Future Professional Communication in Astronomy
(Eds. A. Heck & L. Houziaux, Mém. Acad. Royale Belgique, 2007)

THE JOURNALS OF THE AMERICAN ASTRONOMICAL SOCIETY

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Abstract. The history, current status and future development of the AAS journals are presented hereafter. Better connectivity to the underlying processed data presented in refereed manuscripts, ease-of-use features such as reference water marks on figures and development of a community-focused portal are among the many new features currently under consideration. The goal for the AAS journals in the future is to be more central in the day-to-day research life of astronomers while maintaining our low cost to both subscribers and authors and the high quality of our journals both online and in print.

1. Introduction

The journals of the American Astronomical Society play a leading role in the dissemination of astronomical and astrophysical knowledge. They are central to the research efforts of most astronomers. However, *The Astrophysical Journal Part I*, *Astrophysical Journal Supplement Series*, *Astrophysical Journal Part II Letters*, and *The Astronomical Journal* are in a period of transition. The journals are changing publishers, from the University of Chicago Press to the Institute of Physics Publishing. As the AAS transitions the journals, we will continue to enhance their value to astronomical researchers worldwide. As we move toward the future, the Editors of our journals, the AAS Publications Board and the AAS Council are all committed to maintaining the current excellence of our journals and their preeminence in our field. We will accomplish this goal by moving to an online-only publishing model (with a printable version of articles always

available), by developing features valued by readers and authors and developing direct access to the underlying data presented in the papers published in the journals.

Future developments in scientific publishing will take place at an ever-increasing pace. New technologies, new ways of communicating and new ways of sharing information are driving scientific publishers to innovate and renew their journals constantly. The AAS is committed to the active development and evolution of our journals over time. Having been among the first scientific journals to move online, we hope to remain on the cutting-edge of scientific publication in the future.

Additionally, the AAS is committed to working with other astronomy and astrophysics publishers to establish standards that simplify and enhance the interconnectedness of our journals, the underlying data presented in the archives and connections to data archives and repositories. The early vision for an interconnected astronomy resource is essentially a reality, needing only attention and enhancement to greatly benefit our scientific discipline. Substantial issues are yet to be resolved. Who will archive electronic journals? What is the role of libraries in the digital age? How will we reference electronic content when volumes and issues do not get disseminated in a paper format? These questions and many more require answers, some now, some soon and some in the far future. As publishers, we must engage all communities as our journals evolve. Authors, readers, librarians, the general public and our fellow publishers all have a place at the table. The future for professional communication in astronomy is bright and the AAS is committed to the future of our journals as a central facet of professional astronomy communication.

2. History

2.1. THE ASTROPHYSICAL JOURNAL

The Astrophysical Journal was founded in 1895 by George E. Hale and James E. Keeler. *The Astrophysical Journal* is the foremost research journal in the world devoted to recent developments, discoveries, and theories in astronomy and astrophysics. Many of the classic discoveries of the twentieth century have first been reported in the Journal, which has also presented much of the important recent work on quasars, pulsars, neutron stars, black holes, solar and stellar magnetic fields, X-rays, and interstellar matter. In addition, videos that complement specific issues are periodically available. The journal was acquired by the AAS in 1972 through the efforts of its editor, Subrahmanyan Chandrasekhar, following the suggestion of Otto Struve, who, like Chandra after him, served as editor of the ApJ. The journal is published as three issues per month. *The Astrophysical Jour-*

nal Part II, Letters is published bound separately, but published under the same ISSN. It is dedicated to the very rapid dissemination of new results and has a page limit on any communication of four pages, subject to Editor discretion. The current Editor-in-Chief of *The Astrophysical Journal* is Ethan T. Vishniac, with Associate Editor-in-Chief, W. Butler Burton. *The Astrophysical Journal Part II, Letters* have a separate editor, who is currently Christopher Sneden.

The Astrophysical Journal Supplement Series has been published since 1953 in conjunction with *The Astrophysical Journal*. Designed to bring substantial, extensive support to the material found in the Journal, *The Astrophysical Journal Supplement Series* contains many of the most frequently cited papers in the astronomical literature. A recent innovation in this separate title is the introduction of the so-called Special Issue, where an entire issue is dedicated to papers related to one telescope, space mission, or subject theme. Such issues are created by the Editor-in-Chief in response to queries from interested parties. *The Astrophysical Journal Supplement Series* is published in one volume per month.

2.2. THE ASTRONOMICAL JOURNAL

The Astronomical Journal was established by B.A. Gould in 1849 and published by him until the Civil War began in 1861. Gould served behind the lines in a support role. After the war, Gould moved to Argentina and only returned to the United States in 1886. He took up the publication of the journal again in 1886, ending a gap of 25 years in its publication. It has been published continuously since that time. The journal was acquired by the AAS in 1972. The editor at that time, Benjamin Boss, no longer wanted to maintain it and felt that the AAS would be the right entity to take on its publication. The happy circumstance of a large donation to the Society for the express purpose of acquiring a journal in the years just prior to 1972 allowed the AAS to take on its publication.

