

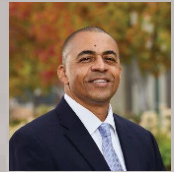
Enhancing Process Control in Metal 3D Printing

Friday, December 2nd, 2022

12:30 PM

Bowen Hall, Room 222

MAE Seminar Series



Manyalibo J. Matthews
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Laboratory

In this talk I will review recent developments in understanding and controlling light-matter interaction and material response associated with laser powder bed fusion additive manufacturing. As part of the critical assessment of the physics of the process, validated hydrodynamic finite element model simulations have proven to be extremely valuable and can be used to inform rapid solidification microstructural models. I will also discuss new approaches to process optimization that have emerged from our modeling efforts, including laser beam shaping, which can improve material properties and part performance. A brief overview of R&D activities in the Materials Science Division will also be presented. Prepared by LLNL under Contract DE-AC52-07NA27344.

Dr. Manyalibo (“Ibo”) Matthews currently serves as Division Leader of the Materials Science Division of the Physical & Life Sciences Directorate at Lawrence Livermore National Laboratory. He earned his Ph.D. in Physics from the Massachusetts Institute of Technology in experimental condensed matter physics, and his B.S. in Applied Physics from the University of California at Davis. Research interests include understanding and optimizing metal 3D printing processes, laser materials processing, high power laser damage mechanisms, laser-based nanoscale surface modification, and in situ characterization of transient processes. Prior to LLNL he was Member of Technical Staff at Bell Laboratories in Murray Hill, New Jersey where he worked on advanced methods for optical materials characterization and led a research team in advanced broadband access networks. Dr. Matthews has published over 175 peer-reviewed articles with >11,000 citations, three book chapters, holds 20 U.S. Patents and is a Fellow of the Optical Society of America.

