

Interactive Open Access Publishing and Public Peer Review:

Transparency and Self-Regulation in
Scientific Communication and Quality Assurance

Ulrich Pöschl

*Max Planck Institute for Chemistry
Mainz, Germany
u.poschl@mpic.de*

*European Geosciences Union
www.egu.eu*

Introduction

- *motivation & challenges*

Interactive Open Access Publishing & Public Peer Review

- *concepts & effects*

Atmospheric Chemistry and Physics (ACP) & European Geosciences Union (EGU)

- *aims & achievements*

Conclusions & Outlook

- *summary & perspectives*

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

Educational:

- inform & stimulate interested public (*school teachers, students, et al.*)
- equal opportunities in the information society (*global & social*)

Economic:

- liberate distorted scientific information market
(*subscription/usage, cost/benefit, library budget crisis*)
- enhance efficiency & facilitate innovation
(*formatting, distribution, evaluation, archiving, etc.*)

Scientific:

- enhance research impact & productivity (*interdisciplinary exchange*)
- **improve quality assurance** (*efficiency & effectiveness*)

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

Traditional Peer Review: fully compatible with OA

- successful OA journals with traditional peer review
(*New J. Phys.*, *BMC Structural Biology*, *PLoS Biology*, *PLoS Medicine*, etc.)

Information for Reviewers: strongly enhanced by OA

- easy & interdisciplinary access to relevant publications
(*subscriptions limit interdisciplinarity*)

Collaborative Peer Review: fully enabled by OA

- easy & interdisciplinary discussion in & between scientific communities
(*subscriptions limit circle of readers & commentators*)
- *EGU/Copernicus, economics e-journal, BMC Biology Direct, PLoS One, etc.*

***Large proportion of scientific research publications
are carelessly prepared & faulty.***

Tip of the Iceberg: fraud

- plagiarism & selective omission, tuning or fabrication of results
(*Schön et al., 2002/2003; Hwang et al. 2004/2005, ...*)

Common Practice: carelessness

- superficial & irreproducible description of experiments & models
- non-traceable arguments & conclusions, duplicate & split papers, etc.
- ***dilute rather than generate knowledge***

Consequences: waste & misallocation of resources

- costly reconstruction of poorly described methods & results
- propagation of errors & misinterpretations
- misevaluation of projects & scientists

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

Editors & Referees: limited capacities & competence

- few editors for large subject areas
 - ⇒ limited knowledge of scientific details & specialist referees
- work overload, conflicts of interest & little reward for referees
 - ⇒ superficial or prejudiced review & evaluation

Closed Peer Review: retardation & loss of information

- delay of publication, watering down of messages, hidden plagiarism
- critical, supportive & complementary comments unpublished/lost

Traditional Discussion: sparse & late commentaries

- labor-intensive, delayed & watered-down by peer review
(comment/article ratio 1978 ⇒ 1998: 1/20 ⇒ 1/100)

***Conflicting needs of scientific publishing:
rapid publication vs. thorough review & discussion***

Rapid Publication: widely pursued

- required for efficient exchange (*new findings, critical questions*)
- traditionally pursued through hasty reviews & short papers
(*lack of time & detailed information*)

Thorough Review & Discussion: often neglected

- required to identify scientific flaws & duplications
- traditionally limited by availability of refereeing capacities
(*referee qualifications & interests, time, access to relevant information*)

Two-stage publication with interactive open access peer review**Stage 1: Rapid publication of Discussion Paper**

