

# Final Proposal: An AGU “Space Weather” Publication

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## 1. Overview

The scientific understanding of Earth’s space environment has developed to the point where a distinct research and applications community has emerged in academia, government, and the commercial sector. In addition to researchers, there are a growing number of space weather forecasters and customers with common interests and goals. This nascent space weather community, the core of which is relatively small but growing, is not yet served by a scientific/technical publication that encompasses its specific information needs. AGU, as a leader in scientific publishing and an established source of basic research in space weather-related disciplines, is in a good position to develop a focused space weather research and applications publication. This proposal outlines a space weather publication that meets the information needs of this community and the goals of the Union.

### *Proposal Development History*

An initial proposal for a space weather journal was presented to AGU staff in Spring 2001. Based on a discussion of this proposal at the AGU Spring Meeting with representatives of the AGU Publications Committee and SPA section (29 May 2001), AGU staff were charged with developing a more detailed proposal and business plan based on additional input from the space weather community. Staff met with representatives of key U.S. agencies involved with space weather at AGU Headquarters (31 January 2002). A preliminary version of the resulting proposal was reviewed positively by SPA section officers and *JGR-Space Physics* Editors prior to review by the AGU Publications Committee on 28 March. The committee requested modifications to the proposal prior to approving it for AGU Council action at the 2002 Spring Meeting.

The preliminary proposal was also presented as an oral presentation and poster at the annual Space Weather Week meeting in Boulder, Colo. (16-19 March 2002). Feedback from meeting attendees was also incorporated in the final proposal.

## 2. Space Weather: A Growing Field

Space weather events can disrupt telecommunications, electrical power systems, satellite systems, navigation systems, and pose a hazard for humans in flight and space. As a result, forecasting space weather and developing systems to address these impacts are of high interest to a variety of groups, including government space and defense agencies and the private sector.

Two major U.S. government programs initiated in the 1990s have provided a new impetus to space weather research and applications.

- The National Space Weather Program, launched in 1994, is an initiative involving six government agencies: Department of Commerce, Department of Defense, National Science

Foundation, NASA, Department of Interior, and Department of Energy. The primary goal of the program is to provide the underlying science for predicting space weather.

- NASA's "Living with a Star" program is a space weather-focused and application-driven research program. Its goal is to develop the scientific understanding necessary to effectively address those aspects of the connected Sun-Earth system that directly affect life and society. The program is part of NASA's Sun-Earth Connection theme within the Office of Space Science.

The size of the space weather community is estimated at 5,000 people (1,000 researchers and forecasters and 4,000 applied users of space weather information). It is an international community – North America, Europe, Asia, and Australia – that is growing, as indicated by an increasing number of meetings on the topic. There have been 28 meetings pertaining to space weather over the last 6 years and the frequency is increasing (from 2 meetings in 1994 to 6 in 2000). AGU annual meetings have included several special sessions devoted to the topic, and it is one of the four themes of the upcoming 2002 Western Pacific Geophysics Meeting. The annual Space Weather Week meeting, sponsored by NOAA and other government agencies, has seen an increased number of attendees and now attracts over 200 people.

Other indicators of growing interest in this field include:

- The National Science Foundation recently funded the "Center for Integrated Space Weather Modeling" under its Science Technology Centers program. The new multi-million dollar center was awarded in May 2002 to a consortium led by Boston University.
- The Commercial Space Weather Interest Group, representing 7 providers of space weather products and services, was formed in April 2002 during the Space Weather Week meeting. The vendor group seeks to foster growth in operational space weather services and establish a market for its members' services.
- Sales of the new AGU Geophysical Monograph *Space Weather* (Song, Singer, Siscoe, editors; 2001) are running ahead of projections in the first 9 months.

Although acknowledged to be a growing community, space weather science and applications is at an "embryonic" stage of development. For this reason, the proposed publication is scaled more modestly than a new publication in a more established field. The publication's frequency, number of submissions, and circulation estimates are all conservative based on this assessment of the maturity of the field.

