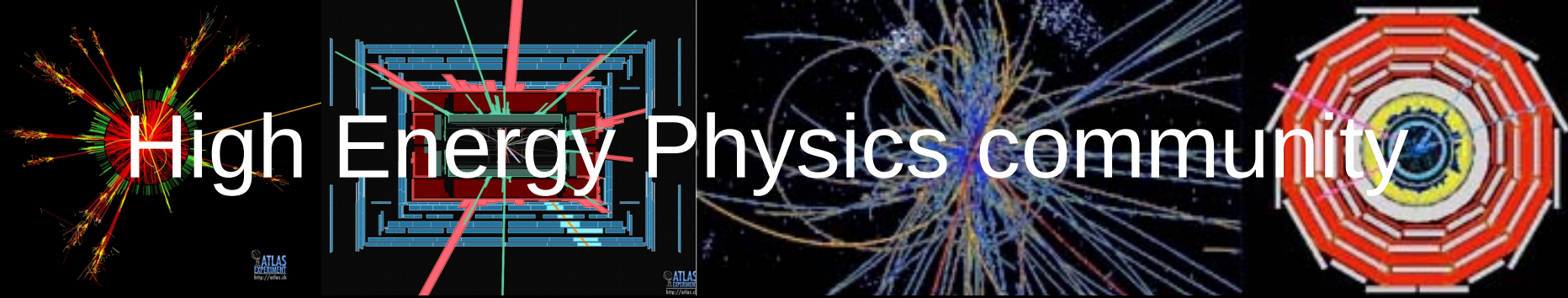




# Do High Energy Physicists read scientific journals?

A study completed by:  
Travis Brooks, SLAC  
Salvatore Mele, CERN  
Anne Gentil-Beccot, CERN



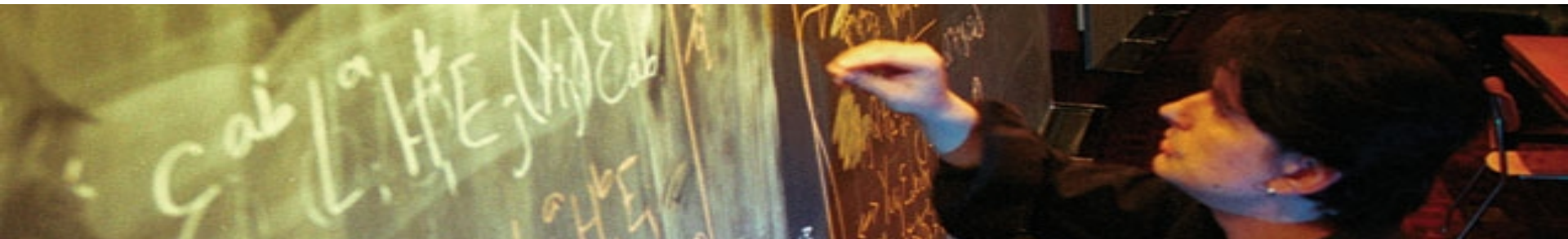
# High Energy Physics community

HEP aims to understand how our Universe works:

- Experimental HEP : builds the largest scientific instruments ever to reach energy densities close to the Big Bang
- Theoretical HEP predicts and interprets the observed phenomena

Small and connected community

- 20,000 scientists
- In total, 5000-7000 articles per year
- > 10 journals
- International collaborations





# HEP and grey literature

- In the '60s, HEP scientists could not wait ~1 year for their articles to reach their peers through journals
- *Grey literature* as main vehicle of information in HEP
- Researchers (of affluent institutions) mass-mailed preprints to hundreds of (prestigious and therefore affluent) institutions
- HEP community creates its working tools:
  - SPIRES: First e-catalogue of grey literature in 1974 (SLAC, Stanford), with WWW, became an online database
    - metadata-only for all HEP literature for over 30 years.
    - jointly compiled together with DESY (Hamburg), Fermilab (Chicago)
    - adds many information to the basic data: citation data (eprints and published articles), keywords, classifications, authors and institutional affiliations.
  - First preprint repository (arXiv.org, Los Alamos, 1991)

