

Scholarly Publishing and the Evolving World of Open Access

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Overview

- ❖ **Introduction & Background**
 - **Defining Open Access**
 - **Market Drivers and Inhibitors**
 - **Market Size and Uptake of Open Access**
- ❖ **AIP's Experience with Open Access (with possible implications for Japanese learned society journals)**
 - **(arXiv)**
 - **Author Select**
 - **AIP Advances**
 - **(SCOAP3)**
- ❖ **Government initiatives US, UK and Europe**

Part I: Introduction & Background

Defining Open Access

- Open access literature is digital, online, free of charge and free of most licensing restrictions
- “True” OA removes both “price barriers” to viewing content and “permission barriers” to the use of the content
- Free availability and unrestricted use are considered vital by OA advocates

Two Main Types of OA

Green

Gold

Green Open Access

- Green OA typically involves the author depositing a version of their paper in a subject or institutional repository
- Green OA is independent of the researchers formal publishing activities, so researchers may also publish in journals
- There is little direct monetization of green OA
- There is slow take up even though most publishers allow archiving of manuscripts

Gold Open Access

- Refers to paid-for publication of an article in an online, typically peer reviewed, journal
- Gold OA is an alternative business model for researchers' formal publishing activities
- Researchers, institutions or funding agencies pay a publisher an Article Processing Charge (APC), in return for which the publisher will peer review, and (possibly) edit, format and publish the article online
- Formal peer review process is the same as for paid access journals
- APC pricing reflects journal prestige and is a function of rejection rate, quality and amount of editing services
- Under gold OA, copyright typically remains with the author. Typically the only restrictions are that attribution to original authors is given

Variations on the OA Model

- Full immediate journal OA
- Delayed OA
- Hybrid OA
- Gold OA can be monetized via subscriptions (sometimes called “institutional membership”)
- OA can also fall under big deal bundles
- Embargoed access
- Access fees are waived for many low-GDP countries

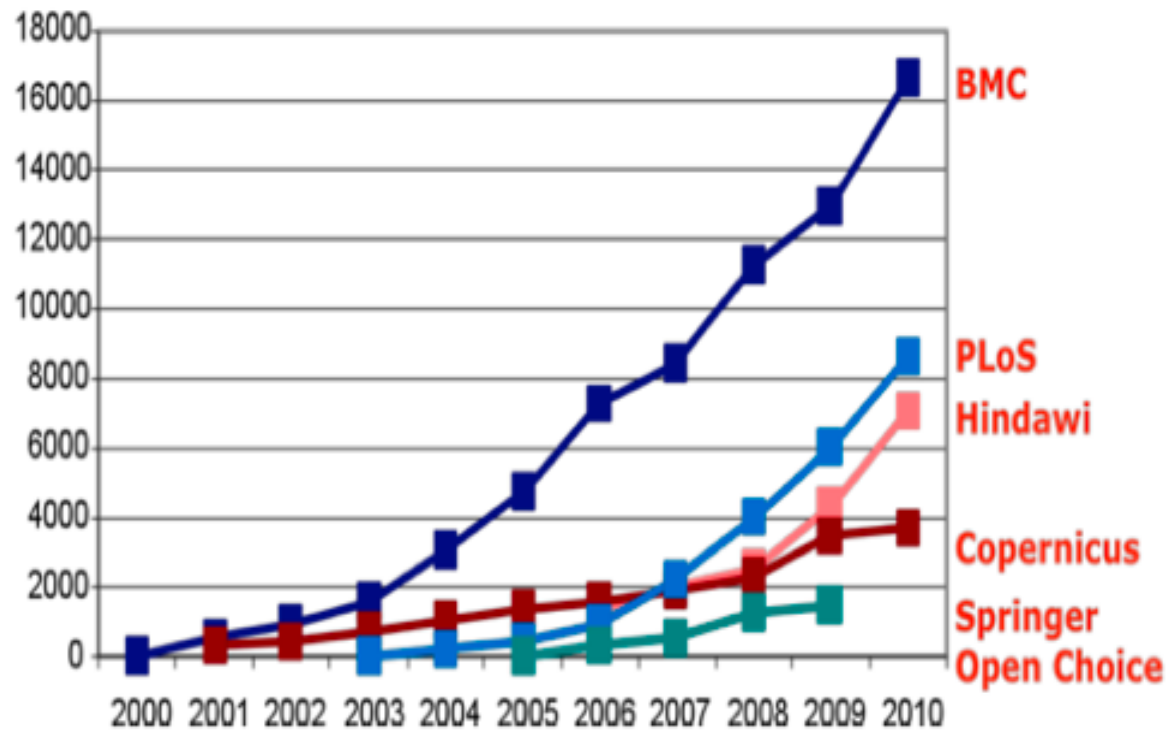
Article Processing Charges

- The majority of OA journals do not charge anything to authors
- Professionally operated OA journals charge author fees ranging from \$20 to \$3800 per article
- Estimated average is \$900
- Established publishers tend to charge higher fees - \$1500 to \$4000 (and often as part of a hybrid journal)
- BMC has raised its APC's to around \$2000 per article
- Nature has an OA option on selected journals and APC's are \$3000+

Some OA Publishers of Note

- Public Library of Science
 - Founded 2000, NFP, PLoS Biology (2003), PLoS ONE is wildly successful
- BioMedCentral
 - Acquired by Springer in 2008. Publishes around 200 journals
- Hindawi Publishing Corporation
- Oxford University Press
 - First to experiment with hybrid OA
- Copernicus

Figure 1 – Evolution of the number of articles published by OA journals



Source: Patterson 2011

Market Drivers and Inhibitors

- Open Access grows from an academic ideal to leverage the web into widest possible dissemination of scholarly literature
 - Budapest (February 2002) → Bethesda (June 2003) → Berlin (October 2003) → Finch report (June 2012) → RCUK policy (September 2012)
- Many funders of science see widest possible access as consistent with their mission-based objectives

Market Drivers

- The so-called serials crisis
- Funders' mission
- Growth in R&D activity
- Mandates
- Authors' rights and use of repositories
- The digital environment

Inhibitors

- Researcher inertia and the culture of academia
- Economics and the balance of power

Market Size and Uptake

- Directory of Open Access Journals (www.doaj.org)
 - 7372 journals listed (Jan 1, 2012)
 - The majority of these are not listed in any indexing service
 - 103 of these journals publish more than 200 annual articles (2009-2011)
- Growth in the annual output of OA

	2000	2011
Articles	20,702	340,130
Journals	744	6,713

- From: Laakso & Bjork (ref 1)
- In comparison, 1.66 million articles indexed by Scopus in 2011

OA Articles Indexed By Scopus in 2011

Breakdown by type of OA

Published in full immediate OA journals	11%
Hybrid OA	0.7%
OA with a maximum delay of 12 months	5.2%

