

# Open Access Publishing in High-Energy Physics:

the SCOAP<sup>3</sup> model

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CERN

scoap3.org


<http://scoap3.org/files/Scoap3ExecutiveSummary.pdf>

<http://scoap3.org/files/Scoap3WPReport.pdf>

# Motivation from a librarian's viewpoint

- Facilitate scholarly communication for the faculty
  - Offering infrastructure for green OA via institutional and subject repositories is a great step, but it is only the first ...
- Respond to the needs of the users
  - Physicists depends on peer review - peer-review is at stake; by stimulating and endorsing new business models for publishing librarians can play a key role in ensuring its continuation
- Contribute to innovation
  - Involvement in new services brings librarians closer to our users. Gold OA is the natural evolution following green

# CERN: European Organization for Nuclear Research (since 1954)

- The world leading HEP laboratory, Geneva (CH)
- 2500 staff (mostly engineers)
- 8000 users (mostly physicists)
- 3 Nobel prizes (Accelerators, Detectors, Discoveries)
- Invented the web 
- Commissioning the 27-km (6000 M€) LHC accelerator
- Runs a 1-million objects Digital Library



The CERN Convention (1953) contains what is effectively an early Open Access manifesto:

“... the results of its experimental and theoretical work shall be published or otherwise made generally available”

# High-Energy Physics

## HEP or Particle Physics

HEP aims to understand how our Universe was created and how it works

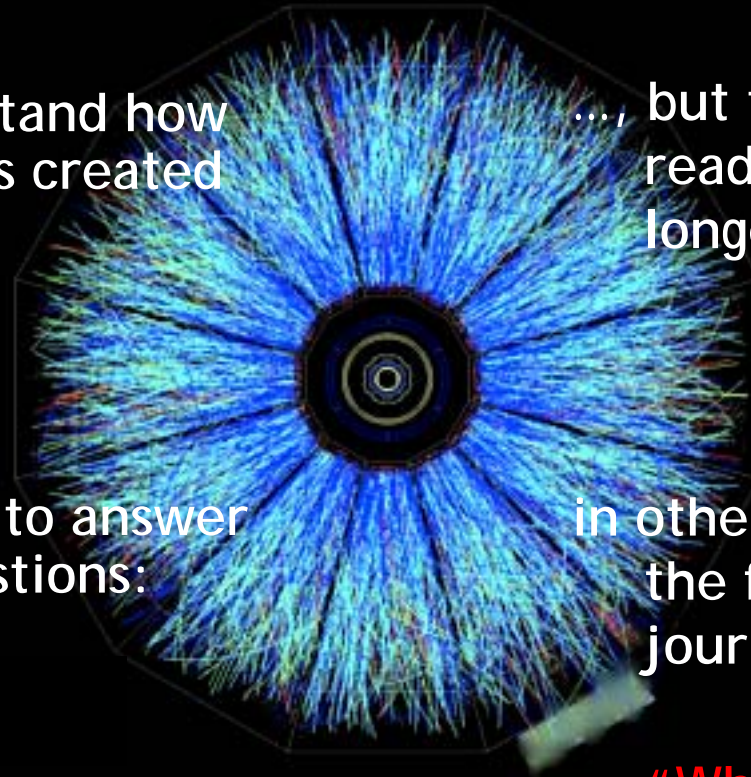
..., but the community hardly read scientific journals any longer

in other words, try to answer two eternal questions:

in other words, try to envisage the future role of the journals:

- "What makes the world?"
- "What holds it together?"

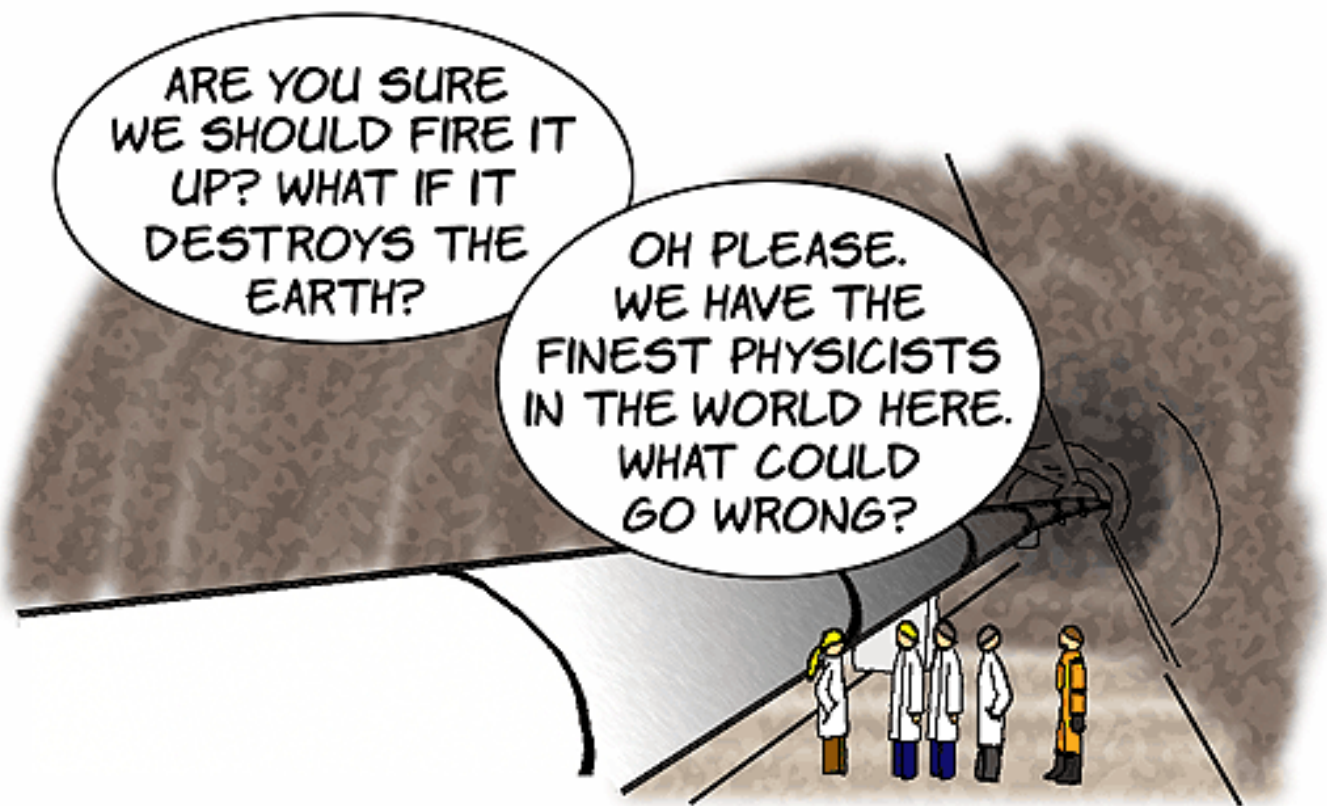
- "What kind of income?"
- "Which services to offer?"