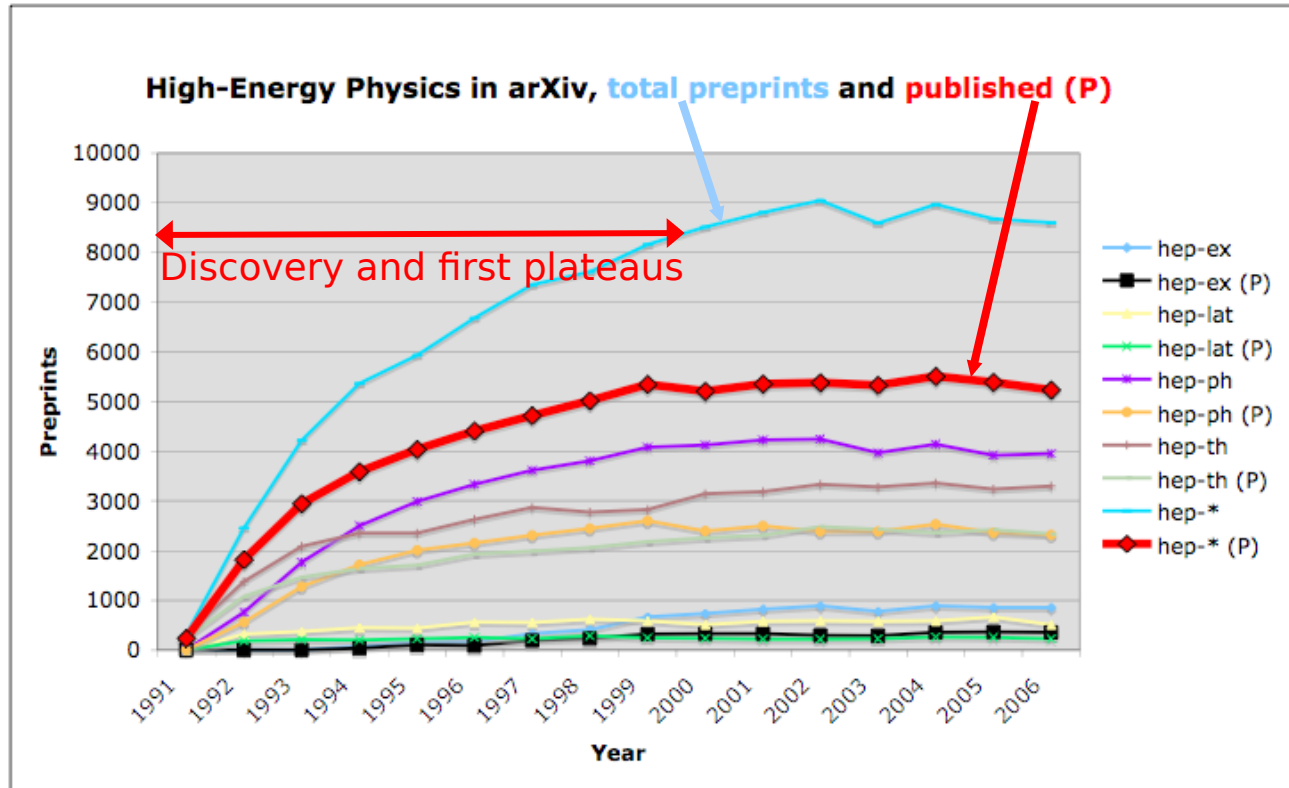
L.Goldschmidt-Clermont, 1965,

[http://eprints.rclis.org/archive/00000445/02/communication\\_patterns.pdf](http://eprints.rclis.org/archive/00000445/02/communication_patterns.pdf)

