



# NATIONAL DESIGN AND RESEARCH

## FORUM (NDRF)

The Institution of Engineers (India)



Hosting National Conference On

Additive Manufacturing in Aerospace, Defence (AMAD - 2022)

and other Engineering Sectors

Webinar Mode

2<sup>nd</sup> July 2022

Co - hosted by Department of Mechanical Engineering,  
BMS College of Engineering, Bengaluru - 560 019



### Co - Organised By



IIT Kanpur



IIT JAMMU



Azadi Ka Amrit Mahotsav



RVCE



NMIT

### Also in Association With



Society for Failure Analysis (SFA),  
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### About The Institution of Engineers (India)

The Institution of Engineers (India)/ IEI, is a professional body that brings together fifteen engineering disciplines and provides ample opportunities to interact, discuss and deliberate with the soul objective of finding solutions and dissemination of creative knowledge leading to service to mankind and the nation. It is perhaps the biggest professional body with nearly eighty thousand engineers in its fraternity. The institution has over one hundred twenty-five centres spread across the nation and has six overseas chapters making its working style true to the spirit of Vasudhaiva Kutumbakam. The headquarters of IEI(I) is at Kolkata. The Institution has on its impeccable record of serving the nation through education, assisting in policy framing, national projects and creating monumental edifices through consultation and advisory notes. Even in international arena, it has made its presence through bilateral agreements with thirty-one international bodies, and also affiliated to eight overseas bodies of advanced nations. It is interesting to record further that as the legacy goes, in the year 1935, IEI(I) was incorporated by Royal Charter, which is unique and perhaps with no parallel to this kind. It is heartening to note with pride that the Institution of Engineers (India) has recently crossed its centenary year of service with continuous journey since its inception in 1920.

In its quest to be abreast with the frontiers of emerging knowledge, the institution for its sustained service has been recognized by the Department of Scientific and Industrial Research of the Ministry of Science and Technology, Government of India through grant-in-aid support. The undergraduate, graduate, and doctoral program students in the engineering institutions and universities are the beneficiaries of this coveted recognition and support.

The Institute also provides a platform to disseminate the research findings and product development efforts in industries by way of publishing technical papers in journals brought out in collaboration with M/s. Springer.

While there have been numerous engineering colleges offering opportunities to pursue engineering education, the institution of Engineers IEI(I) was known earlier for its noble initiative of offering engineering education leading to a certificate with Associate Membership, AMIE, which is recognized as equivalent to engineering degree by any University.

The Institution, in addition to local centres and state centres has seven fora like NDRF, NSDF, RDF, SWF, DAMF and the Engineering Staff College of India (ESCI) dedicated to promote engineering skills, knowledge and technologies in a sustained manner and are all governed by Boards and Council members of eminence and expertise.

The Institution hosts a website [www.ieinida.org](http://www.ieinida.org) to seek all end-to-end professional pursuits of IEI.

### National Design and Research Forum (NDRF)

National Design and Research Forum (NDRF) established by the Institution of Engineers (India), promotes Research, Design, Development, Productization, and Innovation through collaborative effort since 1969. NDRF is anchoring interdisciplinary technological research and plays a major role in deploying engineering and technology services, systems and solutions for nation building. NDRF has emerged as a forum for exploring and disseminating new and emerging design and research concepts.

The core focus areas of NDRF functioning are R& D Management, Micro, Nano and Bio Systems, Micro Air Vehicles (NP-MICAV), Sensors for Societal applications including Chemical and Biosensors, System Identification, Flapping Competitions for MICAVs, Development of Fuel Cells, ProtoLab, Rapid Prototyping and Tooling, Interfacing of Biology and Engineering.

We have consortium partners and associated organizations from industries, laboratories and academia, which helps us to expand in all horizons with expertise. NDRF always looks forward to collaborate with such organizations

Our endeavors and efforts will certainly help the nation by influencing the central and state policies in the current R&D and technology scenarios.

