



To: The Office of Science and Technology Policy

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Re: Response to November 4, 2011, Request for Information, Office of Science and
Technology Policy, Public Access to Peer-Reviewed Scholarly Publications Resulting from
Federally Funded Research, FR Doc: 2011-28623

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The Optical Society of America (OSA) is pleased to provide comments in response to the above-referenced November 4, 2011 "Request for Information" (RFI). We welcome the opportunity to continue to work with OSTP and other federal partners on this issue.

While OSA strongly supports the dissemination of scientific research to the public at large, this must be balanced by sustainable revenue needs of non-profit scientific organizations like OSA whose mission is to foster programs in optics and photonics science, technology and education.

In addition, any mechanism for compliance with open access requirements should not be overly burdensome and prescriptive so that the increased costs and administrative burdens associated with it do not negatively impact cost sensitive non-profit scientific organizations like OSA.

About OSA and Optics

Founded in 1916, OSA was organized to increase and diffuse the knowledge of optics, pure and applied; to promote the common interests of investigators of optical problems, of designers and of users of optical apparatus of all kinds; and to encourage cooperation among them. Based on the science of light, optics and photonics are specialized fields of physics and engineering. From fiber optics and telecommunications to medical imaging and cancer research, optics and photonics are advancing today's critical technologies.

OSA's mission is to promote the generation, application and archiving of knowledge in optics and photonics and to disseminate this knowledge worldwide. The purposes of the Society are scientific, technical and educational. OSA's commitment to excellence and long-term learning is the driving force behind all its initiatives.

Uniting more than 130,000 professionals from 175 countries, the OSA brings together the global optics community through its programs and initiatives. OSA publications, events, technical groups and programs foster optics knowledge and scientific collaboration among all those with an interest in optics and photonics.

OSA Journals

Since 1917, OSA has set the standard of excellence in peer-reviewed optics and photonics research. As a non-profit science publisher, OSA plays a central role in the process by which research is developed, communicated, disseminated, and ultimately consumed by the scientific community and the general public. Today, OSA publications include 15 broad-based journals, one magazine, *Optics and Photonics News* (OPN), and a comprehensive conference proceedings series. To produce these high-quality, well-respected publications, OSA invests an extensive level of resources (staff, volunteers, financial) annually on peer review, editorial management, production, promotion, printing, distributing, and hosting its publications on a fully digital, reliable online platform, making the content available at all times to consumers around the world.

Whether an article is read online or in print, high-quality peer review, page composition (XML), copyediting, and the listing and linking of bibliographic and reference data must be managed, necessitating considerable human capital investment in staff at our Washington DC office. Our 300 scientific editors maintain the quality and reputation of our journals, utilizing OSA's own well-established system of peer review, whereby independent experts in the field review submitted articles. Accepted articles are those that meet OSA established criteria, including novelty and the substantial nature of the research findings. Managing the peer review process is a complex undertaking for OSA. To effectively and efficiently handle the 13,000+ articles submitted to OSA annually requires a large ongoing investment in sophisticated electronic resources, associated support personnel, around 300 editors and help from tens of thousands of referees—many of which require significant training and support, especially the next generation of scientific professionals and students. Each year OSA makes such necessary investments to fulfill its public nonprofit mission, generating an intellectual return through the dissemination of scientific research.

Currently, three OSA journals are produced using an all-electronic or online only format. OSA employs the "Gold" open access business model (ie: supported by author publication fees) for these journals, and the content is available to the public free of charge. Additionally, all three of the journals regularly receive significant exposure to the general public via such mainstream media outlets as the New York Times, BBC, Scientific American, and Time magazine.

Optics Express (OpEx), OSA's first open access journal was launched 15 years ago and is well-known within the optics and photonics field for its 60-day rapid time-to-publication. It is currently ranked number 2 by the total number of cites (46,603) and number 5 by Impact Factor (3.749) out of 78 journals listed in the Optics category of the Thomson Reuters 2010 Journal Citation Reports (JCR). Additionally, OpEx is currently ranked number 12 of all 8,073 journals tracked by the JCR. This reflects not only its importance in the field of optics and photonics but in scientific publishing overall. Today, OpEx publishes more than 3,000 peer-reviewed articles annually, which is half of all OSA papers published each year, and these articles reflect new developments of interest to the optics and photonics community in all fields of optical science and technology.

