

Scholarly & Policy Perspectives of Open Access

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Outline

Introduction

- *motivation & challenges*

Interactive OA Publishing & Multi-Stage Open Peer Review

- *motivation, concepts & examples: ACP, EGU & Copernicus, SciPost Physics, F1000/Wellcome Open Research ...*
- *vision: epistemic web*

Large-Scale Implementation of Open Access

- *OA2020 & DEAL*
- *vision: efficient & swift transition*

Conclusions

- *lessons learned, outlook & propositions*

Motivation for Open Access

Educational, economic & scholarly advantages of immediate free online availability & usability of scholarly research articles.

Educational:

- equal opportunities, information & stimulation (*global/social, teachers/students ...*)
- **re-integrate scholarly & common knowledge** (*Wikipedia, etc.*)

Economic:

- liberate distorted scientific information market (*production, distribution, copyright, etc.*)
- facilitate technological applications & innovations (*text mining by SME, etc.*)

Scholarly:

- enhance interdisciplinary exchange, discussion collaboration
- advance **evaluation & quality assurance** (*public review & discussion, machine-reading & statistics, transparency & new metrics beyond citation counting oligopoly*)

Open Access Variants:

- **OA archiving** (“green”): good but not enough (*delays & limits in usability & sustainability*)
- **OA publishing** (“gold”): **immediate & full benefits and sustainability**

Motivation for Open Peer Review

Traditional peer review is insufficient for efficient quality assurance in today's highly diverse & rapidly evolving world of science.

Editors & Reviewers: limited capacities

- work overload, conflicts of interest, little reward & incentive for constructive reviews

Traditional Pre-Publication Peer Review: retardation & loss of information

- delay of publication, dilution of messages, hidden obstruction/plagiarism
- critical & supportive comments unpublished/lost (often as interesting as paper)
⇒ *waste of reviewer capacities as most limited resource in scientific evaluation*

Traditional Discussion: sparse & late commentaries

- laborious, delayed & diluted by review (comment/article 1978 ⇒ 1998: 1/20 ⇒ 1/100)

Replacement of traditional pre-publication review by post-publication commenting not really successful (comments/article < 5/100)

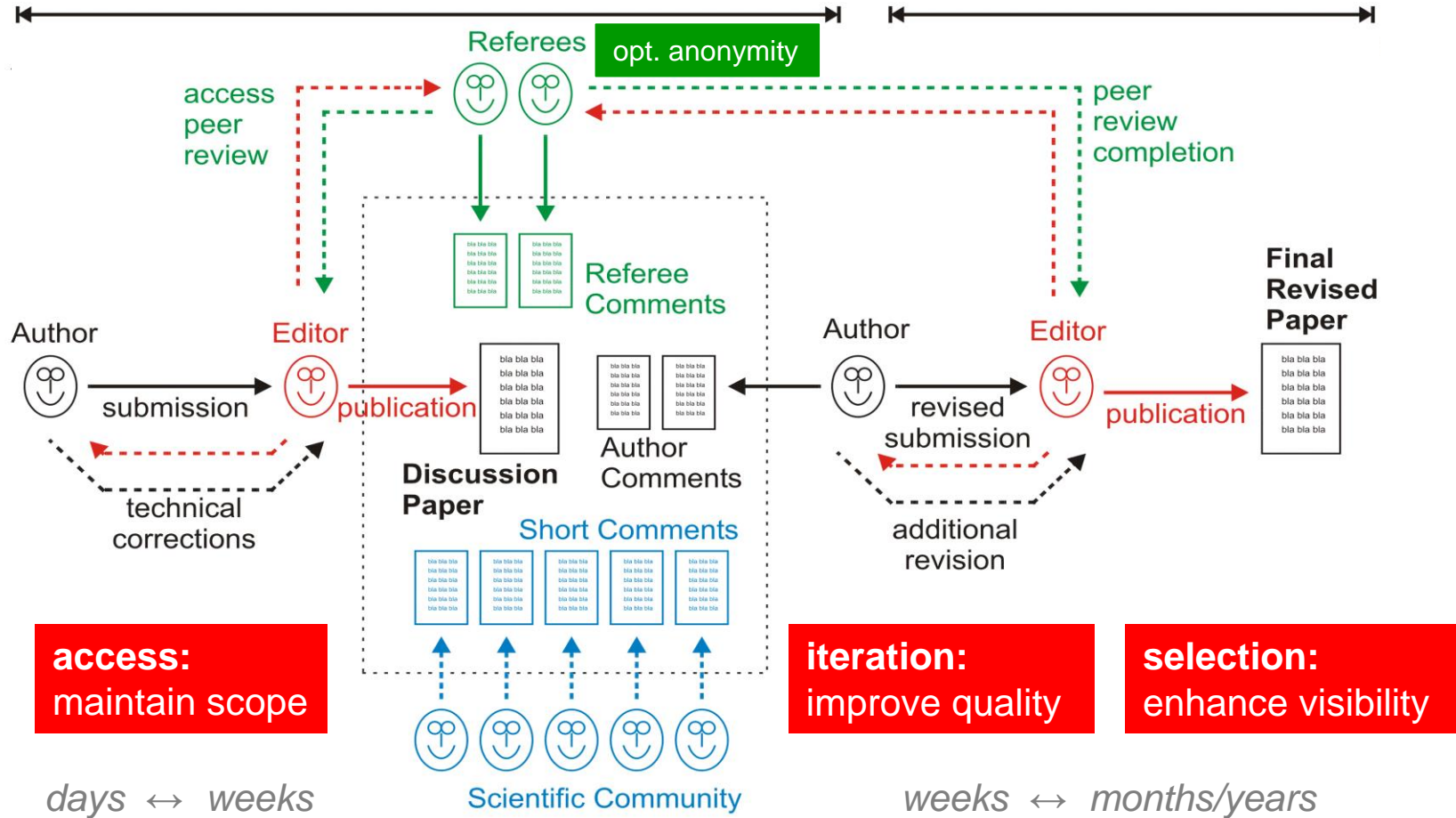
Evolution into Multi-Stage Open Peer Review: combine & integrate strengths of traditional peer review with virtues of **transparency, discussion & self regulation**

Multi-Stage Open Peer Review @ ACP/EGU

Flexible & transparent advancement of traditional journal review:

OA Discussion Forum (ACPD)

OA Journal (ACP)



1. Pre-publication review & selection
short term

2. Public peer review & interactive discussion
mid-term, **integrative !**

3. Peer review completion
mid term

4. Post-publication review & evaluation
long-term, **ALM ...**

Advantages

All-win situation: authors, referees, editors, readers, community

Discussion Paper

- **free speech**, rapid publication, citable record (*authors, readers*)

Public Peer Review & Interactive Discussion

- direct feedback & public recognition for high quality papers (*authors*)
- prevent hidden obstruction & plagiarism (*authors, editors*)
- **foster & document scientific discourse**: critical comments, constructive suggestions, complementary information (*authors, referees, readers, editors*)
- document controversial arguments & innovations or flaws & misconduct (*referees, editors, readers*)
- deter submission of weak & false papers ⇒ **save reviewer capacities** (*referees, editors*)

Final Paper

- **maximize quality assurance & information density** through integration of peer review, public discussion & final revision (*readers*)

Achievements ACP/EGU

Atmospheric Chemistry & Physics (ACP)

launched 2001 with Nobel laureate P. Crutzen &

European Geosciences Union (EGU)

15 EGU sister journals since then:

Biogeosciences, Climate, Hydrology ...

