



FMME OREBITS

FUEL MINERALS AND METALLURGICAL ENGINEERING

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From HoD's Desk

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Dear Readers,

It is with immense pride and joy that I present to you the third edition of our department's monthly newsletter. This edition highlights our continued growth and achievements across our three core verticals: Fuel, Minerals and Metallurgical Engineering.

November proved to be an extraordinary month for the department. We signed a significant MoU with Sentra. world, a Bangalore-based sustainability startup, to spearhead research on decarbonizing the iron and steel industry using biochar as a sustainable alternative to coal. The department congratulates Dr. Shalini Gautam for her exemplary contributions and inspiring leadership.

Our faculty members made a strong impact at prominent forums, delivering invited talks and chairing sessions at technical meetings and international conferences, further cementing the department's reputation for excellence in research and innovation. Research scholars also showcased their cutting-edge work at international platforms. Moreover, the department celebrated multiple publications in reputed international journals, reflecting the outstanding research output of our faculty and students.

Your feedback and suggestions remain invaluable as we strive to enhance our impact in academia, industry, and research. Together, let us continue to forge a path toward innovation and excellence.



**Stay inspired.
Never stop
creating.**

RESEARCH ACHIEVEMENTS

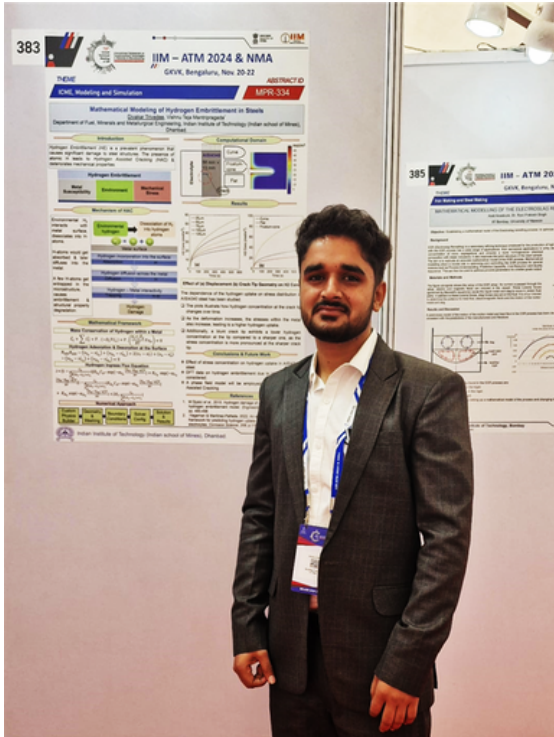
The Indian Institute of Technology (Indian School of Mines) Dhanbad has partnered with sentra.world, a Bangalore-based sustainability startup, to embark on a pioneering research initiative aimed at decarbonizing the iron and steel industry using biochar—an eco-friendly alternative to coal.

Prof. Shalini briefed that the project focuses on recycling surplus biomass waste, such as agricultural residues and forest byproducts, to produce high-quality biochar for applications like coke making and sponge iron production. This effort seeks to mitigate stubble burning, a major air pollutant, while enhancing farmer incomes and creating rural livelihoods.

Advancing Coal Beneficiation: Dr. Raj Kumar Dishwar Presents Dual Method at IIM Annual Technical Meeting

Dr. Raj Kumar Dishwar presented on “Novel Dual Beneficiation Method to Enrich the Carbon Content and End-value of Coal Washery Tailings” at the 78th Annual Technical Meeting of IIM (International Symposium on Transformational Technologies in Material and Manufacturing) held from 20th to 22nd November at GKV Bengaluru.

INTERNATIONAL CONFERENCES



Modeling Hydrogen Embrittlement in Steels: Research scholar presents at IIM Annual Technical Meeting

At the 78th Annual Technical Meeting of the Indian Institute of Metals (IIM), held from 20th to 22nd November at GKVK Bengaluru, research scholar Divaker Trivedee, under the guidance of Prof. Vishnu Teja Mantripragada, presented his research on the "Mathematical Modeling of Hydrogen Embrittlement in Steels." This study delves into the mechanisms of hydrogen embrittlement, a critical issue in the durability and performance of steel materials, particularly in industrial applications.

PUBLICATIONS

- Wu, L., Guan, Y., Reddy, B. R., Li, C., Liew, R. K., & Zhou, J. (2025). Revelation of non-thermal effects on microwave drying of lignite: Reactor design and drying characteristics. *Fuel*, 383, 133893. <https://doi.org/10.1016/j.fuel.2024.133893>
- Mishra, S., Majumder, A.K. Challenges and Opportunities in Vibrometry-Based Online Condition Monitoring of Mineral Processing Equipment. *Mining, Metallurgy & Exploration* (2024). <https://doi.org/10.1007/s42461-024-01139-3>

Conference Proceedings

- M Agilan, Rahul M R, G Phanikumar, "ICME-based approach to establish a processing map for the IN718 welding", Computational Materials Science (CMS-ICME) section
- Manish Kumar Singh, Kesavan Ravi, Rahul M R, "Integrated experimental and simulation study of the effect of Al addition on the As-cast microstructure formation in multicomponent multiphase alloy", ICME, Modelling and Simulation section

INVITED TALKS



Leading the Way: Dr. B. R. Reddy Shares Expertise and Chairs Session at PyroAsia 2024

Dr. Reddy, B. R. Attended and delivered an invited talk in PyroAisa 2024 (4th International Symposium on Analytical and Applied Pyrolysis), 28-29 November 2024 in IITG. Also, he Chaired a Session on "Pyrolysis of Biomass, Plastic Oils & Mixtures-I"

INTERNATIONAL COLLABORATION

Global Research Collaboration: Dr. B. R. Reddy Co-Authors Study on Microwave Drying of Lignite in Fuel Journal



Fuel
Volume 383, 1 March 2025, 133893



Full Length Article

Revelation of non-thermal effects on microwave drying of lignite: Reactor design and drying characteristics

Lei Wu ^{a,1}, Yining Guan ^{a,1}, B. Rajasekhar Reddy ^{b,1}, Changcong Li ^a, Rock Keey Liew ^c,

Dr. B. R. Reddy has co-authored a groundbreaking article in Fuel journal, exploring the non-thermal effects of microwave drying on lignite. The study reveals how these effects enhance the drying rate, moisture removal, and diffusion characteristics, offering new insights into lignite microwave drying processes. This work marks a significant contribution to the field of coal processing.

<https://doi.org/10.1016/j.fuel.2024.133893>

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