

Modelling and Characterization in Metal Additive Manufacturing

SPARC Sponsored Workshop

10-14th November, 2025



ABOUT THE WORKSHOP

The workshop “Deformation in metal additive manufacturing: modeling and simulation of mechanical response” offers participants a comprehensive introduction to advanced metal AM technologies, focusing on Laser Powder Bed Fusion (LPBF) and Directed Energy Deposition (DED). It covers microstructural evolution and mechanical behavior of AM alloys, complemented by practical training in Electron Backscatter Diffraction (EBSD) for texture and grain analysis. Emphasis is placed on constitutive modelling using Johnson–Cook and modified Johnson–Cook models, alongside simulation of mechanical and thermal responses. By combining experimental methods with computational tools, the workshop fosters technical expertise and encourages collaboration between academia and industry.

TARGET AUDIENCE

- 1 Faculty members, research scientists, or industry professionals involved in or interested in process Additive Manufacturing characterization and simulation
- 2 Professionals engaged in manufacturing and process modeling
- 3 Undergraduates, Postgraduate students or research scholars interested in or working on manufacturing



PROF. CLODUALDO ARANAS
UNIVERSITY OF NEW BRUNSWICK, CANADA

PROFILE

Dr. Aranas is Director of the Alloy Design and Materials Testing Research Laboratory (AD-MTRL) at the University of New Brunswick. His work focuses on dynamic phase transformations in steels, including the development of thermodynamic models to predict high-temperature behavior. His research spans alloy development, additive manufacturing of metals, high-speed deformation testing, and thermomechanical processing of ferrous and non-ferrous alloys. Currently, he is leading efforts at UNB to design energy-efficient, next-generation high-strength materials.

COORDINATORS



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COURSE CONTENT

- Fundamentals of Additive Manufacturing and Metallic AM Technologies
- Laser Powder Bed Fusion (LPBF) and Directed Energy Deposition (DED) Processes
- Industrial Applications of Metal AM with Case Studies
- Laboratory Tour and 3D Printing Demonstration
- Microstructural Evolution in AM Alloys
- Mechanical Properties and Performance of AM Alloys
- High-Temperature Behavior and Simulation of Thermal Properties
- EBSD Fundamentals for AM Materials and Microstructure Analysis
- Hands-On EBSD Practice with Software Demonstration
- High-Strain Rate Response and Experimental Testing Techniques
- Constitutive Modelling: Johnson–Cook and Modified Johnson–Cook Approaches
- Process Simulation, Guided Modelling Activities

SELECTION CRITERIA

- Selection will be done based on merit basis. Participants are requested to fill the registration form and upload updated CV. The registration confirmation will be notified through email.

ACCOMMODATION

- Participants can request accommodation from the coordinators. Limited options are available in the Visitors Block: Single Occupancy at ₹ 2000 per day, Double Occupancy at ₹ 2500 per day, and dormitory beds at ₹ 500 per day. Accommodation will be provided based on availability and prior request.

REGISTRATION

The maximum number of participants is 50, with an additional allowance for 10 industry participants. Interested individuals are requested to fill out the Google form provided below

Category	Fee (₹)	18% GST (₹)	Total (₹)
BTech/MTech/Ph.D	500	90	590
Faculty	1000	180	1180
Industry Professional, Scientists (R&D), Govt. Professionals etc.	5000	900	5900

BANK DETAILS

Account Name: DIRECTOR RESEARCH ACCOUNT

Account No. 62266262236

Bank State Bank of India

Branch REC Warangal (NIT Campus)

Branch Code 20149

IFSC SBIN0020149

MICR Code 506002030

SWIFT Code SBININBB

Registration link:

<https://forms.gle/K8C74W5MkZAaIKea6>

Registration Deadline: 30th October 2025

ABOUT NIT WARANGAL

The National Institute of Technology (NIT) Warangal, established in 1959 as the first among 31 NITs, is recognized as an Institute of National Importance. Renowned for R&D, industrial consultancy, and training programs, it celebrated its Diamond Jubilee in 2018. Located 190 km from Hyderabad, the campus is well connected by rail and road, just 2 km from Kazipet and 12 km from Warangal railway stations.