OSA's journals are all hosted on Optics InfoBase, its digital library. Optics InfoBase is an online, searchable archive of all of OSA journals and conference proceedings that dates back to 1917. It includes more than 200,000 articles and the proceedings from 360 conferences. Using Optics InfoBase, visitors can freely review and retrieve all of OSA's open access articles, read abstracts for all

articles at no charge, and gain access to free products like “Spotlight on Optics.” “Spotlight on Optics” features journal articles from OSA’s subscription and open access journals that have been nominated by OSA’s Editors. These Spotlight articles are freely available on Optics InfoBase, and each is accompanied by an original summary written in plain English to extend the reach of the technical content.

In addition to OSA’s investment in open access journals and content, the society also publishes 12 subscription-based journals. These journals represent over 70% of all revenues for OSA. It is important to note that these revenues are then reinvested back into critical science and engineering programming. All of the educational and scientific programs OSA creates support both current and future generations of the optics and photonics communities. Two examples: as a result of these revenues OSA has developed an extensive student and young professionals program that supports more than 4,500 student members and 260 student chapters worldwide. Another example is LaserFest. This was the celebration of the 50th anniversary of the invention of the laser, which took place in 2010, and educated the general public about the inception and continued importance of the laser in our everyday lives. Through OSA’s efforts and those of its partners, we were able to reach a worldwide audience of 365 million people. OSA alone invested \$1M in this year-long event. Agencies, such as NSF and DOE, plus over a hundred non-profit partners, participated as well.

Introduction to OSA’s RFI Response:

One of OSA’s most critical goals is to achieve the widest possible dissemination of the research results it publishes, including associated data and context information. Enabled by internet technologies, OSA is able to disseminate its growing number of articles, more widely and affordably than ever before in its history, reaching the largest number of authors, subscribers, and users since its inception in 1917. This ability to disseminate its content requires substantial investments in technology and infrastructure (such as our online and peer-review platforms) and business-model innovation to deliver the option of free, open or subscription access as well as pay-per-view options, recognizing that the value of the final published article needs to be paid for to remain sustainable.

OSA believes that it would be in the best interest of the United States and its government, as well as in the best interest of all other stakeholders, to strike a balance between public access and ongoing viability and sustainability of the scholarly publishing industry because of the impact and value it brings to the progress of science and its contributions to American society and economy. The business development culture within OSA created its open access publishing model years before a federal agency funding mandate was considered. This product is one example of the shared values between OSA and the federal agencies’ and the desire of both to provide open access materials to a broader audience. Such a balance can be achieved based on shared principles such as the importance of peer review, the recognition of economic realities through adaptable and viable publishing business models, the need to ensure secure archiving and preservation of scholarly information, and the desirability of broad access. One way to achieve this balance is for government to adopt a sensible, flexible, and inclusive approach to drafting public access policies—an approach that engages all concerned parties, including federal agencies, scientists, university administrators, librarians, publishers, and the public.

Consistent with the recognition of economic realities, it is OSA’s position that government agencies develop public access policies through voluntary collaborations with non-governmental stakeholders, including researchers and publishers. Policies should be developed by the need to foster interoperability

of information across multiple databases and platforms. Agencies' efforts then could be directed toward facilitating cyber infrastructure and collaboration programs with and between agencies and the stakeholders to develop robust standards for the structure of full text and metadata, navigation tools, and other applications to achieve interoperability across the scholarly literature. More detail on this is provided later in the document. OSA believes that any scholarly publication access policy needs to be flexible to accommodate agency-specific needs and have the capacity to evolve in response to the rapidly changing nature of scholarly publishing.

OSA Responses to RFI Questions

(1) Are there steps that agencies could take to grow the 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?

- a) According to trade association and other industry surveys, U.S. publishers, in both the non-profit and commercial sectors, serve a robust, innovative global market for the access and consumption of peer-reviewed publications. Academic, corporate, and governmental research and education communities constitute primary segments of the market. The global revenue from scholarly journal publishing was estimated at \$8.0 billion in 2008,^{1,2} with approximately \$3 billion attributed to the U.S. market. The enterprise employs approximately 110,000 people worldwide, 30,000 of which are in the U.S. Additionally, new publishers, journals, and business models either evolve or are emerging constantly, signaling a healthy competitive marketplace.
 - i. This robust market has led to multiple channels of access to and analysis of research across a broad array of social and scientific disciplines. Publishers have led in technological developments. They have likewise been active in assisting the formation of library consortia, both in the United States and globally. These and other **publisher initiatives have helped to accelerate and broaden access to the peer-reviewed literature across the globe and have dramatically decreased the cost of such access.** Currently, OSA serves more than 2,200 of the roughly 2,500 research institutions, government labs and corporations worldwide that have an interest in optics and photonics content, and every individual affiliated with these institutions has instant access to OSA journal content and conference proceedings. As research institutions in developing countries are able to overcome their English language barriers and meet the basic educational needs of their patrons (i.e.: elementary textbooks on math and English), OSA anticipates that there will be a growing need for optics and photonics content. We are closely monitoring this growth and have programs in place to both assist with it and then meet the need once present.