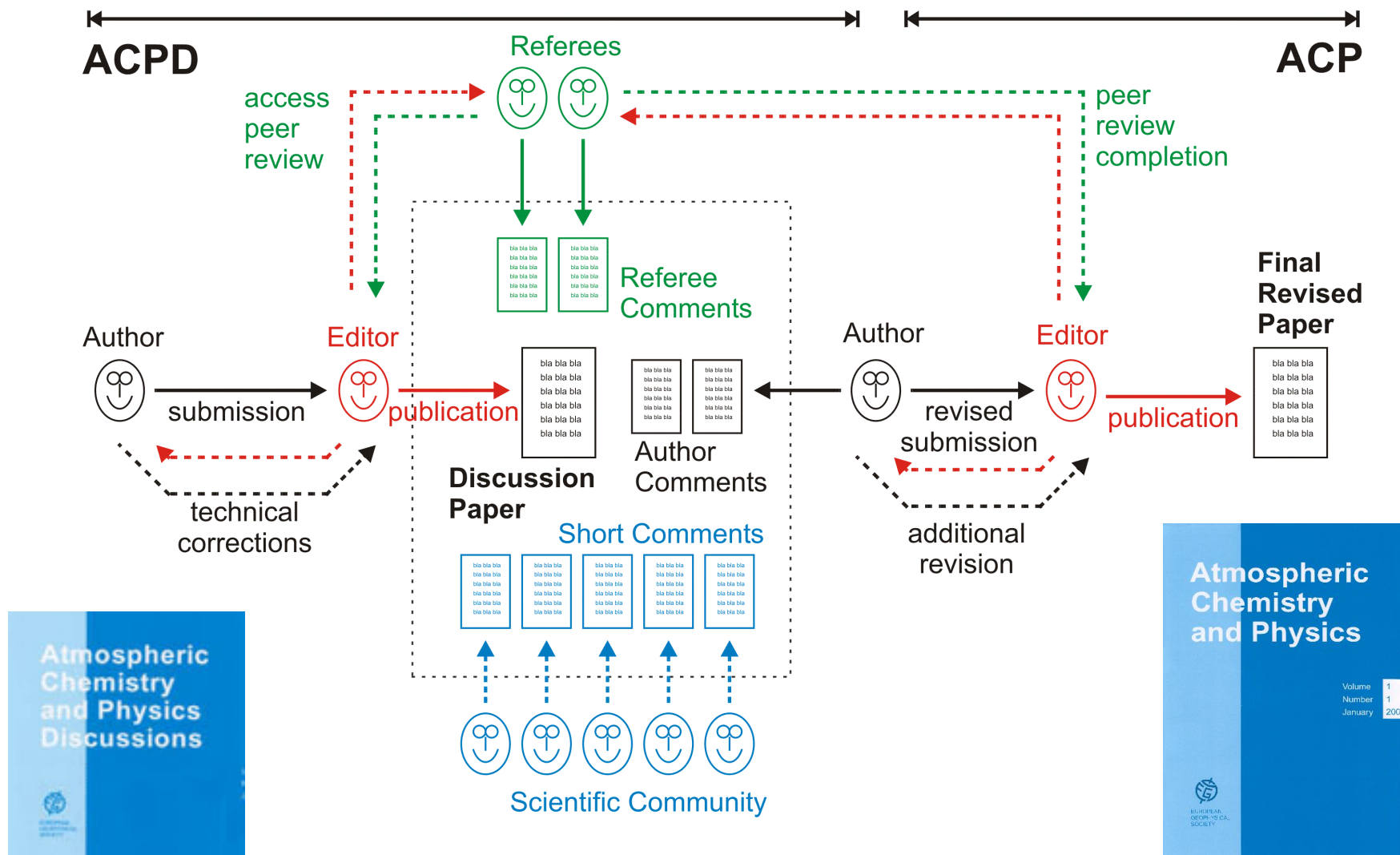
pre-selected by editors (*optionally supported by referees*),
fully citable & permanently archived (*more than traditional preprint,
comparable to Nature Precedings*)

Public Peer Review & Interactive Discussion

referee & community comments published alongside discussion paper
(*anonymous or by name*),
non-reviewed but individually citable & permanently archived

**Stage 2: Review completion & publication of Final Paper**

analogous to traditional peer review & journal publication

Discussion Forum (*Pub. Stage 1*) + Journal (*Pub. Stage 2*)

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

Discussion Paper

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

Public Peer Review & Interactive Discussion (Collaborative Peer Review)