The Astronomical Journal provides expanded coverage of quasars, galaxies, supernova remnants, and studies of the interstellar medium that complements the more traditional areas of astronomy, including galactic structure and dynamics, astrometry, variable and binary stars, solar system studies, and cosmology. With an emphasis on observational papers and a generally short publication time, *The Astronomical Journal* attracts many seminal papers, and is an indispensable journal for serious astronomers.

The current Editor-in-Chief of *The Astronomical Journal* is John S. Gallagher III, with Associate Editor-in-Chief, Margaret M. Hanson.

A longer description of the history of the AAS journals (and the AAS generally) is available in "The American Astronomical Society's First Cen-

tury", edited by D. Devorkin.

3. Current Status

As stated earlier, the journals are transitioning from being published by the University of Chicago Press to publication by the Institute of Physics Publishing (IOP). IOP is based in Bristol, England and will use a distributed production solution to support the peer-review, copyediting, typesetting and production of the AAS Journals.

As the transition takes place, the AAS will hold page charges and subscription rates flat. No journal policies will be changed. This means that access to content older than two years will continue to remain free to all. The AAS Publications Board is considering reducing the subscriber proprietary period to one year, but has not yet made this decision.

Copyright agreements between authors and the Society will remain the same. The current copyright agreement grants significant use back to the author in the form of a license. This includes, but is not limited to, the right of the author to post their article on their own home page in its final electronic form and to submit the article to online preprint services.

During the transition, it is possible that problems with submission of articles, fulfillment of subscriptions or other unknown problems could develop. The AAS takes the satisfaction of all its authors, readers and subscribers very seriously and will work with IOP during the transition to minimize any such difficulties. A special email address[1] has been established as an instantaneous way for such problems to be addressed. This email address is delivered directly to the Executive Officer and Journals Manager and represents the AAS pledge to resolve all issues as quickly as possible.

The Astronomical Journal will begin accepting manuscripts under the new IOP submission system as of 1 September 2007. The first issue published with IOP will be the 1 January 2008 issue. *The Astrophysical Journal Part I* and *The Astrophysical Journal Supplement Series* will begin accepting manuscripts under the IOP submission system as of 1 September 2008, while *The Astrophysical Journal Part II, Letters* will begin accepting manuscripts through IOP later that fall. The first issue of all of these journals to be published by IOP will be the 1 January 2009 issue.

4. The Future

The AAS journals are currently focused on the transition from UCP to IOP, but much thought has been invested in the future evolution of the journals. With the establishment of a Journals Manager position within the AAS,

[1] `journals.transition@aas.org`

more rapid development, while maintaining production standards will be possible.

Plans currently include enhancing the downloadable figures available in the online version through the addition of a discrete watermark. The watermark will include the figure citation and the copyright mark of the journal. This watermark is a benefit to scientists, who routinely download the figures of the journal for inclusion in digital presentations. It is also a benefit to the AAS, clearly indicating the owner of the copyright and enabling potential users of the figure to determine who should be contacted regarding figure reproduction.

Another short-term goal is the modification of the page charge system for full electronic publication and the eventual elimination of print versions of the journal. A printable copy of an article will always be available, but the typesetting process will not be driven by the production necessities of a print version. As we transition to e-only publication, the way authors are billed for the processing and publication of their papers will have to be modified, including the elimination of the current charge for color figures and a change from billing for strict page counts to another model that fully covers the cost of handling text, tables, figures and other materials in the online publication mode. Changes in the page charge system are not anticipated until after the transition to IOP has been completed.

A future goal for the journals is to enhance the journals by providing access to the underlying data presented in research articles. This will require change in the manuscript submission process so that underlying data and appropriate meta-data can be collected with minimal effort by the authors. The AAS is currently pursuing a funded research effort in this area, with partners in the library, virtual observatory, and broader physical science research community.

Our long-term goal is to make the journals more central to the research day of astronomers worldwide. We will accomplish this goal by exploring new technologies and information provision systems with an eye toward enhancing the journals for our authors, readers and subscribers. The journals of the future may not look exactly like the journals of today, but they will perform their role better and will be an ever-present part of the astronomy research process.

5. André's Challenging Questions

At the conference for which this contribution is being prepared, André Heck presented the gathered attendees with a list of complaints of the publishing astronomer[2]. I was struck by these questions. I have heard the complaints

[2]Cf. Table 1 of his introductory talk in this volume.

from my colleagues and have since asked others if they had similar concerns. I have received nearly universal agreement that these complaints are real. As such, it is important that publishers respond to them. I have listed the questions here along with ways in which the AAS journals have attempted to address these problems.