¹ Cox, J. and L. Cox, (2008) *Scholarly Publishing Practice: Academic Journals Publisher's Policies and Practices in Online Publishing*, 3rd ed., ALPSP (2008),

http://www.alpsp.org/ngen_public/article.asp?id=200&did=47&aid=24781&st=&oaid=-1

² Outsell, "An Open Access Primer-Market Size and Trends" (2009),

http://www.outsellinc.com/contact_us/open_access_primer_2009

- ii. **Publishers are willing and able to work with all stakeholders to address existing or future gaps in access.** Agencies should identify specific needs of particular user groups that are not already being met and collaborate with publishers and other stakeholders to meet those needs most effectively. Researchers, the general public, funders, patients, doctors, and others EACH have different information requirements. Publishers have already demonstrated their commitment to identifying and addressing these access gaps, e.g., International Network for the Availability of Scientific Publications (INASP), DeepDyve rentals, Research4Life, patientINFORM, Emergency Access Initiative, access for public libraries, journalists, and high schools.
 - iii. OSA and many other scholarly publishers offer various open access options for authors. In addition to OSA's "gold" open access model, OSA also offers authors the opportunity to have their articles be made freely available in our subscription journals. As with the "gold" open access option, we allow authors to pay a publication fee to enable this option. Currently, less than one percent of OSA authors choose the open access option for their papers published in our subscription journals.
- b) Some options to broaden access to materials that analyze and interpret research for scientists and the public include:
- i. Work to develop standards for data and meta-data to make research more readily searchable and discoverable. Publishers are already working in partnership with third parties like CrossRef³ to develop standardized information and collections.
 - ii. Work with researchers and other stakeholders to create appropriate policies to make the Federal agency-collected and maintained outputs of taxpayer-funded research, such as grant reports and research progress reports, freely available to the public.⁴
 - iii. Make federal agency funds available to authors to support payment for open access of their published articles. Several research funders already do this (Howard Hughes Medical Institute—U.S., The Wellcome Trust—Europe, and Max-Planck Institutes—Europe).
 - iv. License content from publishers to make it available to specific audiences. Publishers license content to customers of many kinds, and can generally customize those licenses to meet specific or specialized user needs, including those of government agencies, and have the ability to ensure the availability of their content with existing infrastructure.
- c) Public access government mandates have significant costs to the scientific enterprise.**

³ CrossRef (<http://www.crossref.org>) is a not-for-profit group founded by publishers in 2002 and maintains 50 million items. Almost 1000 publishers participate and assign Digital Object Identifiers (DOIs) to published content items. Development of the CrossRef service has resulted in seamless navigation of the research literature by users so that researchers using the bibliography in one article can link from a reference to the full text of the referenced article.

⁴ This would ensure readability to the broadest audience. NSF is already pursuing such a policy: <http://www.nsf.gov/pubs/policydocs/porfaqs.jsp>

- i. NIH's PubMed Central data indicates two-thirds of users are from overseas, undermining critical export opportunities for an \$8 billion publishing industry that employs 30,000 jobs in the U.S.
- ii. Significant value added by the publishing industry could be eliminated if revenue channels necessary for publishers to reinvest in their businesses and innovations continue to be threatened by government mandated access policies that provide free access to publishers' works and enable piracy and unauthorized reuse.
- iii. Mandates often result in additional direct and lost opportunity costs for publishers. For example, although only a very small portion of OSA's content is subject to the NIH public-access mandate (OSA is primarily a physical science publisher), OSA has and continues to incur costs to modify formats and procedures in order to deposit manuscripts into NIH's PubMed Central (PMC). Additionally OSA remains concerned that PMC is shifting readers from its site to PMC despite linking arrangements and thus undermining the value of OSA's investments in its content.
- iv. We do not yet know all of the impacts of the NIH policy, but there are significant concerns that it may undermine U.S. competitiveness and negatively impact U.S. jobs.⁵ Because OSA continually spends time, money and resource on working with PMC to overcome its inconsistent and regularly changing standards, OSA has had to divert resources away from innovative efforts to develop new products and services that would provide added value to the research community and public at large. New products and services result in new revenues and the need for additional talent. Without them, there are lost opportunities for OSA and the scientific community and fewer jobs to support the U.S. economy.

