Special Issue

Advances in Cryosphere Monitoring: Integrating Multi-Source Remote Sensing and AI Technologies

Message from the Guest Editors

This special issue addresses the critical challenges of monitoring glaciers, snow cover, and permafrost dynamics within the cryosphere through cutting-edge remote sensing technologies and artificial intelligence (AI)-driven methodologies. Remote sensing provides a scalable, non-invasive platform to assess key cryospheric parameters, including glacier mass balance, ice flow velocity, snow water equivalent (SWE), and permafrost thermal state. Satellite-based optical, radar, and thermal infrared sensors enable systematic tracking of glacier retreat patterns, while hyperspectral imaging and synthetic aperture radar (SAR) enhance the characterization of snowpack properties and subsurface permafrost degradation. Complementing spaceborne observations, unmanned aerial vehicles (UAVs) offer high-resolution monitoring of localized cryospheric processes, bridging the gap between field measurements and satellite data. Emerging innovations in multi-sensor data fusion and AI algorithms are revolutionizing cryosphere monitoring. The integration of multi-source remote sensing data with physics-informed AI frameworks enables robust quantification of cryosphere-climate feedback mechanisms.

Guest Editors

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Message from the Editor-in-Chief

Remote Sensing is now a prominent international journal of repute in the world of remote sensing and spatial sciences, as a pioneer and pathfinder in open access format. It has highly accomplished global remote sensing scientists on the editorial board and a dedicated team of associate editors. The journal emphasizes quality and novelty and has a rigorous peer-review process. It is now one of the top remote sensing journals with a significant Impact Factor, and a goal to become the best journal in remote sensing in the coming years. I strongly recommend *Remote Sensing* for your best research publications for a fast dissemination of your research.

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