsurpassed design freedom in both the geometric topology and the material composition of a product. Using AM, a designer has the power to selectively place (multi)material only where it is needed, and thus is afforded the opportunity to realize products that satisfy multiple functions and design objectives. However, to fully realize this potential, AM processes are in need of further advancements in material selection and process capability. Perhaps equally as critical, designers are in need of tools, methodologies, and background knowledge to empower them to fully exploit AM capabilities.

To address this need, and thus to advance industrial adoption of AM for the realization of end-use products, Dr. Williams' DREAMS Lab conducts research in the areas of "Design for AM," materials and process optimization, and AM education. In this talk, Dr. Williams will provide insight into the future capability of AM technologies by sharing examples of his group's research in advancing AM materials (e.g., advanced engineering polymers, copper, and ceramics), processes (e.g., hybrid AM and Direct Write processes for printing parts with embedded sensors), and products (e.g., ceramic-metal composite cellular structures).

SPEAKER BIO – **Christopher B. Williams** is an Associate Professor and Electro Mechanical Corporation Faculty Fellow in the Department of Mechanical Engineering at Virginia Tech. He is the Director of the Design, Research, and Education for Additive Manufacturing Systems (DREAMS) Laboratory and Associate Director of the Macromolecules Innovation Institute (MII). His research contributions have been recognized by eight Best Paper awards at international design, manufacturing, and engineering education conferences. He is a recipient of a National Science Foundation CAREER Award (2013), the 2012 International Outstanding Young Researcher in Freeform and Additive Fabrication Award, and the 2010 Emerald Engineering Additive Manufacturing Outstanding Doctoral Research Award. He serves on the Additive Manufacturing Community Advisors for SME. Chris holds a Ph.D. and M.S. in Mechanical Engineering from the Georgia Institute of Technology (Atlanta, Georgia) and a B.S. with High Honors in Mechanical Engineering from the University of Florida (Gainesville, Florida).



Dr. Christopher Williams

Associate Professor
Department of Mechanical
Engineering and Associate Director,
Macromolecules Innovation Institute
Virginia Tech

USC Viterbi
School of Engineering
*Daniel J. Epstein Department of
Industrial and Systems Engineering*

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3:30PM – 4:50PM

USC ANDRUS GERONTOLOGY CENTER (GER), Room 206