The space weather community can be divided into four groups:

- 1) *Basic researchers*: scientists from many disciplines, including solar physics, heliospheric physics, magnetospheric physics, and ionospheric/thermospheric physics
- 2) *Operational forecasters*: primarily within government agencies, scientists and technical staff responsible for observing and forecasting space weather
- 3) *Engineers*: a wide range of aerospace and systems engineers working to find solutions to the technological problems created by space weather

- 4) *Industry and government end users*: customers for the products developed by space weather engineers in telecommunications, aerospace, electric power, insurance, and other industries

#### *Current Space Weather Publications*

Space weather scientific/technical information is currently available in a number of journals, newsletters, and Web sites produced by government agencies, scientific/technical associations, and commercial publishers. Several research journals publish articles on space weather within a much broader space science context. These publications are primarily aimed at basic researchers and do not contain a significant fraction of space weather articles. Titles include:

<i>Astrophysical Journal</i> (AAS)	2.82 impact factor
<i>Geophysical Research Letters</i> (AGU)	2.71
<i>JGR-Space Physics</i> (AGU)	2.68
<i>Space Science Reviews</i> (Kluwer)	2.58
<i>Annales Geophysicae</i> (EGS)	1.76
<i>Journal of Atmospheric and Solar-Terrestrial Physics</i> (Elsevier)	1.12
<i>Planetary and Space Science</i> (Elsevier)	1.07
<i>Radio Science</i> (AGU)	0.92

Space weather applied research also appears occasionally in journals published by engineering societies such as the Institute of Electrical and Electronics Engineers, the American Institute of Aeronautics and Astronautics, and the American Astronautical Society.

There currently is no publication that focuses on both the science and applications of space weather. Existing publications are predominantly focused on basic research (*JGR*, *JASTP*) or specific applications areas (engineering journals).

### **3. Proposed Space Weather Research and Applications Publication**

#### *Scope Statement*

The purpose of this new space weather publication will be to foster the research-to-applications information transfer by forming a bridge between researchers, forecasters, and users of space weather data. The name of the publication – “Space Weather: The International Journal of Research and Applications” – clearly states this focus. The publication will:

- provide an authoritative source of technical information critical to the research and applications community,
- advance the growth and development of this emerging community by providing an active communication forum between the diverse segments of this community, and
- inform and engage key government and corporate decision-makers involved in space weather research and applications about the advances and needs of the community.

The publication would be a central information “hub” for the many different segments of the space weather community, providing a comprehensive resource of valuable information and an effective means of communication. The publication furthers AGU’s mission to “welcome researchers from across the physical, mathematical, and life sciences who share our interest in

understanding the Earth and its space environment and those who seek to *apply this knowledge to the solution of problems that face mankind.*” (AGU Plan 2001-2004, 13 June 2001)

### *Content*

The publication will contain two very different types of content to address the different components of the scope statement. This “hybrid” publication provides both the archival-quality technical information of a traditional journal and the “current events”/commentary information of a newspaper or newsletter.

1) As an authoritative source of technical information, the publication will contain peer-reviewed articles on space weather research and applications, including:

- descriptions of space weather events
- model development and validation studies
- new data resources
- analysis of impacts on engineered systems
- invited reviews and tutorials

Authors will be encouraged to provide relevant electronic auxiliary material with these articles, such as data sets.

The publication will also contain summaries of new space weather research results published in the major research journals. Subscribers will also have the option to directly access new space weather articles in AGU journals via an Editor’s Choice-style virtual journal collection.

2) A forum for the diverse segments of the space weather community:

- news reports and feature articles on major developments, events, and policies from around the world
- descriptions of space weather programs and missions
- discussion and commentary on major issues facing the community
- announcements of upcoming events and new information resources

### *Editorial Structure*

This hybrid publication faces the dual challenge of publishing peer-reviewed technical papers that meet AGU standards as well as news and feature articles that cover a wide range of topics and appeal to a non-specialist readership. To meet this challenge, the publication will have a lead Editor and a team of Associate Editors (3-4) in the relevant scientific and engineering disciplines to peer review the technical articles. The Editor will be responsible for peer-review of technical article submissions following general AGU guidelines. (These guidelines may need to be adapted by the Editor to meet the unique requirements of the publication’s application-oriented submissions.) The number of manuscripts submitted will grow from 12 to 48 in the first 4 years.

