



## Observations and Analysis of Upper Atmosphere

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### Message from the Guest Editors

This Special Issue belongs to the section Upper Atmosphere. The upper atmosphere is the conjunction of matter and energy exchange between the lower atmosphere and outer space. It is affected by disturbance from interstellar space and the influence from the lower atmosphere, with a variety of possible coupling processes. For example, solar flares, coronal mass ejection (CME), and energetic particle precipitation (EPP), may cause significant disturbances to the middle and upper atmosphere. In addition, various disturbances in the surface and lower atmosphere, such as lightning, volcanoes, and typhoons, etc., may also have an impact on the upper atmosphere. Therefore, it is a great challenge to investigate the coupled multi-layer processes through the use of combined ground-based and air-based observations. Topics of interest for this Special Issue include, but are not limited to, the following:

- Mesospheric layering phenomena;
- Stratospheric sudden warming (SSW);
- Gravity waves in the middle and upper atmosphere;
- Lidar/radar observations;
- Interaction between ionosphere and upper atmosphere;
- Coupling between the lower and upper atmosphere.





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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!

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