Large-scale move to interactive OA

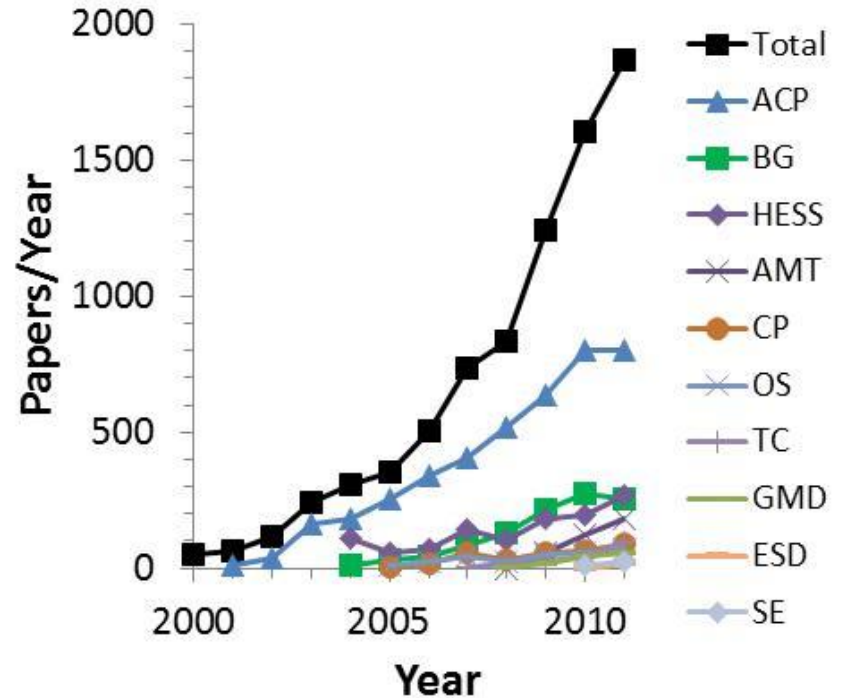
publishing in geosciences:

> 10 000 papers; > 50 000 comments

Spread of concept to other communities/platforms:

Economics e-journal, SciPost Physics/arXiv.org,

F1000 Research, Wellcome Open Research ...



Unique combination:

- top speed: 1+x weeks from submission to citable publication (discussion paper)
 - top impact & visibility (across atmos., environ. & geosciences)
 - low rejection rate (~15% vs. ~50+%)
 - large volume (~10% of geoscience journal market)
 - low cost (~1000 EUR/paper vs. ~2000-4000 EUR/paper)
 - fully self-financed & sustainable (incl. review, production, archiving & 10-20% surplus for publisher & society), 2014: ~3000 papers, ~3 MEUR turnover, ~300 kEUR surplus
- self-regulation by transparency



Efficient handling & self-regulation of controversial papers & discussions

Volume 16, issue 6



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Atmos. Chem. Phys., 16, 3761-3812, 2016
<http://www.atmos-chem-phys.net/16/3761/2016/>
doi:10.5194/acp-16-3761-2016
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Article Peer review Metrics Related articles

Research article

22 Mar 2016

Ice melt, sea level rise and superstorms: evidence from paleoclimate data, climate modeling, and modern observations that 2 °C global warming could be dangerous

James Hansen et al.

Download

- Final revised paper (published on 22 Mar 2016)
- Supplement to the final revised paper
- Discussion paper (published on 23 Jul 2015)
- Supplement to the discussion paper

Hansen et al. 2016: Climate Change, 110 comments, 138 000 downloads

www.atmos-chem-phys.net/16/3761/2016/acp-16-3761-2016-discussion.html

Search articles

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- Supplement (2930 KB)

Short summary

We use climate simulations, paleoclimate data and modern observations to infer that continued high fossil fuel...

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Citation

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Interactive discussion

Status: closed

AC: Author comment | RC: Referee comment | SC: Short comment | EC: Editor comment

- Printer-friendly version - Supplement

- SC C5202: 'SC Two papers that conflict with section 2.2. argument for Eemian "superstorm" activity', Andrew Revkin, 26 Jul 2015
- SC C5522: 'Is a 10% increase in wind speed enough to increase wave heights enough to move the Bahamian boulders in the Eemian?', Michael Wehner, 31 Jul 2015
- AC C8101: 'Response to SC C5522', James Hansen, 15 Oct 2015
- AC C5615: 'Boulders in the Bahamas: Response to Comment by A. Revkin on paper Ice Melt, Sea Level Rise and Superstorms', James Hansen, 04 Aug 2015
- SC C5885: 'Boulders show mega-tsunamis and multi-metre sea level rise could result from rapid Arctic warming; both precautionary and preventative actions are required urgently', John Nissen, 13 Aug 2015
- AC C7872: 'Response to SC C5885', James Hansen, 12 Oct 2015
- SC C6270: 'Speculations on superstorms', Max Engel, 26 Aug 2015
- AC C7633: 'Reply to SC C6270 'Speculations on superstorms'', Max Engel, 26 Aug 2015', James Hansen, 06 Oct 2015

- SC C5208: 'Evidence and validation', Erik Stabenau, 26 Jul 2015
- SC C6508: 'Antarctic sea ice growth', Steven Marcus, 03 Sep 2015
- AC C7963: 'Response to SC C6508', James Hansen, 13 Oct 2015
- AC C7962: 'Response to SC C5208', James Hansen, 13 Oct 2015

- RC C5209: 'Very important but strenuous paper', David Archer, 27 Jul 2015
- SC C5270: 'Archer's comment on Hansen's new SLR paper', Rud Istvan, 27 Jul 2015
- SC C5316: 'RE: Rud Istvan's reply to 'Archer's comment on Hansen's new SLR paper'', Tim Pa, 29 Jul 2015
- SC C5336: 'Greenland ice mass loss', Rud Istvan, 29 Jul 2015
- AC C7878: 'Response to SC C5336', James Hansen, 12 Oct 2015
- AC C7876: 'Response to SC C5316', James Hansen, 12 Oct 2015
- AC C7874: 'Response to SC C5270', James Hansen, 12 Oct 2015

Makarieva et al. 2008, 2013: Meteorology, 33+20 comments

www.atmos-chem-phys-discuss.net/acpd-2008-0250/
www.atmos-chem-phys.net/13/1039/2013/acp-13-1039-2013-discussion.html

Journal metrics

- IF 5.053**
- IF 5-year 5.656**
- SNIP 1.574**
- IPP 5.054**
- SJR 3.022**
- h5-index 92**

[Definitions](#)

Abstracted/indexed

- Science Citation Index

Alternative Concepts

Details & subtleties can make a difference.