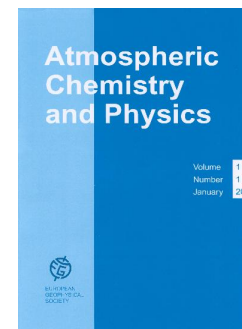
- direct feedback & public recognition for high quality papers (*authors*)
- prevent hidden obstruction & plagiarism (*authors, editors*)
- foster & document scientific discourse: critical comments, constructive suggestions, complementary information (*authors, referees, readers, editors*)
- document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

Final Paper

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

Publisher

- *European Geosciences Union (EGU) & Copernicus (Max Planck Society Spin-Off)*
- *free internet access (www.atmos-chem-phys.net), paper copies & CDs on demand*
- *copyright: Creative Commons License*



Editors

- *globally distributed network of >150 co-editors (covering 32 subject areas)*
- *coordination by executive committee & chief executive editor*
- *advisory board chaired by Nobel laureate P. J. Crutzen*

Publication Market (Atmospheric Science)

- *~70 journals publishing ~ 8000 papers/yr*
- *major journals (2010):*
 - Atmos. Chem. Phys. (EGU) ~ 800 papers/yr (~10%)*
 - J. Geophys. Res. (AGU) ~ 800 papers/yr*
 - Atmos. Environ. (Elsevier) ~ 600 papers/yr*
 - J. Climate (AMS) ~ 400 papers/yr*
 - J. Atmos. Sci. (AMS) ~ 250 papers/yr*

Discussion Papers (ACPD)

- **submissions** (*increasing*): ~ 100 month⁻¹ (US, D, UK, F, ...)
- **rejections** (*access review*): ~ 10 %
- **submission-to-publication time**: ~ 1 month (*min: 10 days*)
- **publication charge** (*author*): ~ 1000 EUR/paper (*incl. final paper*)

Final Papers (ACP)

- **rejections** (*review completion*): ~ 5 % (< 20 % total, *save referees*)
- **submission-to-publication time**: ~ 1 month (3-6 months in total)

Interactive Discussion

- **interactive comments / discussion paper**: ~ 5 (*up to ~30*)
- **comment pages / paper pages**: ~ 50 %
- **referee anonymity** (*exp. vs. mod.*): ~ 70 % (80% vs. 60%)
- **community comments / discussion paper**: ~ 1/4 (*up to ~20*)
- **constructive suggestions, harsh criticism, compliments**

Extended Discussion

- **peer-reviewed commentaries / paper**: ~ 1/100 (*≈ trad. journals*)

Discussion Paper

Publication Date **Title, Authors, Reference**



Online Access



20.08.2004 **A review of the Match technique as applied to AASE-2/EASOE and SOLVE/THESEO 2000**
 G. A. Morris, B. R. Bojkov, L. R. Lait, M. R. Schoeberl
Atmospheric Chemistry and Physics Discussions, 4, 4665-4717, 2004
 SRef-ID: 1680-7375/acpd/2004-4-4665


[Abstract](#)
[Online Version \(PDF, 3860 KB\)](#)
[Print Version \(PDF, 3622 KB\)](#)
[SRef Overview](#)

Interactive Discussion

Status: Final Response (Author Comments only)



RC S1626 : 'General comments from reviewer' , Anonymous Referee #3, 27.08.2004, 17:21  

AC S3996 : 'Response to Reviewer #3' , Gary Morris, 17.05.2005, 0:23  

RC S1660 : 'Technical issues with the Figures' , Anonymous Referee #2, 31.08.2004, 18:14  

AC S1793 : 'correcting figures' , Gary Morris, 15.09.2004, 6:07  

RC S1971 : ' Match analysis of the winters 1991/1992' , Anonymous Referee #2, 05.10.2004, 9:30  


AC S4010 : 'Response to Referee #2' , Gary Morris, 17.05.2005, 0:49  

RC S1731 : 'Trajectory mapping approach' , Anonymous Referee #2, 07.09.2004, 9:40  



