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PRESS-RELEASE

IIT (ISM) bridges tradition and technology as leaders outline national priorities in minerals and geo-energy

The Centenary Foundation Week at IIT (ISM) Dhanbad entered a dynamic and intellectually charged second day as the Institute hosted the high-profile DST–PAIR Event on *Innovative Technologies for Critical Minerals, Geo-Energy and Geosciences*. The Penman Auditorium resonated with discussions on India's mineral future, sustainability challenges, and the technological transitions needed to support the nation's long-term resource security. The day embodied IIT (ISM)'s 100-year legacy as India's leading cradle of geoscience education and research.

The inaugural function began with a traditional lamp-lighting ceremony followed by a short film capturing the institute's century-long journey. Senior faculty from Applied Geology, Applied Geophysics, Mining Engineering, and Fuel, Minerals & Metallurgical Engineering outlined success stories that showcased how IIT (ISM) is contributing to *Viksit Bharat @2047* through advancements in mineral exploration, geo-energy innovation, automation-driven mining and novel resource-assessment technologies. Prof. Bhanwar Singh Choudhary (HoD, Mining Engineering) delivered the welcome address.

Director Prof. Sukumar Mishra, in a comprehensive and forward-looking address, highlighted India's accelerating mission toward Viksit Bharat 2047. Drawing a link to the insightful discussions of Day 1, he praised the arts and science departments for demonstrating how digital technologies are rapidly reshaping traditional academic disciplines. He acknowledged the national recognition being received by researchers integrating digital methods with conventional studies and commended TEXMi for driving digital innovation and helping academic research reach higher TRL levels. Prof. Mishra called for converting fundamental research into technologies of commercial relevance and urged faculty, students and external collaborators to make full use of IIT (ISM)'s innovation-friendly ecosystem to deliver impactful, outcome-oriented work.

The day also featured powerful reflections from industry and academic leaders who underscored the urgent national need for innovation, digitization and sustainable resource management. Prof. V. M. S. R. Murthy, Director of IEST Shibpur, emphasized IIT (ISM)'s nurturing academic environment and the interdisciplinary strength that binds geosciences, mining and mineral engineering. He highlighted India's pressing need for technology-driven resource extraction and pointed to the transformative potential of AI/ML, remote sensing, digital tools and advanced recycling. He stressed the importance of translating innovations such as selective mining with surface miners and drum-design trials into deployable field technologies that support energy security, decarbonization and national self-reliance.

Delivering a strategic energy-sector perspective, Sanjeev Kumar Choudhary, ED & State Head, IOCL, outlined the world's rapid shift toward sustainable energy systems and the implications for a country like India that remains heavily dependent on fossil fuels. He highlighted the challenge of balancing energy security, sustainability and equity while detailing India's transition strategy built around diversification, renewables and biofuel initiatives. He pointed to IOCL's all-India infrastructure network, its net-zero commitments, advancements in solarization, biofuels, hydrogen and EV charging, and he appreciated the CSR-supported **solar hydrogen clean-cooking project with IIT (ISM)**—describing it as a model for impactful industry–academia partnerships.

Adding critical insights from the mining sector, Shri Niladri Roy, Director (Technical–Operations), ECL, spoke about the global shift from coal-based fossil fuels to renewable sources and its implications for India's coal industry. He cautioned that reduced coal demand and high stock levels pose production challenges, making **adaptation, diversification and technology infusion** essential. He emphasized the national importance of critical minerals, particularly for **renewable-energy storage and battery technologies**, which he described as central to India's ability to meet future energy needs.

In a deeply insightful keynote, Prof. Harsh K. Gupta, eminent ISM alumnus and distinguished seismologist, emphasized the increasing national significance of adopting advanced technologies for critical minerals, geo-energy and geosciences. He highlighted how **data-driven exploration, advanced seismic tools, innovative resource assessment methods and modern geo-energy solutions** are transforming India's ability to map, evaluate and sustainably utilize strategic mineral resources. He called for stronger collaborations between academia and industry to accelerate technological advancement and reinforce India's long-term resource security.

Across plenary and technical sessions, speakers explored future directions in **critical mineral exploration, deep-earth imaging, seismic vulnerability assessment, mineral-security policy, and smart and sustainable mining technologies**. Discussions repeatedly underscored IIT (ISM)'s historic contributions—mapping key mineral belts, identifying gold-bearing zones, developing seismic observatories—and emphasized that these achievements continue to shape India's evolving geoscience and mineral strategy.

The programme brimmed with youth engagement as school students participated enthusiastically in **Geophysical Field Challenges**, a **Geo-Science Quiz**, and demonstrations on **disaster management**, sparking early interest in geoscience careers. Observance of **Wildlife Conservation Day** brought focus to the essential balance between technological advancement and ecological responsibility.

The day concluded with vibrant cultural performances by AVAY Dramatics, LITM and WTC, adding creative energy to an otherwise academically intense schedule and reflecting the spirit of community that defines IIT (ISM).

In every session—from visionary keynote reflections to industry perspectives, digital innovation insights, youth participation and cross-disciplinary discussions—the second day of Centenary Week reaffirmed IIT (ISM) Dhanbad's status as a **national powerhouse of geoscience leadership**. As the Institute steps confidently into its second century, the scientific rigor, technological aspiration and collaborative momentum displayed today reflect a future in which IIT (ISM) will continue to shape India's mineral destiny, geo-energy resilience and sustainable-resource vision with unwavering excellence.

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