Open Access Publishing in Physics

Eberhard Bodenschatz
Max Planck Institute for Dynamics and Self-Organization
**The Past**

1991: Electronic Future Taskforce of the American Physical Society

- the preprints would be available on-line
- one physics database or information system
- publishers download from there
- open review, comments and discussions
- available to everyone

Goals:  
A National Physics Database  
A National Physics Information System  
A World Physics Database or Information System  
A World Scientific Database or Information System

more see http://publish.aps.org/reports/lokenrep.html
THE PAST

1991: Electronic Future Taskforce of the American Physical Society

1991: Physics E-print archive LANL(High Energy Physics Theory)
1996: E-Print server APS (taskforce 1995)

Science 273 (1996) 304:
"The society started its archives to serve not just as a repository of un-peer-reviewed preprints but also the point from which articles are submitted to any APS journal for review and publication.

The APS also views it as a learning exercise and a test bed for technological innovations that might fit its needs and those of physicists better"
says Arthur Smith, the physicist who created the APS e-print archive.
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Science 273 (1996) 304:

After a set amount of time articles not accepted by journals--either APS journals or others--will be removed.

"We don't want to have all these useless publications that never made it into a refereed journal,"

says Eberhard Bodenschatz, a Cornell University physicist and a member of the APS task force.
The Past

1991: Electronic Future Taskforce of the American Physical Society
1991: Physics E-print archive LANL (High Energy Physics Theory)
1996: E-Print server APS (taskforce 1995)
1997: Optics Express (Optical Society of America, OSA)
1997: Report of the German Physical Society

"New Journal of Physics (NJoP) ... will be freely available on the internet, of highest quality, without size restrictions. A rigorous peer review will guarantee quality. The journal is to be financed by publication charges comparable to page charges in Physical Review Letters or Journals of the OSA."

Author paid model: 300£ ~ 500$
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1996: E-Print server APS (taskforce 1995)

1997: Optics Express (Optical Society of America, OSA)
1998: Living Reviews (Max Planck Institute for Gravitational Physics)
1998: APS/xxx.lanl.gov collaborative agreement

2001: arXiv (xxx.lanl.gov) moves to Cornell University

→ now
The Present

Directory of Open Access Journals – Physics General

18 USA: Bentham 5, HEXIS, Hindawi Publ. 9, Kent State U., NIST, SRX
6 Germany, India
5 Brazil, Ukraine
4 Croatia, United Kingdom
3 Armenia, Czech Rep., Egypt, Japan, Poland, Switzerland
2 Argentina, France, Italy, Mexico, Turkey
1 Bulgeria, Canada, Cuba, Iran, Nigeria, Romania, Russia, Singapore, Taiwan, UAE, Venezuela

Estimated: total # articles published ~ 50,000 ~5% OA
THE PRESENT - arXiv

arXiv:

Monthly Submission RATE for arXiv.org:hep

First 18.4 years (Dec '09 hep total = 135,973 + 23250)

Eberhard Bodenschatz  OA Publishing in Physics  Berlin 8, MPI-DS Göttingen
The Present - arXiv

Monthly Submission RATE for arXiv.org:cond-mat

First 18.4 years (Dec '09 cond-mat total = 107,118 + 10662)

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THE PRESENT - arXiv

Monthly Submission RATE for arXiv.org:astro-ph

First 18.4 years (Dec '09 astro-ph total = 105,560 + 12167)

- physics: 79.6%
- math: 16.4%
- comp. sci.: 2.6%
- bio: 0.7%
- statistics: 0.5%
- finance: 0.1%

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2009 arXiv

- **physics**: 79.6% (66.7%)
- **math**: 16.4% (23.4%)
- **comp. sci.**: 2.6% (6.8%)
- **bio**: 0.7% (1.1%)
- **statistics**: 0.5% (1.4%)
- **finance**: 0.1% (0.5%)

- **mathematics**; 23.40%
- **astronomy and astrophysics**; 17.60%
- **condensed matter**; 16.10%
- **other physics**; 15.90%
- **high-energy physics**; 17.10%
- **statistics**; 1.40%
- **computer science**; 6.80%
- **finance**; 0.50%
- **biology**; 1.10%
Average monthly downloads each year from 2004 to 2010
THE PRESENT - NJP

- NJP is article charge financed
- currently $1100 (PRL $500 and $1300 OA)
- per referee report $170 discount
- discount for NJP associated members
- spec. regulations for scientists in need.
- centralized funding agreements

→ example Max Planck Society
**The Present - NJP**

- Centralised funding agreement in place since April 2006
- MPG publications in NJP have grown by >200% since 2005
- 12 separate Max-Planck institutes have published with NJP so far in 2010

![Number of Max-Planck Articles Published in NJP from 2004 to 2009](chart.png)
Living Reviews Journals

- Began 1998 with *Living Reviews in Relativity*.
- Open access, articles invited but refereed.
- Living: frequent updates to articles. Makes review articles more useful.
- Open publishing platform, including back-office software, created by MPDL.
- Impact factor for *LR Relativity* is 10.6.
- Three further journals published by non-Max Planck organizations. Others being considered.
- Portal: http://www.livingreviews.org/
The Present

- OA – since 1991 – almost 20 years now.

- OA – publishing (NJP) has shown that it is viable in the field of Physics.

- Article based funding - shown to be economically viable for publishers.

- Support structure is developing across the world.
**The Future**

- New features:
  - speech and video
  - interactive formulae
  - living plots and data exploration
  - living paper

- real data - also active – databases that compute on remote resources and deliver new data.
  - see e.g. [http://turbulence.pha.jhu.edu](http://turbulence.pha.jhu.edu)

- next revolution in online only publications is on the horizon.
The Future

- OA will be common place
- Funding schemes need to evolve
- The challenge will be

A National Physics Database
A National Physics Information System
A World Physics Database or Information System
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(1991 APS Taskforce)