Open Access in High-Energy Physics and the SCOAP3 project

Open Access tradition
Open Access advantages
Open Access publishing - SCOAP3

Salvatore Mele
CERN European Organization for Nuclear Research

scoap3.org

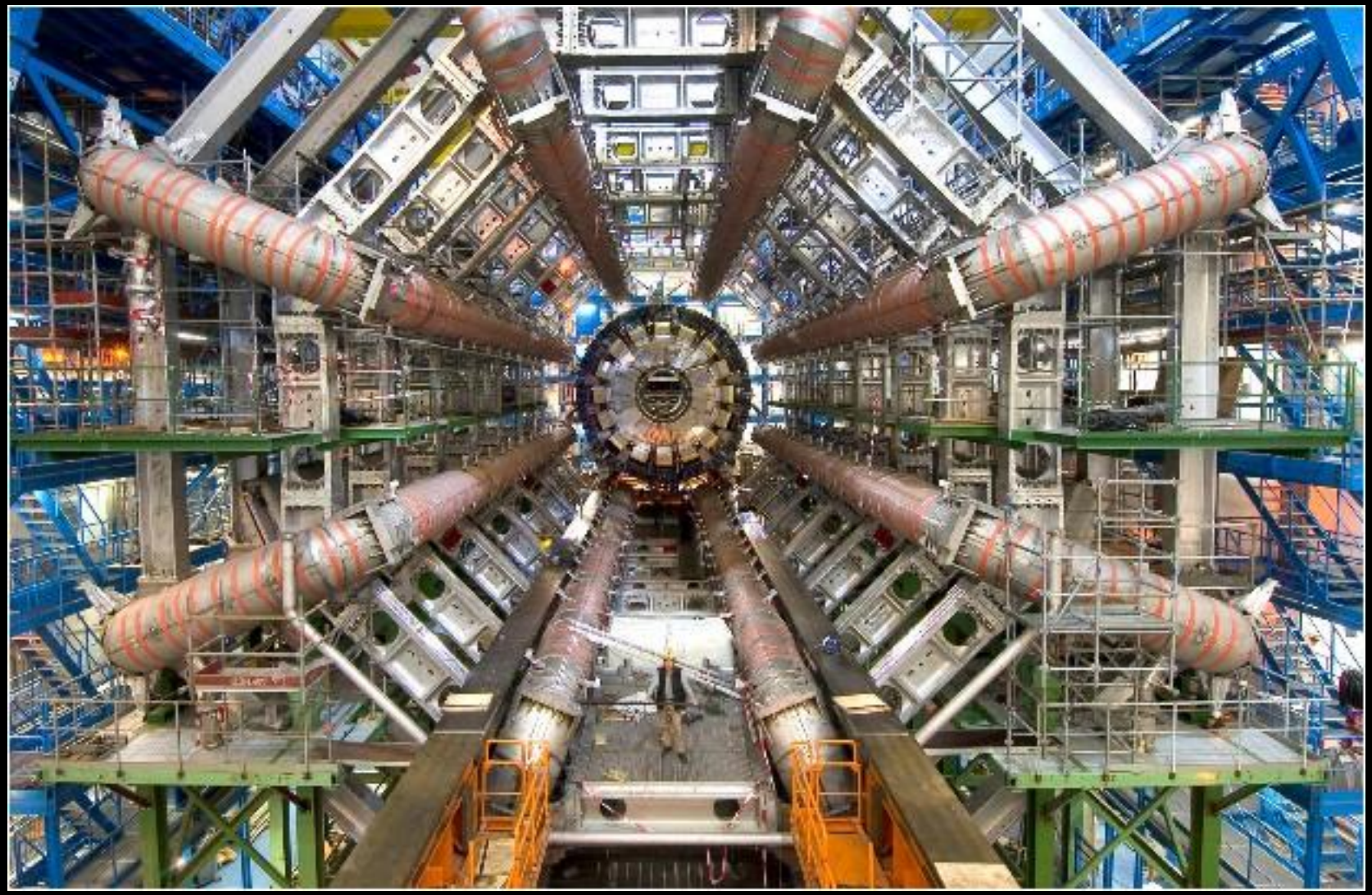
CERN: European Organization for Nuclear Research (since 1954)