(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?

- a) Do not establish mandates that take IP without the full rights holder authorization and compensation. It is of paramount importance that the government does not take any actions that undermine publishers' legal right and entitlement to protect their intellectual property.
- b) Ensure copyrighted materials are protected from unauthorized dissemination and piracy. Scientific publishers rely heavily on the reputation of their journals to compete in the marketplace. **Copyright is an essential ingredient in promoting creativity, innovation, and the continued integrity and reliability of the scholarly record.**

⁵ House Energy and Commerce Committee Subcommittee on Health Chairman Joe Pitts sent a [letter to Francis Collins, NIH Director](#), expressing concern that the NIH Public Access Policy undermines the competitiveness of STM journal publishers, and seeking additional information on the NIH Public Access Policy, PubMed Central, and its impact on the science, technology and medical publishing fields.

- i. We have seen that the NIH policy undermines IP and promotes pirating. Not only is PMC undermining an important U.S. export market,⁶ but PMC copies of copyrighted material appear on rogue sites, contributing to millions of dollars in annual losses to U.S. publishers.
 - ii. Nearly all scholarly publishers adopt liberal copyright policy with regard to authors, allowing them to post copies of their manuscript on their individual and institutional websites, with very little restriction, share copies with colleagues, and to use their manuscripts for other educational and research purposes. For example, within the physical science community, authors regularly post their articles accepted for publication to Cornell University's arXiv platform.⁷ Only commercial use is restricted and enforced by the industry.
- c) Provide free public access to funder-collected and maintained final research reports and link to the peer-reviewed journal articles, which are available through a variety of mechanisms. This solution would allow standardization of information reported,⁸ rapid and broad dissemination of the government-funded materials even before publication of a peer reviewed article, and the preservation of IP. The NSF policy referenced above can be positively contrasted with the NIH policy.
- d) Support the continued operation of various models of publishing to ensure access to innovation and the ability for researchers to publish in the venue of their choice.

(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?

- a) Centralized, government-controlled custody of publication carries significant downsides and few upsides.
 - i. **Long-term stewardship of content carries significant costs that are already being borne by publishers.** In an era of dwindling federal resources, central federal repositories are duplicative and an unnecessary expense and recurring burden that may

⁶ See question 1

⁷ arXiv (<http://arxiv.org>) is an e-print service in the fields of physics, mathematics, non-linear science, computer science, quantitative biology, quantitative finance and statistics. Submissions to arXiv must conform to Cornell University's academic standards. arXiv is owned and operated by Cornell University, a private not-for-profit educational institution. arXiv is funded by Cornell University Library and by [supporting user institutions](#). The National Science Foundation funds research and development by [Cornell Information Science](#).

⁷ Some agencies may want to establish a template for certain kinds of reports so as to facilitate various kinds of aggregate meta-analysis.

not be viable for long-term stewardship.

- ii. With multiple sources of scholarly publications, many of which are not based on U.S. government-funded research, partnerships among stakeholders are essential for achieving effective access to literature that represents the latest scholarly discoveries.
- iii. A centralized governmental approach will deter private sector innovation by establishing unnecessary levels of oversight and bureaucracy that stifle creativity. It will also minimize scientific and commercial opportunities by reducing potential traffic to innovative new applications, such as those provided by publishers that facilitate the work of researchers.

b) The publishing industry is already doing a good job of promoting interoperability, search, development of analytic tools, and other scientific and commercial opportunities.⁹ There is no reason to doubt that publishers will continue providing innovative products and services, unless their financial livelihood is undermined by harmful policies.