Open Peer Review without Anonymity

- e.g. *JIME, BMJ, BMC Medicine, BMC Biology Direct ...*
- *no opportunity for referees to remain anonymous*
- *difficulties with critical comments & refereeing capacities*

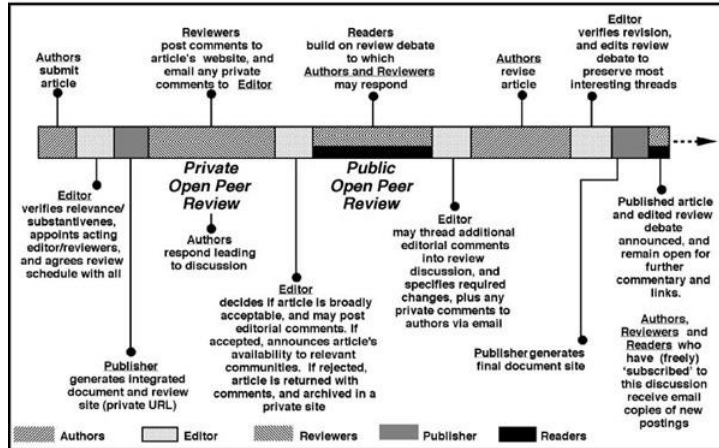
Pre-Publication History & Post-Commenting (Peer Commentary)

- e.g. *BMC Medical Journals, BBS, PLOS One, BMJ, PeerJ ...*
- *no integration of peer review & public discussion*
- *less opportunity & incentive for community participation*

Multi-Stage Open Peer Review

- e.g. *ACP & EGU/Copernicus, Economics e-journal, F1000 Research, SciPost/arXiv ...*
- *do not abandon traditional peer review but maintain its strengths & reduce its weaknesses by transparency & interactive discussion*
- *optional anonymity, integrate peer review & public discussion, iterate review & revision*
- *evolutionary & modular approach, flexibly adjustable to different communities*

Development & Variants of Multi-Stage Open Peer Review

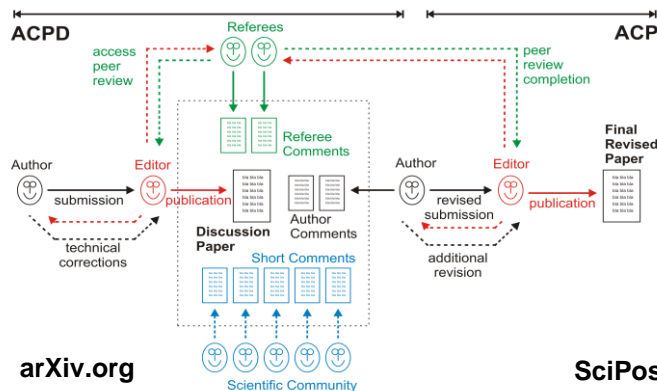


Electronic Journals (since 1996)

JIME: J. Interactive Media in Education, since 1996, returned to traditional review

ETAI: Electr. Transact. Artificial Intelligence, 1997-2002

... too complex/immature, too early ?



Forums/Repositories + Journals (since 2001)

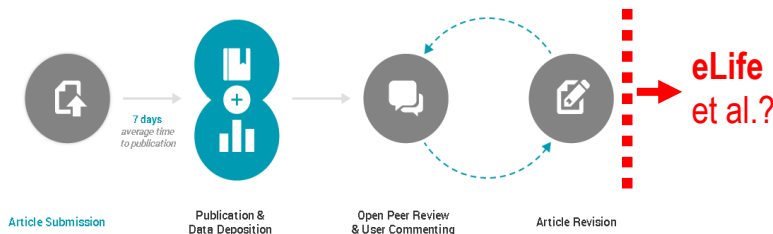
ACP & EGU: Atmos. Chem. Phys. & European Geosciences Union, 15 journals, since 2001

Economics E-Journal: since 2007

SciPost Physics/arXiv.org: since 2016

... well-defined, mature & successfully competing with traditional top journals

similar mechanics & options, why truncate ?



