

# CONFERENCE ON PROCESSING AND CHARACTERIZATION OF MATERIALS (CPCM 2020)



**December 18<sup>th</sup> - 20<sup>th</sup> 2020**

**Hosted Online**



Organised by

**Department of Metallurgical and Materials Engineering**

**National Institute of Technology, Rourkela**

<http://cpcm2020.com/>

## PATRON



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Director, NIT Rourkela

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## About the conference

The Department of Metallurgical and Materials Engineering, National Institute of Technology Rourkela is going to organize the Conference on Processing and Characterization of Materials (CPCM-2020) during 18<sup>th</sup>-20<sup>th</sup> December 2020 through online mode after successful completion of earlier 2<sup>nd</sup> international conference/9<sup>th</sup> national conference in this series (NCPCM-2011-2019). The *Conference* on Processing and Characterization of Materials, CPCM2020 will be a forum to bring together the users, manufacturers, designers and researchers involved in structures or structural components manufactured using different materials. The forum would provide an opportunity for the exchange of the researches and insights from scientists and scholars, and promoting research in the field of Metallurgy and Materials Science. Papers dealing with design, research and development studies, experimental investigations, theoretical analysis and fabrication techniques relevant to the application of materials in various assemblies, ranging from individual components to complete structure will be presented at the conference.

## About NIT Rourkela

National Institute of Technology Rourkela (NITR), formerly Regional Engineering College Rourkela (REC Rourkela), established in 1961, is one of the premier national level institutions for technical education in the country and is funded by the Government of India. As per the Times Higher Education World University Rankings of 2021, NIT Rourkela has the position in between 801-1000 in the world and 190<sup>th</sup> in Asia. QS BRICS overall University Ranking 2019 has figured NIT Rourkela at 121<sup>st</sup> position. NIT Rourkela is presently ranked the 3<sup>rd</sup> best NIT and 16<sup>th</sup> nationwide (including IITs) by the MHRD. The campus has all the amenities for developing personal, social and academic skills of the student community. The Institute has been modernized by two foreign collaborative funding agencies i.e. the Material theme in the Materials and Metallurgical Engineering department under Indo-U.K. REC project and the Computer Science and Electronics streams under World Bank cum Swiss Development Corporation IMPACT project. With 21 departments awarding graduate and post graduate degrees including Ph.D. in Engineering, Science, Planning and Architecture, Management, and Humanities, NIT Rourkela is one of the prestigious institutes in the country. NIT Rourkela is a well-known technical institute of national importance serving as a knowledge hub to the nation. The campus of the institute consisting of the Institute buildings, halls of residence and staff colony, spread over an area of 262 hectares of land is surrounded by scenic hills providing a spectacular rejuvenating atmosphere, which is very conducive for study and research. The well maintained green campus of the Institute provides accommodation to all students, faculties and staffs. The campus has all the amenities for developing personal, social and academic skills of young people. The greeneries and flowers in the campus further make the stay very pleasant and enjoyable.

## About Department of Metallurgical and Materials Engineering

Established in 1964, the Department has emerged as a powerhouse for academics, scientific research, and cutting-edge technologies. With time, the department grew noticeably and established new areas of research and teaching in materials engineering, while retaining its strength in traditional areas of metallurgical engineering. The department is actively involved in fundamental research in diversified fields like steel technology, advanced manufacturing processes, alloy designing, nanotechnology, composites and computational materials. The alumni of the department hold strong positions in many prestigious organizations over the world. The department attracts highly qualified faculties and bright students from the entire nation. The well-developed infrastructure, diversified expertise of the faculties and incredibly talented students has placed the department in the global forum. The graduates from the department are well-placed in esteemed industries and institutions. The department has a history of producing highly ambitious students motivated for higher education in India and overseas. The department is actively involved in research activities in the front line areas of Metallurgical and Materials Engineering in collaboration with reputed R&D organizations and industries throughout the country. The research wing of the department is strongly supported by various public and private organizations. At present, various research projects are being run in the department by external sponsoring agencies like Department of Science and Technology (DST), Council of Scientific and Industrial Research (CSIR), Naval Research Board (NRB), Defence Research and Development Organisation (DRDO), Board of Research in Nuclear Sciences (BRNS), National Aluminum Company (NALCO), TATA Steels, Steel Authority of India Ltd (SAIL).

## Call for Papers

Interested Research Scholars, Faculty Members, Scientists and Engineers working in Research Institutes, Universities, Colleges and Industries related to the field of Materials Science & Engineering and allied branches may submit the Extended Abstract to the Conference convener.

All selected Abstracts will be published in the e-Book of Abstract.

The selected papers presented in the Conference will be published as a book chapter of a book published by Springer.

Corresponding / Presenting Author(s) have to register themselves for the Conference.

