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Dynamics and Chemistry of the Middle and Upper Atmosphere and Its Response to External Forcing—Observations and Models

Guest Editors:

Dr. Stefan Bender
Instituto de Astrofísica de Andalucía (CSIC), Glorieta de la Astronomía s/n, 18008 Granada, Spain

Dr. Yvan Orsolini
Norwegian Institute for Air Research (NILU), Norway & Department of Physics, Norwegian University of Science and Technology (NTNU), 7491 Trondheim, Norway

Dr. Kristell Pérot
Department of Space, Earth and Environment, Chalmers Technical University, 412 96 Gothenburg, Sweden

Deadline for manuscript submissions:
closed (5 May 2023)

Message from the Guest Editors

Dear Colleagues,

In recent years, the IPCC has recognized processes in the middle and upper atmosphere as important for future climate projections. This region of the Earth's atmosphere maintains a balance between external forcings and forcing emanating from the lower atmosphere in the form of planetary waves, tides and gravity waves. Quantifying how these forcings drive the general circulation of the atmosphere and control the chemical balance and its variability is crucial to understanding how the different layers couple vertically and horizontally in the atmosphere and ionosphere. Still, many of these processes have been only quantified poorly, leading to large uncertainties in their variability.

This special issue invites both observation-based and modelling contributions that concern the chemistry and dynamics of the **middle and upper atmosphere** with respect to

- the treatment of energetic particle precipitation (EPP) in chemistry-climate models
- the coupled climate system response to EPP and UV forcing
- the response to Stratospheric Warming events
- natural variability induced by gravity waves and tides

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Editor-in-Chief

Prof. Dr. Ilias Kavouras
Environmental, Occupational, and Geospatial Health Sciences, CUNY School of Public Health, New York, NY 10027, USA

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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Contact Us

Atmosphere Editorial Office
MDPI, St. Alban-Anlage 66
4052 Basel, Switzerland

Tel: +41 61 683 77 34
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atmosphere@mdpi.com
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