AC S4002 : 'Response to second Referee #2' , Gary Morris, 17.05.2005, 0:28  

SC S1734 : 'Ozone loss from ozone-tracer correlation' , Simone Tilmes, 07.09.2004, 11:36  


AC S4007 : 'Response to S. Tilmes' , Gary Morris, 17.05.2005, 0:30  

RC S2014 : 'Review' , slimane BEKKI, 07.10.2004, 14:48  

AC S4036 : 'Response to Bekki' , Gary Morris, 17.05.2005, 1:09  

SC S2118 : 'Comment #1' , Markus Rex, 19.10.2004, 11:37  

AC S4025 : 'Response to M. Rex' , Gary Morris, 17.05.2005, 0:54  

SC S2126 : 'Comment # 2' , Markus Rex, 19.10.2004, 11:37  

AC S4032 : 'Response to M. Rex - Detailed comments' , Gary Morris, 17.05.2005, 0:56  

AC: Author Comment (on behalf of all co-authors)

RC: Referee Comment (anonymous or attributed)

SC: Short Comment (attributed)

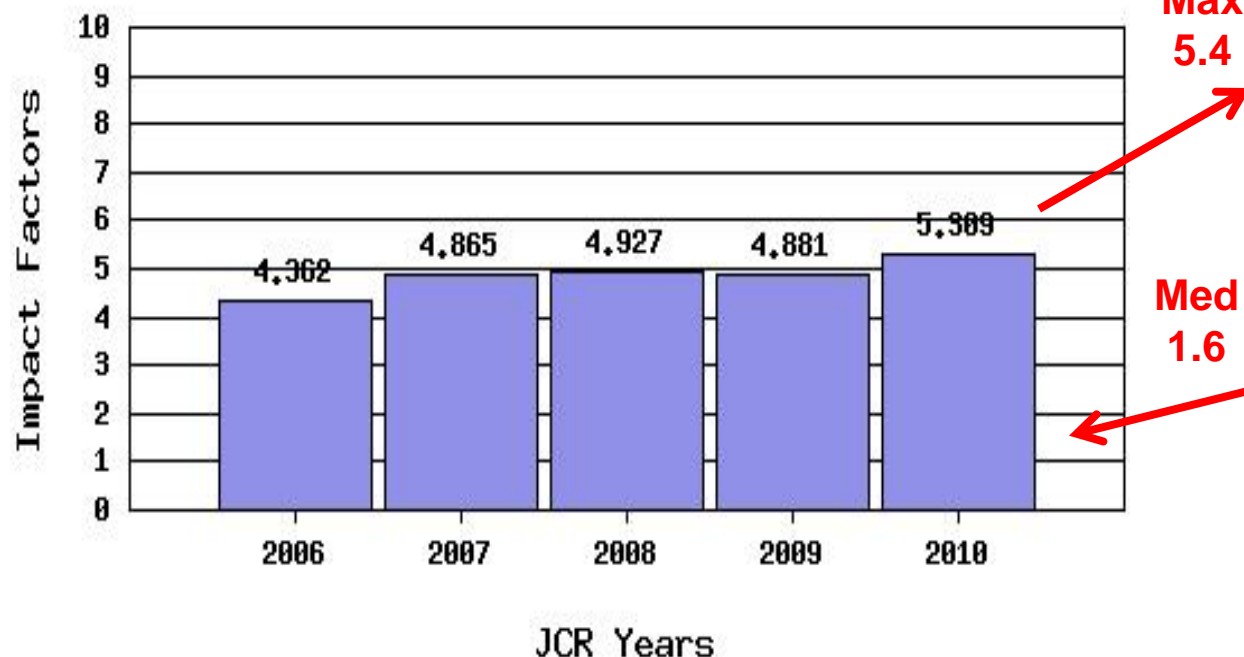
EC: Editor Comment (attributed)

 [Online Version \(PDF\)](#)