5.1. PUBLISHERS ARE PUTTING ON US MORE AND MORE TECHNICAL REQUIREMENTS.

Some of our authors like to use LaTeX to prepare their documents. Some do not. Most do not know that much of the detailed layout capability that LaTeX provides them is disregarded during the publication process. Building and assembling tables is time consuming. Tracking and inserting references in a manuscript is time consuming and sometimes difficult, especially with varied information requirements from different publishers. Creating proper figures for publication is hard work. Providing access to supplementary information is also time consuming and challenging. All of the new technology available provides greater opportunity to enhance publications, but too often the author is burdened by additional requirements. The AAS has tried to make many of the tasks easier for authors, such as creating a LaTeX table generator and providing lookup capability for keywords, however much remains to be done. Each new possible enhancement should factor in the additional work required of authors and weigh this added burden against the benefit to the discipline.

5.2. WE ARE DELIVERING A FINALIZED PRODUCT FOR WHICH WE ARE NOT PAID.

Authors do significant work to produce their manuscripts. However, publishers provide significant improvements to the submitted manuscript. From the peer-review process to copyediting to typesetting as well as online presentation, cross-referencing and indexing and other value-added enhancements (not to mention distribution) publishers significantly enhance the work of their authors. The publication process should be viewed as a partnership and the publisher should never forget this. Working with authors to efficiently disseminate scientific knowledge of high quality should be our goal.

5.3. WE HAVE THE MEANS TO DO EVERYTHING OURSELVES AT LOWER COST.

At first glance, this would appear to be true in the modern era. However, managing the peer-review process and enhancing manuscripts through

copyediting and typesetting are important functions not yet shown feasible by individual collections of authors. Additionally, who will ensure the long-term availability of information? Self-published manuscripts on individual authors web pages or blogs are already going missing only a few years (or less) after creation. Scientific results are too valuable to allow them to disappear. Publishers must work with authors and librarians to ensure longevity of scientific knowledge. The issue of costs is an important one and publishers must pay attention to this author complaint. Costs must be kept low, while quality must be kept high.

5.4. PUBLISHING DELAYS ARE TOO LONG AND THE OUTCOME IS NOT ALWAYS SATISFACTORY.

The AAS has worked very hard with our publisher and will continue to do so in the future to keep time to publication as short as possible. Most delay in time to publication for our journals is now author-related, with the bulk of the delay coming from delayed submission of revisions after the peer-review process. What is certainly unacceptable is a modification or change of the manuscript after the peer-review process of which the author is not aware (leading to dissatisfaction). The AAS actively involves the authors during the typesetting process so that the author themselves is aware of any typesetting or copyediting changes suggested by the publisher. Ultimately, the editors may resolve disputes between authors and copyeditors or typesetters about the presentation of a manuscript in the journal. We have few complaints right now about the final outcome of our publication process.

5.5. THE PRICES (BOOKS/JOURNALS) ARE MUCH TOO HIGH.

The subscription cost for AAS journals is among the least expensive of all astronomy and astrophysics publications on a per-page basis. This is due to our distributed revenue model. We collect page charges from authors to offset the costs of peer-review and collect subscription revenue to offset the cost of producing and distributing copies of our journals. The page charges have dropped substantially in the last several years (as pointed out by former AAS Executive Officer Bob Milkey[3]) and are now as low in a real sense as they have ever been. After the transition of our journals to a new publisher is complete, the page charges will likely drop and there will be modifications to other author-related costs. Subscription increases

[3]Milkey, R.W. 2006, The Scholarly Journals of the American Astronomical Society, in *Organizations and Strategies in Astronomy – Vol. 7*, Ed. A. Heck, Springer, Dordrecht, 241-261.

will continue to be low and justified by the increased costs of creation, distribution and archiving of our journal content.

5.6. WHY SHOULD WE PAY SO MUCH TO GET BACK INFORMATION THAT WE INITIALLY PROVIDED?

For this complaint, publishers must continually explain and justify the value they add to a submitted manuscript. Most authors recognize that their manuscript is significantly enhanced by their chosen publisher. Publishers cannot sit back and assume an arrogant attitude. The value of a printed, bound volume is decreasing, we must enhance and evolve our journals to provide value to our authors, readers and subscribers as technology changes.

5.7. WE LOSE ACCESS TO ARCHIVES IF WE STOP SUBSCRIBING TO DIGITAL EDITIONS.

It is the position of the AAS that archival versions of our electronic journals should be freely available to the research community. After a short (currently 2 year) proprietary period during which only subscribers have access to our journal content, all materials are freely available to all. We will maintain this policy as the AAS feels that the information published in our journals is not ours, but the shared common property of all. It is likely that our proprietary period will decrease to one year. We will never charge for access to older content.

5.8. SOME ILLUSTRATIONS ARE NOT AVAILABLE ONLINE (OR AVAILABLE ONLY IN COLOR ONLINE).

Currently, the AAS does allow authors to have color figures in the online version of the journal (the version of record) only, while appearing in print in black and white. As we move forward with our transition, this option is likely to go away mainly due to the decreased costs in handling color figures and the growth in numbers of color printers. The AAS will continue to enhance the online version of our journal and guarantee that a printable version of a given paper is always available.

Acknowledgments

The author acknowledges conversations with Mike A'Hearn, Ethan Vishniac, John S. Gallagher and other members of the AAS community that helped with the preparation of this manuscript.