Special Issue

Ocean Climate Modeling and Ocean Circulation

Message from the Guest Editors

Ocean circulation plays a critical role in regulating the global climate and transporting energy and materials. It profoundly influences both the climate system and marine ecosystems. Advances in ocean climate modeling, including numerical models and artificial intelligence (AI), now enable a more accurate simulation and prediction of circulation patterns and their climate feedbacks. This Special Issue seeks contributions on the latest developments in ocean climate modeling and circulation, with emphasis on predictive modeling using numerical and AI-based approaches, model-driven analyses of ocean processes, and interactions between the ocean and other spheres. Submissions exploring subgrid-scale parameterizations that integrate dynamics and AI to enhance model fidelity and computational efficiency are also encouraged. In addition, this Special Issue will address how ocean processes respond to climate change, with a focus on key mechanisms such as circulation variability, heat transport, and carbon cycling.

Guest Editors

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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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