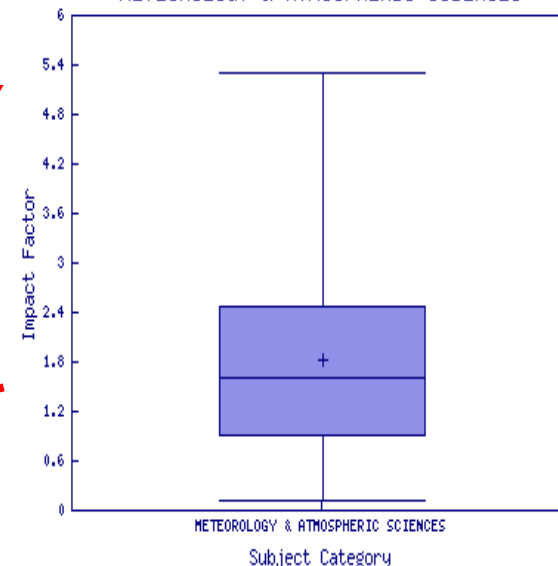
 [Print Version \(PDF\)](#)

See (Google Search):
ACPD, “Online Library” (OA),
“Most Commented Papers”

ATMOSPHERIC CHEMISTRY AND PHYSICS



METEOROLOGY & ATMOSPHERIC SCIENCES



ISI Journal Citation Report 2010: ~800 papers, ~12000 pages

ACP impact factor 2010: **5.3 / 5.8** (2 yr / 5 yr)

1 of 68 journals in “**Atmosphere Sciences**” (incl. Meteo & Climate), 8000 articles

5 of 167 journals in “**Geosciences**” (Multidisciplinary), 18000 articles

5 of 193 journals in “**Environmental Sciences**”, 27000 articles

Interactive open access publishing with multi-stage peer review & interactive public discussion

⇒ transparency & self regulation

⇒ unique combination of achievements (within/beyond discipline):

- **Highest impact & visibility** (#1 JIF: 5.4/5.8)
- **Largest volume** (~10% market share)
- **Low rejection rate** (~15%)
- **Low cost** (~1000 EUR/paper)
- **Self-financed & sustainable** (incl. review, production & archiving)

⇒ successful proof of concept

European Geosciences Union (EGU), www.egu.eu

- **Mission & History:** *international scientific society for Earth, planetary & space sciences, merger of EGS & EUG, partner of AGU*
- **Meetings:** *up to ~ 10 000 participants, turnover ~ 3 MEUR/yr*
- **Publications:** *global leader in geoscientific open access publishing (since 2001), ~2000 papers/yr, ~25 000 pages/yr, ~2.5 MEUR/yr*
- **11 Interactive OA Journals:** *Atmos. Chem. Phys. (ACP), Atmos. Meas. Tech. (AMT), Biogeosciences (BG), Climate (CP), Cryosphere (TC), Earth System Dynamics (ESD), Geoscientific Instrumentation (GI), Geoscientific Models (GMD), Hydrology (HESS), Ocean Science (OS), Solid Earth (SE), ... more to come*
- **3 OA Journals** (trad. peer review, formerly subscription-based): *Geophysics (ANGEO), Natural Hazards (NHESS), Nonlinear Processes (NPG)*

Copernicus Publications, www.copernicus.org

- **Mission & History:** *scientific service provider for EGU & other societies, SME spin-off of the Max Planck Society*
- **Meetings & Publications:** *development & application of advanced software tools for high quality at low cost (~100 EUR/page, ~1000 EUR/paper)*

affiliation of EGS/EUG with various journals and publishers; ANGEO owned but not controlled wrt. operation, pricing, etc.; 1988 EGS Office & Copernicus (A. Richter)

1994: launch NPG, operate ANGEO (subscription)

Growth (since 2001)

2001: launch NHESS (subscription) & ACP (interactive open access)

2002: launch SMSPS (books)

2003: launch ADGEO (procs.)