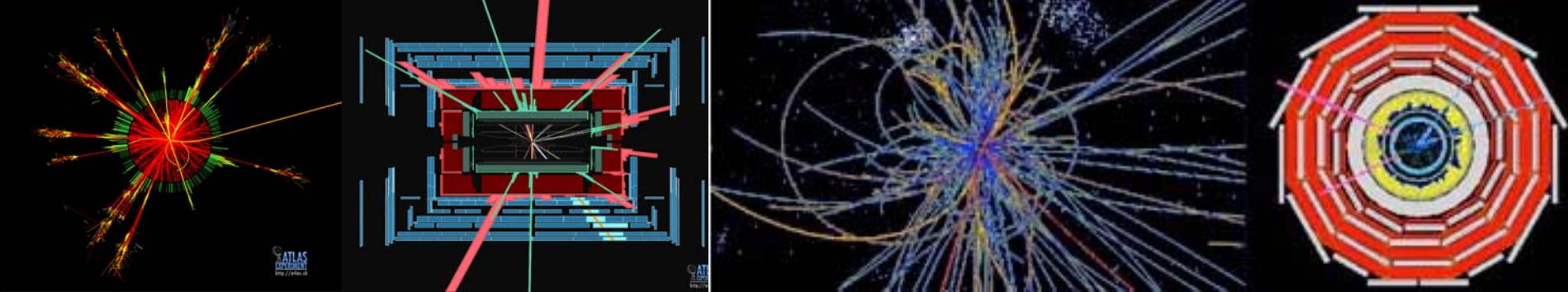


# THE LARGE HADRON COLLIDER: ACTIVATION DAY

ARE YOU SURE WE SHOULD FIRE IT UP? WHAT IF IT DESTROYS THE EARTH?

OH PLEASE. WE HAVE THE FINEST PHYSICISTS IN THE WORLD HERE. WHAT COULD GO WRONG?





## Open Access:

Grant anybody, anywhere and anytime access to the (peer-reviewed) results of (publicly-funded) research

...and contain costs.



# Communication patterns in HEP

L.Goldschmidt-Clermont, 1965

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

Luisella Goldschmidt-Clermont, CERN (early '60)  
(the first 'preprint librarian')

- HEP scientists cannot wait ~1 year for their articles to reach their peers through journals
- *Preprint* are the main vehicle of information in HEP: final version of articles as sent to journals
- Researchers (of affluent institutions) mass-mail preprints to hundreds of (prestigious and therefore affluent) institutions
- *Ante-litteram* (author-pays) Open Access
- At CERN preprints get indexed and displayed (and often discarded once published)
- The weekly "new preprints" display is a big event

# HEP and Open Access: a synergy

- HEP is decades ahead in thinking Open Access:
  - Mountains of paper preprint shipped all over the world by HEP institutes for 40 years (at author/institute expenses!)  
CERN 1M€/year, DESY 1MDM/year (!)
  - HEP launched arXiv (1991), the archetypal Open Archive
  - The first Open Access peer-reviewed electronic journals:
    - *Journal of High Energy Physics* (1997) • *Physical Review Special Topics Accelerators and Beams* (1998) • *New Journal of Physics* (1998)
- Small and connected community (<20000 scientists)
- Small number of articles (<10000)
- Small number of journals (< 10)
- Reader and author communities largely overlap
- Open Access, second nature: posting on arXiv before even submitting to a journal is common practice.
  - No mandate, no debate, no advocacy. Author-driven.

# Is it all about vocal librarians?

## Strong support form the LHC collaborations

*"We, the   \* Collaboration, strongly encourage the usage of electronic publishing methods for   \* publications and support the principles of Open Access Publishing, which includes granting free access of our   \* publications to all. Furthermore, we encourage all   \* members to publish papers in easily accessible journals, following the principles of the Open Access Paradigm."*

*\*  
— —* { ATLAS; approved on 23rd February 2007  
CMS; approved on 2nd March 2007  
ALICE; approved on 9th March 2007  
LHCb; approved on 12th March 2007

# Is it all about vocal librarians? Strong support form HEPAP

After discussing Open Access at a recent meeting (29 Nov. 2007), the panel expressed its strong support for SCOAP3, contingent upon its sustainability."

