IAF SYMPOSIUM ON ONGOING AND NEAR FUTURE SPACE ASTRONOMY AND SOLAR-SYSTEM SCIENCE MISSIONS (A7)
Space Astronomy missions, strategies and plans (1)

Author: Ms. Krishna Bulchandani
University of Mumbai, India

Dr. Swarniv Chandra
Institute of Natural Scienes and Applied Technology (INSAT), India

COMPREHENSIVE MINERALOGICAL AND THERMAL MAPPING OF THE LUNAR SURFACE USING CHANDRAYAAN-2 DATA

Abstract

This study presents a comprehensive approach to mineralogical and thermal mapping of the lunar surface utilizing data from Chandrayaan-2's Imaging IR Spectrometer (IIRS), Dual Frequency Synthetic Aperture Radar (DFSAR), and Solar X-ray Monitor (XSM). The objectives include high-resolution mineralogical mapping, thermal characterization, and correlative analysis to understand the relationships between mineralogical makeup and thermal properties. The methodology involves data acquisition, preprocessing, analysis, integration, mapping, and interpretation. Mineralogical analysis employs spectral analysis techniques to identify and quantify mineral abundance, while thermal analysis focuses on temperature variations correlated with lunar day-night cycles and surface features. GIS software is used for spatial analysis and visualization, while image processing tools enhance spectral data. Statistical analysis software is employed for data analysis. The study aims to generate mineralogical maps showing mineral distribution, thermal maps indicating temperature distribution, and composite maps overlaying mineralogical and thermal data. The integration of these datasets provides insights into the geological implications of the lunar surface features and phenomena. The results contribute to our understanding of lunar geology and have implications for future lunar exploration and resource utilization.