Uptake of OA

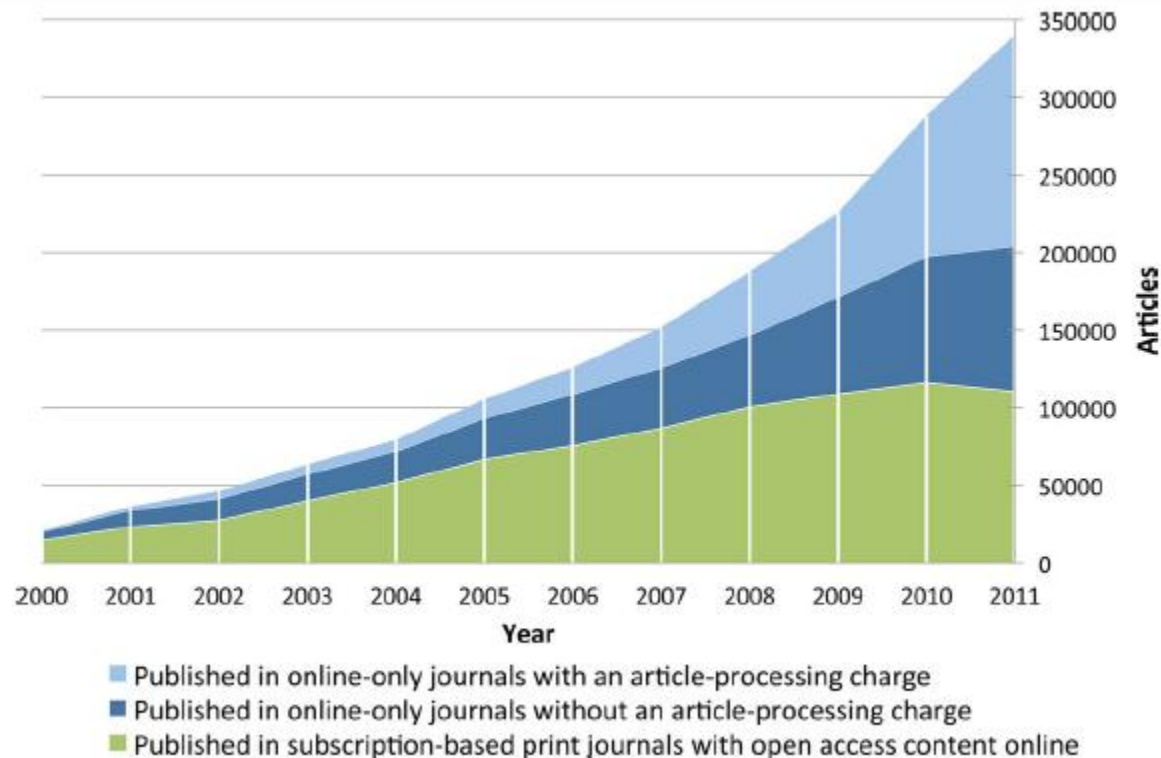
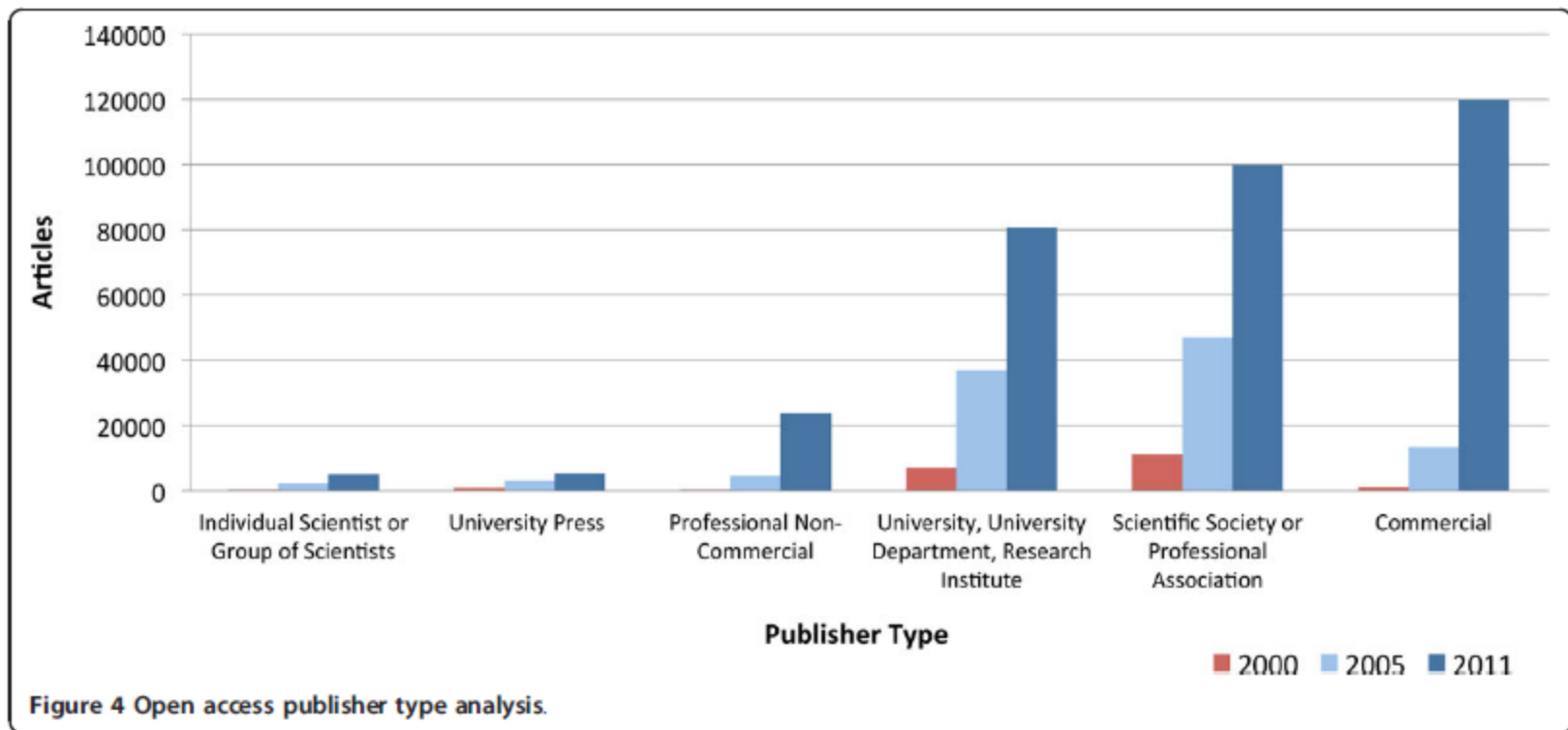


Figure 2 Annual volumes of articles in full immediate open access journals, split by type of open access journal.

