AMERICAN ASTRONOMICAL SOCIETY

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The American Astronomical Society (AAS) appreciates the opportunity to submit comments in response to the Request for Information concerning Public Access to Peer-Reviewed Scholarly Publications Resulting From Federally Funded Research [FR Doc. 2011-28623].

Sincerely yours,

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Request for Information: Public Access to Peer-Reviewed Scholarly Publications Resulting From Federally Funded Research

[FR Doc. 2011-28623]

Submission from the American Astronomical Society

The mission of the American Astronomical Society is to enhance and share humanity's scientific understanding of the Universe.

The American Astronomical Society (AAS) is the major association for professional astronomers in the United States, with over 7500 members. One of its primary functions is the publication of the key North American scientific journals dedicated to the dissemination of peer-reviewed research in astronomy and astrophysics, the *Astrophysical Journal* and the *Astronomical Journal*. As a society of research and higher education professionals, we have made a concerted effort to conduct our scholarly publishing enterprise with sensitivity to and balance among the need for prompt and inexpensive access to new results, the pressures on the budgets of technical libraries, and the challenges of obtaining grant and institutional funding to support author fees. We have struck this balance in several ways:

- The journals' revenues are nearly evenly distributed between subscriptions and author charges. Receipts from author fees permit us to charge very low subscription costs to individual members for electronic content, and low institutional subscription rates, appropriate for a not-for-profit scholarly publisher.
- Fees charged to authors are nominal. In return for payment of publication charges, authors are granted generous rights for the use of their published material to meet professional needs and institutional obligations.
- In consideration of paid subscriptions, there is a limited proprietary period (12 months) before full public access is granted.

This approach has allowed the Society to maintain the integrity of its editorial and peer review processes, critical for maintaining quality and integrity in the dissemination of scientific results. We are unaware of any substantial dissatisfaction among professionals or the general public with the modes that are currently used for disseminating astronomical information.

Questions from the RFI

1. *Are there steps that agencies could take to grow existing and new markets related to the access and analysis of peer-reviewed publications that result from federally funded scientific research? How can policies for archiving publications and making them publically accessible be used to grow the economy and improve the productivity of the scientific enterprise? What are the relative costs and benefits of such policies? What type of access to these publications is required to maximize U.S. economic growth and improve the productivity of the American scientific enterprise?*

   Agencies should ensure that there are policies and full institutional support for the payment of author fees with agency funding. Payment of author fees with funds from NSF awards has a long tradition at the NSF. The practice needs to be accepted by all US agencies that fund scientific research.

We find it doubtful that such policies will have substantial impact on the economy. Policies about archiving the scholarly literature have been in place for centuries, and those policies have served scientific productivity by supporting good practices of scholarship. Making the scholarly literature publically accessible has always been a secondary consideration in the adoption and implementation of these policies (maximizing the productivity of the scientific enterprise is the primary reason), but the public has always had access to the literature nonetheless, through college and university libraries and in some regions public libraries. In the case of the AAS specifically, the rights that the Society grants back to authors permits those authors to share their published articles with other individuals. That sharing usually occurs between mentor and student or among researchers that share in interest in a particular research problem, but there is nothing to prevent AAS authors from sharing research papers with the public. Authors are free to share their scholarly articles with interested members of the general public, and also with journalists and educators who prepare content for public consumption – in text books, newspaper and magazine stories, planetarium shows and science museum exhibits, broadcast media productions, etc.

2. *What specific steps can be taken to protect the intellectual property interests of publishers, scientists, Federal agencies, and other stakeholders involved with the publication and dissemination of peer-reviewed scholarly publications resulting from federally funded scientific research? Conversely, are there policies that should not be adopted with respect to public access to peer-reviewed scholarly publications so as not to undermine any intellectual property rights of publishers, scientists, Federal agencies, and other stakeholders?*

   Final research reports are required by funding agencies at the conclusion of grant periods. Arguably, it is these reports that provide the most direct assessment of the research conducted with specific grant funds. By comprehensively providing access to final research reports, agencies would address the need of the public to obtain accurate information about how specific grant funds translated into particular research results.

3. *What are the pros and cons of centralized and decentralized approaches to managing public access to peer-reviewed scholarly publications that result from federally funded research in terms of interoperability, search, development of analytic tools, and other scientific and commercial opportunities? Are there reasons why a Federal agency (or agencies) should maintain custody of all published content, and are there ways that the government can ensure long-term stewardship if content is distributed across multiple private sources?*

   Some nominal economy of scale accrues to centralized projects, but only if the materials collected are amenable to identical processes and policies. The range of policies and practices for disseminating information among the scholarly disciplines is substantial, and the differences exist for reasons that need to be respected and protected. More to the point, there are already repositories for literature supporting the various scholarly disciplines. Those platforms already perform the necessary services, and they exist in an obviously decentralized infrastructure. It would be better for the government to take advantage of the existing apparatuses, policies, and bodies of expertise that are distributed effectively already.