### Nodal Dates

|                                     |                                |
|-------------------------------------|--------------------------------|
| Abstract Submission Deadline        | 30 <sup>th</sup> November 2020 |
| Notification of Abstract Acceptance | 8 <sup>th</sup> December 2020  |
| Full Paper Submission Deadline      | 31 <sup>st</sup> December 2020 |
| Registration Deadline for Authors   | 10 <sup>th</sup> December 2020 |

## PLENARY SPEAKERS

- **Prof. B. S. Murty** : *Director, IIT Hyderabad, Professor, IIT Madras, India.*
- **Dr. G. Padmanabham** : *Director, ARCI, India*
- **Prof. Indranil Manna** : *Vice Chancellor, BIT Mesra, Ex – Director IIT Kanpur and CGCRI Kolkata, Professor, IIT Kharagpur*
- **Prof. Douglas Spearot** : *Professor, University of Florida, USA*
- **Prof. Amitava De** : *Professor, IIT Bombay, India.*
- **Prof. Kantesh Balani** : *Professor, IIT Kanpur, India.*
- **Prof. Chuang Deng** : *Associate Professor University of Manitoba, Canada.*
- **Dr. Saurav Kundu** : *Chief of Process Research, Tata Steel*

## KEYNOTE SPEAKERS

- **Mr. G.V.R. Murty** : *General Manager(Retd), Mishra Dhatu Nigam Limited (Min of Defence), Hyderabad*
- **Prof. Jatin Bhatt** : *Associate Professor, VNIT Nagpur, India*
- **Prof. S. Sen** : *Professor, NIT Rourkela*
- **Prof. Amlan Dutta** : *Assistant Professor, IIT Kharagpur, India*
- **Prof. Anish Karmakar** : *Assistant Professor, IIT Roorkee, India*
- **Prof. Snehanshu Pal** : *Assistant Professor, NIT Rourkela*
- **Prof. Anshuman Patra** : *Assistant Professor, NIT Rourkela*
- **Dr. Madhumanti Mandal** : *Researcher Engineer, Institut Jean Lamour, CNRS- Université de Lorraine Nancy, France*
- **Mr. Sujan Hazra** : *Principal Researcher, Tata Steel*

# CONFERENCE THEMES

## Materials Processing

- Nanoscale synthesis
- Process metallurgy
- Fabrication of Material
- Equipment Processing
- Designing of materials
- Industrial unit processes
- Machining of materials
- Processing of materials and its environmental effect
- Social distancing enabled materials processing management
- Iron and steelmaking technology

## Advanced Materials

- Smart materials
- High Temperature Materials
- Functionally graded materials
- Energy materials
- Ultralight materials
- Nanomaterials & Nanotechnology
- Oxide Dispersion Strengthened Alloys
- Plasma technology
- Bulk Metallic Glass
- Aero-vehicle Materials
- Functional Graded Materials
- Bio-Implants
- Magnetic Materials
- Protein-material interaction

## Surface Engineering

- Surface Design
- Surface modification technologies
- Surface process control
- Surface non-destructive examination
- Tribology of surface
- Thin film
- Surface and Interface analysis
- Surface Engineering for antiviral and antibacterial applications
- Bioactive surfaces

## Sustainable Energy Materials

- Cleaner methods of producing energy and energy conservation
- Materials used for solar energy
- Materials used for wind energy
- Materials used for geothermal energy
- Materials used for tidal energy and hydropower
- Energy storage materials
- Clathrate Hydrates

## Computational Methods and Material

- Nonlocal theories
- Fracture mechanics, Delamination
- Generalized continuum theories
- Multiscale Analysis of materials
- Advanced Numerical Techniques
- Micromechanics
- Optimization techniques and methods
- Plate and Shell finite elements
- Industrial equipment structure design
- Structures simulations
- Thermal problems on material structures

- Atomistic Simulation
- Thermodynamic and Kinetic Modelling
- Phase field Modelling

## Materials Characterization

- Characterization Technique
- Product characterization
- Microanalysis and surface analytical techniques.
- Advanced characterization
- Nanoscale characterization

## Composites

- Polymer, Ceramic, Metal matrix composites
- Mechanics of composites
- Fiber reinforced composites
- Nano composites, Bio composites
- Textile Hybrid composites
- Auxetic materials
- Porous and cellular materials
- Composite Repair techniques, self-healing
- Composites in Innovative applications
- Repair & Recycling of composite
- Offshore structures and Marine Applications

## Defence Materials

- Nuclear Materials
- Materials for advanced defence application
- Transport of nuclear materials
- Storage of nuclear materials
- Disposal of nuclear materials
- Antiballistic materials
- Defence materials for low temperature environment
- Friction resistant materials

## Waste Utilization

- Industrial Waste Utilization
- Organic waste Utilization
- Hazardous Waste Utilization
- Recyclable waste
- Electronic waste utilization in material
- Industrial Waste management
- Medical waste Utilization

## Corrosion and Environmental Degradation of Materials

- Corrosion & Protection
- Corrosion resistant materials
- Nanocoatings
- Oxidation resistant materials for low and high temperature applications
- High Temperature degradation
- Bio-corrosion
- Self-passivating materials
- Techniques for protection against degradation

## Submission of Synopsis / Full Text

The authors are requested to submit the Extended abstract and full text (post-acceptance of abstract) through online website: <http://cpcm2020.com/>. Acceptance of abstract will be notified after duly reviewed by the technical committee.

