

# Open Access in the Scientific Discourse: Achievements & Perspectives

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# Outline

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## Overview

- *motivation & development*

## Open Discourse in the Humanities

- *cultural heritage & epistemic web*

## Open Discourse in the Sciences

- *multi-stage open peer review*

## Conclusions

- *vision & propositions*

## Acknowledgement:

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P. Crutzen, A. Richter & ACP-EGU-Copernicus Team*

# Motivation of Open Access

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***Scientific, educational & economic advantages of free online availability & usability of (publicly funded) research publications.***

## Educational:

- inform & stimulate interested public (*school teachers, students, et al.*)
- equal opportunities in the information society (*global & social*)
- **re-integrate scholarly & common knowledge** (*wikipedia, etc.*)

## Economic & Technological:

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

## Scientific:

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

# Open Access & Quality Assurance

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***Open Access is not a threat to scientific quality assurance  
but an (urgently needed) opportunity for improvement.***

## **Traditional Peer Review:** compatible with OA

- successful OA journals with traditional & refined review procedures:  
*New J. Phys., Living Reviews, BMJ, BMC Medicine, PLOS Biology, Frontiers, eLife, et al.*

## **Information for Reviewers:** augmented by OA

- easy & interdisciplinary access to relevant publications

## **Public Review & Interactive Discussion:** enabled by OA

- exchange across & between scientific communities:  
*ACP/EGU, Economics e-journal, Biology Direct, F1000 Research, et al.*

## **Post-Publication Review & Evaluation:** enhanced by OA

- transparent & comprehensive analyses of article contents & impact (diversity, no oligopoly):  
*Article Level Metrics (ALM): downloads, views, citations, scientific & social media, ...*

**Predatory OA Publishers:** side-issue, transition problem & red herring

- low quality outlets not new but attracted by “OA vacuum”; OASPA vs. Beall’s list ...

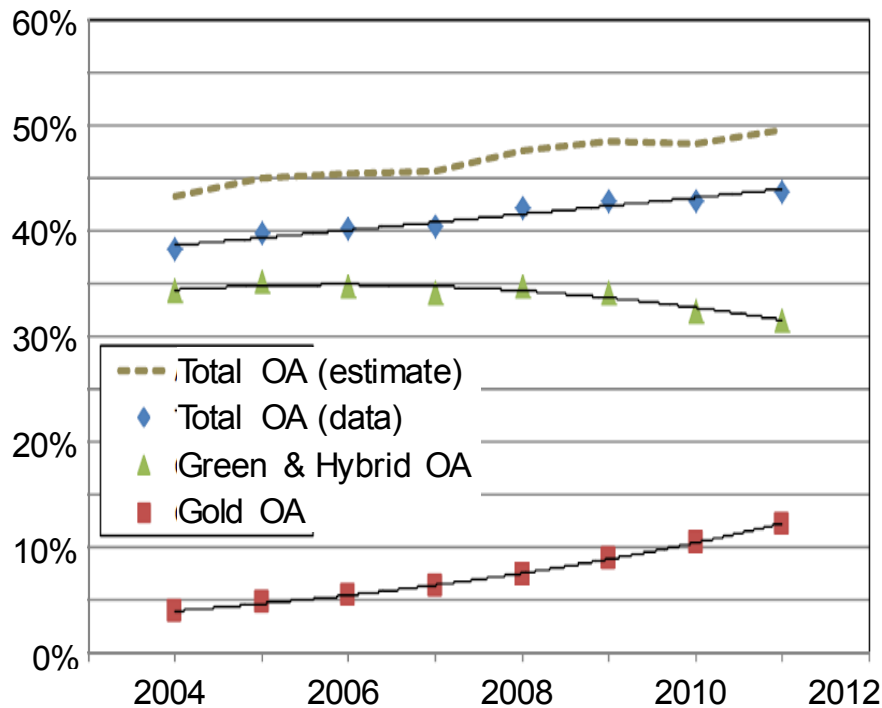
# OA Archiving & Publishing

**OA Archiving** (“Green OA”):

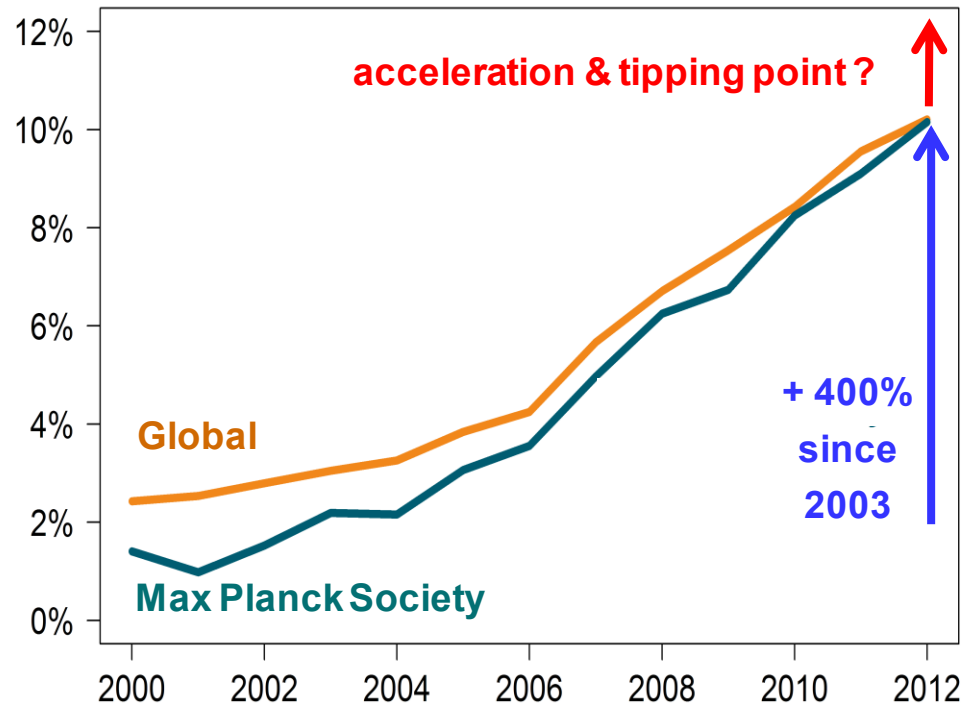
**~30+X %** of recent peer-reviewed publications,  
*delays & limits in usability & sustainability*

