



## From HoD's Desk

Dr. Shravan Kumar

Associate Professor & HOD

Department of Fuel Minerals & Metallurgical Engineering

Indian Institute of Technology (ISM) Dhanbad

Mob: +91-9771421510, LL: +91-326-223-5948

Email: [fmme@iitism.ac.in](mailto:fmme@iitism.ac.in)



*Dear Readers,*

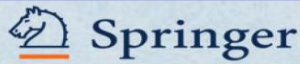
*It is with great pride and delight that I present to you the second edition of our department's monthly newsletter. This marks a significant milestone as we continue to thrive in our three core verticals: Fuel, Minerals, and Metallurgical Engineering. Our department's research endeavors are intricately aligned with the nation's aspirations, focusing on the processing of critical minerals, pioneering technologies for harnessing alternative energy resources, advanced methodologies in iron and steel processing, the exploration of non-ferrous metals, the integration of AI and ML into our practices, and innovative equipment design.*

*The past month has been particularly eventful and rewarding for the department. We successfully hosted an engaging invited talk on sustainable recovery of critical metals delivered by Dr. Dhruva Kumar Singh, Head, Hydrometallurgy & Rare Earths Development Section, BARC, Mumbai. The faculties of the department have also earned recognition for outstanding contributions to peer review and editorial work in prestigious journals. Additionally, the department celebrated multiple publications in reputed international journals, showcasing the exceptional research output of our faculty and students.*

*Your feedback and suggestions serve as a guiding light for us to grow further and refine our impact in academia, industry, and research. Together, let us forge a path toward innovation and excellence.*

# RESEARCH ACHIEVEMENTS

## Recognition for Excellence: Reviewer Appreciation Award from TIIM



### CERTIFICATE OF REVIEWER APPRECIATION

**Dr. AARTI KUMARI**

Thank You for your critical assessment and review of the manuscript for the Month of Sep 2024. Your time and commitment are deeply appreciated and vital to ensuring the High Standards of Transactions of The Indian Institute of Metals. Looking forward to your continued support to TIIM.

*Narayana Murty S.V.S*

**Dr. S.V.S. Narayana Murty** Editor-in-Chief, TIIM

Dr. Aarti Kumari received "CERTIFICATE OF REVIEWER APPRECIATION" from Transactions of the Indian Institute of Metals (IIM) journal for the month of September, 2024 for my outstanding service as a reviewer of TIIM. Her recent review of a manuscript submitted to TIIM has been rated as 5 (in the scale of 1-5, with 5 being the highest) by the Editor. The appreciation mail was received on October 24, 2024.

## Guest Editor for a Special Issue on Advanced Functional Materials

Dr. M.R. Rahul was recently appointed as a Guest Editor for the Special Issue on "Advanced Functional Materials: Materials Performance and Characterization" with ASTM International. Additionally, Dr. Rahul has joined the editorial board of Nature Scientific Reports from October 2024, contributing to the Engineering section, a prominent journal known for publishing research across various engineering disciplines.



# INVITED TALKS

## Powering the Future of Energy Security: Dr. Dhruva Kumar Singh Talks Rare Earths Recovery at FMME



IIT(ISM), Dhanbad

Department of Fuel, Minerals & Metallurgical Engineering

### Sustainable Recovery of Rare Earths and Critical Metals from Primary & Secondary Sources: A Pathway to Energy Security

#### About the speaker

Dr. D. K. Singh is a recognized expert in rare earth resource processing and critical minerals, contributing over three decades at BARC to developing process flow-sheets for uranium, rare earths, and base metals from primary and secondary sources. He has been recognized with the INS Gold Medal in 2006 by Indian Nuclear Society, Hindustan Zinc Gold Medal by Indian Institute of Metal in 2018 and the Ministry of Steel's "Metallurgist of the Year" award in 2015. He has been awarded the "Department of Atomic Energy (DAE) Group Achievement Award" in 2020 for "Development of indigenous technology for production of Nd metal required for making NdFeB magnet in the country". Recently, Dr. Singh has been bestowed "Lifetime Achievement Award 2024" by Rare Earth Association of India for his seminal contributions in the field of rare earths resource processing and value addition.