L. Addis, 2002, <http://www.slac.stanford.edu/spires/papers/history.html>

R.Heuer et al, <http://arXiv.org/abs/0805.2739>

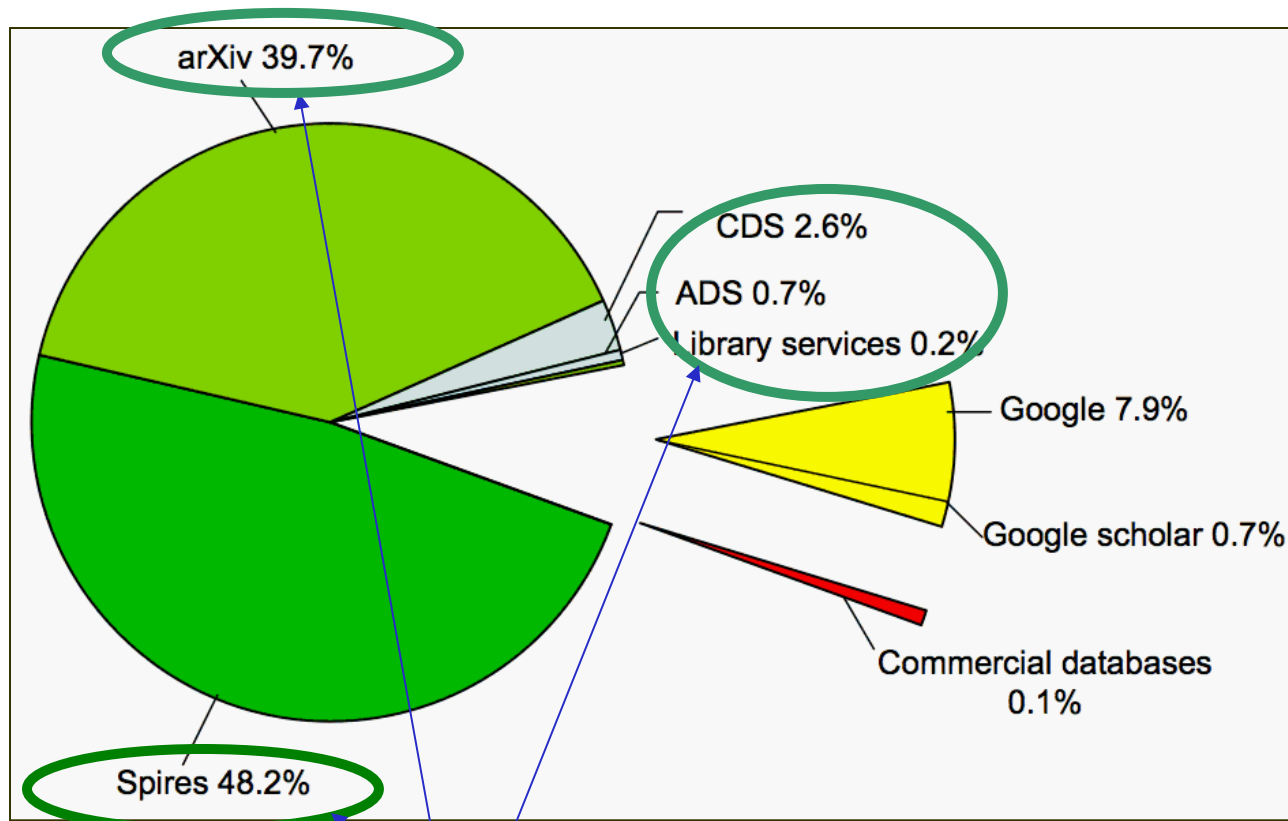
# arXiv population



Grey literature, second nature: posting to arXiv before even submitting to a journal is common practice

- No mandate, no debate, no advocacy. Author-benefit driven
- Author-formatted peer-reviewed revisions routinely uploaded
- All publishers allow self-archiving. APS hosts an arXiv mirror!

# Preferred HEP information system?



## Preferred HEP information system?

User's survey: 2000 resp.

GL9 - 2007

Arxiv:0804.2701

91% of the users prefer arXiv or Spires (or other community-based systems) to search information

- Where do HEP scientists \*search\* information?
  - Grey literature!
- Where do HEP scientists actually \*access\* information?