**OA Publishing** (“Gold OA”):

**~10+X %**, *immediate & full benefit, sustainable*



European Commission, Science Metrix 2013



MPDL 2013

**Percentage OA Publishing  $\approx$  Percentage OA Journals** (WoS: 1500 of 12000)

**$\Rightarrow$  OA publishing & increase limited by availability of OA journals** (with high quality)

# OA Publishing @ Max Planck Society

## Major Journals & Publishers

**NJP + 6** (IOP-DGP), since 1998

**Living Rev. Relativity + 6** (MPS), since 1998

**ACP + 14** (EGU-Copernicus), since 2001

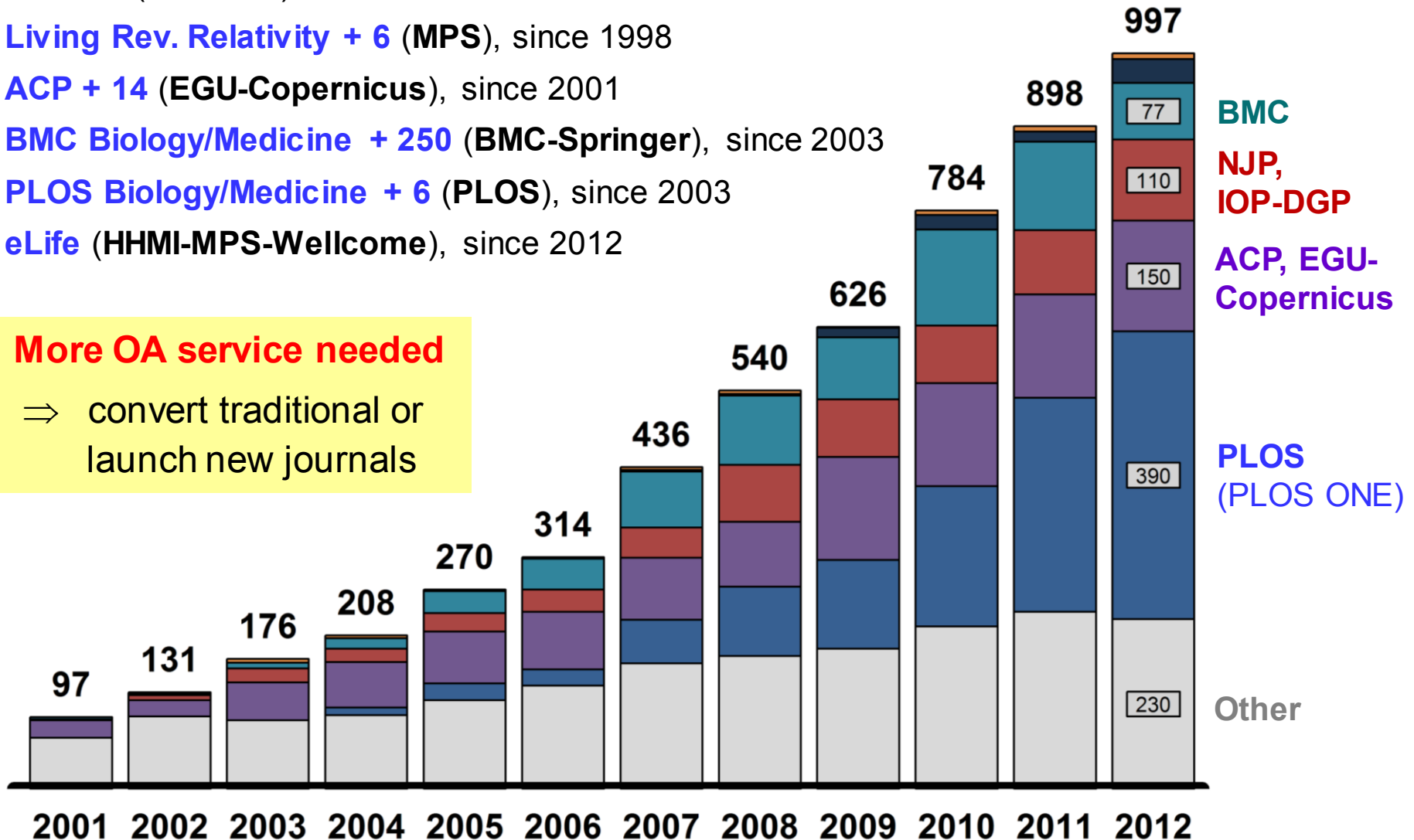
**BMC Biology/Medicine + 250** (BMC-Springer), since 2003