- i. A competitive publishing environment of not-for-profit and for-profit organizations – all of whom must receive a return on investment to survive – has led to robust technology development in scholarly publishing during the past 20 years. This sector of the publishing community, which includes professional associations, commercial publishers and university presses, moved quickly and decisively to introduce new technologies that meet researchers’ demands for faster and more user-friendly delivery of scholarly information. Just in the last year, OSA has committed to spending \$2.5M over the next five years (and has already spent \$500K) to further upgrade its platform in an effort to more easily develop new products, enhance researchers’ experience on our site by providing in-line access and linking to and within the full-text (as opposed to just the PDF), as well as greater interoperability, discoverability and accessibility of all OSA content.
- ii. Through the CrossRef service, publishers over the past decade have developed the Digital Object Identifier (DOI) a unique identifier for each piece of content in a scholarly publication. In partnership with stakeholders, we are continuing to innovate in the creation and standardization of metadata to make it easier for researchers and the public to find and use scientific research information.
- iii. Publishers collaborated with librarians and database providers to establish COUNTER (Counting Online Usage of NeTworked Electronic Resources) which has produced an international set of standards and protocols governing the recording and exchange of online usage data. This enables libraries to better understand how the digital collections are being used and it allows publishers to better understand the usage patterns of their digital content.
- iv. Internet search engines, abstracting services, and other tools do an excellent job of ensuring the discoverability of research, and innovations in this area are happening

⁹ See question 5

every day without government interference.

- c) U.S. federally funded research is only one part of the entire universe of information on any given topic, and in some disciplines, research is increasingly non-U.S. government funded. A centralized repository such as PubMed Central, though by some measures successful, is not a model that is universally applicable or necessarily the best model for the future. Any successful and optimized scientific publishing system will incorporate effective incentives to implement and expand interoperability and reuse across internationally distributed databases.
- d) What constitutes a publication and the nature of publication is changing with technology. Publications can include supplemental material, multimedia files, software, links to resources on the web, and can be revised and corrected over time by the authors and publishers, hence the emergence of new community initiatives such as CrossRef's CrossMark¹⁰ service, which electronically watermarks an article's Version of Record (VoR), and DataCite,¹¹ which extends the CrossRef-promoted Digital Object Identifier (DOI) to datasets. Any plan for the future should recognize that the static aggregation/library model is not likely to hold up well in the distributed and dynamic Internet milieu.
- e) It seems unlikely that one optimal procedure for preservation and stewardship would emerge to become applicable across all of scholarly publishing, thus agency policies should embrace diversity, decentralization, and interoperability. In the long term, systematic collaborations among stakeholders (government, publishers, universities and their libraries, and other not-for-profit participants in the scholarly publishing system) will be necessary to achieve maximum benefit. Libraries, in partnership with publishers, have established entities for preservation of digital documents that are already in wide use, for example, Portico¹² and CLOCKSS¹³.

(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?

¹⁰ CrossMark is a current pilot project of CrossRef to that will allow readers to easily determine whether they are looking at the publisher-maintained, stewarded version of a journal article.

¹¹ DataCite is a not-for-profit organization established to facilitate easier access to research data on the Internet, increase acceptance of research data as legitimate, citable contributions to the scholarly record and support data archiving that will permit results to be verified and re-purposed for future study.

¹² Portico (<http://www.portico.org/digital-preservation/>) is a digital preservation service provided by a not-for-profit organization with a mission to help the academic community use digital technologies to preserve the scholarly record and to advance research and teaching in sustainable ways. It is among the largest community-supported digital archives in the world, working with libraries, publishers, and funders to preserve e-journals, e-books, and other electronic scholarly content.

¹³ CLOCKSS (*Controlled LOCKSS*) is a not for profit joint venture between the world's leading scholarly publishers and research libraries whose mission is to build a sustainable, geographically distributed dark archive with which to ensure the long-term survival of Web-based scholarly publications for the benefit of the greater global research community (<http://www.clockss.org/clockss/Home>)

- a) **Publishers provide significant value and are uniquely positioned to partner for long-term archives and innovations in accessibility and interoperability. Such innovation is dependent on continued funding for the value-added work of publishing.**
- b) Journal publishers are actively working with federal research agencies to develop and implement multiple collaborative projects that will enhance the public access, utility, and preservation of materials that report on and analyze and interpret federally-funded research including progress reports, scholarly publications and data for use by both the research community and the general public. Such agencies include NSF and DOE.
- c) A pertinent recommendation of the 2010 *Scholarly Publishing Roundtable* report¹⁴ states that government policies should be guided by the need to foster interoperability and encourages “...additional multiagency programs supporting research and development to expand interoperability capacity and to develop and promote additional interoperability practices and standards.” The *Roundtable Report* further notes that the National Science Foundation, the Department of Energy, and other agencies provide important funding for the development of interoperability capacities through their cyber infrastructure programs.
- d) OSA has and continues to partner with NIH on an innovative, open-access visualization tool for the optics and photonics community. Please see our response in Question 5 for more details on this specific initiative and other possible public-private partnerships.