<http://www.science.doe.gov/hep/HEPAPSummaryLtrNov2007.pdf>

The High Energy Physics Advisory Panel (HEPAP)  
is the Advisory committee to the DoE and NSF  
Statement issued 4th January 2008

# HEP and its journals

- Journals are on the way to lose (lost?) a century-old role as vehicles of scholarly communication.
- Still, evaluation of institutes and (young) researchers is based on high-quality peer-reviewed journals.
- The main role of journals is to assure high-quality peer-review and act as keepers-of-the-records
- The HEP community needs high-quality journals, our “interface with officialdom”
- Implicitly, the HEP community supports this role by purchasing subscriptions, as it reads off arXiv anyhow
- Subscription prices make the model unsustainable
- As an “all-arXiv discipline” HEP is at high risk to see its journal canceled by large multidisciplinary university libraries (when not already happened)

# ..., but nobody reads journals !

Preliminary data from a sample of  
4000 HEP scientists in 5 institutes and countries

Full-text downloads		
	per user per year	arXiv coverage
Physics Letters B	0.6	88%
Physical Review D	0.4	95%
Nuclear Physics B	0.4	97%
JHEP	0.1	100%
Eur. Phys J. C	0.1	77%
Nucl. Instr. Meth. A <sup>(*)</sup>	12.0	12%

(\*) not only HEP

# What's the problem with (some) journals?

- Organizing the peer-review has a cost
- It is accepted that this cost is borne by the community (so far by the readers, through subscriptions)
- How much do the costs grow?

Subject	Average No. of Titles 2003–2007	Average Cost Per Title 2003	Average Cost Per Title 2004	% of Change '03–'04	Average Cost Per Title 2005	% of Change '04–'05	Average Cost Per Title 2006	% of Change '05–'06	Average Cost Per Title 2007	% of Change '06–'07	% of Change '03–'07
Agriculture	71	\$522	\$654	25	\$710	8	769	8	\$834	8	60
Philosophy & Religion	165	163	183	12	199	9	228	14	252	11	55
Physics	103	1,950	2,096	7	2,292	9	2,479	8	2,770	12	42
Political Science	81	257	283	10	313	11	353	13	394	12	54
Zoology	43	648	736	14	810	10	866	7	907	5	40

<http://www.libraryjournal.com/article/CA6431958.html>

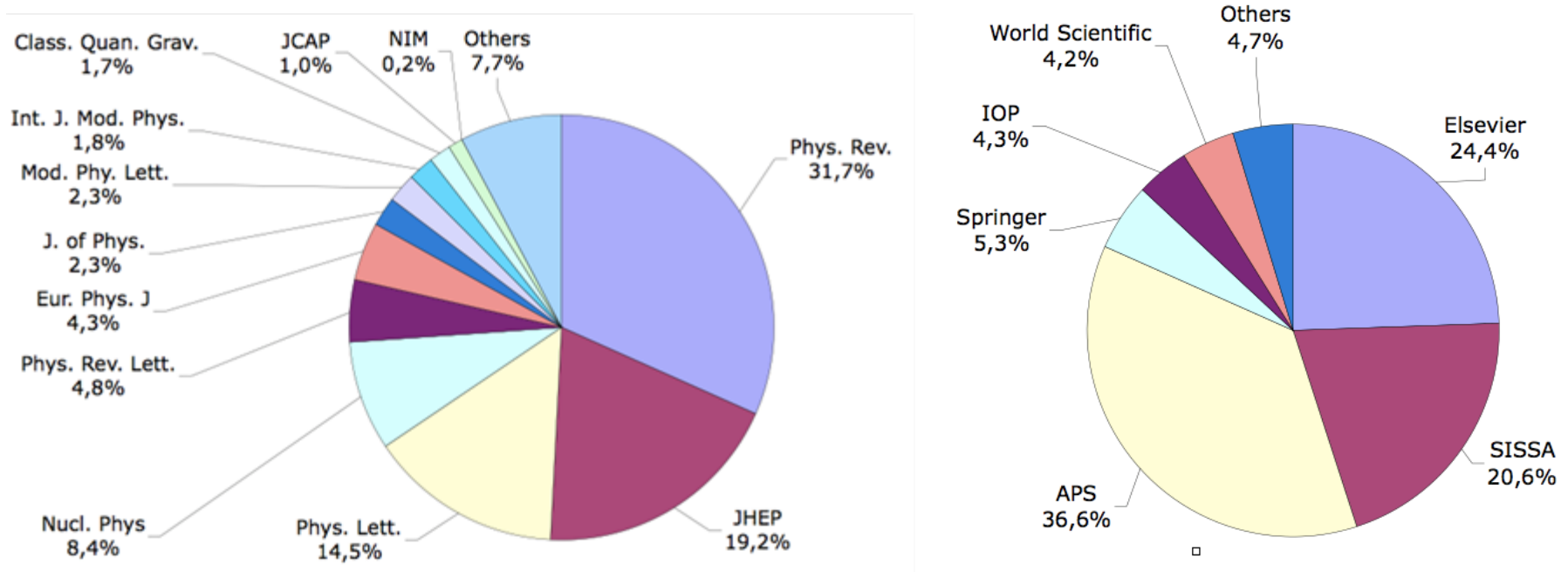
SOURCE: LJ PERIODICALS PRICE SURVEY 2007

The present subscription model is not sustainable:  
 the community needs a new model to  
 (1) contain costs and (2) achieve Open Access

# The HEP publishing landscape

S.Mele *et al.* JHEP 12(2006)S01 arXiv:cs.DL/0611130

5016 articles submitted to arXiv:hep in 2005 and published in peer-reviewed journals



90% of articles are in theory and by less than 3 authors

83% of articles published in 6 leading journals

87% of articles published by four publishers

57% of articles by not-for-profit (nor-for-loss) publishers



# HEP and Open Access



After preprints, arXiv and the web,  
Open Access journals  
are the natural evolution of  
HEP scholarly communication



# Open Access experiments



**Sponsoring model:** institutions funds. No author charges. All content free to read. Successful niche journal (200 art./y), 15 sponsors



**Hybrid model:** authors can pay journals to make their articles OA. The rest of the journal is under subscriptions. Subscriptions reduced according to the fraction of OA articles.