**Understand the needs of our users in order to adapt our tools and systems.**

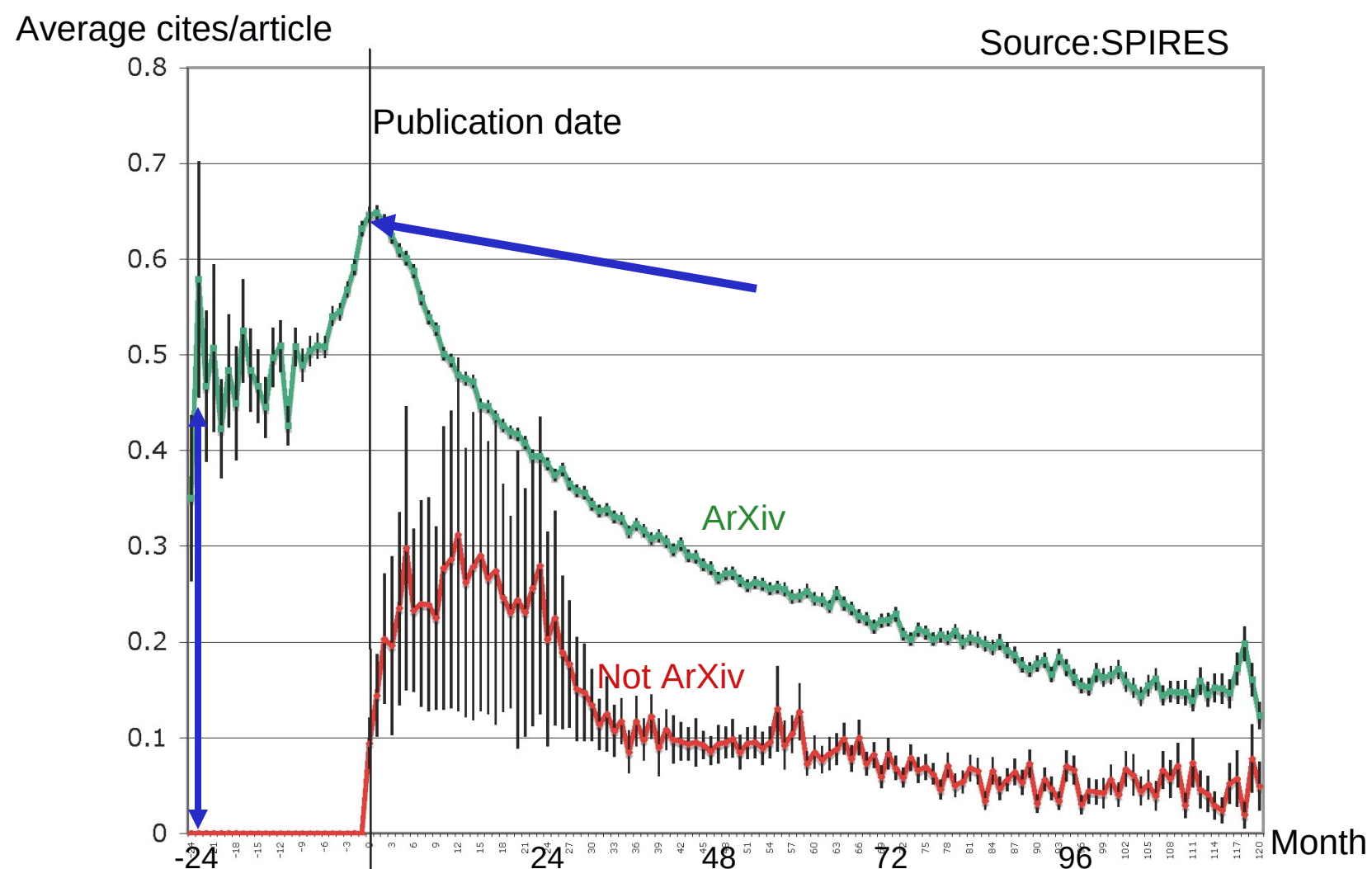


# Advantage of grey literature (1)

Citation analysis: 26,000 papers

Average number of cites per article per month before/after publication

J. High Energy Phys. and Phys. Rev. D, 1997-2008



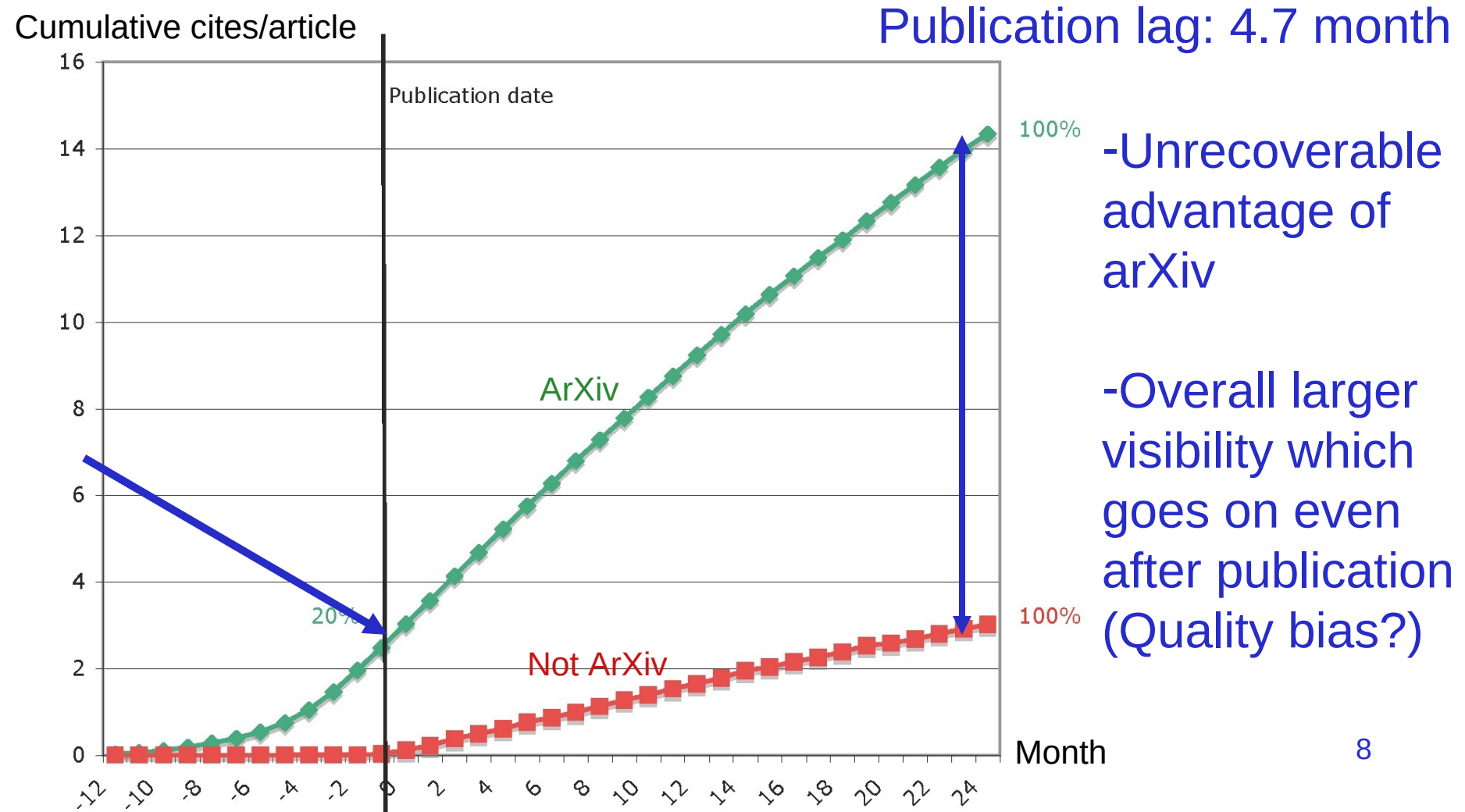
# Advantage of grey literature (2)