- World leading HEP laboratory, Geneva (CH)
- 2500 staff (mostly engineers, administrators/services)
- 10000 users (physicists from 580 institutes in 85 countries)
- 3 Nobel prizes (Accelerators, Detectors, Discoveries)
- Invented the web    
- Operates the 27-km (6bn€) LHC accelerator, “the big-bang machine”
- Top management committed to Open Access
- Runs a 1-million objects Digital Library

CERN Convention (1953): *ante-litteram* Open Access manifesto

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

~15’000 High Energy Physics (HEP) scientists smash stuff at the speed of light to produce new stuff



~15’000 HEP theorists scratch their heads to make sense of all that stuff and then some more



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The “preprint culture”

L.Goldschmidt-Clermont, 1965, http://eprints.rclis.org/archive/00000445/02/communication_patterns.pdf

Scientific journals of ‘60s too slow for HEP

Mass-mail preprints to institutes worldwide

Ante litteram (institute-pays) Open Access

Leading libraries “serve” preprints

“Our ADS”: SPIRES (Stanford) 1st U.S. WWW!

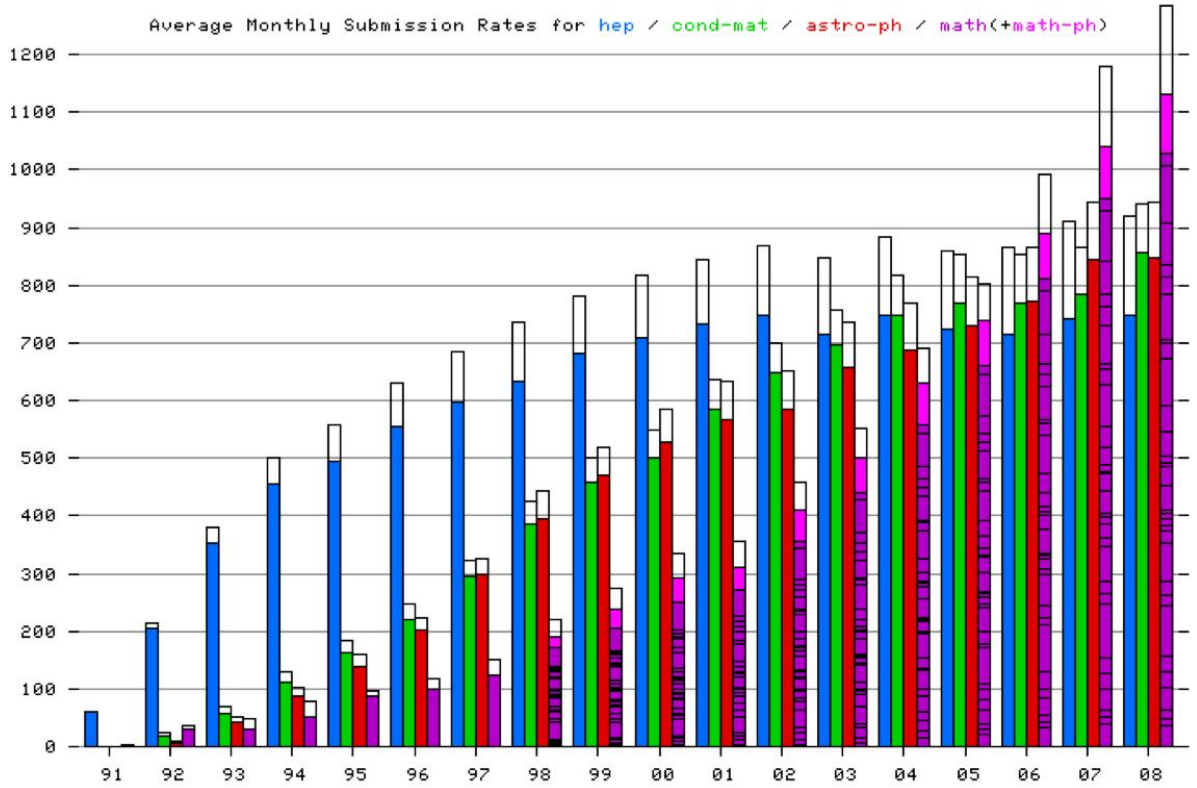


CERN Library, circa 1960

arXiv.org the archetypal repository

http://vmsstreamer1.fnal.gov/VMS_Site_03/Lectures/Colloquium/presentations/090506Ginsparg.pdf

- P. Ginsparg, LANL, 1991. Now Cornell Library
- E-mail based, then immediately on the web
- No mandate, no debate, author-driven
- 1/2 Million preprints. HEP, Astro and growing



What more do users want?