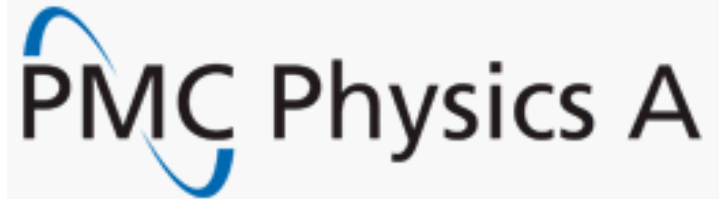
- Springer in 2004, followed by APS and Elsevier
- Prices range from 975\$ to 3,000\$
- Little, if any, success: in competition with research funds

# Open Access experiments

Φ DEUTSCHE PHYSIKALISCHE GESELLSCHAFT | IOP Institute of Physics

**New Journal of Physics**

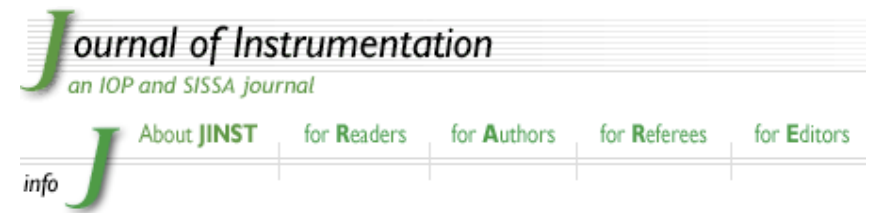
The open-access journal for physics



**Author-pays:** all content of the journal is free to read. After acceptance, authors pay journals for processing fees

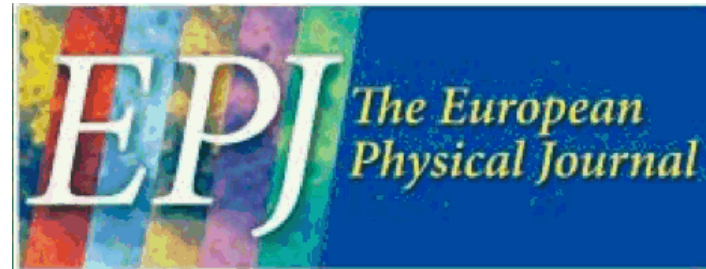
- Successful in Life Sciences (BioMedCentral). However sustainability problems are arising (subscriptions to other journals still there & library budgets fixed or reducing)
- *New Journal of Physics* (IOP)
  - Started 1998, attracts only 20 HEP articles/year
- New HEP journals
  - Hindawi: Advances in High-Energy Physics
  - PhysMathCentral: *Physics A*
- Model in its infancy in HEP. FAQ: why pay something (peer-review) you can get for free (the library pays subscriptions)

# Other Open Access experiments



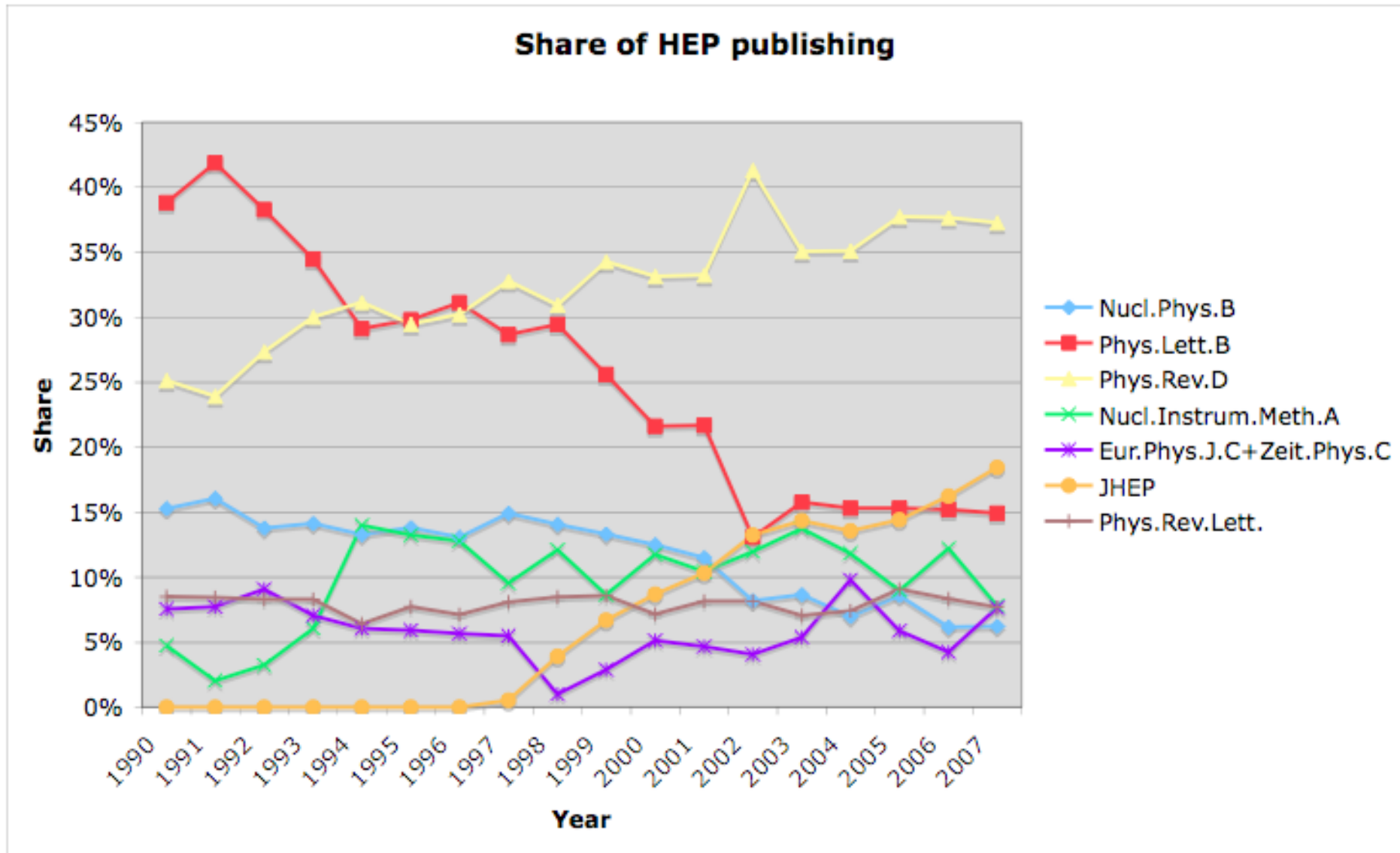
**Institutional membership:** for a (small) fee in addition to subscriptions, JHEP and JINST publish OA all articles with at least one author from the institution.