Citation analysis: 5000 articles

Source:SPIRES

Cumulative number of cites per article before/after publication, year 2005

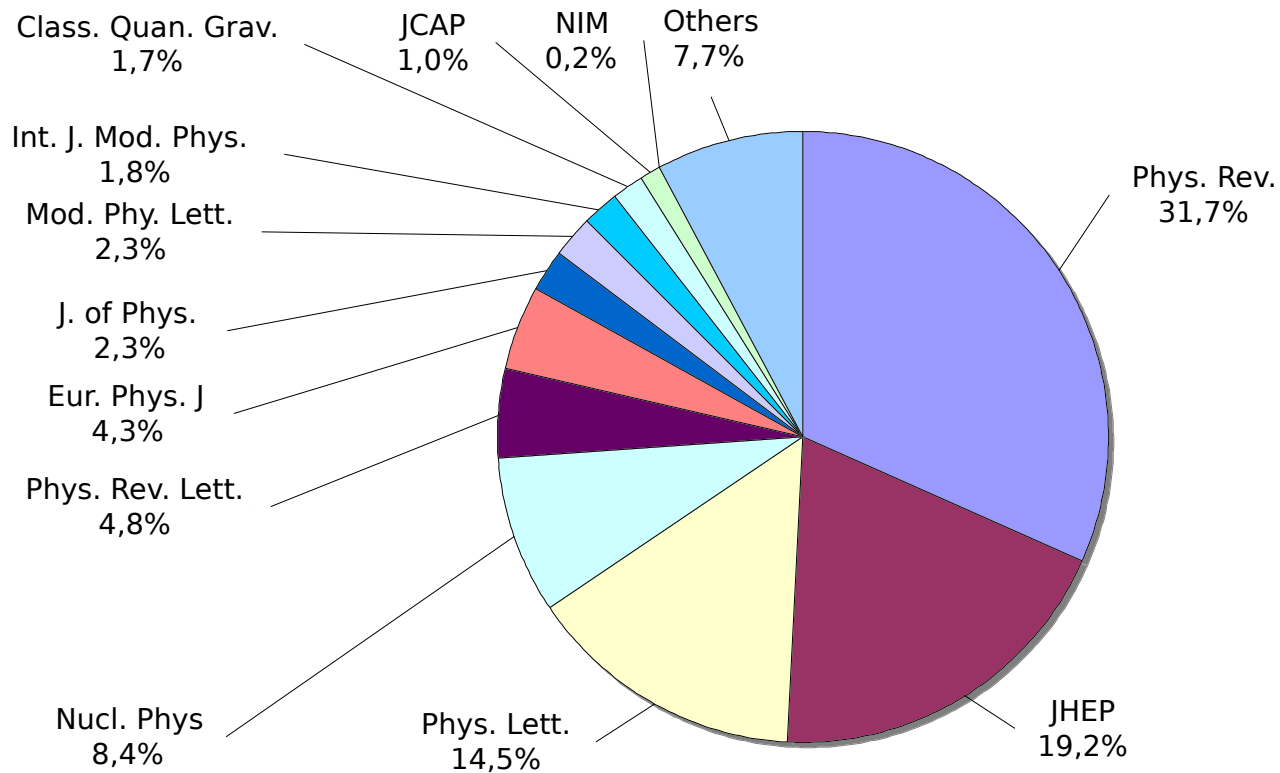
J. High Energy Phys., Phys. Rev. D, Eur. Phys. J. C, Phys. Lett. B, Nucl. Phys. B