**PLOS Biology/Medicine + 6** (PLOS), since 2003

**eLife** (HHMI-MPS-Wellcome), since 2012

**More OA service needed**

⇒ convert traditional or  
launch new journals



# OA Endorsement by Alfred Nobel et al.

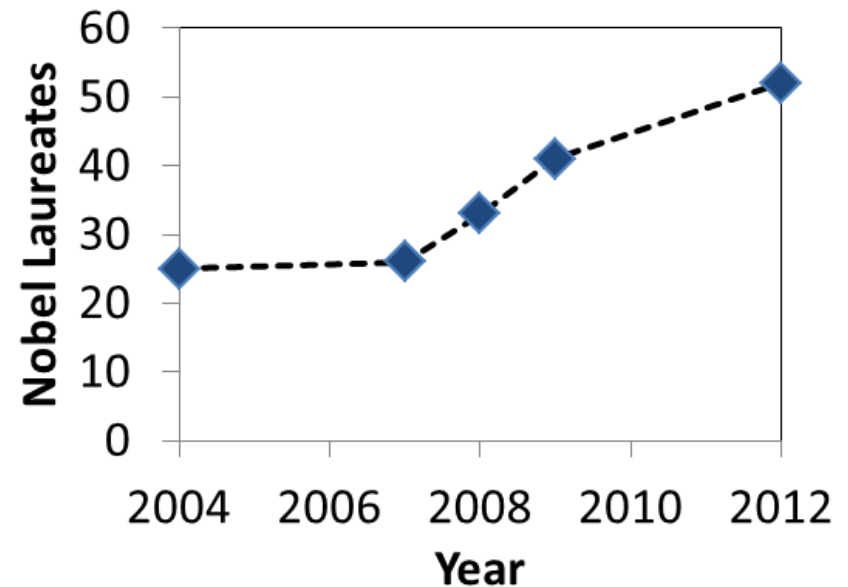


eLIFE

2013 Nobel Prize in Physiology/Medicine to [Randy Schekman](#), Editor-in-Chief of eLife

## Similar boost for other initiatives:

- [Paul Crutzen](#) for ACP/EGU (since 2001)
- [Harold Varmus](#) for PLoS (since 2003)
- Increasing number of Nobel Laureates publicly signing [OA support letters to US Congress](#) (2004 → 2012: 25 → 52)



