Announcement of a Special Issue
Advances in Space Research

Cosmic Rays and the Multi-Messenger Sky

Papers are invited for a special topical issue of *Advances in Space Research* (ASR) entitled "**Cosmic Rays and the Multi-Messenger Sky"**

In recent years, the field of high-energy astrophysics has been transformed by groundbreaking discoveries in cosmic ray (CR) physics, driven by innovative experimental techniques and advanced instrumentation deployed in space and the upper atmosphere. Key space-borne missions—such as AMS-02, CALET, DAMPE, Fermi-LAT, INTEGRAL, ISS-CREAM, NUCLEON, and PAMELA—have provided unprecedented precision in characterizing local particle environments. Simultaneously, ground-based gamma-ray observatories, including H.E.S.S., LHAASO, MAGIC, VERITAS, and the HAWC water Cherenkov detector, as well as UHECR arrays like the Pierre Auger Collaboration and the Telescope Array Project, have enabled direct probes of CR fluxes and acceleration signatures in distant galactic and extragalactic regions. This observational landscape is further enriched by the historic multi-messenger milestones of gravitational-wave astronomy (LIGO, Virgo, and KAGRA) and the detection of high-energy astrophysical neutrinos by IceCube. Complementing these modern assets, historical data from the Voyager 1 and 2 spacecraft offer a unique, invaluable baseline of in situ measurements from the boundary of interstellar space.

This Special Issue, "Cosmic Rays and the Multi-Messenger Sky," will bring together recent spectacular discoveries across multi-messenger astrophysics, highlighting new measurements of CR elemental spectra and isotopic composition. Papers should include dedicated investigations into CRs in the heliosphere, solar modulation effects, and gamma-ray or neutrino emissions from discrete particle accelerators and interstellar space, alongside new findings on CRs at high through ultra-high energies. By bridging innovative experimental frameworks, advanced data modeling techniques, and rigorous theoretical analyses, this issue will serve to address the foundational questions surrounding the origin, acceleration, and propagation of cosmic messengers in our universe. Furthermore, it will highlight ideas for future experiments and upcoming missions, focusing on next-generation space, high-altitude, and ground experiments designed to push the boundaries of particle astrophysics.

We welcome high quality and relevant manuscripts from all scientists involved in the study of cosmic rays and the multi-messenger sky. Papers must be submitted electronically to https://www.editorialmanager.com/AISR. To ensure that all manuscripts are correctly identified for inclusion into the special issue, authors must select **"Special Issue: CRs & Multi-Messenger Sky"** when they reach the "Article Type" step in the submission process.

The general format for submission of papers can be found on the *ASR* Elsevier web site at https://www.sciencedirect.com/journal/advances-in-space-research/publish/guide-for-authors.

Submitted papers must be written in English and should include full affiliation postal addresses for all authors. Only full-length papers will be considered for publication, subject to peer review by a minimum of two reviewers. There are no page limits although the length of the paper should be appropriate for the material being presented. While the deadline for submissions is **7 March 2027**, papers will be published electronically as soon as they are accepted. The printed issue will be assembled within a reasonable time with late papers being printed in regular issues of ASR. All articles will be typeset at no cost to the author.

Dr. Eun-Suk Seo and **Dr. Igor V. Moskalenko** are the Guest Editors for this Special Issue. Questions can be directed to Dr. Seo (seo@umd.edu) and Dr. Moskalenko (imos@stanford.edu) or to the Co-Editor for Special Issues, Dr. Peggy Ann Shea (sssrc@msn.com).