- SLAC, Fermilab, DESY, CERN, and the entire France trying this scheme.



*“EPJC is willing to negotiate with funding agencies interested in Open Access to become fully Open Access. In anticipation of such successful negotiations, all experimental papers accepted by The European Physical Journal C will be published Open Access without any fees”*

# Evolving publication habits



# The SCOAP<sup>3</sup> model

Sponsoring Consortium for Open Access Publishing  
in Particle Physics



**A practical approach:**  
How to publish OA  
about 5'000 articles/year,  
produced by a community  
of about 20'000 scientists?

<http://scoap3.org/files/Scoap3ExecutiveSummary.pdf>

<http://scoap3.org/files/Scoap3WPReport.pdf>

# SCOAP<sup>3</sup> in one line

A consortium sponsors HEP publications and makes them OA by re-directing subscription money.

Today: (funding bodies through) libraries buy journal subscriptions to support the peer-review service and to allow their patrons to read articles.

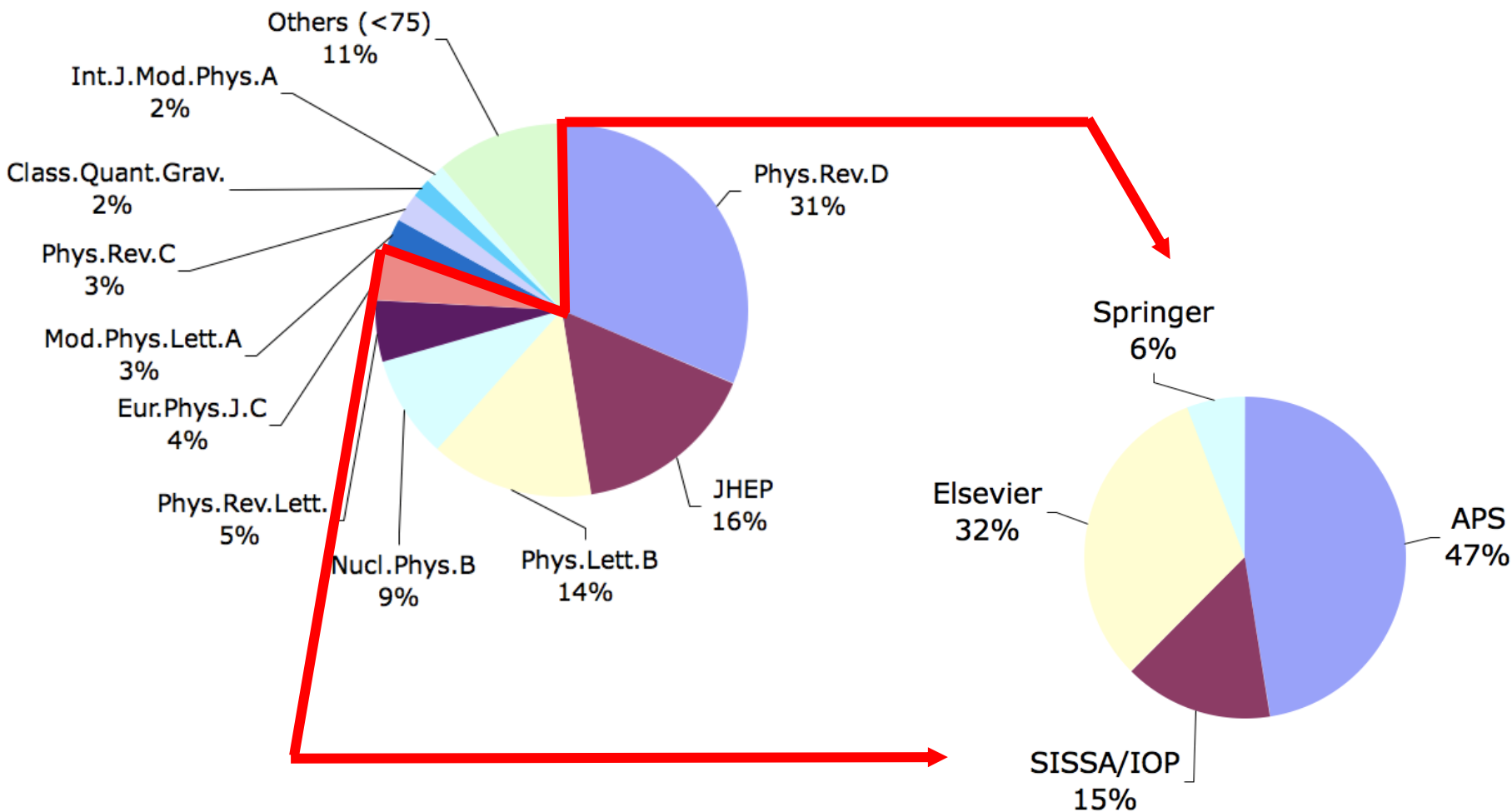
Tomorrow: funding bodies and libraries contribute to the SCOAP<sup>3</sup> consortium, which pays centrally for the peer-review service. Articles are free to read for everyone.