(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?

- a) **Publishers, like OSA, are dedicated to the widest possible dissemination and discoverability of publications that analyze and interpret research.**
- b) Many scholarly publishing non-profit organizations, such as OSA, were founded by scientists for scientists and fully embrace providing myriad publishing opportunities for the scientific communities that they serve. OSA not only provides open access and subscription-based journal publishing opportunities but a host of other educational and scientific services as its primary mission. As part of the publishing options that OSA provides to the optics and photonics scientific community, OSA partnered with the NIH National Library of Medicine and AFRL to develop an open access visualization tool called Interactive Science Publishing (ISP).

With ISP, authors can integrate large 2D and 3D image datasets and the original source data with a peer-reviewed journal article. The datasets and source data can be freely viewed and analyzed interactively by readers.

¹⁴ Report and Recommendations of the Scholarly Publishing Roundtable, January 2010, available at: www.aau.edu/WorkArea/showcontent.aspx?id=10044.

- c) To facilitate public access and drive and support scholarship, federal agency databases should be able to communicate with each other. Each federal agency's policies should include common core properties that promote access to and interoperability among the content in all public access databases.
- d) Beyond common properties, federal agencies should have the flexibility to manage and modify their policies in response to evolving circumstances for the various constituencies that they serve and that are affected by their policies. Federal agencies should fully engage researchers, institutions, and publishers working in fields that coincide with the agencies' missions, both in establishing initial public access policies and in modifying those policies as appropriate over time.
- e) When determining the common properties that all federal agency databases should share, OSA strongly encourages the agencies to develop collaborations and partnerships with scientific publishers so that the properties are vetted and are consistent with industry norms for capturing data within the STM industry—and especially within the physics and engineering market where mathematical equations are the norm and difficult to capture in differing database structures.
- f) More specifically, OSA recommends that federal agencies develop collaborations and partnerships with scientific publishers to develop and implement:
 - i. ***Standards and persistent identifiers to enhance the discoverability of federally funded research results and to promote interoperability among agency, publisher, and any third party databases and platforms;***
 1. Most funding agencies currently require researchers to acknowledge in publications the support that they have received. There are no standards, however, on how this should be done. Consequently, agency funders find it difficult to know what publications have arisen from the research they have funded. OSA strongly recommends that publishers develop, in collaboration with funding agencies and CrossRef, a means of standardizing funder information and make that information available to funding agencies and the public. We believe that a community-wide solution of this type will be easier and far less expensive to deliver than for each agency to develop its own response to the problem. This is because **publishers are in the best position to provide a simple way of ensuring that journal articles are accompanied by standardized, high-quality metadata providing information about the agency, program, and the specific grant that funded the research.** It would be very expensive for agencies to obtain this information through data mining existing publisher databases and equally expensive for publishers to be required to work with each funding agency to comply with their individual standards. OSA's experience to date with NIH's PubMed Central is that the standards in place are not being consistently applied and do not always comply with the needs of content, such as from OSA's journals, that has extensive math and equations in it. As a result, significant time, resource and expense is being incurred by OSA on an ongoing basis to ensure that federally funded research published in its journals is available on the PubMed Central database.

2. This proposal has been endorsed by CrossRef and the major scientific, technical, and medical (STM) publishing trade associations: the Professional and Scholarly Publications Division of the American Association of Publishers (PSP-AAP) and the International Association of Scientific Technical and Medical Publishers. Related to this proposal, the DOE's Office of Scientific and Technical Information (OSTI) has agreed to maintain a registry of standard nomenclature for funding agencies and the associated naming and numbering system for grants. OSTI already houses technical reports and data sets for more than 40 federal and international funding organizations.
3. With the successful implementation of this funding identity proposal by STM publishers and CrossRef, agencies would have access to standard metadata from published articles. By displaying this information on agency websites, visitors—from the research community to the general public—could follow the link [enabled through the Digital Object Identifier (DOI)] to the publisher's platform where article abstracts are freely available and the Version of Record (VoR) of the article (maintained by the publishers) is available through a variety of access mechanisms. More than 40 scholarly publishers are currently testing this access mechanism.
4. Additionally, publishers are aware that increasingly grant investigators are being asked to share or provide plans regarding how they will share with other researchers the primary data, samples, physical collections, and other supporting materials created or gathered in the course of their work. Grantees are expected to encourage and facilitate such sharing. Scholarly publishers are already participating in a number of initiatives designed to facilitate the voluntary sharing of data or to foster interoperability among data sharing repositories, and they would be willing to work with NSF, DOE, and other database/repository operators to develop recommended practices for assigning DOIs to data sets and supplementary material.
5. For helping federal agencies to standardize data policies, publishers would draw on their experience with initiatives such as Opportunities for Data Exchange (ODE; see www.alliancepermanentaccess.org/current-projects/ode), which aims to gather and promote best practices on the way scientific data are treated, and CoData, a partner of the International Council for Science (ICSU) World Data System (www.icsu-wds.org). The goals of the relatively new ICSU World Data System (WDS) are to create a global federated system of long-term data archives and data-related services covering a wide spectrum of natural sciences, thereby encouraging interdisciplinary scientific approaches. For supporting information, publishers would draw on their involvement with the joint NISO/NFAIS Working Group on Supplementary Journal Information (see www.niso.org).

