

Special Issue

Terrestrial Gamma-Ray Flashes and High-Energy Atmospheric Events—Detection and Analysis

Message from the Guest Editor

Thunderclouds and lightning have been pointed out as capable of producing high-energy phenomena with disparate energetics and durations, ranging from sub-millisecond bursts of gamma-rays named Terrestrial Gamma-ray Flashes (TGFs) to minute-long gamma-ray glows, including the release of energetic particles such as positrons and neutrons. In particular, with energies up to tens of megaelectronvolts, TGFs represent the most powerful natural emissions occurring on Earth to date. The exact mechanisms behind the production of these emissions are still being researched. The multidisciplinary study of these events can help provide new insights into the behavior of atmospheric electricity, the production of high-energy radiation in extreme environments, and the complex interactions between lightning and the surrounding context. This Special Issue focuses on the detection and analysis of TGFs and other atmospheric high-energy emissions, with particular reference to new detection systems and observational campaigns aimed at investigating these events. Contributions on other thunderstorm-related atmospheric phenomena, such as lightning and Transient Luminous Events (TLEs), are also welcome.

Guest Editor

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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

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