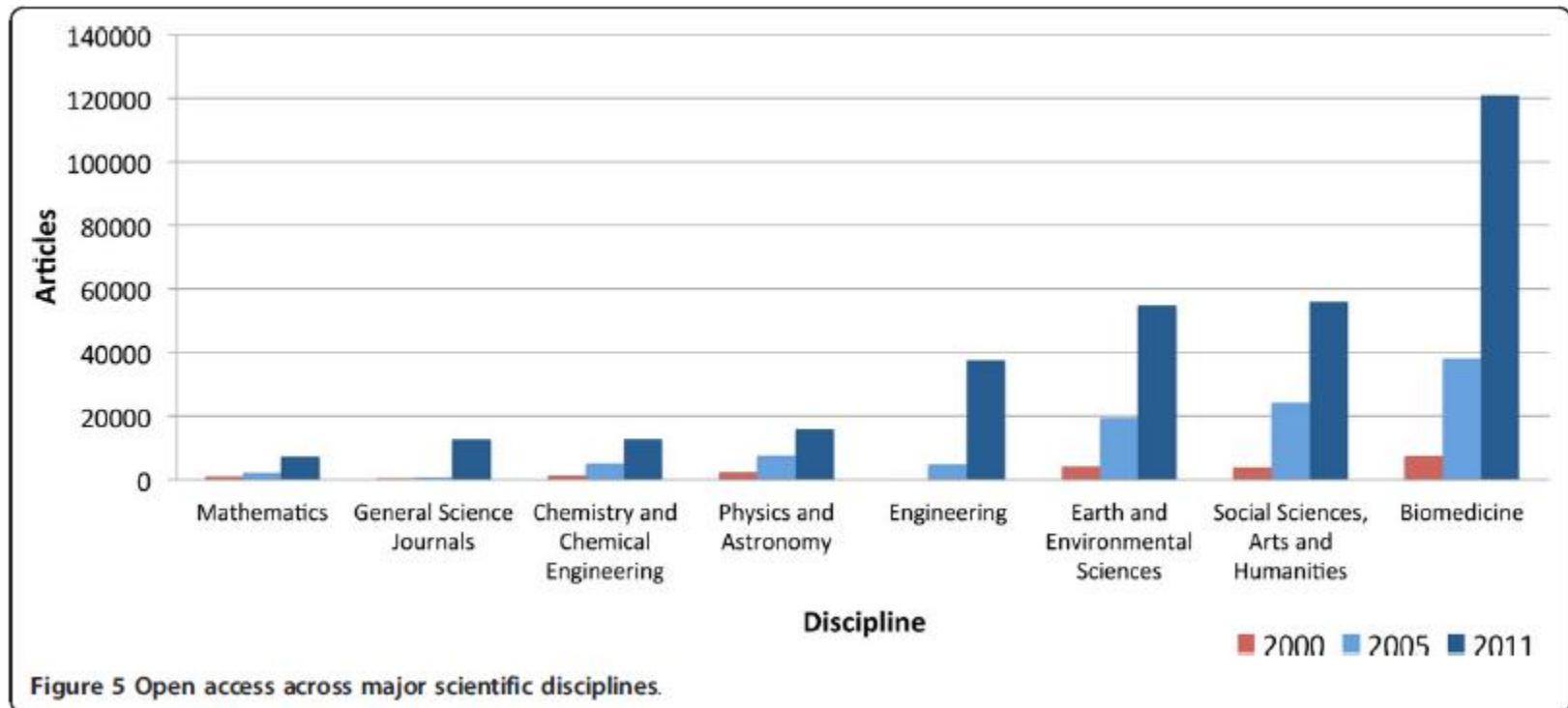
From: Laakso & Bjork (ref 1)

Open Access by Publisher Type



From: Laakso & Bjork (ref 1)

Open Access by Scientific Discipline



From: Laakso & Bjork (ref 1)