Additionally, OSA is already a member and/or participates in a number of standards organizations initiatives such as the National Information Standards Organization (NISO—www.niso.org), National Federation of Advanced Information Services (NFAIS—www.nfais.org), CrossRef (www.CrossRef.org) and the newly formed consortium Open Researcher and Contributor ID (ORCID—www.orcid.org), with a purpose to develop unique researcher identifiers. OSA would use its specific knowledge with these organizations/initiatives to help federal agencies standardize

their data policies specific to content for the optics and photonics scientific community.

ii. *Discovery tools to facilitate journal content mining:*

1. Content mining can be especially useful to the scientific community in driving interdisciplinary research and supporting the identification of new areas of discovery, and publishers are committed to managing content in modern digital formats to ensure that users gain maximum benefit.
2. As part of the content mining work that STM publishers are already undertaking or are planning to pursue, they should work with funding agencies to develop pilot projects for journal content mining that would create thesauri, using their expertise to identify, organize, and analyze content to create conceptual links within and between highly technical subject matter. Although there are various ways to perform this type of processing, certain elements are common to all methods, including an automated way to process all sizes and types of content in which to identify relevant information and facilitate its extraction and analysis.

iii. *Possible pilot project that federal agencies and publishers could collaborate on that would drive access, use, and innovation from research results:*

Linking to/from Research Reports—OSA encourages federal agencies to fund a pilot project that would seek to determine whether and how publisher content derived from agency-funded research could be mapped against agency research reports and other content. Specifically, the pilot would send users from publisher websites to the agency website to view free government-sponsored research reports and would, likewise, send users from the agency websites to publisher sites to view free abstracts and links to the Version of Record of articles connected to a particular research report or funded project.

If successful, this would result in interoperability between onsite agency content and publisher platforms. This is of interest to scholarly publishers because they would like to work with major research funders to identify, organize, evaluate, and highlight published results from federally funded research, as well as identify relationships, projects, and offerings that might be applicable to other research funders.

Possible outcomes of the pilot could include:

1. The ability to identify all agency-funded research within publisher offerings and the ability to deliver associated metadata to agencies.
2. The ability to establish mechanisms and approaches that could be implemented (for all research funders) across the industry.
3. A capability to report to major funders on the impact of the research they fund, e.g., through bibliometric and other tools.
4. A “research dashboard” capability or the ability to contribute to one already in existence, e.g., <http://rd-dashboard.nitrd.gov/>.
5. A mechanism for low-cost content rental access to published articles (Versions of Record) and a mechanism to explore its impact.

6. Subject area content portfolios of agency-funded research articles for internal agency use (e.g., study sections).
7. The possibility to use the DOE-OSTI platform (the <http://www.science.gov/>) to extend this pilot to other federal funding agencies.
8. Models to illustrate how traditional publishing systems can coexist with self-archiving.

(6) How can federal agencies that fund science maximize the benefit of public access policies to US 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?

- a) Publishers understand that federal agencies want to maximize public access to the federally-funded research in which taxpayers invest. It is important to note that publishers heavily invest in the peer-reviewed literature. The federal investment is in research, not in the publication of that research, and it is the publisher that adds significant value to the research through its efforts and expenses. U.S. federally funded research agencies should not expect nor require publishers to provide the products they have produced at significant expense for free public access. Such mandates jeopardize the sustainability of a robust peer-review publishing system which the vast majority of scientific researchers consider to be first-rate and which helps ensure U.S. leadership in scientific research.
- b) An excellent mechanism to ensure public access to federally funded research results is by providing access to final agency reports. Every federally funded research project is required by law to provide a detailed final report. The research reports are a condition of the government contract and should be indexed and archived and made easily accessible to the public.