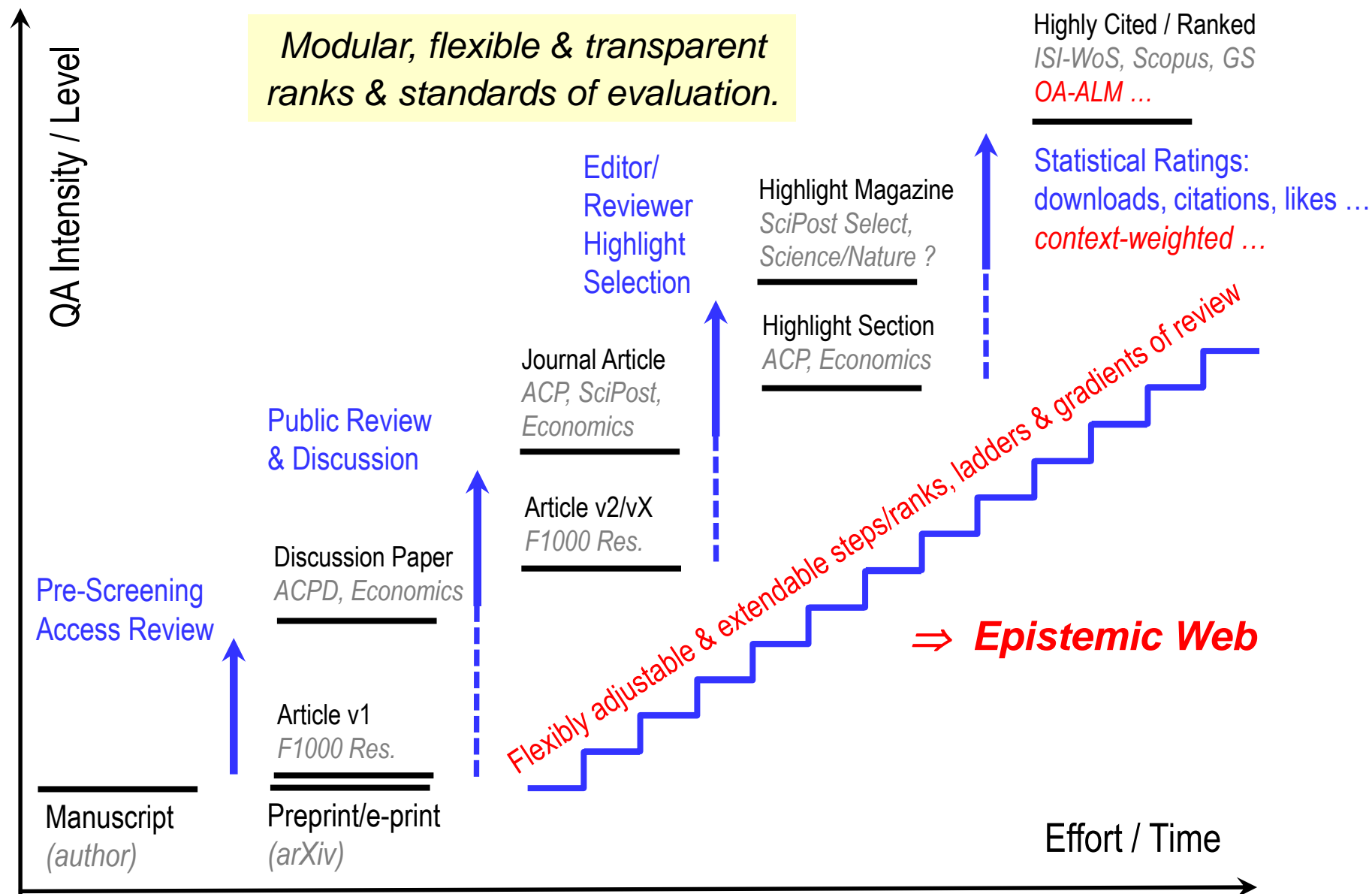
Platforms w/o Journals (since 2012)

F1000 Research: since 2012

Wellcome Open Research: since 2016

*... technical advances vs. conceptual truncation ?
how to attract & maintain high quality ?*

Adjustments & Gradients of Multi-Stage Open Peer Review



Vision

*Promote societal progress by OA & OPR
in global commons of scholarly information.*

Provide access to high quality scientific publications

review & revision involving the community

⇒ *more & better information for scientists & society*

Document the scientific discourse

public record of scientific evidence, arguments & progress

⇒ *universal & traceable web of knowledge (epistemic web)*

Demonstrate transparency & rationalism

transparent & rational approach to complex questions & problems

⇒ *role model for societal decision processes*

A Scientist's Perspective

on the Needs and Opportunities for Large-Scale
Open Access to Scholarly Research Articles & Journals

Ulrich Pöschl

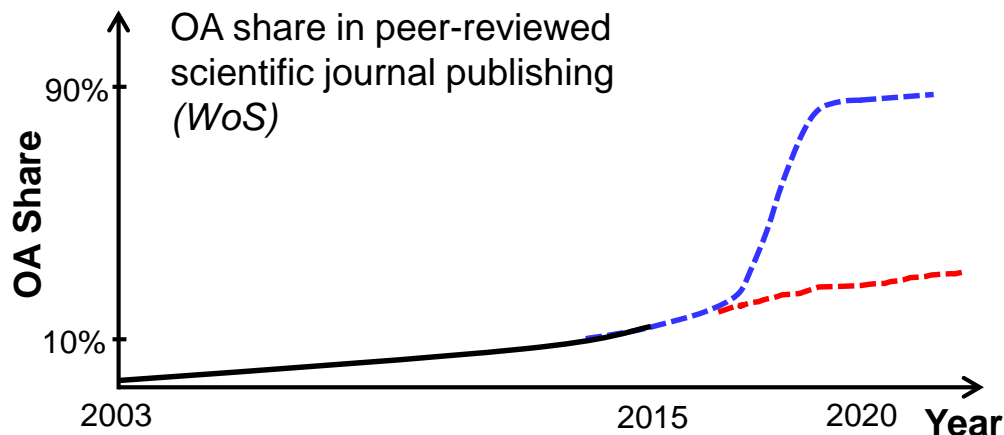
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Original Presentation: B12 Open Access Conference, Berlin, 6 December 2015

Let's act now because ... (2015)



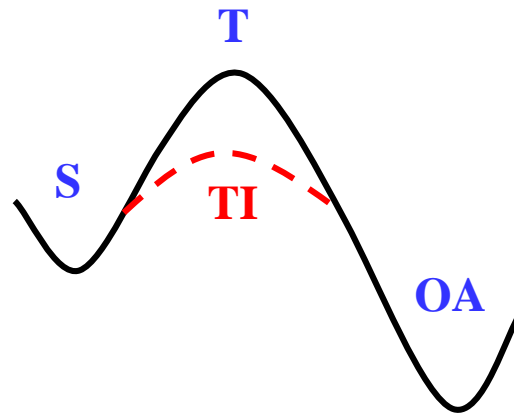
Concerted action is required to reach high OA share swiftly
(long-term contracts, ...)

Inactivity may lead to slow increase of high quality OA & promote low quality OA („predatory publishers“)

- **OA publishing well established (~20 years); substantial volume achieved (~13% pure OA journal articles in WoS); tipping point in reach ...**
- Politics pay attention and support, traditional publishers start to move
- Junior scientists & public demand free information on the Internet (*collective & personal use*)
- **OA publishing & increase limited by availability of high quality OA journals:**
percentage OA publishing \approx percentage OA journals (WoS: ~ 1500 of ~ 12000)
- **Delayed transition may harm integrity & quality of scientific literature:**
predatory publishers & self-archiving may erode trad. system before adequate replacement
- **Concerted action enables continuity, stability & full benefit**
- **Pilots & role models available** (SCOAP3, AT-IOP, DE-RSC, AT/NL/UK/MPG-Springer, ...)
- **Publishing Costs \approx 1-2% of Science Budgets: Let's stop the tail wagging the dog**

Transition from Subscription to OA Publishing

Subscription (S):
high cost/low value;
tightly restricted
access & usability



Transition (T):
activation needed

Transformation Initiative (TI)