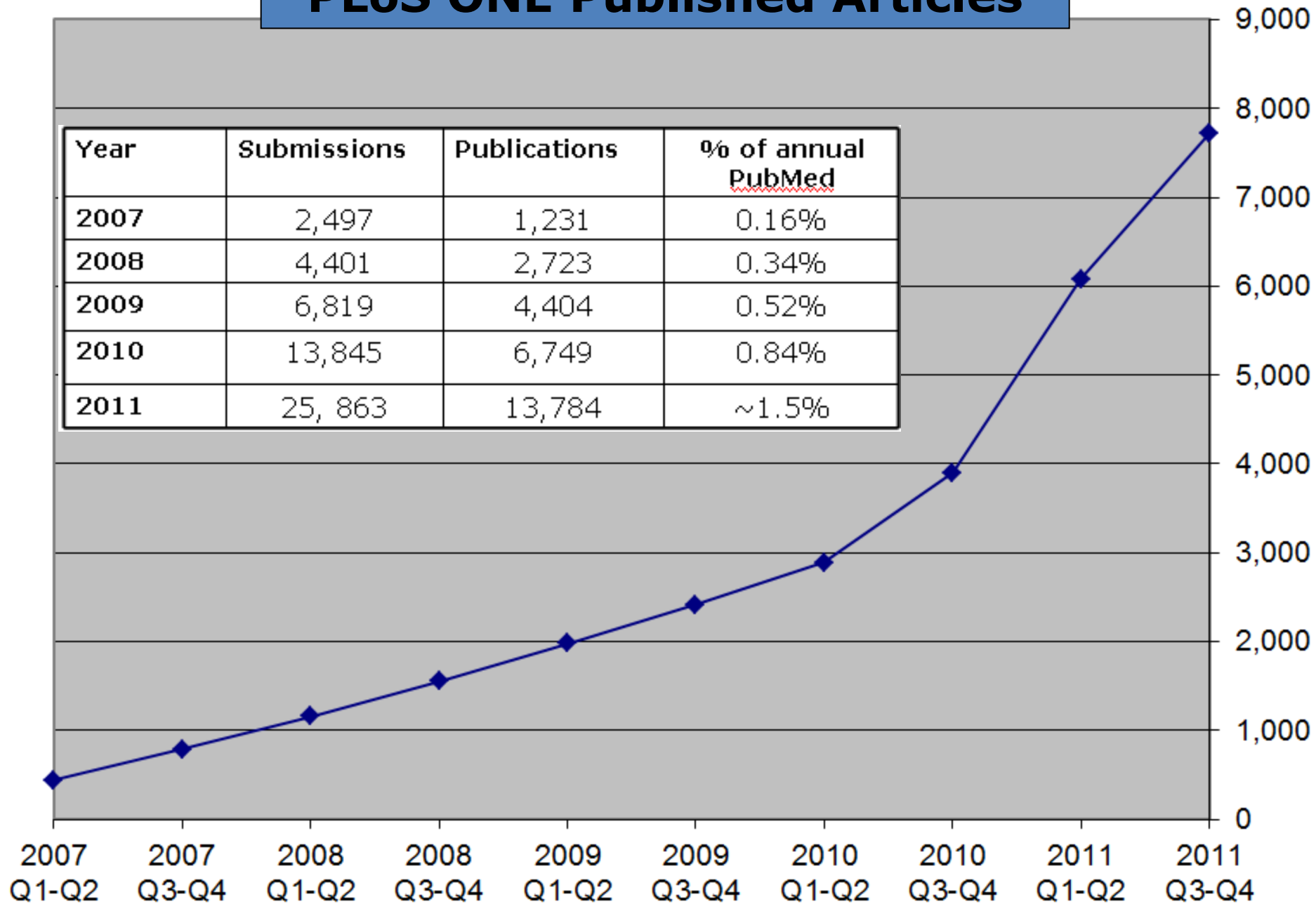
The PLoS ONE story

Status

- Published 1230 articles in first full year
- By 2010 had become the largest peer reviewed journal in the world
- Published 14,000 articles in 2011
- Impact Factor (2010): 4.411
- Number of editors: 3100 (added 1000 new editors in 6 months)

PLoS ONE Published Articles

Year	Submissions	Publications	% of annual PubMed
2007	2,497	1,231	0.16%
2008	4,401	2,723	0.34%
2009	6,819	4,404	0.52%
2010	13,845	6,749	0.84%
2011	25, 863	13,784	~1.5%