Some science funding agencies currently make these reports freely available via the web while others do not. Making all such reports available and accessible in a comprehensive and systematic way would solve an essential public access problem. One leading example is DOE's Office of Scientific and Technological Information, which publishes final reports online in a portal called Information Bridge. These reports are not journal articles. Rather the final reports are often much longer than the resulting journal article (if such articles exists—researchers typically publish only positive results and then have to meet the publication standards of the journals in their field) and provide more information.

- c) NSF instituted a new reporting requirement as a result of specific legislation in the America COMPETES Act (Section 7010: Reporting of Research Results), which required that “all final project reports and citations of published research documents resulting from research funded in whole, or in part, by the Foundation, are made available to the public in a timely manner and in electronic form through the Foundation’s Website.” For several years, publishers have proposed working with authors to develop short abstracts for a lay audience to accompany each research report.
- d) Publishers are partnering with federal agencies to develop policies that maximize public access to research results and provide easy links between research reports (detailing research results, perhaps including lay summaries) and the peer-reviewed Version of Record, including complete access to the abstract or summary. Such projects would result in interoperability between funder and publisher content, ensuring access and better reporting on the results of funding.

In addition, please see the response to Question 5 above for specific agency initiatives.

(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?

- a) No. Publishers also invest in these other types of content used by researchers, often by conceptualizing the project, commissioning the content, and investing heavily in its development. Any kind of mandated access to that content is an expropriation of that content.

(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?

- a) OSA believes that a uniform access policy or mandate for scholarly publications would be an ineffective approach. An overarching government-wide policy or embargo period would fail to accommodate such key factors as the specific needs of any given agency, the rapidly changing nature of scholarly publishing, and the unique considerations of the various fields of science and the journals that serve them.
- b) OSA analyzed related industry data using the “cited half-life” metric as a relative indicator for how long journal titles within scientific categories are being accessed and cited. The cited half-life for a journal is the median age of its items cited in the current year and reflects how many years that content is considered of critical importance to a particular field of study. The longer the cited half-life, the bigger the value to the publisher from a revenue standpoint. The findings noted in the chart on the next page could help inform considerations related to embargo periods and the associated financial impacts on publishers.

Cited Half-Life of Physics/Optics Journals

The cited half-life for the journal is the median age of its items cited in the current year. Half of the citations to the journal are to items published within the cited half-life.

Scientific Categories	Avg Cited Half-Life within Category (Years)	Avg Cited Half-Life of AIP/OSA Journals within Category (Years)	AIP/OSA Journals in Category
Applied Physics	5.6	7.8	AIP: <i>Applied Physics Letters</i> , <i>Journal of Applied Physics</i> , <i>Journal of Low Temperature Physics</i> , <i>Review of Scientific Instruments</i>
Chemical Physics	7.1	>10	AIP: <i>The Journal of Chemical Physics</i>
Physics - Fluids & Plasmas	6.6	7.6	AIP: <i>Physics of Fluids</i> , <i>Physics of Plasmas</i>
Mathematical Physics	6.5	>10	AIP: <i>Journal of Mathematical Physics</i>
Optics	5.3	7.5	OSA: <i>Applied Optics</i> , <i>Journal of the Optical Society of America A</i> , <i>Journal of Lightwave Technology</i> , <i>Journal of Optical Society of America of America B</i> , <i>Optics Express</i> , <i>Optics Letters</i>

Source: Thomson Reuters, *ISI Web of Knowledge, Journal Citation Reports, Year 2010*. Data provided for journals published by the American Institute of Physics (AIP), an umbrella society for physics publishers in the U.S., and OSA.

- c) Based on the evidence related to OSA journals and to journals covering physics and related sciences, significant economic uncertainty remains with the assignment of minimum embargo periods. In looking at a sample of several physics and optics journals within those categories, AIP and OSA found that physics and optics journals have very long cited half-lives. **While some disciplines reflect data that shows that the cited half-life is within the first year or two, for physics and optics the cited half-life ranges from 7-10+ years. This is a significant finding as it relates to establishing an embargo period for federally funded research** and one that OSA strongly recommends that federal agencies give careful thought and consideration to when discussing this issue.

In summary, OSA appreciates the opportunity to have input on this important topic via the OSTP RFI, and we look forward to continuing to work with OSTP and other federal agencies to develop mutually agreeable guidelines relating to the public access of federally funded peer-reviewed scholarly research.