*“Basically, all the same funders pay more-or-less the same money to the same publishers but instead of for their own good, it's for the common good.”*

John Dupuis, York, Canada

# Potential initial partners of SCOAP<sup>3</sup>

Journals where HEP researchers mostly publish today



SCOAP<sup>3</sup> is not limited to this initial set of journals but open to all high-quality, existing and new HEP journals!

# Towards Open Access journals

- Six journals cover 80% of central HEP literature
- Five “core” journals: *Physical Review D* (APS), *Journal of High Energy Physics* (SISSA/IOP), *Physics Letters B & Nuclear Physics B* (Elsevier), *European Physical Journal C* (Springer)
  - Carry a majority of HEP content
  - 10%-30% Nuclear Physics and Astroparticle Physics
  - Aim to convert them entirely to Open Access
  - Reduce prices of “packages” accordingly
- One “broadband” journal: *Physical Review Letters* (APS)
  - 10% HEP (including Nuclear and Astroparticle Physics)
  - Sponsor the conversion to OA of this fraction
  - Reduce subscription price accordingly
  - Similarly for *Nucl.Instr.Meth* (Elsevier), JINST (SISSA/IOP)

SCOAP<sup>3</sup> is not limited to this initial set of journals but open to all high-quality, existing and new HEP journals!

# Guesstimating the budget envelope

(€/ \$ exchange rate of April '07)

- *Physical Review D* (APS) operates with **2.7M€/year** (31% of arXiv:hep)
- *Journal of High Energy Physics* (SISSA/IOP) needs **~1M€/year** (19% of arXiv:hep)

**HEP Open Access price tag: 10M€/year**

- A published PRD article costs APS **~1500€**
- 6-8 leading journals publish 5000-7000 articles a year

[no money changes hands on the basis of this guesstimate]

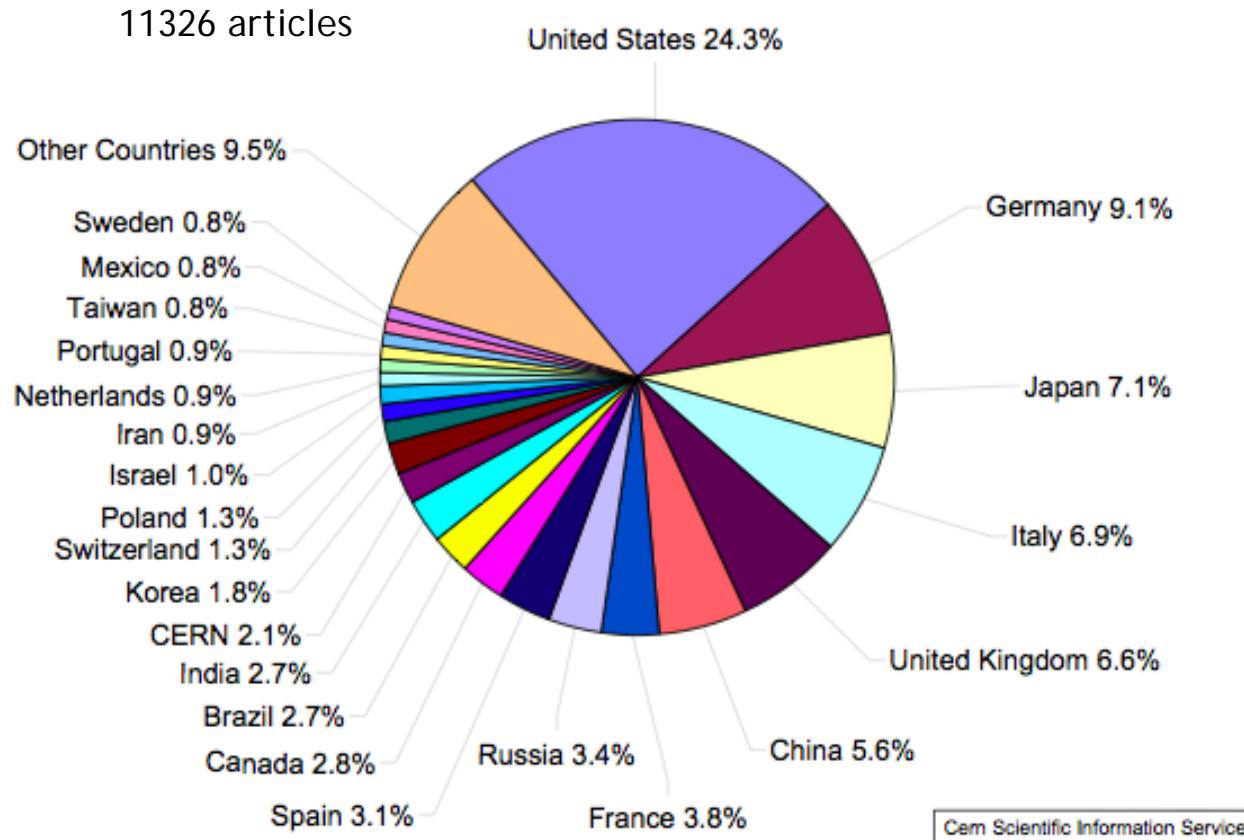
# SCOAP<sup>3</sup> financing

- SCOAP<sup>3</sup> exact yearly cost to be known after a tender is sent to publishers. [no money changes hands till then]
- SCOAP<sup>3</sup> financing to be distributed according to a “fair-share” model based on the distribution of HEP articles per country, accounting for co-authorship.
- Make a 10% allowance for developing countries who at the beginning might not contribute to the scheme.
- **The model is viable only if every country is on board!** Allowing only SCOAP<sup>3</sup> partners to publish Open Access simply replicates the subscription scheme and does not solve the problems: need to buy/read what others write.