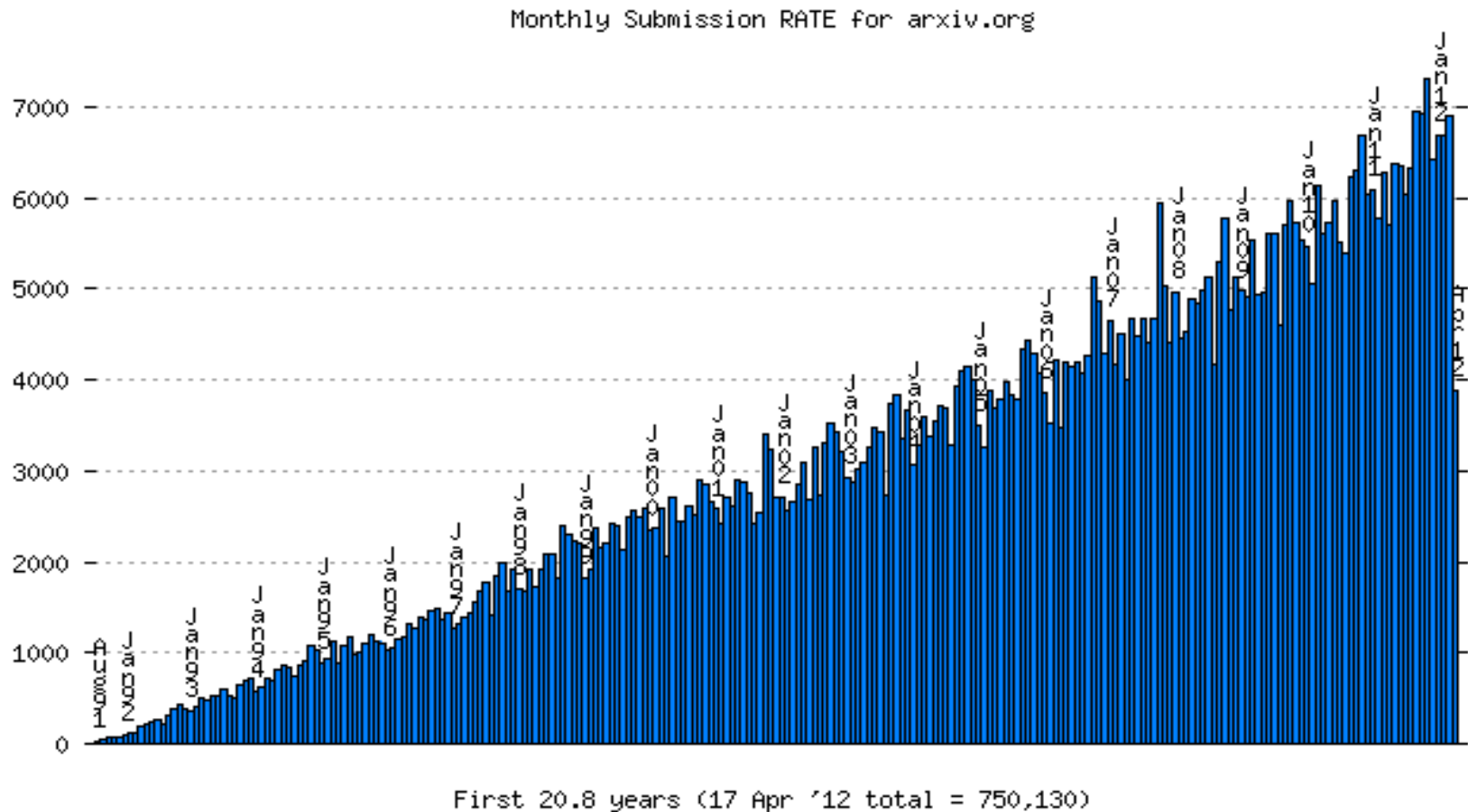


Part II: AIP's Experience

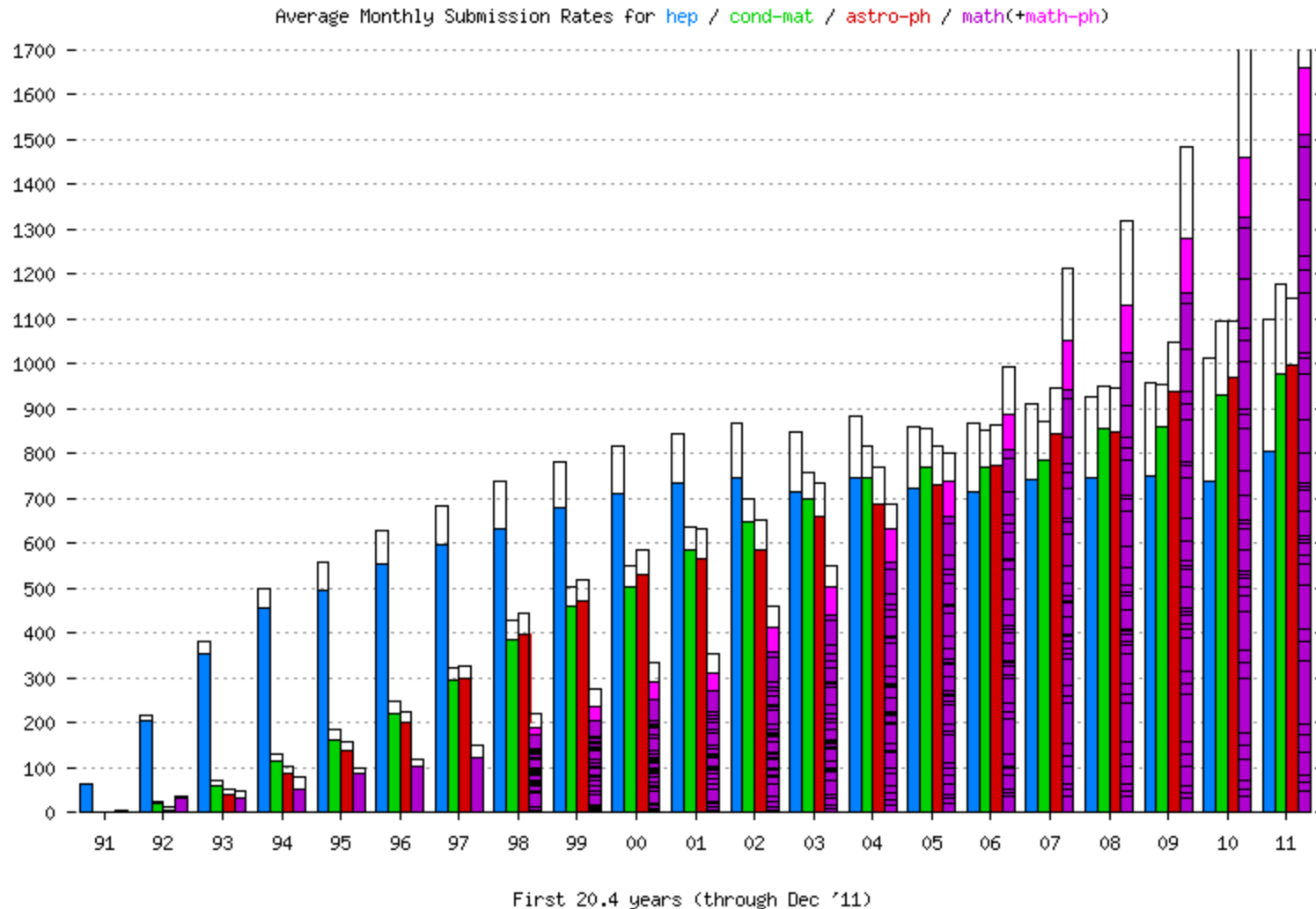
AIP's Experience

- **arXiv**
- **AIP Author Select**
- **AIP Advances**

arXiv monthly submission rate



arXiv monthly submission rate



Assertions About the arXiv

“Of course, all *Physical Review Letters* papers are contained in the arXiv”

Jack Sandweiss, Editor, *Physical Review Letters*

“If 14 years of concerted self-archiving in physics have not yet hurt the physics publishers ...”

Stevan Harnad, American Scientist OA Forum

APS Journal Content in arXiv.org

Journal Title	Articles in arXiv
<i>Physical Review Letters</i> Short, important papers from all branches of physics	55.0%
<i>Physical Review B</i> Condensed Matter and Materials Physics	40.0%
<i>Physical Review D</i> Particles, Fields, Gravitation, and Cosmology	97.1%

n = 0.05

AIP Journal Content in arXiv.org

Journal Title	Content in arXiv
<i>Applied Physics Letters</i>	4.6%
<i>Journal of Applied Physics</i>	2.4%
<i>Chaos</i>	17.2%
<i>Journal of Chemical Physics</i>	7.2%
<i>Journal of Mathematical Physics</i>	53.6%
<i>Physics of Fluids</i>	3.9%
<i>Physics of Plasmas</i>	2.7%
<i>Review of Scientific Instruments</i>	4.2%

n = 0.10

AIP Copyright Policy

(1) All proprietary rights other than copyright, such as patent rights.

(2) The nonexclusive right, after publication by AIP, to give permission to third parties to republish print versions of the Article or a translation thereof, or excerpts therefrom, without obtaining permission from AIP, provided the AIP-prepared version is not used for this purpose, the Article is not published in another journal, and the third party does not charge a fee. If the AIP version is used, or the third party republishes in a publication or product charging a fee for use, permission from AIP must be obtained.

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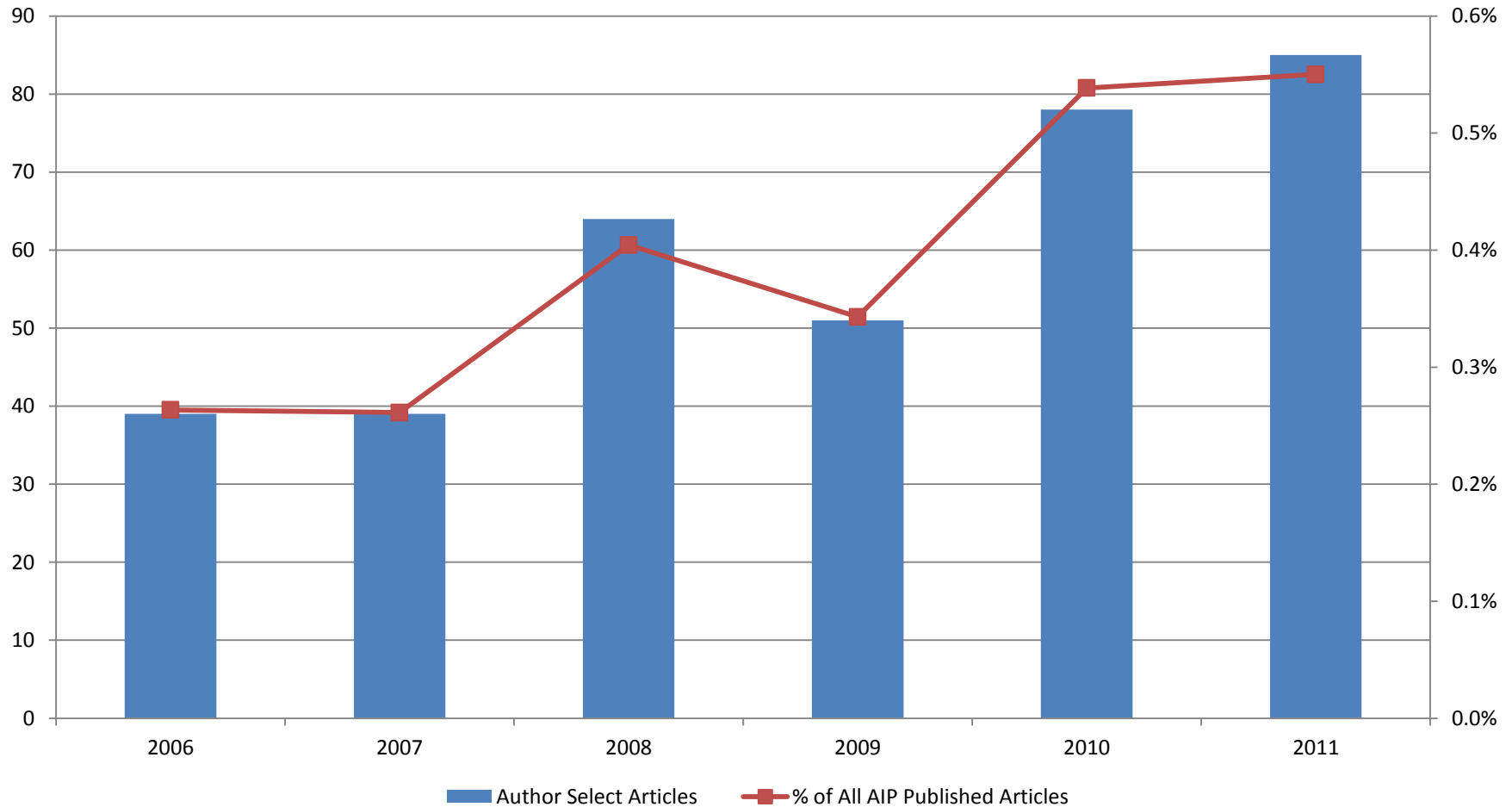
(5) If the Article was prepared under a U.S. Government contract, the government shall have the rights under the copyright to the extent required by the contract.