**Reflect top quality & wide spread of OA**

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Search

Anthropology

Archaeology

Bibliotheca Polyglotta

Buddhism

Chinese Knowledge

Copperplates

Cuneiform Tablets

Folk Religion

Greek Science 1600-1821

Historical Maps

Historical Travel Guides

History of Architecture

History of Chemistry

History of Cosmology

History of Demography

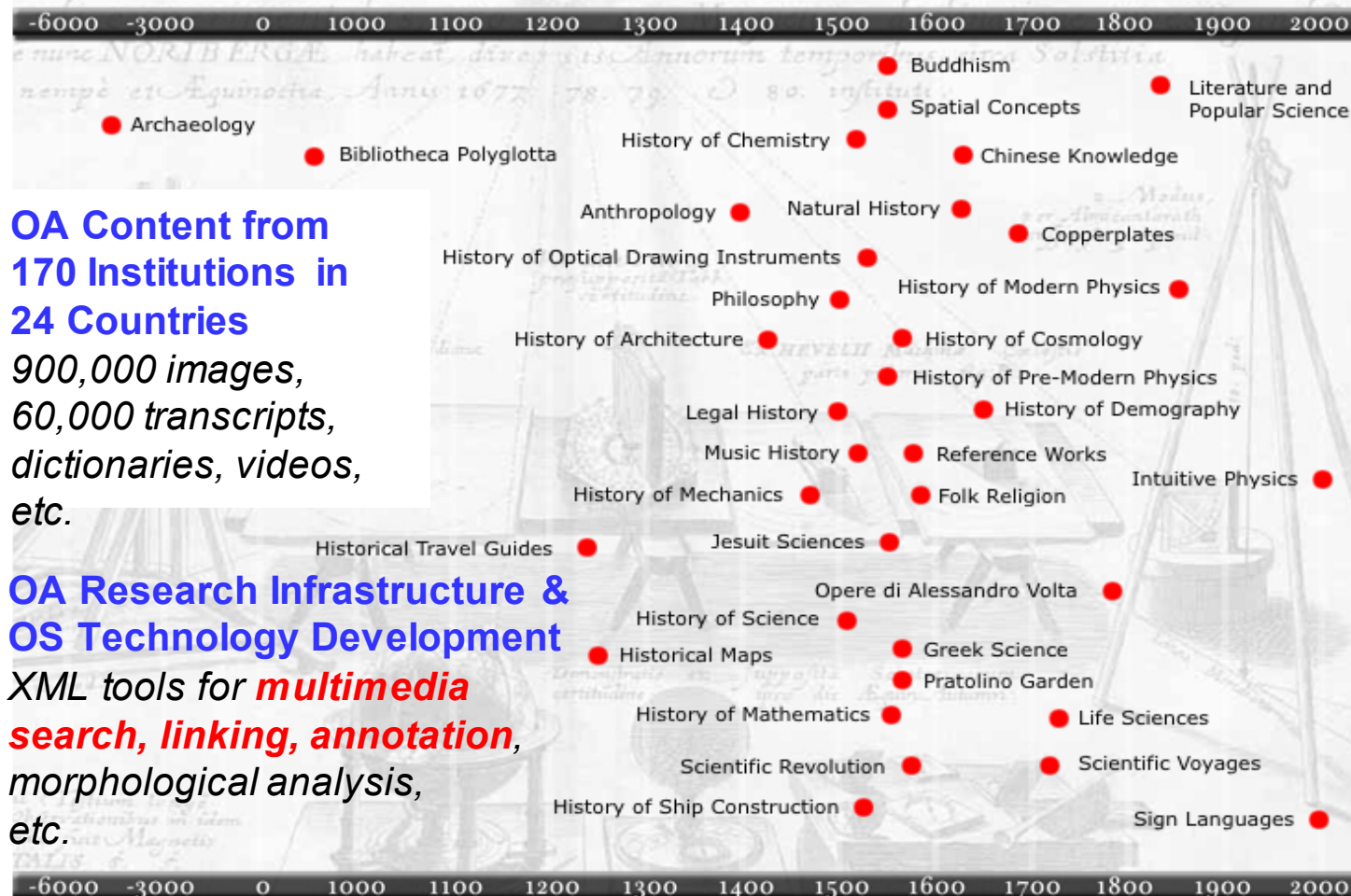
History of Mathematics

History of Mechanics

History of Modern Physics

History of Optical Drawing Instruments

## The ECHO Content: Seed Collections of a Growing Web of Culture



## OA Content from 170 Institutions in 24 Countries

900,000 images,  
60,000 transcripts,  
dictionaries, videos,  
etc.

## OA Research Infrastructure & OS Technology Development

XML tools for **multimedia**  
**search, linking, annotation,**  
**morphological analysis,**  
etc.

<http://echo.mpiwg-berlin.mpg.de/content>



# Edition Open Access

Max Planck Research Library for the History and Development of Knowledge

■ Studies

■ Sources

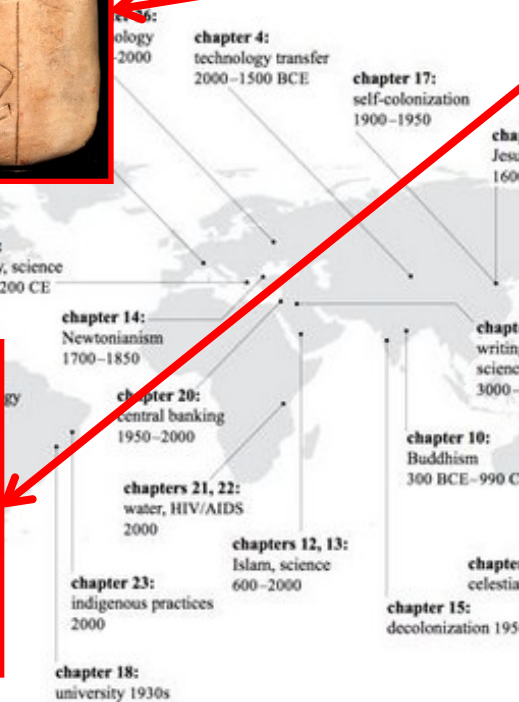
■ Textbooks

■ Proceedings

[Home](#) / [Studies](#) / [The Globalization of Knowledge...](#) / [World Map – Chapter Overview](#)

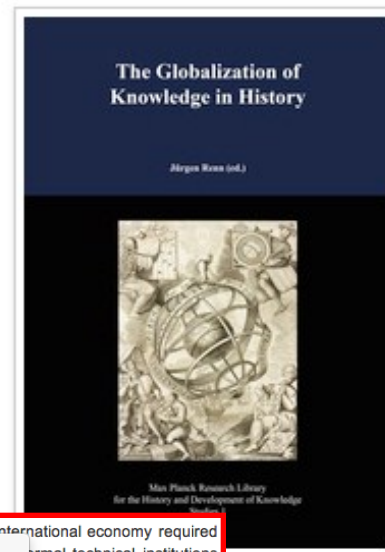
◀ [About the Contributions](#)

## World Map – Chapter Overview



**Combine Sources, Studies, Textbooks & Proceedings with Annotations & Links**

## The Globalization of Knowledge in History



of colonial rule. The changing place of Britain in the international economy required Keywords and Persons

percolation model: 1  
actor: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20  
missionary activities: 1 2 3 4 5 6 7 8 9 10  
literati: 1 2 3

scientific entourage, businessmen, missionaries, and on the other side indigenous elites and the literati who finally had to legitimate the uptake of this new knowledge form. Indigenous elites visualized this encounter with science as a means for enriching their repertoire of skills as well as a path to revitalization Kopf 1969; Panikkar 2007. Studies of Ayurvedic and Unani and Tibb medicine in late nineteenth-

Permanent Link

If you want to directly link to this paragraph in the text, you can use the following URL:

<http://www.edition-open-access.de/studies/1/19/index.html#19>

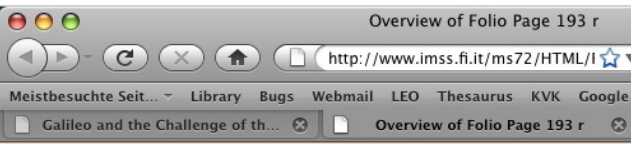
[Contributions](#)