# HEP publishing landscape

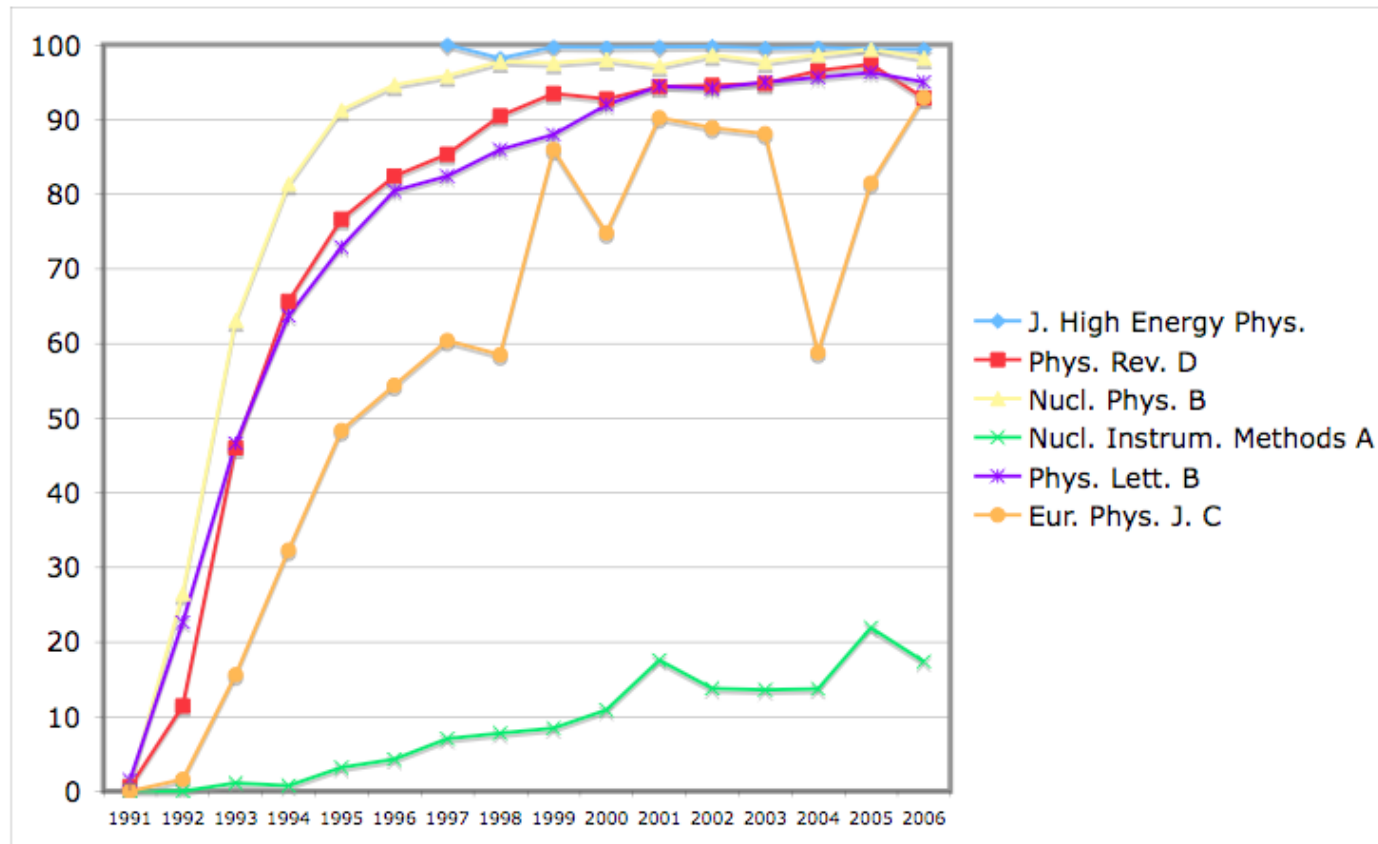
Source: SPIRES, 2006



000-7000 HEP articles/year, according to definition of HEP  
new journals

# Journal coverage in arXiv

Source:SPIRES



90% of the published articles are available in arXiv!

# Some journals usage statistics

- 4000 HEP scientists, 5 institutes
- Usage statistics 2006

	Average number of downloads per available article	Average number of downloads per potential user and publication year
Journal A	0.1	0.1
Journal B	0.1	0.1
Journal C	0.2	0.4
Journal D	0.4	0.6
Journal E	0.6	0.4

(Journals already mentioned in the previous pages...)

# click when they find a document? (1)

## 1) Five-Year Wilkinson Microwave Anisotropy Probe (WMAP) Observations: Cosmological Interpretation.

By WMAP Collaboration (E. Komatsu *et al.*). Mar 2008. 49pp.

e-Print: [arXiv:0803.0547](#) [astro-ph]

TOPCITE = 500+

[References](#) | [LaTeX\(US\)](#) | [LaTeX\(EU\)](#) | [Harvmac](#) | [BibTeX](#) | Cited 595 times

[Abstract](#) and [Postscript](#) and [PDF](#) from arXiv.org (mirrors: [au](#) [br](#) [cn](#) [de](#) [es](#) [fr](#) [il](#) [in](#) [it](#) [jp](#) [kr](#) [ru](#) [tw](#) [uk](#) [za](#) [aps](#) [lanl](#))

[EXP WMAP](#)

[Bookmarkable link to this information](#)