2004: launch BG, NHESS & NPG open access, HESS interactive OA

2005: launch CP & OS

2006: launch eE

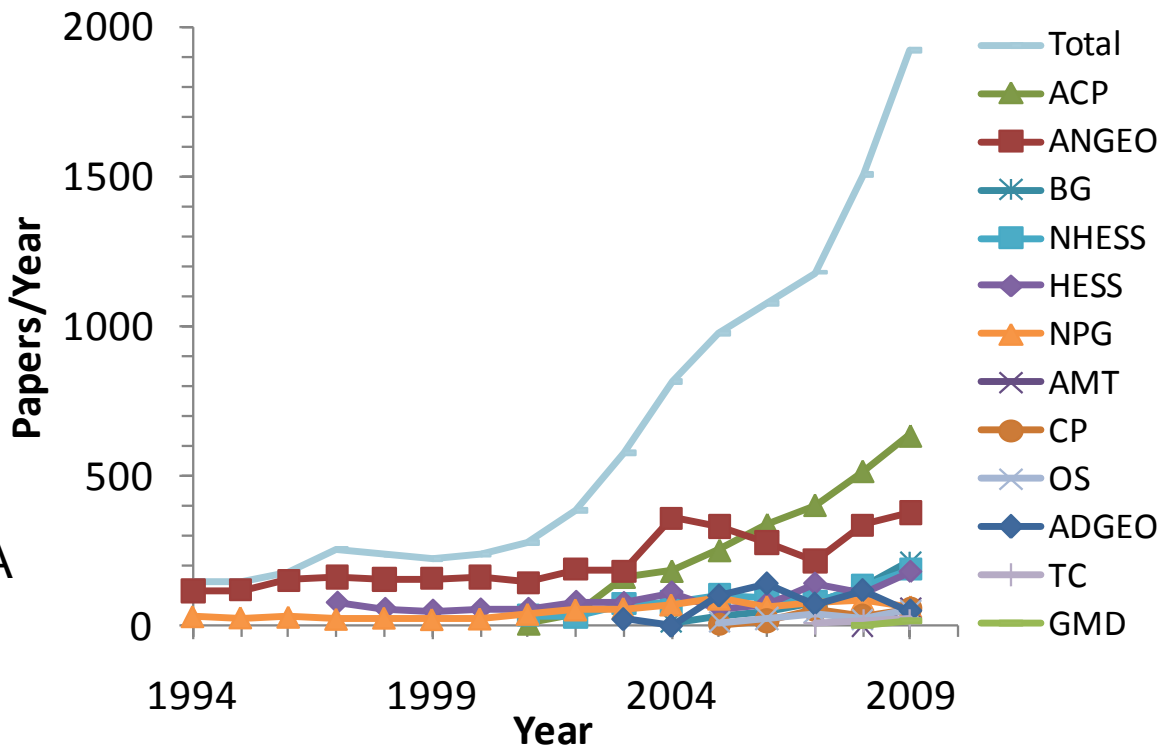
2007: launch TC

2008: launch AMT & GMD

2009: launch SE, ANGE0->0A

2010: launch ESD

2011: launch GI



11 Interactive Open Access Journals (public review & discussion)

ACP, AMT, BG, CP, ESD, GI, GMD, HESS, OS, SE, TC

3 Open Access Journals (traditional review)

ANGEO, NHESS, NPG

2 Special Publication Series (traditional review)

ADGEO, SMSPPS

Annual Volume: *~2000 papers/yr, ~25000 pages/yr,*

contributors: US, DE, FR, UK, IT, CN, NL, ... (74 countries)

Financial Turnover: *~2.5 MEUR/yr, ~10% surplus,*

proof of open access viability (without subsidies or venture capital)

Global Leadership of EGU/Copernicus:

#1 in interactive open access publishing (public review & discussion)

#1 in geoscientific open access publishing

Among Top 10 open access publishers (PLoS, BioMedCentral, IoP, ...)