Gentil-Beccot *et al.* arxiv:0804.2701

- Seamless Open Access to pre-'90s articles
- "Greyer" literature (laboratory reports)
- Conference slides (linked with articles)
- "Publication" of "ancillary" material:
  - Data behind tables, figures
  - Re-usable experimental data
- Some sort of peer-review overlaid on arXiv
- "Smarter" search tools



Building INSPIRE

http://www.projecthepinspire.net/

- Joint project of CERN, DESY, FERMILAB, SLAC
- Synergy of Libraries and IT. Beta this week!
- Full-text search. Citations. Speed. AuthorID
- Bi-directional feeds with arXiv, ADS, publishers

...and... OA publishing platform, metadata on data, more theses and grey literature, drop-box for old preprints, “attach” non-text material, user



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Open Access tradition

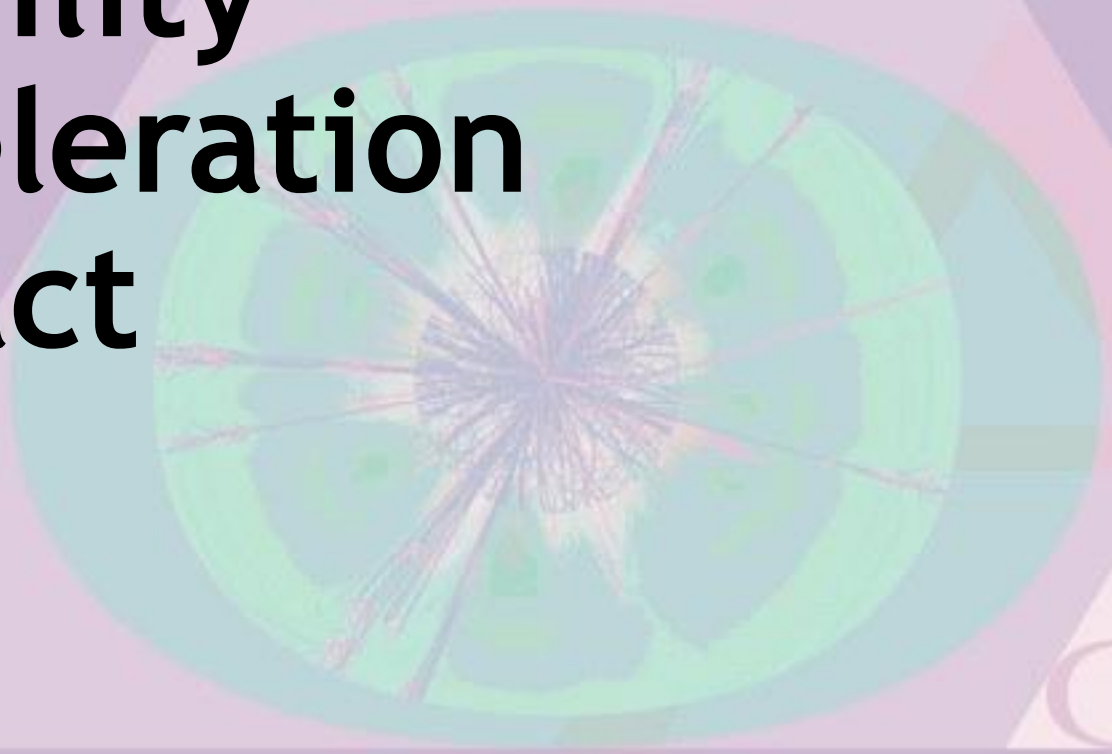
Open Access advantages

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Open Access advantages in HEP