## Guidelines for Authors

Authors of accepted abstracts may submit their full paper for the Conference as per the Guidelines as mentioned below. The papers which are not following these guidelines may not be considered for peer review and publication.

### Preparation of Abstract

- The Extended Abstract should be in doc / docx; Title should be in 14 pt & Bold; Affiliation should be in 12 pt; Abstract should be in 12 pt Bold; Text of Abstract should be in 12 pt.
- Only those abstracts which follow the mentioned format will be considered for evaluation by the Scientific Committee of the Conference. The Extended Abstract should be submitted in: <http://cpcm2020.com/> on or before 5th November, 2020.

### Preparation of Power point Presentation

- 10 min Presentation followed by 2 min discussion

## Preparation of Full Text of Paper

Papers should be camera-ready in MS-Word format, not exceeding 10 pages in length and should not carry more than 5 illustrations / photographs. The language of the Publication is English. The mode of presentation should be in third person. The Template for preparation of article is attached for ready reference of the authors. SI units should be used wherever possible. Other units, if used, should be given only in parentheses preceded by SI units. Mathematical symbols should be typed and care should be taken to differentiate between similar characters (e.g. 1 and I), upper and lower case letters and superscripts and subscripts. Lengthy mathematical proofs and derivations and extensive test data are discouraged. If absolutely essential, they should be given as an appendix. The template of Paper can be downloaded from the paper submission guidelines from the conference website.

## Copyright

The papers are considered for possible publication on the understanding that these have not been submitted to any other publisher. The copyright of papers accepted for publication lies with the conference organizer and reproduction of the papers or any part thereof is not allowed without the permission of the Institution. Contributors are required to sign a declaration to this effect while submitting their papers. The Declaration form of journal can be downloaded from the conference website.

## Publication in a book published by Springer.

The articles presented in the conference will likely be published in a book published by Springer after peer review.

## Registration Fee for the conference

| Delegates  | Indian (INR)                         |
|--|--------------------------------------|
|  | Registration (by 10th December 2020) |
| Students / Research Scholar  | 500                                  |
| Faculties & Staff from institutes and universities/<br>Scientists from research laboratories | 750                                  |
| Person from Industry   | 1,000                                |

## Payment

Payment for the conference registration fee will be online and copy of online registration payment and Manuscript ID will be submitted to Convener.

\*DD/Cheque drawn in favour of **“CONFERENCE NIT ROURKELA”**  
payable at **Rourkela**

*For online payment, please follow the details:-*

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**Patron: Prof. Animesh Biswas (Director, NIT Rourkela)**

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**Convener: Prof. S. Pal, pals@nitrkl.ac.in**

**Co-Convener: Prof. A. Patra, patraa@nitrkl.ac.in**

**Treasurer: Prof. S. N. Alam, syedn@nitrkl.ac.in**

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**Prof A. Behera**

**2018**

1<sup>st</sup> International Conference on Processing  
and Characterization of Materials  
**and**  
8<sup>th</sup> National Conference on Processing  
and Characterization of Materials

Published by:

- 1) Materials Science Forum,
- 2) Int. Journal of Materials Research

**2016**

6<sup>th</sup> National Conference on Processing and  
Characterization of Materials

Published by: Materials Science and  
Engineering (IOP)

**2014**

4<sup>th</sup> National Conference on Processing and  
Characterization of Materials

Published by: Materials Science and  
Engineering (IOP)

**2012**

2<sup>nd</sup> National Conference on Processing and  
Characterization of Materials

**2019**

2<sup>nd</sup> International Conference on Processing  
and Characterization of Materials  
**and**  
9<sup>th</sup> National Conference on Processing  
and Characterization of Materials

Published by:

1. Materials Today Proceedings (Elsevier)
2. International Journal of Materials and Product Technology Journal

**2017**

7<sup>th</sup> National Conference on Processing and  
Characterization of Materials

Published by: Materials Science and  
Engineering (IOP)

**2015**

5<sup>th</sup> National Conference on Processing and  
Characterization of Materials

Published by: Materials Science and  
Engineering (IOP)

**2013**

3<sup>rd</sup> National Conference on Processing and  
Characterization of Materials

**2011**

1<sup>st</sup> National Conference on Processing and  
Characterization of Materials



## REGISTRATION

You can register at <http://cpcm2020.com/>

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