

## Special Issue

# New Methodological Aspects of Physics and Applications of Atmospheric Nonlinear Optics

### Message from the Guest Editor

High-power laser pulses undergo nonlinear propagation in transparent media. This action includes exciting and challenging physics with many applications. Areas of study include intense-field physics, extreme nonlinear optics, nonlinear electromagnetic pulse propagation, quantum optics, and some unknown new physical phenomena. Phenomena like self-focusing, self-guiding, self-reflection, four-wave mixing, self-phase modulation, self-steepening, and pulse splitting have been extensively studied from theoretical and experimental points of view. In those years, a pioneering experiment demonstrated creation of atmospheric plasma channels using white light. The dynamical balance between Kerr self-focusing and plasma defocusing produces filaments in the optical media. Filamentation aroused a great interest and became a field of intense research activity. This Special Issue invites contributions describing new methodological aspects of physics and applications of atmospheric nonlinear optics. In addition, it is essential to present the impact of the latest disclosures on applications in the field on human activity and include examples of new measurement methods.

---

### Guest Editor

Dr. Irit Juwiler

Department of Electrical and Electronics Engineering, Shamoon College of Engineering, Ashdod 77245, Israel

---

### Deadline for manuscript submissions

closed (21 March 2025)



## Atmosphere

---

an Open Access Journal  
by MDPI

---

Impact Factor 2.3  
CiteScore 4.9

---



[mdpi.com/si/195431](https://mdpi.com/si/195431)

*Atmosphere*  
Editorial Office  
MDPI, Grosspeteranlage 5  
4052 Basel, Switzerland  
Tel: +41 61 683 77 34  
[atmosphere@mdpi.com](mailto:atmosphere@mdpi.com)

[mdpi.com/journal/  
atmosphere](https://mdpi.com/journal/atmosphere)





# Atmosphere

---

an Open Access Journal  
by MDPI

---

Impact Factor 2.3  
CiteScore 4.9



[mdpi.com/journal/  
atmosphere](https://mdpi.com/journal/atmosphere)



## 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

Dr. Daniele Contini

Institute of Atmospheric Sciences and Climate (ISAC), National Research Council (CNR), Str. Prv. Lecce-Monteroni km 1.2, 73100 Lecce, Italy

---

### Author Benefits

#### Open Access:

free for readers, with article processing charges (APC) paid by authors or their institutions.

#### High Visibility:

indexed within Scopus, SCIE (Web of Science), Ei Compendex, GEOBASE, GeoRef, Inspec, CAPlus / SciFinder, Astrophysics Data System, and other databases.

#### Journal Rank:

CiteScore - Q2 (Environmental Science (miscellaneous))