## 2) Five-Year Wilkinson Microwave Anisotropy Probe (WMAP) Observations: Likelihoods and Parameters from the WMAP data.

By WMAP Collaboration (J. Dunkley *et al.*). Mar 2008. 57pp.

e-Print: [arXiv:0803.0586](#) [astro-ph]

TOPCITE = 250+

[References](#) | [LaTeX\(US\)](#) | [LaTeX\(EU\)](#) | [Harvmac](#) | [BibTeX](#) | Cited 270 times

[Abstract](#) and [Postscript](#) and [PDF](#) from arXiv.org (mirrors: [au](#) [br](#) [cn](#) [de](#) [es](#) [fr](#) [il](#) [in](#) [it](#) [jp](#) [kr](#) [ru](#) [tw](#) [uk](#) [za](#) [aps](#) [lanl](#))

[EXP WMAP](#)

[Bookmarkable link to this information](#)

## 3) Observational Constraints on the Nature of the Dark Energy: First Cosmological Results from the ESSENCE Supernova Survey.

By ESSENCE Collaboration (W. Michael Wood-Vasey *et al.*). SLAC-PUB-12281, Jan 2007. 82pp.

Published in *Astrophys.J.* 666:694-715, 2007.

e-Print: [astro-ph/0701041](#)

TOPCITE = 250+

[References](#) | [LaTeX\(US\)](#) | [LaTeX\(EU\)](#) | [Harvmac](#) | [BibTeX](#) | Cited 262 times

[Abstract](#) and [Postscript](#) and [PDF](#) from arXiv.org (mirrors: [au](#) [br](#) [cn](#) [de](#) [es](#) [fr](#) [il](#) [in](#) [it](#) [jp](#) [kr](#) [ru](#) [tw](#) [uk](#) [za](#) [aps](#) [lanl](#))

[Journal Server](#)

[ADS Abstract Service](#)

[PhysOrg.com article](#)

[SLAC Document Server](#)

[Bookmarkable link to this information](#)

## 4) Unparticle physics.

Howard Georgi (Harvard U., Phys. Dept.). Mar 2007. 7pp.

Published in *Phys.Rev.Lett.* 98:221601, 2007.

e-Print: [hep-ph/0703260](#)

TOPCITE = 100+

[References](#) | [LaTeX\(US\)](#) | [LaTeX\(EU\)](#) | [Harvmac](#) | [BibTeX](#) | Cited 222 times

[Abstract](#) and [Postscript](#) and [PDF](#) from arXiv.org (mirrors: [au](#) [br](#) [cn](#) [de](#) [es](#) [fr](#) [il](#) [in](#) [it](#) [jp](#) [kr](#) [ru](#) [tw](#) [uk](#) [za](#) [aps](#) [lanl](#))

[Journal Server](#)

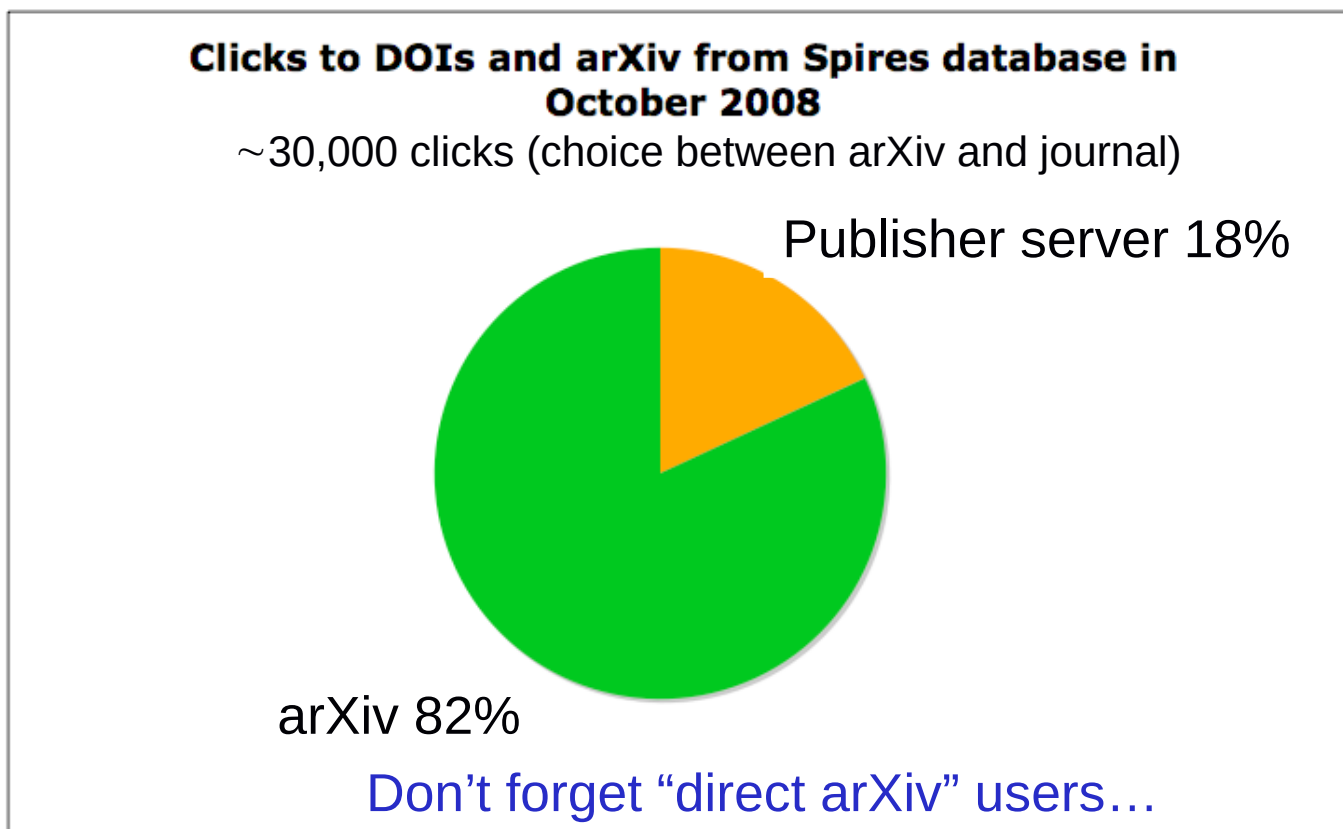
[PhysOrg.com article](#)

