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

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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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