Open Access (OA):
lower cost/higher value;
full access & usability

Trust & apply the principles of mass/energy conservation & kinetics

Necessary funds are already in the system (>30% buffer)*

OA will liberate the market and lead to higher value at same or lower cost

Change requires activation: Transformation Initiative focused on STM journals
shall serve as **energizer** (EoI/declaration) & **catalyst** (collaboration)

Hybrid, offsetting & cooperative models to attract & support traditional publishers

Pilots & role models: institutional, national & topical agreements with various publishers

** see Ralf Schimmer, MPDL White Paper 2015, related references & next slide*

Financial Conditions in a Nutshell

Subscription journal market today:

total budget ~7.6 bn EUR/yr for ~2 Mio articles/yr

⇒ average „article processing charge“(APC): **~3800 EUR/article**,
including expensive magazines, large inefficiencies (access & usage barrier management, long-term oligopoly effects), high profits (up to ~35%)

OA journal market today:

conservative average APC **~2000 EUR/article** for high quality OA journals,
less than ~1500 EUR/yr in top quality OA journals from efficient OA publishers, established since >10 yrs with substantial profits for publishers & learned societies

OA journal market after transformation:

conservative average APC ~2000 EUR/article for ~2 Mio articles/yr

⇒ **base budget ~4 bn EUR/yr** for ~2 Mio articles/yr

⇒ **buffer of ~3.6 bn EUR/yr** (~45%) for remaining subscription journals/magazines, new & improved services, APC waivers against undue publication barriers, etc.

⇒ **budget-neutral transformation possible at short notice**

⇒ **plenty of buffering capacity for valid concerns**

⇒ **substantial service improvements or savings possible**

⇒ *for details see Ralf Schimmer, MPDL White Paper 2015 & related references*

Basic Concept of Transformation Initiative

Zero-Order Approximation:

- (1) maintain payments & drop paywalls
- (2) adjust budgets & cash flows

First-Order Approximation:

- (1) **Every organization continues to pay** for some time the same amount as for past journal subscriptions while requesting OA for their corresponding author articles
- (2) **Calculate “equivalent APC”** = subscription fees divided by number of corr. author articles for every organization & for every publisher/every journal
- (3) **Check balances** between equivalent APC, publisher APC (*hybrid/offsetting*) & market APC (*<1500 EUR/article, ~2000 EUR/article, ~3800 EUR/article*)
- (4) **Adjust balances** on individual, regional & global levels (*those who publish a lot usually also subscribe to a lot, v.v.*) and include mechanisms against undue publication barriers (*waiver programs etc.*)
- (5) **Move to free OA market** (*moderated/regulated by competition and/or cooperation*)

More sophisticated description & implementation:

⇒ *see Ralf Schimmer, MPDL White Paper 2015 & related references*

⇒ *develop Consensus, Expression of Interest & Roadmap for International Initiative*

Why can we expect publisher collaboration & success?

OA causes no extra cost (*rather savings*) and has become a competitive advantage for all: **authors** (*visibility*), **readers** (*access*), and **publishers** (*attractiveness*)

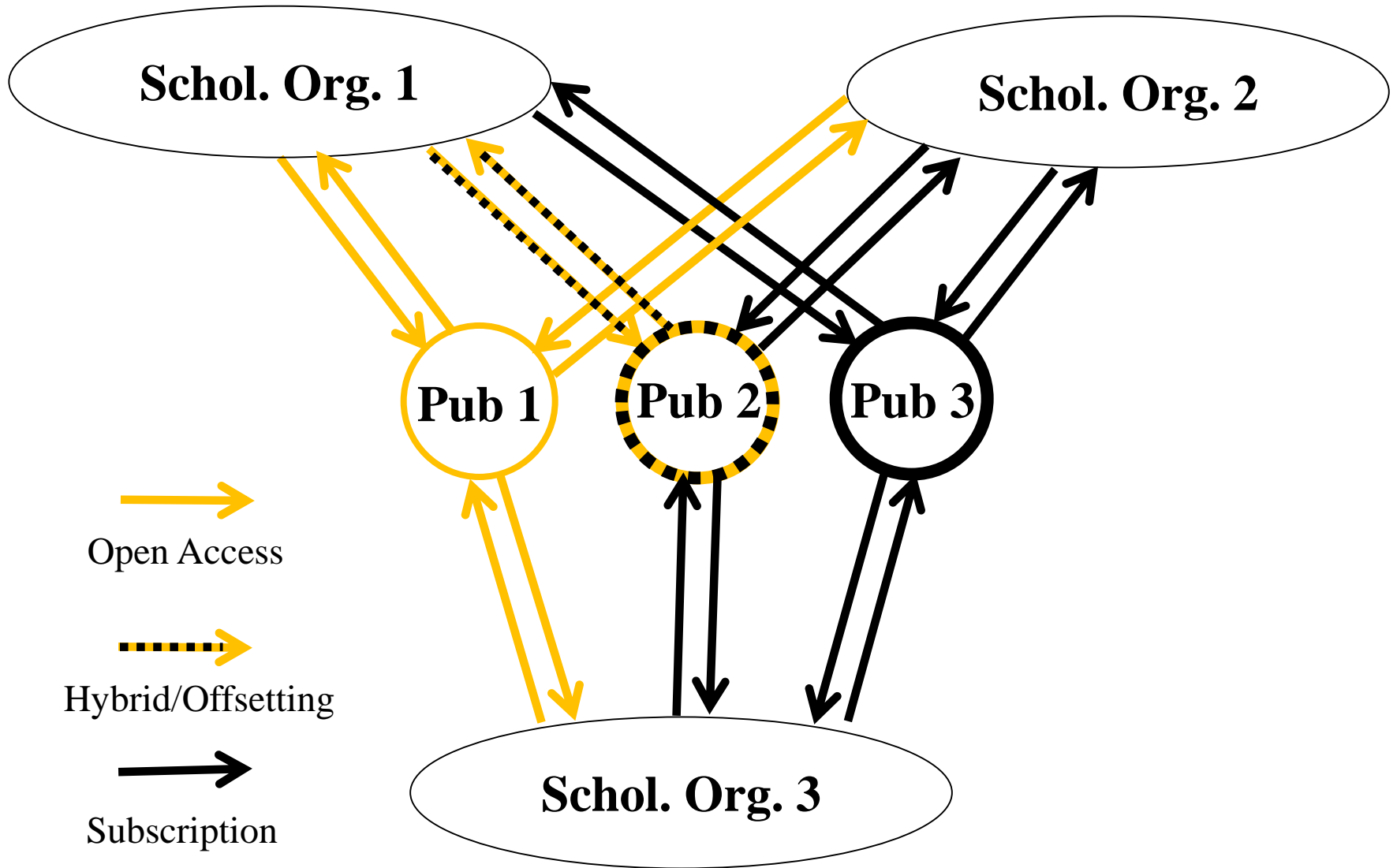
Traditional publishers have already lost 13% of the journal market (WoS) and expect growth primarily in OA