[Chapter Overview](#)

[Contributors](#)

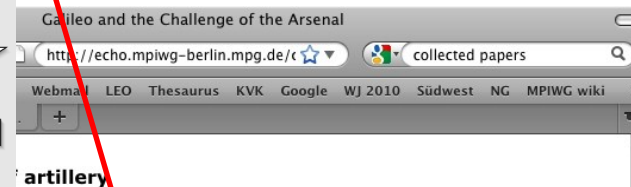
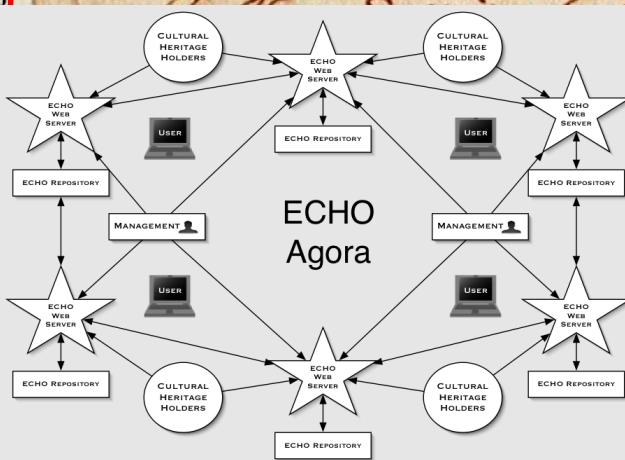
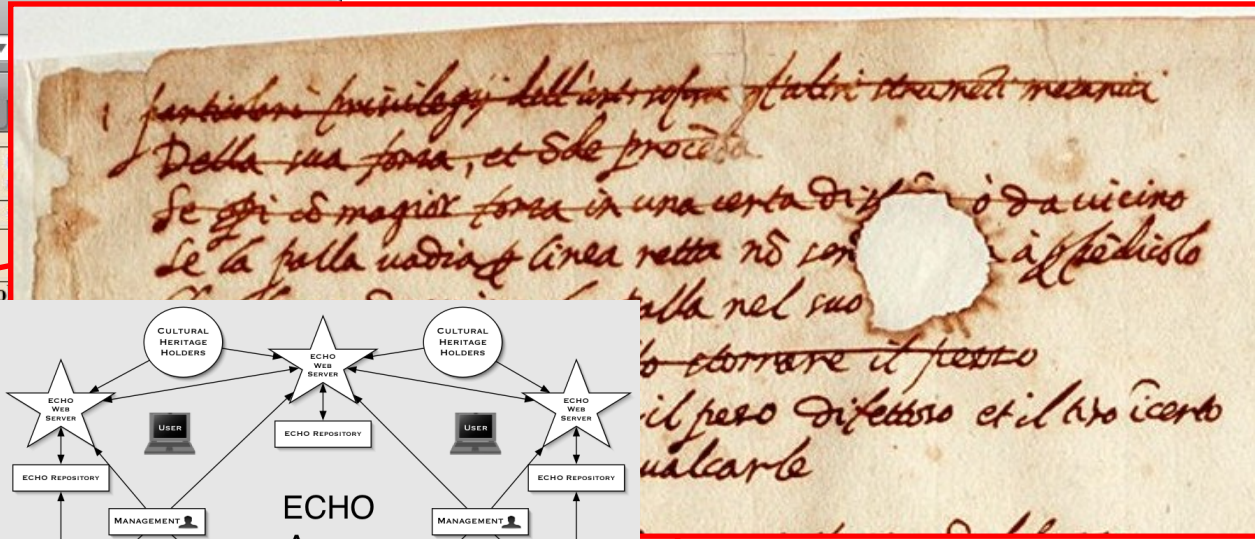


# Distributed Sources, Studies, Annotations & Links



**Galileo's Notes on Motion, Ms. Gal 72:** online article with hyperlinks to source text & scholarly data on the internet

Size	Height 300 mm, width 214 mm.
Comments	Written by Galileo; contains table.
References	<a href="#">Caverni 1972</a> 519-520; <a href="#">Damerow et al. 1992</a> 203 footnote; <a href="#">Wohlwill 1899</a> 620



Among his papers Galileo left the outline of an unwritten treatise entitled "Particular privileges of the artillery with respect to other mechanical instruments",<sup>[13]</sup> probably dating back to his early years in Padua. The planned treatise was possibly related, just as other writings extant from this period such as the treatise *Le Mekaniche*<sup>[14]</sup> or the writings on the military compass, to Galileo's private teaching. This essentially followed a curriculum which covered the whole spectrum of issues needed for the education of military officers. The following selection from topics listed in Galileo's outline make it indeed clear that his planned treatise was not intended to expound a new theory of motion but to deal with issues of practical interest to military commanders and artillerymen.

If one operates with a greater force in a certain distance or from nearby If the ball goes along a straight line if it is not [projected] along the vertical Which line the ball describes in its [course] On the course and the time of charging the canon [...] In which elevation you shoot farthest and why That the ball in turning downwards in the vertical returns with the same forces and velocities as those with which it went up [...]

