

# MECHANICAL ENGINEERING & ENGINEERING SCIENCE GRADUATE SEMINAR SERIES

Thursday, October 1st

11:30 am – 12:30 pm

Zoom

<https://uncc.zoom.us/j/93413935093?pwd=eVIZSmFycGZwb3VsdjUwZjBzT0FYQT09>

Meeting ID: 934 1393 5093

Passcode: 040771



## **Kuldeep Mandloi**

Mechanical Engineering and  
Engineering Science PhD  
Student

## **Build Direction and Surface Roughness Influence on the Heat Transfer Characteristics of Additively Manufactured Parts**

**Kuldeep Mandloi**, Mechanical Engineering and Engineering Science PhD Student

**Advisors – Dr. Harish Cherukuri and Dr. Chris Evans**

The dependence of fluid flow and heat transfer characteristics of the surfaces of additively manufactured (AM) parts on build direction and surface roughness parameters is the focus of the study which is a collaborative effort between UNC Charlotte and NIST. CFD models using StarCCM+ are developed for AM microchannels with various roughness parameters, different wavy patterns and different build directions. The pressure drops across the microchannels and Nusselt numbers are computed and analyzed for these cases under both laminar and turbulent flow conditions. The results and partial conclusions from these ongoing studies are discussed in this presentation.

Kuldeep is a PhD student at UNC Charlotte doing research under the supervision of Dr. Evans and Dr. Cherukuri. He also serves as a Secretary of the ASPE Student Chapter at UNCC. His current research focuses on heat transfer and fluid flow analysis of additively manufactured microchannels and DEM modelling of powder spreading process for SLM. He earned his Master's in Advanced Material Science and Technology from National Institute of Technology (NIT) Durgapur, India with his thesis focused on the design of the thermal shield for 650 MHz cryomodule used in a proton linear particle accelerator.



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