2026 Workshop: ITM science and innovation

Long title
Coupled Ionosphere, Thermosphere, and Mesosphere (ITM) System: Advances, Innovations, and Future Opportunities
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Description

We invite short (~10-minute) presentations highlighting recent advances in ionosphere, thermosphere, and mesosphere (ITM) research spanning altitudes from ~80-1,000 km. This workshop is organized around three themes: 1) New science results and discoveries; 2) Innovative approaches and methodologies; 3) Future directions and opportunities. We particularly encourage contributions to instrument and mission development, observing system simulation experiments (OSSEs), numerical modeling, and data assimilation using traditional and emerging Machine learning/AI techniques.

Justification

The ionosphere, thermosphere, and mesosphere (ITM) constitute a complex and strongly coupled system. Understanding cross-scale interactions within this system is essential for improving space weather prediction and ensuring reliable satellite operations. Recent advances in observational capabilities, combined with continued progress in whole atmosphere modeling, data assimilation, OSSEs, and both traditional and AI-driven analytical methods have created new opportunities to improve our understanding of ITM coupling processes. This workshop aims to foster cross-disciplinary collaborations and chart future research directions for the CEDAR community. It directly supports CEDAR’s core mission and aligns with key program thrusts of ionosphere-thermosphere coupling and space weather effects.

Related to CEDAR Science Thrusts:

Encourage and undertake a systems perspective of geospace
Develop observational and instrumentation strategies for geospace system studies
Fuse the knowledge base across disciplines in the geosciences
Workshop format
Short Presentations
Keywords
mesosphere and thermosphere/ionosphere, ground and space observations, numerical modeling, emerging techniques
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