Major commercial & society publishers have already entered collaboration on institutional, national & topical OA hybrid/offsetting/cooperation contracts

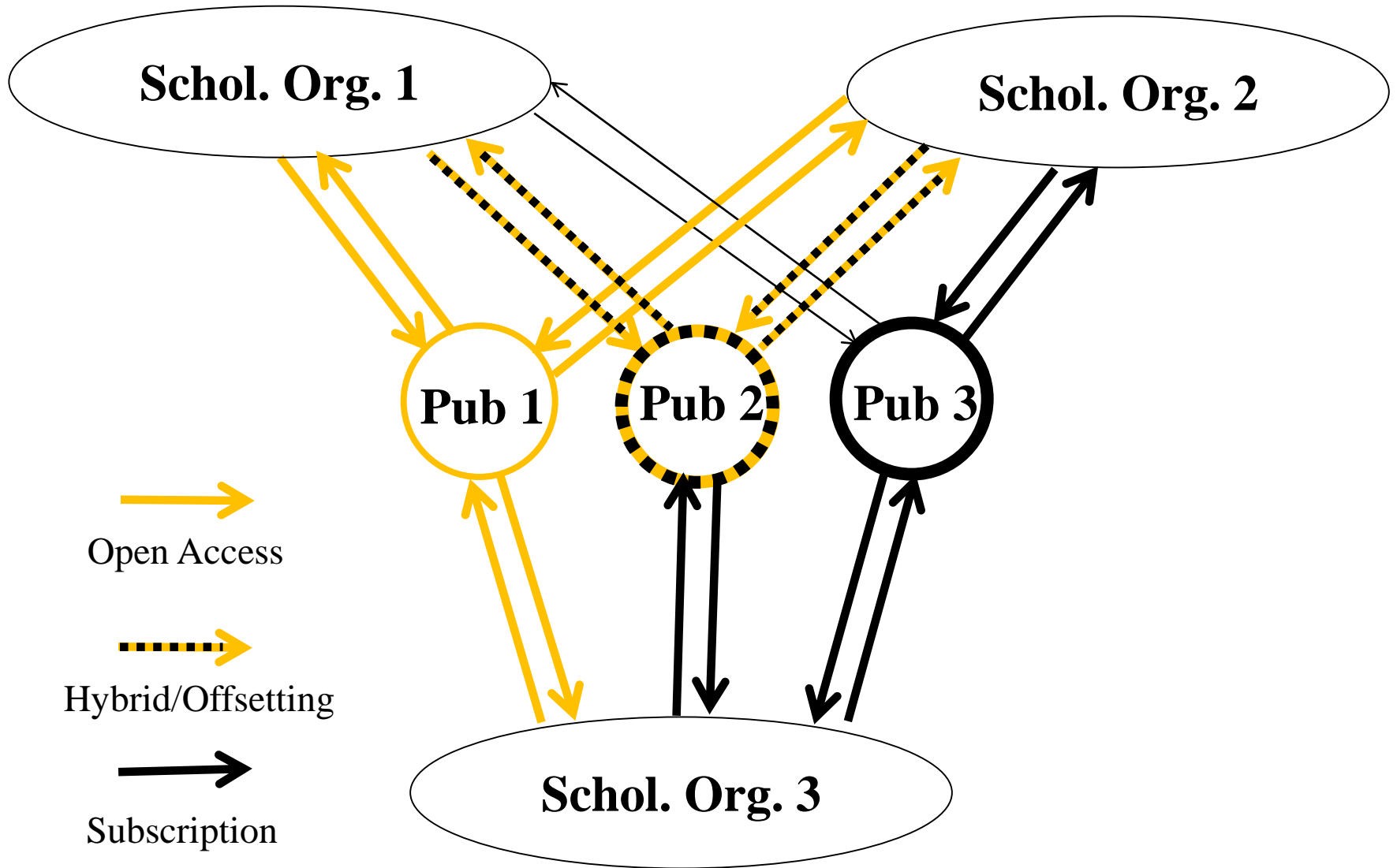
Pressure & support from public, politics & junior scientists is building up & can be catalyzed by global collaboration of scholarly organizations with all involved parties
⇒ **Expression of Interest (EoI) & Roadmap for International Initiative**

Transformation already successfully pursued by individual organizations, countries & fields but will be most effective in global collaboration of scholarly organizations
⇒ **modular approach likely to trigger swift, smooth & scholarly oriented transition**

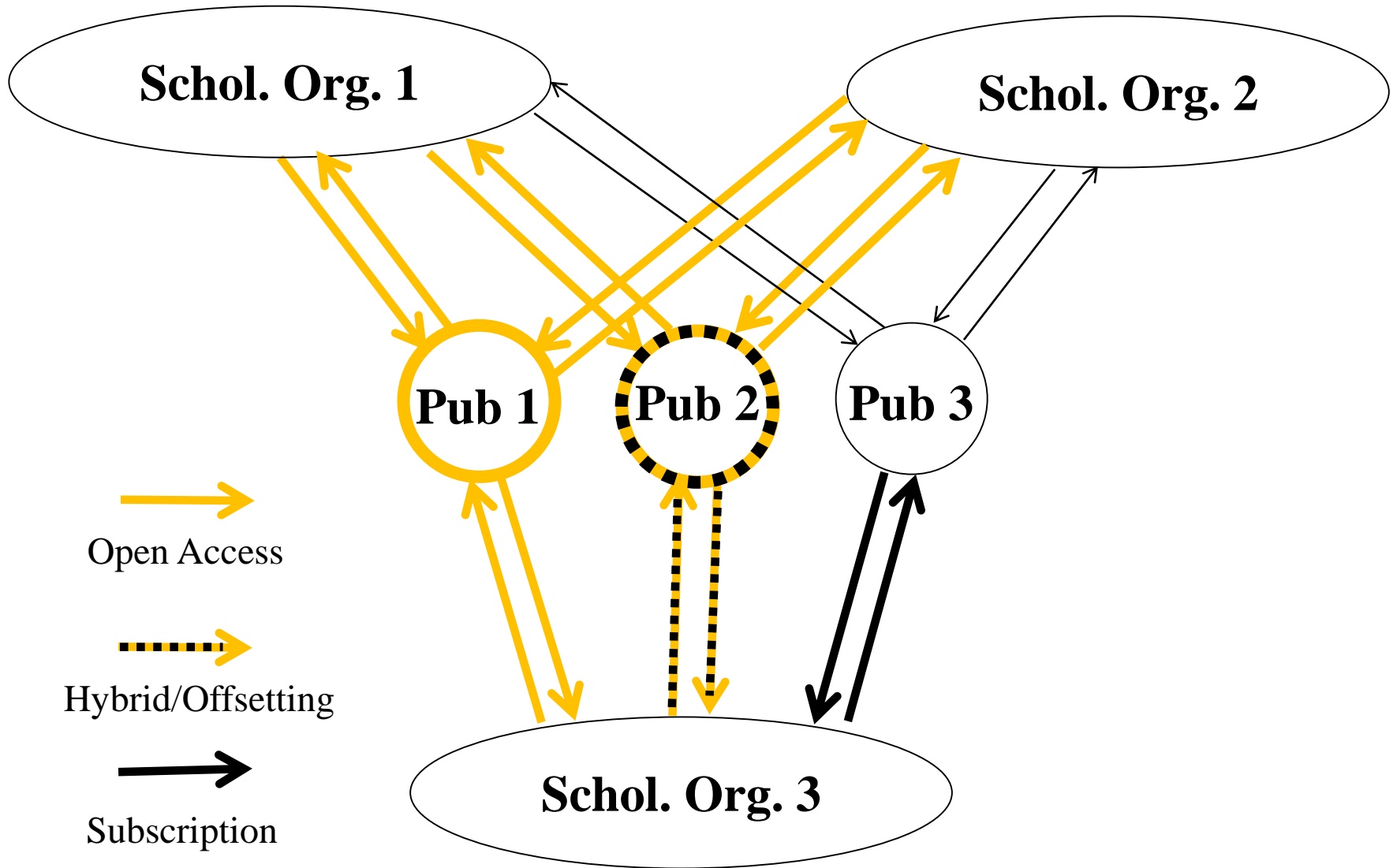
Status Quo (2015)