In addition, the publication will have an Editorial Advisory Board (6-8 members) composed of representatives from the major audience sectors and geographic areas to advise the Editor and staff on news and feature content. The Editor will provide general direction and oversight for the

“magazine” section, which will be managed and edited by a staff editor/writer. Content in this section will include manuscripts submitted by members of the community or written by the staff editor/writer (similar to the way in which *Eos* is produced). Contributed manuscripts will be reviewed by individual members of the Board. The staff editor/writer also coordinates online and print production.

#### *Publication Format*

The primary publication medium for this publication will be the World Wide Web. The online version will be the version of record. (A survey of Space Weather Week 2002 attendees did not discern a strong preference for print over online among either basic researchers or applied users.) Subscribers will have access to a dedicated AGU Web site containing both the technical articles (in HTML and PDF format) and the news content.

New content will be posted on the Web site monthly or more frequently, with regular e-mail alerts being sent to subscribers to notify them of the latest updates. The electronic format allows the technical articles in this publication to be incorporated into AGU’s existing suite of “virtual journal” products and online bibliographic search tools. Subscribers to the publication will have access to the standard online features of other AGU journals.

A print companion to the Web site will be published for a limited time as a mechanism to market the online publication to its broad and widely scattered target audience. Once the print edition’s circulation-building objective has been achieved, it will cease publication. The cost of publishing both print and online is not sustainable at the projected subscription rates and circulation of this publication.

The print edition will be a 4-color magazine format (32 pages + cover) that will include all of the online news content, summaries of the online technical articles, and 1-2 of the technical articles. (Articles with the broadest appeal will be selected by the Editor for publication in the print version following initial online publication.) The print edition will be published quarterly.

#### **4. Business Plan Summary**

Revenue for this publication will be entirely from subscriptions. Neither page charges nor advertising revenues are included in the business plan. Given the relatively small number of papers to be published, author page charges would not be a significant revenue source. While the potential exists for advertising revenues from space weather-related businesses, the small size of the nascent vendor community and the low projected circulation of this publication would prevent advertising from being a significant revenue source, at least during the publication’s early years.

The National Science Foundation has expressed interest in supporting the launch of *Space Weather* during its first 3-5 years. If this proposal is approved by AGU Council, staff will submit an application to NSF for Fiscal Year 2003 funding this summer.

### *Circulation and Subscriptions*

- Online access would be unrestricted (free) during the first year to encourage readership. Once paid subscription access goes into effect in the 2<sup>nd</sup> year, a portion of the online news content will continue to be unrestricted.
- The print edition will be published quarterly. It will be distributed free to a broad list of potential subscribers (~2000 in 1<sup>st</sup> year, ~1000 in 2<sup>nd</sup> year) using available mailing lists of the space weather community and then to paid subscribers in subsequent years. We plan to publish 5 years of the print edition.
- Subscription rates will accommodate the potentially significant audience of individual subscribers who are not AGU members. Initial annual rates will be \$30 for AGU members; \$90 for individuals (non-members); and \$300 for institutions.
- Projected circulation: 300 individuals, 90 institutions in the 5<sup>th</sup> year; 360 individuals and 110 institutions by the 9<sup>th</sup> year.

## **5. Establishing a Strategic Publishing Partnership**

The success of this publication requires AGU to reach beyond its traditional constituency to a more applied user audience not currently served by AGU programs. Consequently, a strategic partnership will be established with a major space weather organization prior to launching the publication.

Preliminary discussions regarding co-sponsorship have been held with David Boteler, the new director of the International Space Environment Service (ISES). ISES represents 12 national space weather alert and forecasting services (including NOAA) with extensive user contact lists and well-visited Web sites. ISES operates within URSI, an organization that co-sponsors AGU's *Radio Science* journal. An association with ISES would provide not only an international marketing partner but an important information channel with the forecaster/user community.