# A study of HEP authorship in leading journals

J.Krause, C.M.Lindqvist, S.Mele CERN-OPEN-2007-014

Distribution of HEP articles by country, average 2005-2006



All HEP "core" journals and HEP fraction of broadband journals.

Co-authorship is taken into account on a *pro-rata* basis by assigning articles to countries according to their number of authors.

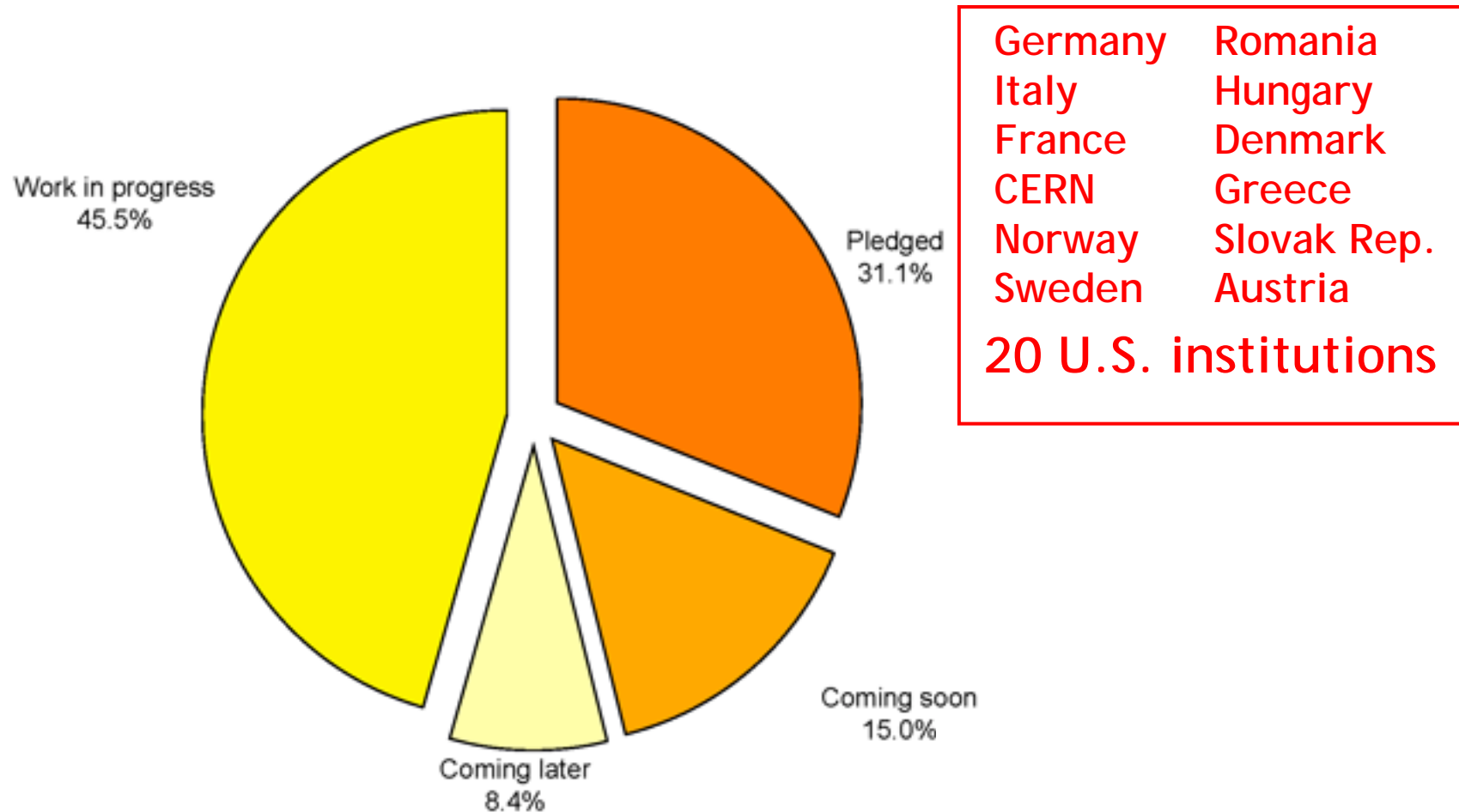
# Next steps

- Funding partners identify country-by-country schemes to re-direct journal subscriptions to SCOAP<sup>3</sup> [no money changes hands]
- Countries pledge their contribution to SCOAP<sup>3</sup> through a countrywide Expression of Interest [no money changes hands]
- Once a sizeable fraction of budget is pledged, SCOAP<sup>3</sup> can issue a tender to publishers [no money changes hands]
- Publishers answer the tender. Formal agreement on:
  1. Journal licence packages are un-bundled, the OA titles are removed and subscription prices are reduced accordingly
  2. In the case of long-term subscription contracts, publishers will be required to reimburse subscription costs pertaining to OA journals [no money changes hands]
- SCOAP<sup>3</sup> partners establish the consortium, adjudicate contracts and commit funds [no money changes hands]
- Contracts with publisher are signed and funds are transferred to SCOAP<sup>3</sup>, through single intermediary for each country. SCOAP<sup>3</sup> pays publishers [payments]

# New practical obstacles, if any ...

- Budget planning; price increase; contract length
  - The scientific contribution to HEP is stable across countries
  - The price increase is aimed to be aligned with inflation
  - The contracts will be based on a 3 years sliding window
- Negotiating package prices with publishers
  - Packages are not static; SCOAP<sup>3</sup> will thus not introduce additional complexity
  - No contributions will be paid to SCOAP<sup>3</sup> without corresponding reduction in the package prices or reimbursement of existing long term contracts
- National/regional clearing houses
  - No difference in paying the SCOAP<sup>3</sup> bill compared to the payment of any other bill