**OA essential for epistemic web**  
= universal & traceable web of knowledge

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# Scientific Peer Review

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

**Manuscripts** often careless & faulty, diluting rather than generating knowledge

**Limited capacities** of editors & reviewers; delay & hidden obstruction of scientific exchange & innovation; little incentive & reward for constructive reviews ...

**Information loss**: review comments & discussion often as interesting as papers

⇒ waste of reviewer capacities as most limited resource in scientific evaluation

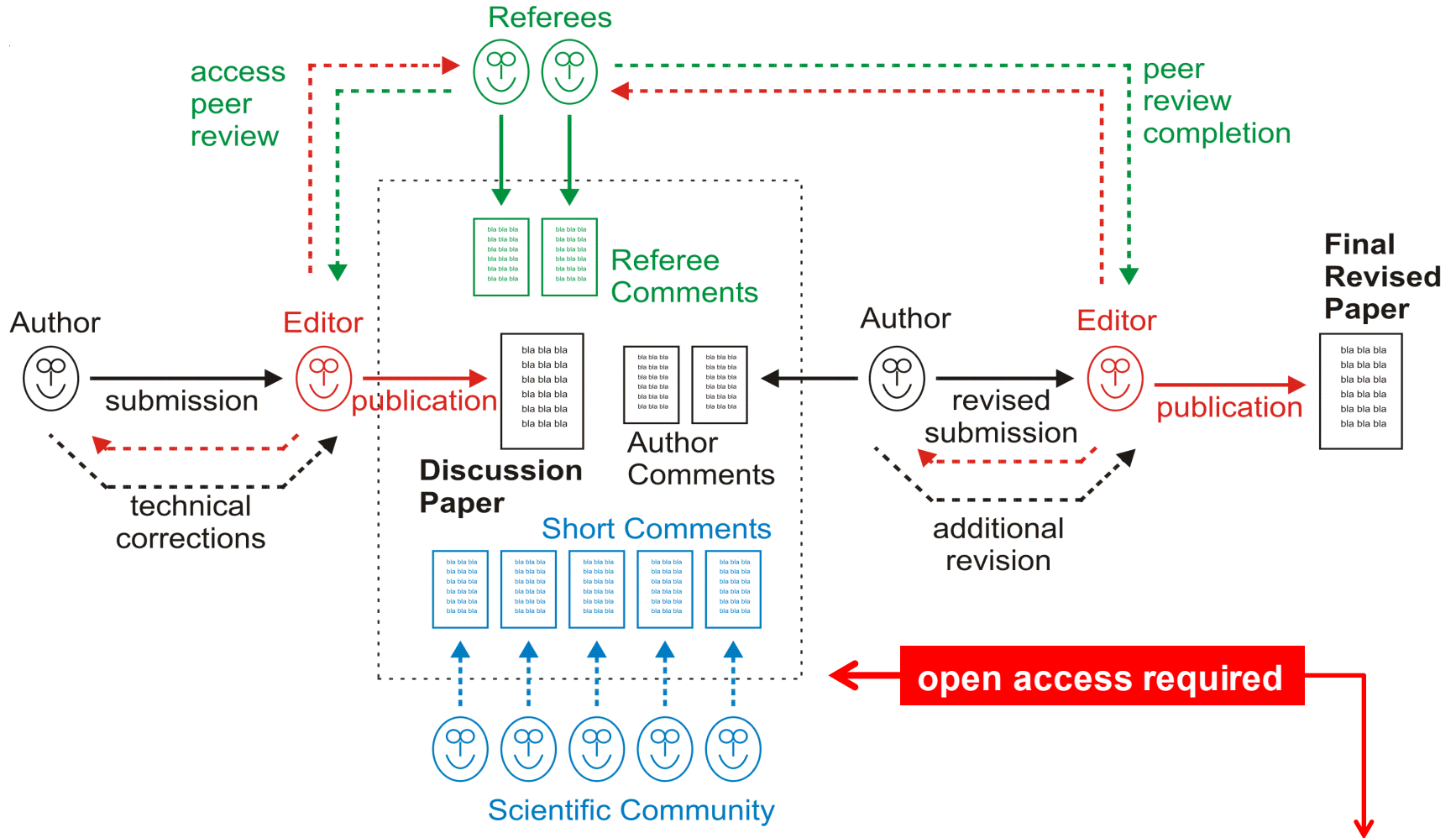
**Replacement** of traditional pre-publication review & by post-publication commenting not really successful

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

# Multi-Stage Open Peer Review – Interactive OA Publishing

## Discussion Forum (Stage 1)

## Journal (Stage 2)



**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

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

## 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*)





- Home
- Online Library ACP
- Online Library ACPD
- Papers in Open Discussion
- Volumes and Issues
- Special Issues
- Most Commented Papers
- Full Text Search
- Title and Author Search
- Alerts & RSS Feeds
- General Information
- Submission
- Review
- Production
- Subscription
- Comment on a Paper

Atmos. Chem. Phys. Discuss., 8, 17423–17437, 2008  
www.atmos-chem-phys-discuss.net/8/17423/2008/  
doi:10.5194/acpd-8-17423-2008  
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Article Discussion Metrics Related Articles

## On the validity of representing hurricanes as Carnot heat engine

A. M. Makarieva, V. G. Gorshkov, and B.-L. Li

### Review Status

This discussion paper has been under review for the journal Atmospheric Chemistry and Physics (ACP). A final paper in ACP is not foreseen.