[Bookmarkable link to this information](#)

???



## click when they find a document? (2)



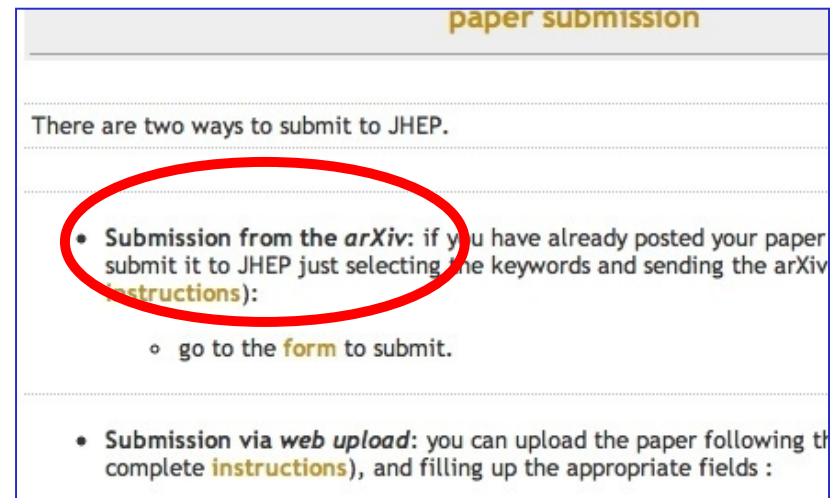
# Should I cancel all HEP journals subscribed by CERN Library?

- Of course not!
- (Most) authors (still) publish in peer reviewed journals
  - Peer review system is felt as crucial for HEP as for other sciences
  - Evaluations of scientists proceed as in all other fields, through journals
  - Journals perform quality assurance and are the keepers of the records
  - Journals are the "interface" of HEP scientists to officialdom

# Grey and published literature: a synergy

Authors and publishers benefit from parallel (or advance) submission to the arXiv:

- Quality checking (peers are fast to read arXiv preprints and spot errors)
- Metadata quality (peers are *\*VERY\** fast to read the reference list of arXiv preprints and spot missing references, especially to their own work)
- arXiv performs a strict LaTeX checking which benefits the publisher system
- Most publishers just require an arXiv number and some keywords as submission to their journals



The image shows a screenshot of a web page titled "paper submission" in a yellow box. The page content is as follows:

There are two ways to submit to JHEP.

- **Submission from the *arXiv*:** if you have already posted your paper submit it to JHEP just selecting the keywords and sending the arXiv (**instructions**):
  - go to the **form** to submit.
- **Submission via *web upload*:** you can upload the paper following the complete **instructions**, and filling up the appropriate fields :

A red circle is drawn around the first bullet point, highlighting the "Submission from the arXiv" option.

# Conclusions

- HEP journals are no longer used for HEP work!
  - Discovery of information in GL - immediate communication
  - Actual reading in GL
- But journals and their peer-review system keep a crucial role as interface with officialdom
- SCOAP<sup>3</sup> (<http://scoap3.org>)
  - Convert high quality HEP journals to Open Access by redirecting subscription funds
  - Openly, fairly and sustainably pay for the peer-review service, rather than access





Thank you!

Questions?

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Anne Gentil-Beccot, GL10, 09 December 2009