Abstract

As defined by ASTM Standard F2792-12a, additive manufacturing (AM) is defined as “a process of joining materials to make objects from three dimensional (3D) model data, usually layer upon layer, as opposed to subtractive manufacturing methodologies.” More conventionally known as 3D printing, AM tools commonly use a thermally- or chemically-driven material phase transition, adhesives, evaporation, or physical contact to adhere material in a layer-by-layer fashion. This short course will provide an overview of the important physics-based models that have been used to describe and analyze AM processes. The short course will assume an undergraduate level of understanding of differential equations, heat transfer, fluid mechanics, and system dynamics and demonstrate the application of core theory in these topics to a select group of AM processes. There will be a focus on how physics-base predictions explain common material addition and defect modes in AM.

Hosted by Prof. Marcelo Dapino