Announcement of Special Issue
Advances in Space Research

Information Theory and Machine Learning for Geospace Research

Papers are invited for a special topical issue of *Advances in Space Research* (ASR) entitled "*Information Theory and Machine Learning for Geospace Research*".

Recent works point to a considerable importance of information theory and machine leaning in Solar and Space Physics; and Space Weather. Information-theoretic measures have been used to shed light on solar flare waiting times, the storm-substorm interaction, and the solar wind drivers of the outer radiation belt through the general perspective of quantifying information transfer, including linear and nonlinear mechanisms. Machine learning techniques have been applied to the forecasting of geomagnetic indices, relativistic electrons in the radiation belts, solar flares occurrence, coronal mass ejection propagation time, and solar wind speed. In this Special Issue, we invite contributions of information theory for uncovering relevant yet complex processes interlinking different solar and geospace subsystems, variables and spatio-temporal scales. Furthermore, we solicit contributions of machine learning for space weather forecasting and on open challenges for the community related to the combination of physics-based and machine learning approaches, known as gray box. Studies combining information theory and machine learning in solar and space physics as well as space weather would be of particular interest.

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: Information & ML Geospace"** 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
http://www.journals.elsevier.com/advances-in-space-research/

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 **31 May 2023**, 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. There is a charge for printing color figures; there is no charge for color figures on the electronic version.

Dr. Georgios Balasis (gbalasis@noa.gr) and Dr. Simon Wing (Simon.wing@jhuapl.edu) are the Guest Editors for this special issue. Questions can be directed to Drs. Balasis and Wing or to the Co-Editor for Special Issues, Dr. Peggy Ann Shea (sssrc@msn.com).