Building Technologies Research & Integration Center

Science Research Seminar Series

Altering the Course of Heat Transfer Through Additive Manufacturing

Monday, March 24, 2014

9:00 – 10:00 a.m.

Building 5100, JICS Auditorium

Abstract

Additive manufacturing (AM) is an exciting new frontier with the potential to transform manufacturing in the United States. ORNL has taken a leadership role in this area in terms of manufacturing techniques and materials. Dr. Geoghegan is leading the research to embed heat transfer intelligence into AM parts. A combustion engine, for example, may be cooled by embedding loop heat pipes intimately close to the cylinder. The engine will operate more efficiently and will be expected to have a longer lifetime because of lower thermal stressing. Embedded phase change materials can act as transient energy storage devices to prevent thermal surges. Examples of heat transfer deployed AM parts will be presented, as well as examples of how AM is helping researchers understand fundamental heat transfer.

Dr. Patrick Geoghegan

is a research engineer at ORNL focused primarily on heat transfer and fluid flow applications. He spent 5 years at the Spallation Neutron Source and was the principal fluid flow designer of the jet flow mercury target, the first major design change to the original mercury target since the SNS was commissioned. Previously, he was an Oak Ridge Associated Universities post-doctoral research associate. He began his career at the Sanger Institute (Genome Project) in Cambridge, England.

Patrick was a Wellcome Scholarship recipient during his PhD and studied (and rowed) at University College Dublin, Cambridge University, and Boston College. He received an R&D100 Award in 2011 and was honored by the National Society of Professional Engineers in 2010.

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ORNL 2014-G00243/DLR