# SCOAP<sup>3</sup> world wide



Europe: all countries contacted and poised to join  
Americas: U.S. under way, contacts in Canada and South Am.  
Asia: contacts with Korea, China and Japan  
Australia: expected to join shortly

# SCOAP<sup>3</sup> world wide

# Breaking News:

# Belgium joins as of today!

- |                      |             |
|----------------------|-------------|
| Germany              | Romania     |
| Italy                | Hungary     |
| France               | Denmark     |
| CERN                 | Greece      |
| Norway               | Slovak Rep. |
| Sweden               | Austria     |
| 20 U.S. institutions |             |

Europe: all countries contacted and poised to join  
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Asia: contacts with Korea, China and Japan  
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# Financing schemes adopted across Europe

- **The main bulk:** Redirection of subscription funds controlled by national subscription consortia (in all cases “opt-in consortia”)
- **A few agencies:** Redirection of subscription funds controlled by national high-energy physics funding agencies
- **A couple of partners:** national ad hoc SCOAP<sup>3</sup> arrangements
  - Central allocation from research funding agencies
  - Distributed best effort among universities

# Fundraising status: received pledges

- Germany, 1000k€ (Helmholtz, Max Planck, TIB)
  - Re-direction of library subscriptions with TIB backed by either DFG or consortia funds
- Italy, 700k€ (INFN)
  - Re-direction of INFN library subscriptions and recovery of remaining fraction from re-direction of consortia subscriptions
- France, 420k€ (CNRS/IN2P3)
  - Re-direction of HEP library subscriptions
- CERN, 230k€
  - Re-direction of HEP library subscriptions (and additional in-kind staff and infrastructure contribution)
- Sweden, 88k€ (Royal library)
  - Re-direction of national consortia subscriptions\
- Belgium, 77k€ (FRS-FNRS)
  - Directly supported by funding agency
- Greece, 77k€ (Alliance of University Rectors)
  - Best-effort re-direction, backed by the Alliance of Universities
- Denmark, 66k€ (Danish Library Agency)
  - Re-direction of national consortium subscriptions
- Austria, 55k€ (Institute of High Energy Physics of the Academy of Sciences)
  - Re-direction of HEP library subscriptions
- Hungary, 44k€ (Hungarian Academy of Sciences)
  - Re-direction of HEP library subscriptions
- Norway, 33k€ (Norwegian Association of Higher Education Institutions)
  - Re-direction of national consortium subscriptions
- Romania 14k€ (IFIN-HH)
  - Directly supported by funding agency
- Slovakia, 4k€ (Slovak CERN Committee)
  - Directly supported by funding agency

Total: 2.8M€

# Fundraising status: other EU countries, Canada and Russia

- UK, 730k€
  - JISC is organizing re-direction of subscriptions paid by university libraries
- Spain, 340k€
  - Political will confirmed that the ministry will appropriate the contribution
- Poland, 140k€
  - There might be a political will at the ministry to appropriate the contribution
- Portugal, 100k€
  - Re-direction of (centralized) library subscriptions under discussion
- Netherlands, 100k€
  - NIKHEF and the universities are discussing a splitting of the contribution
- Finland, 55k€
  - Dossier currently at National Librarian's desk
- All remaining European countries and Russia contacted
- Canada, 310k€
  - Library consortia are discussing re-direction of subscriptions

Total: 1.8M€

# Fund-raising in the US (target 2.7M€)

A three-pronged approach reflecting de-centralized structure of funding in the US

1. Re-direction of subscriptions of DoE-laboratory libraries
2. Re-direction of subscriptions of individual university libraries, not organised in consortia
3. Re-direction of subscriptions by library consortia

A SCOAP<sup>3</sup> “Focal” meeting held in Berkeley on 29/2. 90 representative from over 50 U.S. institutions. Unanimously agreement in advocating SCOAP<sup>3</sup> in the U.S. and try to engage partners in these three categories. First signs already showing

# SCOAP3 in the US (so far...)

- Maine InfoNet, 09 April
- University of Oregon, 04 April
- OhioLINK, 25 March
- Johns Hopkins University, 17 March
- DoE National laboratories
  - Argonne National Laboratory, 28 February
  - Fermilab, 28 February
  - Los Alamos National Laboratory, 28 February
  - Pacific Northwest National Laboratory, 28 February
- California Institute of Technology, 28 February
- California Digital Library, 25 February

*18/04/2008, The Greater Western Library Alliance endorses SCOAP3*  
*The Deans and Directors of the Greater Western Library Alliance (GWLA), a consortium of 31 research libraries in the mid-western and western United States, endorsed the SCOAP3 project. They expressed interest in redirecting their subscription expenditures in High-Energy Physics journals toward the SCOAP3 project.*

# Fundraising status: Asia

- Japan, 0.8M€
    - Contacts are established with MEXT and KEK. Internal discussions are underway.
  - China, 0.6M€
    - Contacts are established with CAS and NSFC. Internal discussions are underway.
  - Korea, 0.2M€
    - Contacts are established
- Total: 1.6M€

# Ensure the future: Remain at service for the community!

Let's walk these steps  
together...

...and make Open Access happen

It is an unstoppable and irreversible process!

[Jens.Vigen@cern.ch](mailto:Jens.Vigen@cern.ch)

[scoap3.org/files/Scoap3WPRReport.pdf](http://scoap3.org/files/Scoap3WPRReport.pdf)

[scoap3.org/files/Scoap3ExecutiveSummary.pdf](http://scoap3.org/files/Scoap3ExecutiveSummary.pdf)