DEPARTMENT OF
MECHANICAL ENGINEERING

DEPARTMENT OF MECHANICAL ENGINEERING SEMINAR SERIES

Developing Polymer Additive Manufacturing Technologies

Monday, December 17, 2018 | 11 a.m.
2164 Martin Hall, DeWALT Seminar Room

Guest Speaker

Dr. John LaScala

Scientist

Army Research Laboratory

ABSTRACT

The Army Research Laboratory is developing polymer additive manufacturing (AM) technologies to make replacement parts for Army weapons, platforms, and support equipment that have long lead-times. Additionally, we are expanding the use of additive manufacturing through design, material improvements, and processing improvements to enable additive manufacturing of gun propellants and replacement of metals parts for light-weighting. This presentation will highlight our general approach towards developing AM of energetics and structural materials. Additionally, this presentation will focus on some recent ARL polymeric additive manufacturing success-stories including development of low viscosity bio-based (meth)acrylate resins with glass transition temperatures over 200°C; creation of morphology in stereolithography resins to improve toughness; dual-material filaments to enable annealing and strengthening of parts produced via fused filament fabrication; use of indigenous plastic waste to make useable filaments for field AM; and development of cranial bone surrogates.

BIO

Dr. John La Scala is a scientist at the Army Research Laboratory (ARL) and was recently granted a sabbatical at Drexel University and Rowan University. He received a B.S. in chemical engineering from the University of Virginia in 1997 and a Ph.D. in chemical engineering from the University of Delaware in 2002. He was a postdoctoral scientist at Drexel University before becoming an Oak Ridge Institute for Science and Education postdoctoral fellow at ARL in Aberdeen Proving Ground, MD in 2003. In 2005, he was hired as a federal employee at ARL, promoted to senior scientist in 2007, and appointed branch chief of the Coatings, Corrosion, and Engineered Polymers Branch in 2009. Throughout his career, he has continued his work in bio-based thermosetting resins, where he now has 19 years of experience. Since joining ARL, he has expanded his work to thermosetting resins for adhesives and coatings and environmentally friendly polymers for composites, adhesives, coatings, and engineering applications. His scientific advances are evidenced by over 50 open literature publications, while his ability to innovate are demonstrated by his numerous patents and his ability to transition new technology to the field and commercial industry. Dr. La Scala has been the recipient of numerous environmental awards for his work on polymers. In April, he was inducted into the National Academy of Inventors as a Fellow.

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