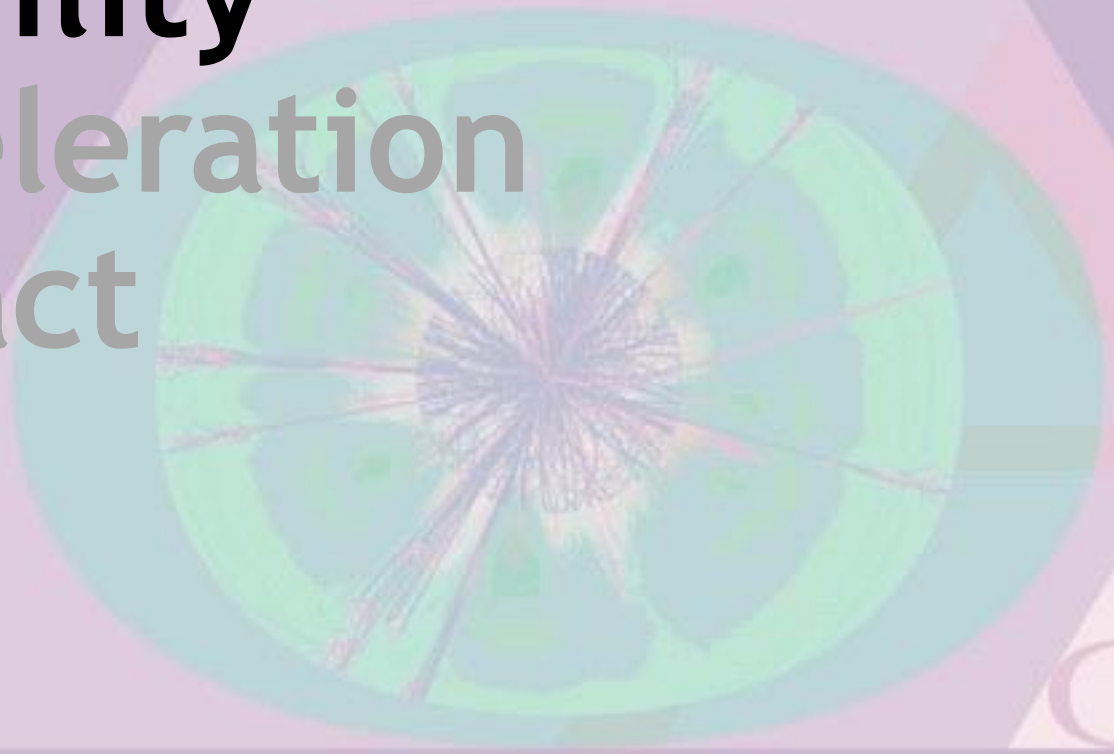
Visibility
Acceleration
Impact

Open Access advantages in HEP

Visibility

Acceleration

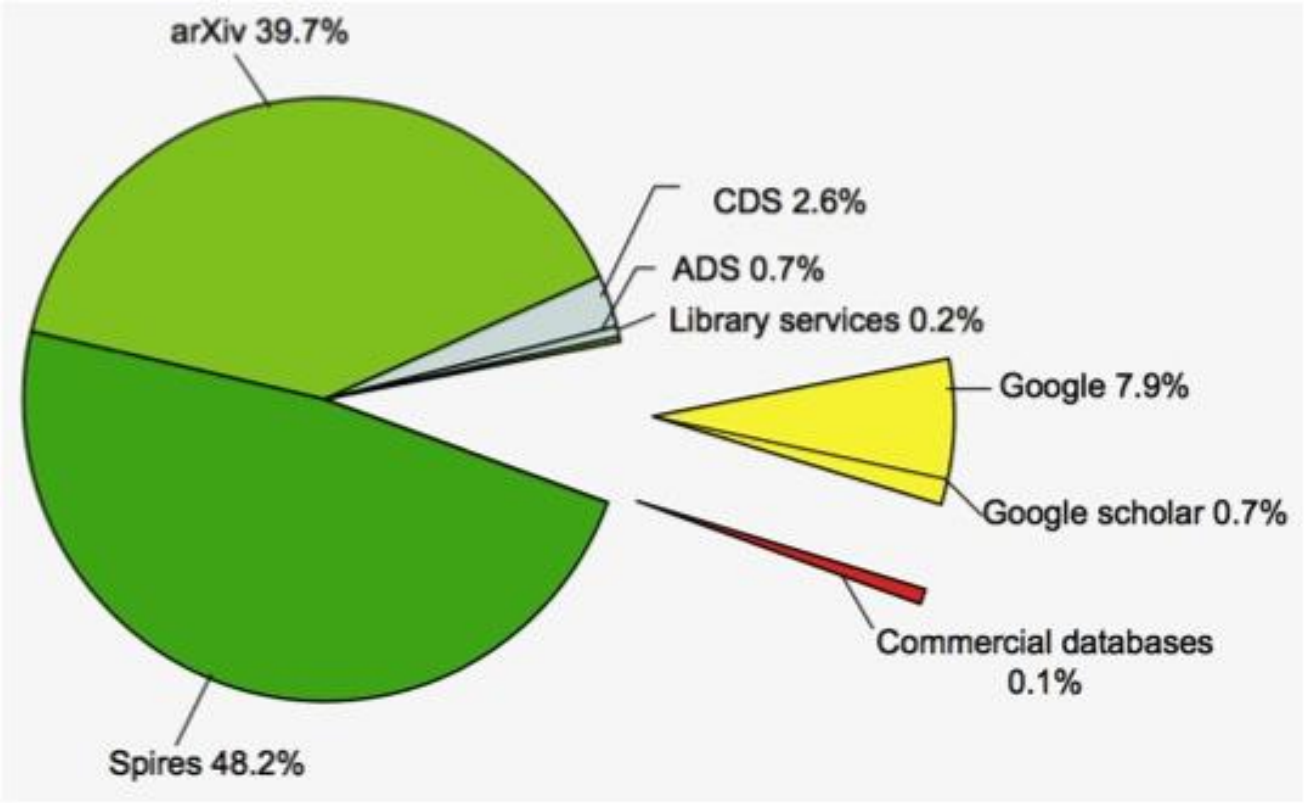
Impact



Where do HEP scientists look for info?

Gentil-Beccot *et al.* arxiv:0804.2701