   There are no plausible reasons for Federal agencies to assume custody of all published content. Long-term stewardship of the scholarly literature has motivated the invention of technologies and policies in the academy for a very long time. The publishing, library, and higher education communities came together on their own, driven by obvious needs and

benefits for scholarship, to create services such as LOCKSS [1] and Portico [2] that provide sustainable infrastructure for long-term preservation.

4. *Are there models or new ideas for public-private partnerships that take advantage of existing publisher archives and encourage innovation in accessibility and interoperability, while ensuring long-term stewardship of the results of federally funded research?*

   It is possible to connect award identifiers mentioned in articles in the scholarly literature to the corresponding final research reports held at Federal agencies.

5. *What steps can be taken by Federal agencies, publishers, and/or scholarly and professional societies to encourage interoperable search, discovery, and analysis capacity across disciplines and archives? What are the minimum core metadata for scholarly publications that must be made available to the public to allow such capabilities? How should Federal agencies make certain that such minimum core metadata associated with peer-reviewed publications resulting from federally funded scientific research are publicly available to ensure that these publications can be easily found and linked to Federal science funding?*

   Agencies should be aware of existing efforts already underway, they should join or participate in those efforts as may be appropriate, and they should clearly endorse those efforts that are accomplishing important objectives. CrossRef [3] is an example of a highly effective service, one that assembled comprehensive participation among organizations involved in scholarly publishing. The consortium that created CrossRef for article linking has also developed a variety of other services that support scholarly communication. Other organizations modeled on CrossRef have also convened to address other concerns in this problem space. ORCID [4] is a project to investigate and resolve the need for the unambiguous identification of contributors to scholarly communication. DataCite [5] is a coalition initiated in the library community to create an infrastructure for the identification and linking of data sets.

   The minimum metadata elements that are applicable for the scholarly literature are most likely those identified in the Dublin Core [6]. Beyond that core, metadata that are helpful for exploring the literature in a particular discipline is discipline-dependent.

   Agencies should join, participate in, or more efficiently, just be aware of efforts in the scholarly arena that define metadata element sets. This problem will take care of itself in the academy simply out of self-interest; the government does not need to intervene.

6. *How can Federal agencies that fund science maximize the benefit of public access policies to U.S. taxpayers, and their investment in the peer-reviewed literature, while minimizing burden and costs for stakeholders, including awardee institutions, scientists, publishers, Federal agencies, and libraries?*

   The most direct action the government could take would be to provide for comprehensive taxpayer access to final research reports. Federal agencies could also support smaller libraries, community colleges, university alumni associations, and so forth, to obtain access to portions of the scholarly literature that might be of interest.

   It is worth recognizing that the public obtains most of its knowledge about astronomy and astronomical research from non-scholarly sources: text books, newspaper and magazine stories, planetarium shows, science museum exhibits, broadcast media productions, and so on. These outlets offer the public clearly interpreted communication about scientific research

broadly – whether the research was publically funded or not – and the producers all have business models that allow them to persist. The only burdens on the academy are that researchers publish results in the scholarly literature, and for researchers to be available to the journalists and educators who prepare these communications for the public. These mechanisms have been operative for decades in astronomy, because the community in the broadest sense recognized years ago the merits of communicating scientific results with the wider public.

7. *Besides scholarly journal articles, should other types of peer-reviewed publications resulting from federally funded research, such as book chapters and conference proceedings, be covered by these public access policies?*

   It is our view that to pursue these additional categories of the literature is to go in the wrong direction. We have already stated that the primary purpose of the scholarly literature is to enhance the scientific research process, and to improve its productivity, not to inform the general public about science. The public is much better informed through other channels that are far more accessible and understandable than the scholarly literature.

8. *What is the appropriate embargo period after publication before the public is granted free access to the full content of peer-reviewed scholarly publications resulting from federally funded research? Please describe the empirical basis for the recommended embargo period. Analyses that weigh public and private benefits and account for external market factors, such as competition, price changes, library budgets, and other factors, will be particularly useful. Are there evidence-based arguments that can be made that the delay period should be different for specific disciplines or types of publications?*

   We reiterate our response to this question when it appeared in the RFI two years ago: we endorse the recommendation of the Scholarly Publishing Roundtable [7] that embargo periods be established between publication and public access that are discipline-specific. The AAS strives to maintain an adaptable business model, but an abrupt devaluation of subscriptions has consequences for researchers and for their funding. Maintaining a proprietary period, however limited, is an acknowledgement of the value and importance of subscriptions for maintenance of quality editing and peer review. The length of time that large-scale repositories of digital journals have existed is not long enough compared with reasonable embargo times for there to be sufficient data to draw a meaningful objective conclusion, in our opinion. The proprietary period for AAS journals is currently 12 months. We have reduced the period over the last 15 years from 5 years to 12 months without significant loss of perceived value in subscriptions, although this is a judgment on the Society's part and is not based on analysis of any particular data.