**Dr. Dhruva Kumar Singh**

Head, Hydrometallurgy & Rare Earths Development Section  
Materials Group, Bhabha Atomic Research Centre, Mumbai

Date: October 24, 2024 (Thursday)

Time: 11:00 AM

Venue: Seminar hall (2<sup>nd</sup> floor),  
FMME Department

On October 24, 2024, Dr. Dhruva Kumar Singh, Head of the Hydrometallurgy & Rare Earths Development Section at BARC, Mumbai, delivered an insightful invited talk at the FMME Department's seminar hall. His presentation, titled "Sustainable Recovery of Rare Earths and Critical Metals from Primary & Secondary Sources: A Pathway to Energy Security," focused on the critical issue of rare earths and metals recovery for ensuring energy security. The event, which was co-ordinated by Dr. Aarti Kumari, attracted 102 participants, including 91 students from B.Tech, M.Tech, and PhD programs, along with 12 faculty members.



# INVITED TALKS

Transforming Cooling Technology: Dr. Ravi Talks Polymer Microstructures at SICE 2024

## Designing Microstructures of Polymers for Passive Daytime Radiative Cooling Structural Integrity Conference and Exhibition SICE 2024



### Kesavan Ravi

Assistant Professor  
Fuel Minerals & Metallurgical Engg.  
Indian Institute of Technology (ISM)  
Dhanbad  
kesavanravi@iitism.ac.in

### Sarthak S Singh

Assistant Professor  
Mechanical Engg.  
Indian Institute of Technology (ISM)  
Dhanbad  
sarthakssingh@iitism.ac.in

### Olivier Lame

Professor  
MATEIS  
INSA Lyon, France  
olivier.lame@insa-lyon.fr

### Contributions by

Saumya Ranjan (Mtech, IIT ISM Dhanbad)  
Abhishek Shah (Btech, IIT ISM Dhanbad)  
Sujith Dunna (Btech, IIT ISM Dhanbad)  
Chandaswi Borra (Btech, IIST)  
Prajwal Chaudhary (Mtech, IIT ISM Dhanbad)  
Gaurav Kumar (PhD, IIT ISM Dhanbad)

Dr. Kesavan Ravi delivered an engaging and insightful talk on "Designing Microstructures on Polymers for Passive Daytime Radioactive Cooling" at the SICE 2024 conference held at VNIT Nagpur. The presentation focused on innovative approaches to utilizing polymer microstructures for efficient passive cooling, an emerging technology with significant applications in energy efficiency and sustainable cooling solutions.



# PUBLICATIONS

1. Sukhbaatar, T., Piton, R., Giusti, F., Arrachart, G., Duvail, M., Kumari, Aarti, Daware, S, Gupta, S., Goverapet, S., Sahu, S. K., Rai, B., Pellet-Rostaing, S. Lipophilic EDTA-based ligands in different diluents for the extraction of rare earths: Preliminary results with Nd(III), Dy(III) and Pr(III) in chloride and nitrate media, *Hydrometallurgy*, October 2024,106415. <https://doi.org/10.1016/j.hydromet.2024.106415>
2. Pushp raj Patel, Ioanna Dimitriou, Prasenjit Mondal, Omvir Singh, Shubhi Gupta\*, 2024, Process optimisation and environmental assessment of carbon-negative hydrogen production from biomass co-gasification, *Energy Conversion and Management*.

## EDITORIAL BODY

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Prof. Shravan Kumar  
Head of the Department

### Editors

Dr. Kasturi Sala  
Assistant Professor

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Assistant Professor (Visiting)

### Contact Us:



[fmme@iitism.ac.in](mailto:fmme@iitism.ac.in)



+91-326-223-5948



[fmme.iitism.ac.in/](http://fmme.iitism.ac.in/)

*Stay tuned for more exciting updates in our next edition...*