### Conference Theme

Additive manufacturing (AM) also known as 3D Printing being a novel and recently acquired techniques enables increased design freedom via layer-by-layer deposition of powder and having unique structural design features. These are not possible through conventional manufacturing route. AM enables economic production of low-volume engineering components that can be highly specialized. AM finds good lot of applications in aerospace, defense, automotive and other engineering fields. A reasonable amount of work has been reported regarding research and development activities in 3D printing, also known as rapid prototyping for achieving the improved properties in terms of strength, corrosion, wear, residual stress and metallurgical characteristics. In the 3D printing technology, Direct Metal Layer Sintering (DMLS) and Selective Laser Sintering (SLS) processes are quite popular and widely used. The adoption of different input settings such as layer thickness, laser-scan speed and its orientation, types of powders are important to optimize the process parameters. However, AM has certain challenges such as component size, consistency in the product quality, limitations of scalability, usage of very few and expensive material powders and limited multi-material capabilities. Hence the conference addresses and discusses these challenges and issues in various engineering sectors specially aerospace, defence and other industries such as transportation, energy, chemical, electronics, electrical and biomedical implants.



## Objectives

The conference organized on additive manufacturing technologies are designed to provide a good transformation to produce parts/products to near net shape as well to deliberate key issues. Further the conference would serve as a platform and immensely benefits the practicing engineers, industrialists for scientists, researchers, students, academicians from the manufacturing/production units, quality control departments, R & D establishments, education institutes from the point of learning exercise, gaining knowledge, part of problem solving, standardizing the input parameters to get best properties, achieving reliability in the performance and discuss the challenges pertaining to AM by way of interactions and assimilation of facts.

The conference primarily focuses on the technological development and advances in AM, residual stress induced during AM manufacturing, developing Indian standards for AM, repair technologies and exploring development of ecosystem in training and awareness of AM. Exhibition and demonstration of producing AM parts involving automation are planned with the participation of leading manufacturers and software companies.

## Topics

1. AM Challenges and Advances in Design, manufacturing and product quality.
2. Mitigation, measurements and management of Residual stress in AM process, Components and Structures.
3. Computational, modeling and simulation of AM process, components and structures.
4. AM for Repair, Retrofitting & Restoration Refurbishment Technologies.
5. 3D Printing and Space Exploration
6. Evolving standards for AM production.
7. Eco system development for AM associated laboratories/ R&D institutes/Academia/Industries.

## Call for contributed abstracts / papers

The Participants/persons are invited to submit an abstract of their original work. This will be reviewed by the expert panel. The selected abstract shall be presented as oral paper and also planned to publish in the special issue of a leading journal covered by science citation Index (Scopus Index, Google Index with IESSA number). The one page abstract may be sent to the E- mail Id: [ndrfncamad2022@gmail.com](mailto:ndrfncamad2022@gmail.com). The articles are invited from the practicing engineers, research scientists, academicians, research scholars and students. The merited papers presented in the conference abstract prizes / awards. The delegate participation and abstract submission letters, template for paper submission, registration link, registration form, tentative program schedule and last date for submission of full length paper are provide in the **website: <https://ndrf.res.in/nc.html>**.

## Resource persons

Prof. Satyam Suwas, IISc  
Dr. U. Chandrashekar, WIPRO  
Dr. P. Ramesh Narayanan, VSSC  
Prof. J. Ramkumar, IIT Kanpur  
Dr. S. Anandkumar, IIT Jammu  
Dr. Rajkumar, IIT Jammu  
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Dr. Nikhil Gupta, New York University, USA  
Mr. B. K. Nagesh, GTRE, DRDO  
Dr. L. Jyothish Kumar, AMSI

## Participation

Scientists / Engineers from Industries and R&D Institutes, Research Scholars and Students are encouraged to send abstracts.

## Registration

Participants / delegates are required to register for the Conference by filling an application available in the website ([www.ndrf.res.in](http://www.ndrf.res.in)). The registration fee details are given below.

1. Persons from Industries and National R & D Organizations : Rs. 1000/-
2. IEL and Conference Associating Member : Rs. 500/-
3. Research Scholar / Faculty / Student : Rs. 100/-

The E - Certificates will be issued to the registered participants/delegates. Registration may be done through the link provided in the website, which also covers payment option.

## Important Dates

One Page Abstract submission : 25-06-2022  
Acceptance of Abstract : 29-06-2022  
Last date for Registration : 01-07-2022

## Online Payment

Account Holder Name :  
"The Institution of Engineers (India) – A/c NDRF"  
Name of the Bank : State Bank of India  
Account No : 64146494189  
Name of the Branch : Dr. B.R. Ambedkar Veedhi, Bengaluru  
IFSC Code : SBIN0040022  
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