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IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing

Special Issue on
"Cross-Sphere Near-Surface Processes: Remote Sensing–Based Retrieval and Modeling"

As the planet continues to warm and extreme climate events become more frequent, terrestrial, cryospheric, and aquatic systems are undergoing profound transformations. Near-surface energy and water budgets are being reorganized, and linkages among ecological, hydrological, and geological processes manifest multi-scale responses and feedbacks. The research focus has shifted from documenting phenomena to resolving processes and mechanisms, including: closing energy–water budgets; identifying and quantifying the coupling pathways and feedback loops that govern system dynamics; detecting critical transitions and nonlinear behavior; elucidating cascades and transfers in cross-scale interactions; and disentangling, across scales, the superposed influences of natural variability and human activities.

To address these challenges, this Special Issue centers on an integrated chain of remote sensing–driven retrieval, modeling, and impact assessment. Within data-assimilation and uncertainty-propagation frameworks, we aim to integrate multi-sensor satellite observations with in-situ measurements and reanalysis datasets to produce trend-faithful, spatiotemporally continuous key environmental variables; to advance synergistic, mechanism-informed and data-driven modeling (e.g., physics–AI integration, cross-scale and multi-process coupling, unified representations of continuous and discrete processes) that deepens process understanding and improves predictability; and to conduct systematic evaluations of model uncertainty, interpretability, and cross-domain transferability. We welcome studies on related processes effectively driven or constrained by remote sensing, spanning terrestrial, cryospheric, and aquatic (including nearshore) environments.

The broad topics include (but are not limited to):

- Multi-Source, Multi-Scale Remote-Sensing Retrieval and Spatiotemporal Reconstruction
- Data Assimilation and Fusion Across Satellite Remote Sensing, In-Situ Measurements, and Reanalysis
- Mechanism-Informed and Data-Driven Synergistic Modeling
- Cross-Sphere Coupling and Feedback Mechanisms
- Impact Assessment and Prediction of Extreme and Compound Events
- Remote-Sensing-Based Monitoring and Mechanistic Modeling
- Land-Surface Deformation and Geohazard Risk
- Key Cryospheric Processes and Interpretation of Remote-Sensing Signals
- Explainable Machine Learning and Causal Attribution

Schedule

01 Dec 2025 Submission system opening
30 Jun 2026 Submission system closing

Format

All submissions will be peer reviewed according to the IEEE Geoscience and Remote Sensing Society guidelines. Submitted articles should not have been published or be under review elsewhere. Submit your manuscript on http://mc.manuscriptcentral.com/jstars, using the Manuscript Central interface and select the "**Cross-Sphere Near-Surface Processes: Remote Sensing–Based Retrieval and Modeling**" special issue manuscript type. Prospective authors should consult the site https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9082768 for guidelines and information on submission. All submissions must be formatted using the IEEE standard format (double column, single spaced). Please visit http://www.ieee.org/publications_standards/publications/authors/author_templates.html to download a template for transactions. Please note that as of Jan. 1, 2024, IEEE J-STARS, being a fully open-access journal since 2020, charges a flat publication fee $1,800 per paper.

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