

Special Issue

Advancing the Understanding and Forecasting of Severe Convective Weather

Message from the Guest Editors

This Special Issue invites contributions that advance both the fundamental science and operational forecasting capabilities for severe convective weather. We welcome studies employing novel observational platforms (including remote sensing, radar technologies, and field campaigns), high-resolution numerical simulations, machine learning and artificial intelligence approaches, and data assimilation techniques. Of particular interest are investigations into:

- Convective initiation mechanisms and predictability in complex terrain and varying environmental conditions;
- Supercell dynamics, tornado genesis, and tornadic processes;
- Hail formation and growth mechanisms with implications for size prediction;
- Convective mode transitions and upscale growth into mesoscale convective systems;
- Environmental controls on severe weather potential, including moisture transport, instability, and wind shear;
- Innovative forecast methodologies integrating ensemble prediction systems, probabilistic approaches, and nowcasting techniques;
- Verification strategies and performance metrics for severe weather warnings.

Guest Editors

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Deadline for manuscript submissions

18 November 2026



Atmosphere

an Open Access Journal
by MDPI

Impact Factor 2.6
CiteScore 5.4



mdpi.com/si/276348

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About the Journal

Message from the Editor-in-Chief

Continued developments in instrumentation and modeling have driven atmospheric science to become increasingly more complex with a deeper understanding of concepts, mechanisms, and interactions. This is the field that innovation built and it has led to a better appreciation for the complexity with atmosphere. Human life is intertwined in this complexity as we strive to better understand our atmosphere. Climate change is constantly stretching the limits of our thinking and forcing new ideas and concepts to be played out. Welcome to the Anthropocene!

Editor-in-Chief

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