AIP Author Select

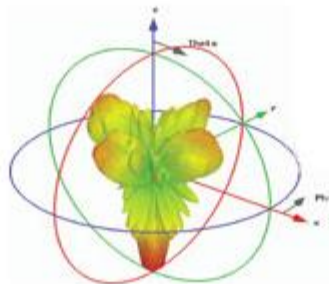
- AIP's hybrid open access model
- Available on 10 AIP journals
- APC: \$1500 or \$1800
- Very low uptake by authors

Author Select – All AIP Journals

Articles Published



Join the conversation! Rate and comment on AIP Advances articles.

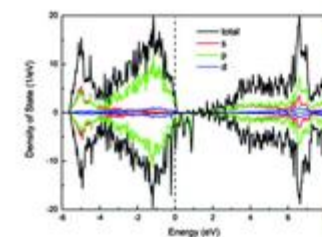


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Defect-induced room temperature ferromagnetism in un-doped InN film

Q. Y. Xie, M. Q. Gu, L. Huang, F. M. Zhang, and X. S. Wu

Here we show epitaxial InN film, a well-known narrow gap semiconductor can be ferromagnetic without doping. The Curie temperature acquired is as high as 297K and the magnetic moment is 1.6 μ B, spawning a

whole new class of potential room temperature DMS (diluted magnetic semiconductors).

AIP Advances 2, 012185 (2012)



Author Interview: Ifor D. W. Samuel
» Other Video and Podcast Interviews

The Idea Box



AIP Advances Editorial Blog

Flipping a film

I'd like to flag a recent publication in Advances, which inverts the usual practice of growing LaAlO₃ films on SrTiO₃ substrates to produce fascinating oxide-interface systems. A team at the National University of Singapore has succeeded in growing SrTiO₃ films ... [Continue reading](#) →

Rope Puzzle

A rope of length L and mass m lies loosely coiled

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AIP Advances: Motivation

- ❖ “Physics has arXiv” – green OA (myth or reality?)
- ❖ OA is here to stay, and we wanted to work with a “gold” OA model after our hybrid OA experiment (“AIP Author Select”)
- ❖ Demand from authors for an OA journal with the AIP brand, particularly as represented by APL and JAP
- ❖ Adherence to core journal principles
 - Independent scrutiny
 - Wide dissemination
 - Long-term archiving

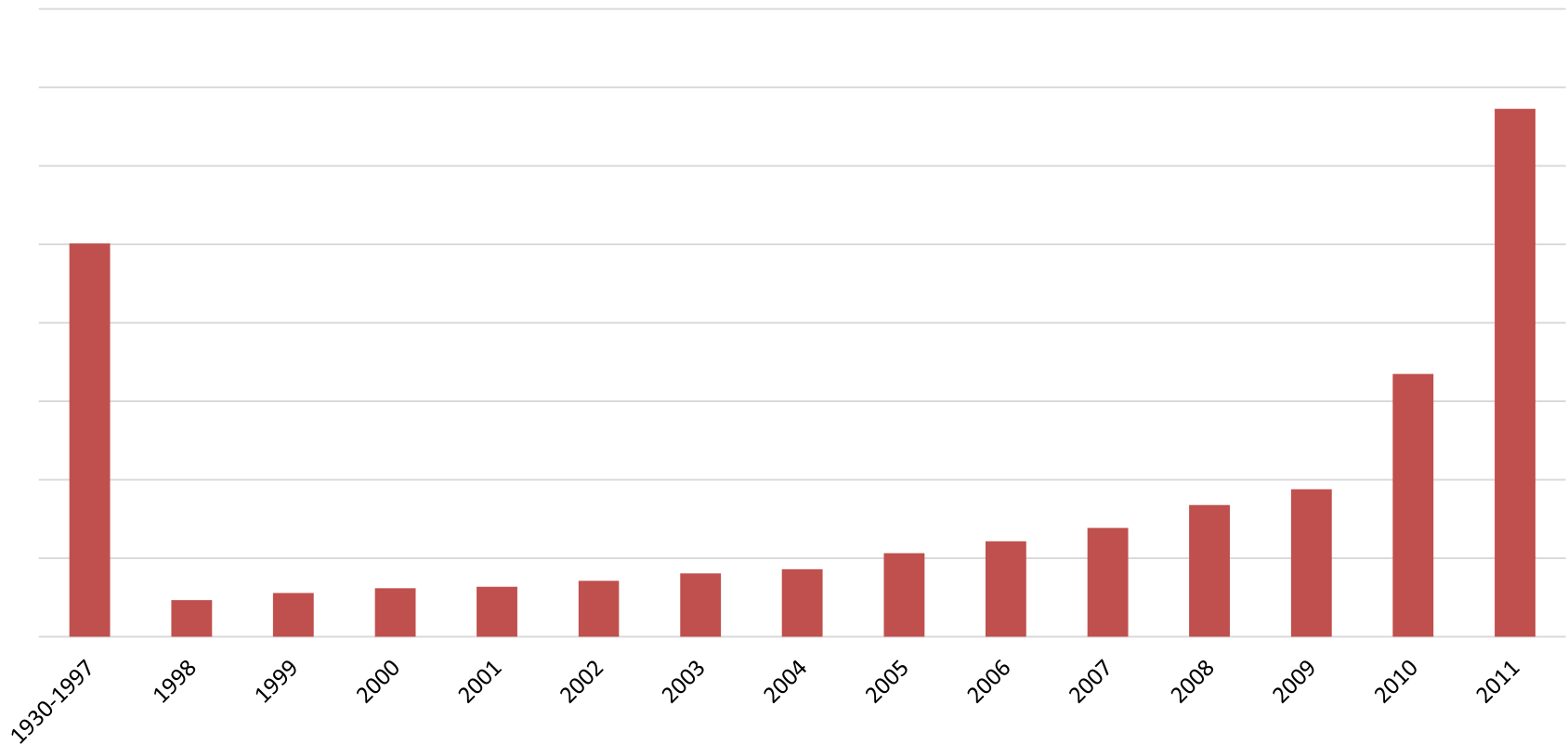


Implications of a move to OA

1. Less research intensive institutions
2. Revenue from corporate customers
3. Digital archive purchase
4. Impact of mandates