Status: Closed

### Interactive Discussion

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

- Printer-friendly Version - Supplement

- AC S7325: 'Response to preliminary criticisms', Anastassia M. Makarieva, 20 Sep 2008
- RC S7915: 'Review', Anonymous Referee #1, 03 Oct 2008
- AC S7947: 'Response to Review of Referee 1', Anastassia M. Makarieva, 04 Oct 2008
- RC S8170: 'Follow-up', Anonymous Referee #1, 12 Oct 2008
- AC S8193: 'Response to Follow-Up by Referee 1', Anastassia M. Makarieva, 13 Oct 2008
- AC S9182: 'Final Response: Heat Release to Space', Anastassia M. Makarieva, 16 Nov 2008
- SC S7609: 'Latent work', Anastassia M. Makarieva, 29 Sep 2008
- SC S8318: 'Motion from condensation', Semen Sherman, 17 Oct 2008
- AC S8340: 'Latent work: Convective potential energy', Anastassia M. Makarieva, 18 Oct 2008
- SC S8164: 'The novel hurricane physics', Andrei Nefiodov, 11 Oct 2008
- RC S8531: 'Review', Anonymous Referee #2, 25 Oct 2008
- AC S8904: 'Condensation as Air Circulation Driver', Anastassia M. Makarieva, 10 Nov 2008
- RC S9081: 'Extraordinary novel atmosphere physics', Anonymous Referee #2, 13 Nov 2008
- SC S11826: 'Considerations of turbulent friction', Anastassia M. Makarieva, 22 Mar 2009
- RC S8627: 'This paper is incoherent', Anonymous Referee #3, 29 Oct 2008
- AC S8635: 'Response to Referee #3', Anastassia M. Makarieva, 30 Oct 2008
- SC S8669: 'The Sun does not orbit around the Earth.', Paulo Nobre, 30 Oct 2008
- SC S8916: 'paper contains bad physics', Antoon Meesters, 10 Nov 2008
- AC S8923: 'Bad physics: Latent heat does not warm', Anastassia M. Makarieva, 10 Nov 2008
- SC S8979: 'latent heat in the atmosphere', Antoon Meesters, 11 Nov 2008
- AC S8998: 'Latent heat is irrelevant', Anastassia M. Makarieva, 12 Nov 2008
- AC S8931: 'On carelessness and responsibility', Anastassia M. Makarieva, 10 Nov 2008

### Search ACPD

Search  
Full Text

### Discussion Paper



### Citation

- BibTeX
- EndNote

### Share



Check it out!  
 **ARTICLE-LEVEL METRICS**  
Available for your paper.

### Journal Metrics

IF 5.510  
 5-year IF 5.556  
 SNIP 1.474  
 SJR 2.346

Definitions

See ACPD Online Library:  
"Most Commented Papers"  
with up to 30 comments



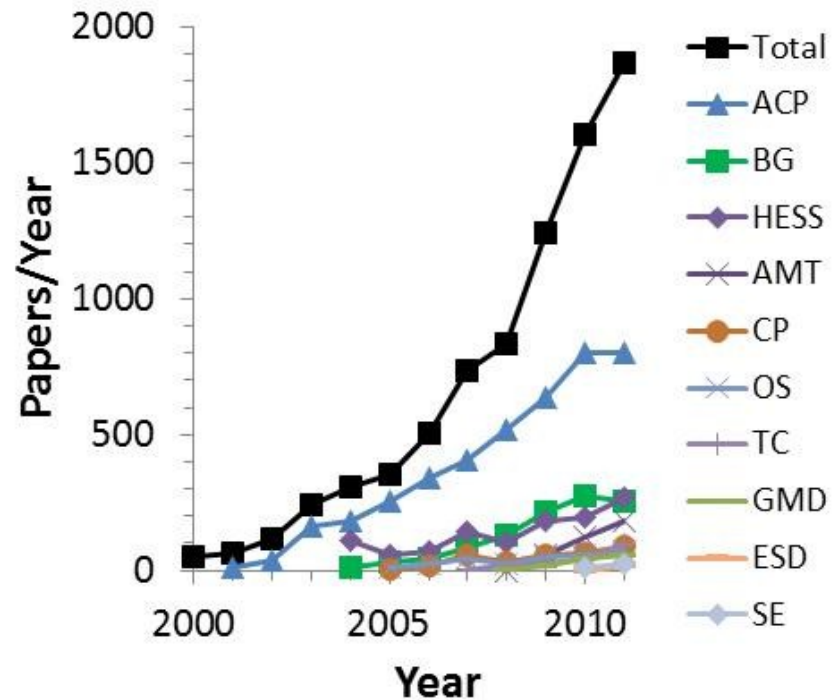
# Achievements

**Atmospheric Chemistry & Physics (ACP)**  
launched 2001 with P. Crutzen, A. Richter &  
**European Geosciences Union (EGU)**

