

# PERFORMANCE ANALYSIS AND COMPUTATIONAL MULTISCALE MODELING OF ADDITIVELY MANUFACTURED COMPONENTS

NARGES DIALAMI <sup>\*</sup> AND ALEKSANDER CZEKANSKI <sup>†</sup>

<sup>\*</sup> International Center for Numerical Methods in Engineering (CIMNE), Universidad  
Politécnica de Cataluña, Campus Norte UPC, Barcelona, Spain  
Narges.Dialami@upc.edu

<sup>†</sup> Department of Mechanical Engineering,  
Lassonde School of Engineering, York University, Toronto, Canada  
alex.czekanski@lassonde.yorku.ca

## ABSTRACT

The goal of this invited session is to gather contributions that explore aspects pertinent to performance characteristics of components manufactured through AM processes using computational multiscale modeling techniques. Among the topics of special interest are:

- Multiscale material models suitable for AM components to capture the diverse material properties and behaviors exhibited by AM-produced parts across different length scales.
- Advanced computational tools to understand the complex interplay between material microstructure, process parameters, and component performance.
- Optimization of the manufacturing process and design of high-performance parts by improving the mechanical performance to enhance the strength, durability, and functionality of the manufactured components.
- Comprehensive characterization and modeling of failure mechanisms of AM components characterizing and modeling how these components fail under various conditions.