Usage Half Life

2011 Downloads by Publication Year
- AIP Journals



Citation Half Life

Title	Cited Half Life (years)
Applied Physics Letters	5.6
Journal of Applied Physics	8.5
Journal of Chemical Physics	>10
Review of Scientific Instruments	8.1
Physics of Plasmas	5.8
Journal of Mathematical Physics	>10
Physics of Fluids	>10
Chaos	5.8
Low Temperature Physics	6.7
Biomicrofluidics	1.6
Journal of Renewable and Sustainable Energy	0
Physics Today	9.3
Journal of Physical and Chemical Reference Data	>10

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

Part III: Government initiatives US, UK and Europe

Recent US Public Access Political History

- 2005-07:** Contentious negotiations between NIH and publishers
- 2007:** NIH Public Access Mandate passed
- 2008:** Dueling legislation on mandates: FCRWA vs. FRPAA
- 2009:** US House sponsored *Scholarly Publishing Roundtable*
- 2010-11:** America COMPETES Act of 2010 passed
**includes many Roundtable recommendations
and directive for an inclusive process but no language
on mandates*

Recent Timeline on Public Access

2011

- Jan:** - COMPETES Act signed by President Obama
- Feb:** - OSTP forms two sub-committees (data and publications)
- Mar:** - NSF's National Science Board workshop on open data and publications
- Feb-Apr:** - Publisher focus groups formed to work with NSF and DOE to propose and implement partnerships on access
- Nov:** - OSTP releases RFI for public comment on publications and data
 - CrossRef announces publisher–funding agency partnership for funding agency metadata (“FundRef”)
- Dec:** - NSB releases draft report on open data
 - US House of Representatives introduces “Research Works Act”

Recent Timeline on Public Access

2012

- Feb:**
 - “Research Works Act” loses traction, but unleashes backlash
 - US House of Representatives introduces Federal Research Public Access Act of 2012 (H.R. 4004)
- Mar:**
 - House Subcommittee on Investigations and Oversight holds hearing on “Federally Funded Research: Examining Public Access and Scholarly Publication Interests.”
 - OSTP releases report, “Interagency Public Access Coordination,” includes information gleaned from the RFIs
- May:**
 - FundRef pilot program announced
- June:**
 - Finch report published in the U.K.

America COMPETES Act of 2010

Sec. 103 calls for OSTP to establish a “working group” under the NSTC to coordinate public access and stewardship policies:

- Identify **specific objectives and public interest** that need to be addressed by any such policies
- Account for **variability among science agencies** and scientific disciplines
- Develop standards for research data, full text metadata, and tools to **maximize interoperability**
“take into account existing (international) standards”
- Work with international science and technology counterparts to maximize interoperability

America COMPETES Act of 2010

Continued

- *“Solicit input and recommendations from, and collaborate with, non-Federal stakeholders”*
(the public, universities, nonprofit and for-profit publishers, libraries, etc.)
- Establish priorities to maximize the benefits of policies with respect to their potential economic impact on the scientific and engineering enterprise...
- Takes into account distinction between publications and research data

America COMPETES Act of 2010

Continued

- Takes into consideration the role that publishers play in the **peer review process**
- Examines agency practices for providing **research reports**
- OSTP Director to provide **a report to Congress in one year** (report delivered March, 2012)



Advocacy

Congressional hearing on Public Access and Scholarly Publication Interests, March 29, 2012

Hearing called by the House Science, Space, and Technology Committee (the same body which organized the Scholarly Publishing Roundtable in June of 2009).

Chairman Rep. Paul Broun (R-GA) and Ranking Member Paul Tonko (D-NY) recognized the complexity of the public access issue. Referred to the engagement process laid out by the COMPETES legislation.

The **testimony and a webcast of the hearing** are posted on the House Science Committee website.

<http://science.house.gov/hearing/subcommittee-investigations-and-oversight-hearing-examining-public-access-and-scholarly>

FYI provides a decent summary: <http://www.aip.org/fyi/2012/049.html>

Public policy development in the US:

The focus moves to funding agencies

- US public access policy can be introduced by the legislative (Congress) or administrative branches of the US government.
 - Legislation is difficult to enact and difficult to change.
- COMPETES legislation encouraged (funding) agency level involvement for detailed policy level development and implementation. Agencies:
 - are directly involved with the research products and the community
 - have a track record of consulting their communities for advice on difficult issues (i.e., funding priorities, standards)
 - have the resources for dealing with this issue
 - benefit from partnering with stakeholders to find effective, cost-saving solutions.

Publisher engagement with NSF and DOE

The National Science Foundation (NSF) and the Dept. of Energy (DOE) are key funding agencies for the focus of STM publisher-agency partnerships.

- NSF and DOE each fund ~\$5B annually of basic research.
- Both agencies have active community advisory committees.
- Publisher focus groups have an on-going and robust engagement with both DOE and NSF.

Proposed areas of collaboration:

- Standards and universal identifiers
- Discovery tools for content mining, etc.
- Pilot projects for access, cross-linking to reports and data, etc.

STM Publisher – Agency Partnerships

- 1) Identifying agency funding (FundRef)
- 2) Linking agency reports to publications
- 3) Linking data and publications
- 4) Identifiers: DataCite and ORCID
- 5) Other initiatives:
Public libraries and article rental



FundRef: A model publisher-stakeholder partnership, providing funding agency credit

On May 2, 2012 CrossRef announced FundRef, a pilot collaboration between scholarly publishers and funding agencies.

- aims to **standardize the names of research funders** and **add grant numbers** attributed in journal articles or other scholarly documents.
- would allow researchers, publishers, and funding agencies to **track the published research** that results from specific funding bodies.



FundREF

Pilot participants include **seven publishers and four funding organizations.**

Publishers	Funding Orgs
AIP	DOE
APS	NASA
Elsevier	NSF
IEEE	Wellcome Trust
Nature Publishing Group	
Oxford Univ. Press	
Wiley	

- Results from pilot are expected by late 2012.
- STM publishers are encouraged to make recommended changes to their editorial software to participate in FundRef.