**14 EGU sister journals** followed:  
*Biogeosciences, Climate, Hydrology ...*

**Large-scale move** to OA publishing  
in geosciences

Concept spread to other communities:  
*e.g., Economics, F1000 Research, ...*

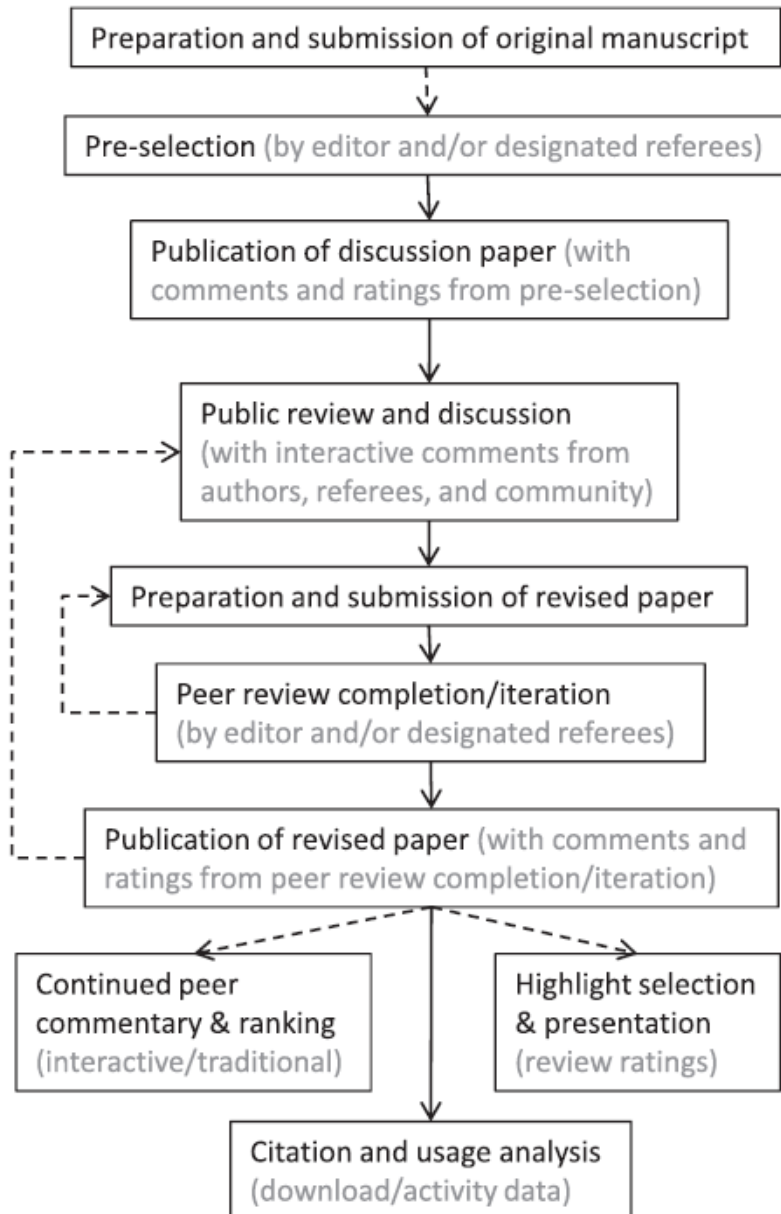


## Unique combination:

- **top speed:** 1+x weeks from submission to citable publication (discussion paper)
- **top impact & visibility** (across atmospheric, environmental & geosciences)
- **large volume** (~10% market share)
- **low rejection rates** (~15% vs. ~50%)
- **low costs** (~1000 EUR/paper) vs. ~2000 EUR/paper)
- **fully self-financed & sustainable** (incl. review, production, archiving & 10-20% surplus for publisher & society), **2013:** ~3000 papers, ~3 MEUR turnover, ~500 kEUR surplus for EGU

# Future Perspectives

## Multi-Stage Open Peer Review as well-defined but flexible new standard of QA:



### Pre-publication review & selection

magazine ↔ critical, repository ↔ technical

### Public peer review & interactive discussion

integrative

### Peer review completion

iterative, optional

### Post-publication review & evaluation

continued commenting, rating, ALM, ...

### Combination & Integration with

- **repositories** (arXiv.org, PLOS ONE ...)
- **living reviews** (Schutz et al.)
- **rankings & tiers** (BE Press Economics)
- **article level metrics** (SPARC et al.)
- **virtual journals & assessment houses** (F1000)  
*highlight selections, seal/stamp of approval ...*
- **Epistemic Web** (Renn et al.)

# Vision

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***Promotion of scientific & societal progress by  
open access, public review & interactive discourse  
in global information commons***

## **Access to high quality scientific publications**

review & revision involving the community

⇒ *more & better information for scientists & society*

## **Documentation of scientific discourse**

public record of scientific evidence, arguments & progress

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

## **Demonstration of transparency & rationalism**

transparent & rational approach to complex questions & problems

⇒ *role model for societal decision processes*

# Propositions

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## 1) Continue & build on successful recent development

- support existing & new OA archiving & publishing pathways

## 2) Mandate OA archiving for journal papers

- explicit & specific request: full access & usability (CC BY) after embargo period
- MPS Rules of Good Scientific Practice (2009, Sect.1c): *“make research results achieved with public funds freely available wherever possible.”*

## 3) Trust the basic principles of mass/energy conservation & evolution

- OA publishing costs can be covered by conversion of subscription budgets
- subscription journals & publishers can adapt or be replaced

## 4) Cut journal subscription budgets by 20-30% per year & convert into OA publishing funds

- start & pursue concerted international action (2014-2015)

## 5) Arrive at ~90% OA publishing in 3-5 years

- various studies & publisher feedback indicate that tipping point is close