

Special Issue

Multi-Source Observations and Intelligent Data Assimilation for Improving High-Impact Weather Prediction

Message from the Guest Editors

In recent years, with the rapid development of multi-source observation networks—including next-generation weather radar systems, geostationary and polar-orbiting satellites, ground-based GNSS, water vapor detection systems, UAVs, and surface sensor networks—atmospheric science has entered a data-rich era. At the same time, artificial intelligence (AI) and machine learning (ML) have shown great potential in model bias correction, observation fusion, and intelligent data assimilation. This Special Issue will focus on how to integrate multi-source observational data and intelligent algorithms to improve the capability and accuracy of high-impact weather prediction, particularly for severe convective systems, extreme precipitation, typhoons, and other hazardous weather events. We aim to bring together contributions from both methodological innovation and application-oriented studies, encouraging cross-disciplinary approaches that combine atmospheric science, computational techniques, and artificial intelligence.

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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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