Linking DOE reports to publications

DOE's Office of Science & Technical Information (OSTI), Wiley, and Elsevier have initiated a pilot program, to make the **citations of DOE-funded journal articles available in the search and retrieval applications operated by OSTI**. OSTI is expanding this effort to other publishers.

April 30 - Workshop held with eight publishers, including AIP and APS, to encourage inclusion of publishers that routinely publish the majority of DOE funded research.

Linking data to publications

NSF has solicited from AAS and AIP a proposal to fund a pilot project to **link data-behind-figures and tables with scholarly publications.**

- Pilot restricted to a well defined community: **astronomy/astrophysics and plasma physics.**
- Significant issues to be examined include author participation, peer review, selection of appropriate datasets.
- Aims to build in compatibility with data repositories and DataCite; responsive to a recent report released by the National Science Board on data management.

Open Researcher & Contributor ID (ORCID)

- ORCID is a collaboration of publishers, academic institutions, libraries and other organizations (OSTI is a recent participant).
- Aims to **solve the author/contributor name ambiguity problem** through **central registry of unique identifiers for individual researchers and transparent linking** between ORCID and other author ID schemes
- Beta version of will launch later this year.

US Public Library Initiative

In 2010 the American Physical Society (APS) began offering **free online access to APS journals to U.S. public libraries**. In 2011 this offer was extended to **U.S. high school libraries**.

- To date, **586 public libraries and 210 high school libraries** are participating.
- **Low cost/low risk way to provide wide public access**
- In-library use only; remote access not permitted
- For personal use only, otherwise downloads or hard copies not restricted
- Downloads are monitored; no instances of attempted abuse
- Libraries sign up online:

https://librarians.aps.org/account/public_access_new

Providing Public Access via Article Rental

DeepDyve, a vendor, provides **simple and affordable access** to millions of articles across thousands of peer-reviewed journals.



- Users rent single articles for 24 hours for a nominal fee.
- Users may read, but not download or print, the full text of an article.
- More than 40 publishers are using DeepDyve. AIP and APS have had good experiences over the last two years.

The Finch Group: Working Group on Expanding Access to Published Research Findings

- Commissioned by David Willetts, the UK minister of state universities and science, **to determine how to best provide wide-ranging access to publications that are underwritten by UK funding agencies.**
- **Participants from all stakeholder groups** in scholarly publications: funding agencies, publishers, universities, librarians, and researchers.
- **Chairperson Dame Janet Finch**, professor of sociology, University of Manchester
- **Target audience:** The public and other potentially underserved markets, such as small businesses.



Dame Janet Finch
ohpa.org.uk

The Finch Report's Key Recommendations

- **Full open access.** U.K. policy should promote and support the publishing of government-funded research in open access or hybrid journals. Repositories play a valuable, *complementary* role, but embargoed access is not the preferred model.
- **Value of the scholarly publisher recognized.** Article Processing Charges should be the main vehicle for payment. Compensation to publishers enables them to continue to review, select, produce, publish and archive this essential product of scholarship.
- **Mixed economy is needed during the transition**
An incremental transition will be less disruptive to all parties: research institutions, funding agencies and publishers.

U.K. response to the Finch Report

Willetts announced in mid-July that policy will be developed to:

- **Move towards open access through a "gold" model**, where upfront article processing charges cover the cost of publication;
- Implement access **via public libraries**;
- Extend the **licensing of access** by universities to high technology businesses for a nominal charge;
- **Beginning April 2013**, make science articles that come from government-funded research available to the public:
 - preferably upon publication via the **"gold" model**, or
 - **within six months of publication** (Finch recommended more flexible embargo lengths) through a publicly accessible repository.
- U.K. Government makes UKP 10 million available for transition

Research Councils UK (RCUK)

- The new policy, which will apply to all qualifying publications being submitted for publication from 1 April 2013, states that peer reviewed research papers which result from research that is wholly or partially funded by the Research Councils:
 - must be published in journals which are compliant with Research Council policy on Open Access, and;
 - must include details of the funding that supported the research, and a statement on how the underlying research materials such as data, samples or models can be accessed.

RCUK continued

- Beginning in April 2013, Research Councils will provide block grants to eligible UK Higher Education Institutions, approved independent research organisations and Research Council Institutes to support payment of the APCs associated with 'pay-to-publish'.
- Organisations will be expected to set-up and manage their own publication funds. The Research Councils will work with eligible organisations to discuss the detail of the new approach to funding APCs and to ensure that appropriate and auditable mechanisms are put in place to manage the funds.

European Commission (EC) Response

- Adopted some Finch Report recommendations relating to open access.
 - Will advance open access in “Horizon 2020,” the research and innovation funding program for 2014-2020.
- ***BUT** several significant steps have to be taken before this plan is codified.*
- So far, there are no EC provisions for funding open access through a prescribed "gold" model.

AIP's Response to U.K. Developments

- Finch report is a thoughtful analyses; **should be applauded for bringing together all the key stakeholders** in the UK to help to shape the debate and the direction of policy.
- The provision for **paying costs of open access publication is crucial**.
- The United States has multiple funding agencies and a large array of research institutions, making **single payer solutions more complicated and controversial**, with wide-reaching implications for the sustainability of some journals.
- AIP will continue to advocate for a **mixture of solutions** (e.g. rental models, linking between agency and publisher sites, public library access, and others) to evolve public access.

AIP's Response to U.K. Developments

Continued

- Governments should encourage access via mutually beneficial **partnerships** with publishers, which would **contribute to the economy** and **maximize the productivity** of the scientific enterprise.

AIP statement:

www.aip.org/press_release/stakeholder_collaboration.html

AIP Matters:

www.aip.org/aip/aipmatters/archive/2012/6_25_12.html

www.aip.org/aip/aipmatters/archive/2012/7_23_12.html

Closing comments

- ❖ OA publishing has grown universally but growth is not uniform
- ❖ Will OA publishing continue to grow at the current rate?
- ❖ Is it if rather then when will OA publishing become the mainstream model?
- ❖ Governments and funding agencies are developing policies to enhance access
- ❖ The economics of open access are crucial
- ❖ Publishers are playing an increased role but should expect disruption
 - ❖ What if 50% of the world's STM literature were published in 100 OA mega journals?
 - ❖ But too early to say that scientists are abandoning the journal ecosystem
- ❖ Core principles of scientific publishing still matter no matter what the business model

Thank you

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Some Background Reading

- Laakso and Bjork: Anatomy of open access publishing, BMC Medicine, 2012, 10: 124
- Solomon and Bjork: A study of open access journals using article processing charges, J Am Soc Info Sci Tech, 2012, 63, 1485
- RCUK announces new OA policy (2012):
<http://www.rcuk.ac.uk/media/news/2012news/Pages/120716.aspx>
- Finch: Accessibility, sustainability, excellence: how to expand access to research publications:
<http://researchinfonet.org/publish/finch>