



भारतीयप्रौद्योगिकीसंस्थान (भारतीयखनिविद्यापीठ), धनबाद Indian Institute of Technology (Indian School of Mines), Dhanbad

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IIT (ISM) Dhanbad Hosts Expert Lecture on Planetary Remote Sensing and Cryosphere as Part of Centenary Guest Lecture Series

As part of its Centenary Guest Lecture Series, the Department of Applied Geophysics at IIT (ISM) Dhanbad organized a talk on "**Planetary Remote Sensing & Cryosphere**" by **Dr. Deepak Singh**, Assistant Professor at the Centre of Studies in Resources Engineering (CSRE), IIT Bombay. The lecture was held on July 7, 2025, in the Conference Room of the department and witnessed the participation of faculty members, research scholars, and students.

Delivering his talk, Dr. Singh highlighted how **planetary remote sensing** has transformed cryospheric research through advanced technologies such as **multispectral, hyperspectral, LiDAR, and radar** data. These tools, he explained, allow scientists to understand the **composition, dynamics, and energy balance of ice** both on Earth and on extraterrestrial bodies in the solar system.

Dr. Singh elaborated, "From terrestrial glaciers to Martian polar ice caps and Europa's icy shells, remote sensing provides deep insights into **albedo feedbacks, dust-ice interactions, and subsurface layering**. On Earth, this helps in monitoring glacier mass balance, snow and ice dynamics, and permafrost changes. For other planetary bodies, it supports the study of **volatile transport, climatic history, and potential astrobiological zones**."

He further emphasized the need for **multi-disciplinary approaches** by integrating laboratory spectroscopy and numerical modeling to interpret data from remote sensing tools. Such methods, he noted, are crucial in reconstructing cryo-climatic histories and in understanding the **surface-atmosphere interactions** of icy planetary environments.

Dr. Singh is an alumnus of ISM Dhanbad, having completed his Integrated Master's in Applied Geophysics. He pursued MS and PhD in Atmospheric, Oceanic, and Space Sciences from the University of Michigan and later worked as a postdoctoral researcher and INSPIRE Faculty at PRL, Ahmedabad. His research interests include **cryosphere-climate interactions on planetary bodies, modeling snow/ice behavior, and exploring energy dynamics** of icy surfaces in the solar system and beyond.

The session began with a welcome address and felicitation of Dr. Singh by **Prof. Saumen Maiti**, Head of the Department of Applied Geophysics, who presented him with a memento and shawl. Also present on the occasion were **Prof. Mohit Agarwal**, Coordinator of the Centenary Guest Lecture Series, and **Prof. P.K. Khan** from the department.

The lecture concluded with an engaging Q&A session, where attendees interacted with Dr. Singh on recent developments and future directions in planetary cryospheric studies.

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