Near Future (2017)



OA Future (2020+)



OA2020 Expression of Interest

... We recognize and endorse various ways of implementing open access (OA), including the development of new OA publishing platforms, archives and repositories.

In scholarly journal publishing, OA has gained a substantial and increasing volume.

Most journals, however, are still based on the subscription business model with its inherent deficiencies in terms of access, cost-efficiency, transparency, and restrictions of use.

To gain the full benefits of OA and enable a smooth, swift and scholarly oriented transition, the existing corpus of scholarly journals should be converted from subscription to open access.

Recent developments and studies indicate that this transition process can be realized within the framework of currently available resources.

With this statement, we express our interest in establishing an international initiative for the OA transformation of scholarly journals, and we agree upon the following key aspects:

We aim to transform a majority of today's scholarly journals from subscription to OA publishing in accordance with community-specific publication preferences.

At the same time, we continue to support new and improved forms of OA publishing.

We will pursue this transformation process by converting resources currently spent on journal subscriptions into funds to support sustainable OA business models.

Accordingly, we intend to re-organize the underlying cash flows, to establish transparency with regard to costs and potential savings, and to adopt mechanisms to avoid undue publication barriers. ...

Large scale transformation to open access; the key role of the Max-Planck-Gesellschaft

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Original Presentation:
Scientific Council of the Max Planck Society,
Berlin, 21 February 2019



MAX PLANCK
digital library

All German research organizations have signed the 2003 *Berlin Declaration on Open Access* and have joined the OA2020 initiative.

The **DEAL** negotiations with **SpringerNature**, **Wiley** and **Elsevier** reflect the **collective demand for more OA and transparent pricing**.

PAR model (Publish & Read)

- Nationwide licenses to the entire portfolio of electronic journals
- All publications by corresponding authors of eligible institutions become open access immediately upon publication (CC-BY (=attribution) license)
- Fair pricing, ultimately only based on the number of papers published

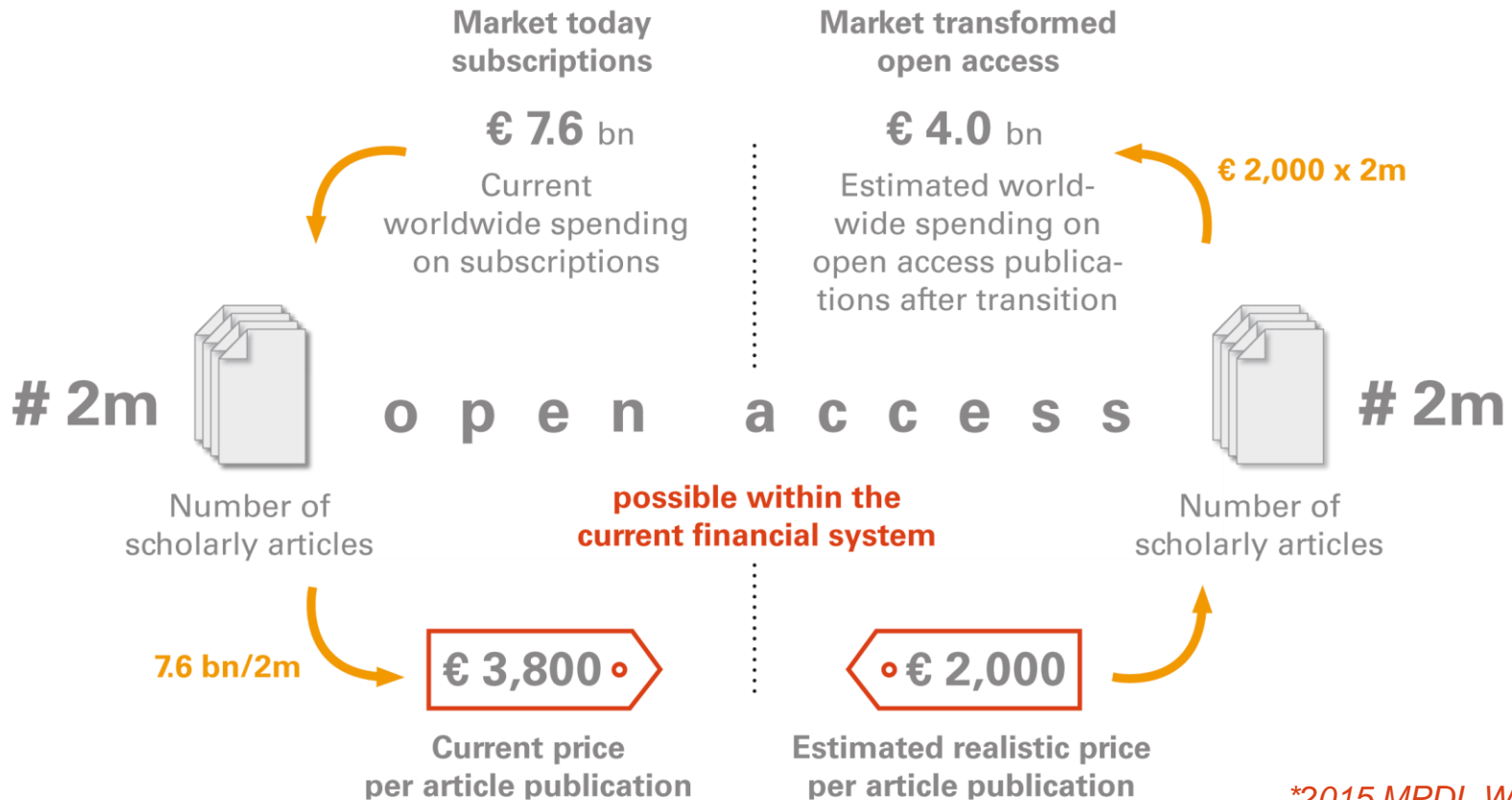
Aligned with national approaches in UK, NL, AT, SE, NO and other countries