Please identify any other items the Task Force might consider for Federal policies related to public access to peer-reviewed scholarly publications resulting from federally supported research.

We believe it would be worthwhile for the Task Force to consider the effectiveness of the AAS business model. As mentioned above, we derive revenue from two sources – authors/researchers and libraries/scholars – in an equitable fashion. These two groups are chosen not just opportunistically: they reflect the scientific and scholarly activities of creating one's own work while building on the work of others. We collect revenue from individual scientists in the form of author charges. We collect revenue from scholars as a class in the form of library

subscriptions. Because we balance the income from these two sources, neither group is overburdened financially: our author charges are among the lowest (of journals that charge author fees), and our library subscriptions are quite low for journals of substantial size. The relatively low subscription prices make our journals accessible to more libraries, resulting in a wider distribution of the journals – which is good for the researchers and good for the Society in addressing our mission. The library community understands and respects our approach. They consider our journals exceptionally good values, and consequently they are loyal subscribers. That librarian loyalty in turn allows us to employ a policy of delayed open access (the current embargo period is 12 months) with no discernible deleterious effect on our renewal rates. We acknowledge that this model is not applicable for all scientific disciplines, but it works remarkably well for astrophysics.

The AAS holds the copyright in the articles it publishes. We obtain the copyright primarily so that the Society can manage rights after authors have passed away, an activity we regard as important for maintaining the integrity of scientific communication. We grant virtually all usage rights back to authors during their lifetime (as do the vast majority of learned society publishers). The combination of the business model and the AAS' generous return of re-use rights to authors satisfies the public's interests as well as those of professional astronomers. In addition to their colleagues, authors are free to share their scholarly articles with interested members of the general public, and also with journalists and educators who prepare content for public consumption.

In an article published in July 2011, Davis and Walters [8] remark that "[c]urrent research reveals no evidence of unmet demand for the primary medical or health sciences literature among the general public." The journals published by the AAS present a useful environment for examining whether the public is inhibited by pay walls when accessing the primary literature in astronomy, and even for judging the public's level of interest in that literature in the first place.

The AAS journals employ a policy of delayed open access to make the backfile accessible at no charge. As of 1 January 2012, the AAS has published over 120,000 articles in its journals. More than 115,000 of these articles are available free. All the metadata for the astronomical literature is aggregated in a service called the Astrophysics Data System [9] (ADS), which is housed at the Center for Astrophysics (CfA) on the edge of the Harvard University campus in Cambridge, Massachusetts. The vast majority of professional astronomers access the literature via ADS, and the majority of the referrals for the astronomical literature from Google are also routed through ADS. The ADS platform is, therefore, a source of rich web usage statistics about the patterns of use of the astronomical literature.

In an attempt to understand how the public uses the astronomical literature, we analyzed ADS' usage logs from November 2011 and counted the number of outbound referrals to AAS journals, dividing them into categories of professional vs. public requests. The public requests are taken to be those referred to ADS from Google that are *not* associated with known network addresses of astronomical institutions. We also distinguished requests for embargoed (pay wall protected) articles from requests for open access articles. The rate of usage of the journals by the public is the same – 1.3% – regardless of whether the content is access controlled or not. These percentages represent a fairly small absolute number of hits: about 3600 per month, if November 2011 is typical.

If the premise were true that the public really wants access to the primary scientific literature and its only barrier is the pay wall, we would expect a larger fraction of usage by the public of the free articles. To the contrary, we see no increased usage.

Astronomy is a popular subject with the public. If the premise were true that the public wants to access the primary literature *at all*, we would expect to see much higher rates of activity by an interested public, especially in comparison to the rather tiny population of professional astronomers. As an independent indicator of the public's interest, we might presume that the number of pay-per-view acquisitions of articles is a reasonable proxy. IOP processes fewer than 10 per month for the AAS journals. This also suggests a negligible interest by the public in the primary literature for astronomy.

It appears that neither of these premises is valid for the discipline of astronomy. Rather, we contend that these goals are well achieved through channels that are far more accessible and understandable than the scholarly literature.

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