ACP/EGU interactive open access sister journals demonstrate that:

- 1) **Strengths of traditional publishing & peer review**
can be efficiently combined with the opportunities of open access, interactive discussion & public peer review
- 2) **Interactive open access peer review (public review & discussion)**
enables efficient quality assurance → high quality & top visibility at low rejection rates; **flexibly adjustable to different communities**
- 3) **Transparency enhances self-regulation** and saves the most limited resource in scientific publishing: **refereeing capacities**
- 4) **Scientific societies & commercial publishers** can establish new open access journals & improve quality assurance mechanisms
- 5) **Traditional journals** can be efficiently & successfully converted into (interactive) open access journals
- 6) **Interactive open access publishing** can be realized at moderate costs (~ 1 kEUR/paper), and technology may reduce costs further

Open Peer Review w/o Anonymity

- e.g.: *Journal of Interactive Media in Education*, *BMC Biology Direct*, *British Medical Journal*
- *difficulties with community acceptance, refereeing capacities & criticism*

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

- e.g.: *BioMed Central Medical Journals*, *Behavioral & Brain Sciences*
- *no integration of peer review & public discussion, less incentive for participation*

Interactive Open Access Publishing & Public Peer Review

- *ACP & EGU/Copernicus sister journals, economics e-journal*
- *do not abandon traditional peer review but complement its strengths & reduce its weaknesses by transparency & interactive discussion*
- *optional referee anonymity, integration of peer review and public discussion, iteration of review & revision*
- *evolutionary & flexibly adjustable to different communities*

***Efficient & flexible combination of
new & traditional forms of review & publication***

Multiple stages & levels of interactive publishing & commenting

consecutive & parallel stages & levels of scientific papers & comments

⇒ *scientific & public discussion forums; iteration of review & revision*

⇒ *formal editorial rating & classification of different levels of quality & relevance*
(Berkeley Journals in Economics)

Statistical analysis & quality assurance feedback

download/usage, commenting & citation statistics for discussion & final papers
or different versions of “living papers” (MPG Living Reviews)

⇒ *compare editorial rating & statistical rating (“community assessment”)*

⇒ *evaluation of editors*

Integration in large-scale open access publishing systems

disaggregation of archiving, evaluation & distribution

⇒ *repositories, peer networks & “assessment houses” (instead of “journals”)*
with discussion forums for public peer review & interactive discussion

*Promotion of scientific & societal progress by
open access & collaborative review
in global information commons*

Access to high quality scientific publications

review & revision with input from referees & community

⇒ *more & better information for scientists & society*

Documentation of scientific discussion

free speech & public exchange of arguments

⇒ *evidence of controversial opinions & open questions*

Demonstration of transparency & rationalism

transparent & rational approach to complex questions & problems

⇒ *role model for political decision process*

Promote open access publishing

- **prescribe open access** to publicly funded research results
- **transfer funds** from subscription to open access publications:
convert subscription budgets (e.g., 10-30 % per year) into OA publishing funds (e.g., 2000 EUR per year & scientist, plus project-specific funds)

Emphasize quality assurance & interactivity

- **foster interactive open access publishing & public peer review:**
implement discussion forums in new & existing journals
- **mere access is not enough** (repositories & self-archiving)
- **attract authors & readers by added value:** *speed, comments, etc.*

Improve scientific evaluation & rating methods

- **evaluate individual papers** *not just journal impact factors*
- **refine statistical parameters** *for citation, download, and usage; interactive commenting & rating ...*

Interactive Commenting:

http://www.atmos-chem-phys-discuss.net/most_commented_papers.html

Prior/Dual Publication Policies & Ethics:

<http://www.egu.eu/statements/position-statement-on-the-status-of-discussion-papers-published-in-egu-interactive-open-access-journals-4-july-2010.html>

Review Article & Further Information:

http://www.atmospheric-chemistry-and-physics.net/pr_acp_poschl_liber_quarterly_2010_interactive_open_access_publishing.pdf

http://www.atmospheric-chemistry-and-physics.net/general_information/public_relations.html