The amount of money in the subscription system*

o p e n a c c e s s
2 0 2 0



Worldwide Publishing Market



**2015 MPDL White Paper*

DEAL negotiations; the main line of negotiations

Time-line



pay subscription fees for reading access (~ 3.800 €/article)

to publish articles Open Access:

pay subscription fees and pay APC (~ 6.800 €/article)

“double dipping”

pay subscription fees; get credits for APCs
(offsetting models; partial OA; ~ 3.800 €/article)

pay for OA publishing & reading (PAR)

(transformative agreements; **PAR-fee 2.750 €/article @ Wiley**)

pay for OA publishing of all articles; “flipped” to pure OA journals
(estimated to be possible for ~ **2.000 €/article**)

Conclusions regarding the DEAL negotiations

The contract signed with Wiley shows that the DEAL approach is realistic, timely and promising.

The DEAL consortium will also continue to strive for a contract with SpringerNature and Elsevier under acceptable and sustainable terms. With SpringerNature this appears likely on a short term. For 2019, the existing contracts with SpringerNature have been continued.

DEAL has not received a similar offer from Elsevier yet. The replacement of their CEO might cause some further delays.

The MPG contract with Elsevier has not been renewed per January 1st, 2019. The MPDL has set up a post-cancellation service. Per February 19th a total of 541 documents have been ordered via the MPDL, distributed over 45 MPIs. Another 28 MPIs take care of this for their institutes themselves.

Pre 2019: contracts with Springer (prior to DEAL), Taylor & Francis, Royal Society of Chemistry, Institute of Physics Publishing.

In 2019: The MPG has reached agreement with the **American Chemical Society** for a 4-year contract. The MPG gets access to the full e-portfolio of scientific journals. All publications of MPI researchers are published OA in hybrid journals at no extra costs for the authors. Copyrights stay with the authors; default CC-BY.

Furthermore, the MPG signed contracts with **EDP Sciences** and with **Oxford University Press** for OA publication, covering with the journals *Astronomy and Astrophysics* and *Monthly Notices of the Royal Astronomical Society* the two journals with the largest number of MPG publications per year.

Contracts with other publishers shall follow soon.

MPDL maintains a list of journals (gold and hybrid) that are effectively open access for MPG researchers (all under a central MPDL contract, with full central cost coverage).

5,823 journals are currently listed, soon to go up to more than 8,000.

<https://rena.mpdl.mpg.de/journals/oagold/>

Conclusions

1) Continue & promote experiments with improved forms of OA & OPR

- build on existing models & experience rather than re-inventing the wheel
- foster transparency & self-regulation (multi-stage open peer review)

2) Introduce & demand access to article reviews & pre-publication history

- establish new standards & proofs of quality assurance to cope with increase of scholarly articles & journals (incl. predatory OA publishers)

3) Advance & apply new metrics of publication impact & quality

- use article level metrics instead of journal impact factors
- use OA to terminate intransparent & unscholarly reliance on citation counting oligopoly (WoS, Scopus, Google Scholar)

4) Return control of scholarly publishing to scholarly community

- continue to support new & improved forms of OA publishing
- trust principles of mass & energy conservation: OA publishing costs can be covered by conversion of subscription budgets (offsetting/transformation, cancelation ...)
- proceed to large-scale implementation of OA & enhance diversity of publishing venues
- endorse OA2020 Initiative for efficient & swift transition to OA (see oa2020.org)

Further References I

The following references and links provide orientation about the development and perspectives of open access in general and interactive open access publishing with public peer review and interactive discussion in particular (multi-stage open peer review as practiced at EGU).

1. Open Access Declarations & Initiatives

1.1. Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities

<http://openaccess.mpg.de/286432/Berlin-Declaration>

<http://openaccess.mpg.de/319790/Signatories>

http://openaccess.mpg.de/mission-statement_en

http://openaccess.mpg.de/1527674/Session_II

<http://openaccess.mpg.de/1528633/Session-2-Poeschl.pdf>

1.2. Bethesda Statement on Open Access Publishing

<http://legacy.earlham.edu/~peters/fos/bethesda.htm>

1.3. Budapest Open Access Initiative

<http://www.budapestopenaccessinitiative.org/>

<http://www.budapestopenaccessinitiative.org/boai-10-recommendations>

<http://www.opensocietyfoundations.org/voices/opening-access-research>

2. Development & Concepts of Interactive Open Access Publishing & Public Peer Review

2.1. Multi-stage open peer review: scientific evaluation integrating the strengths of traditional peer review with the virtues of transparency and self-regulation

<http://journal.frontiersin.org/Journal/10.3389/fncom.2012.00033/abstract>

2.2. Interactive journal concept for improved scientific publishing and quality assurance

<http://www.ingentaconnect.com/content/alpsp/lp/2004/00000017/00000002/art00005>

Further References II

2.3. A Short History of Interactive Open Access Publishing

http://publications.copernicus.org/A_short_History_of_Interactive_Open_Access_Publishing.pdf

2.4. EGU Position Statement on the Status of Discussion Papers Published in EGU Interactive Open Access Journals, European Geosciences Union 2010

<http://www.egu.eu/about/statements/position-statement-on-the-status-of-discussion-papers-published-in-egu-interactive-open-access-journals/>

2.5. Further initiatives & visions of open evaluation

<http://www.economics-ejournal.org/>

<http://f1000research.com/>

<https://www.scienceopen.com/>

http://www.frontiersin.org/Computational_Neuroscience/researchtopics/Beyond_open_access:_visions_for_open_evaluation_of_scientific_papers_by_post-publication_peer_review/137