- Survey of 2'000+ scientists (10% of community)
- OA tools answer scientists' information needs
- Google as proxy of arXiv, SPIRES, publishers

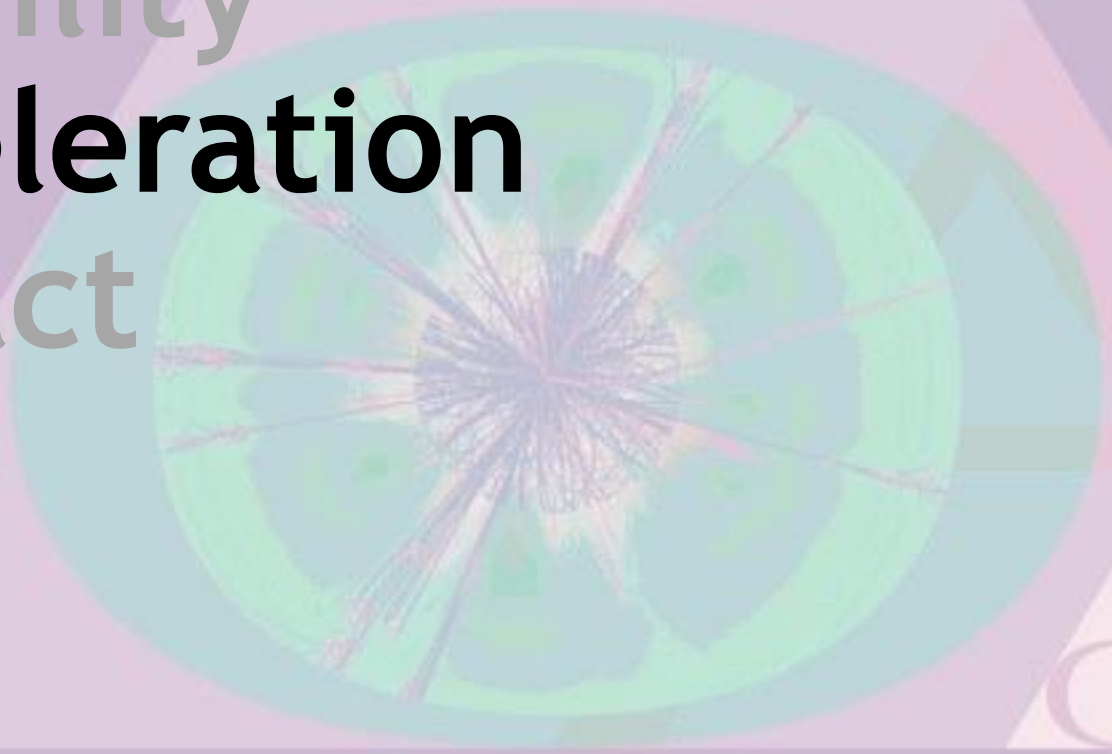


Open Access advantages in HEP

Visibility

Acceleration

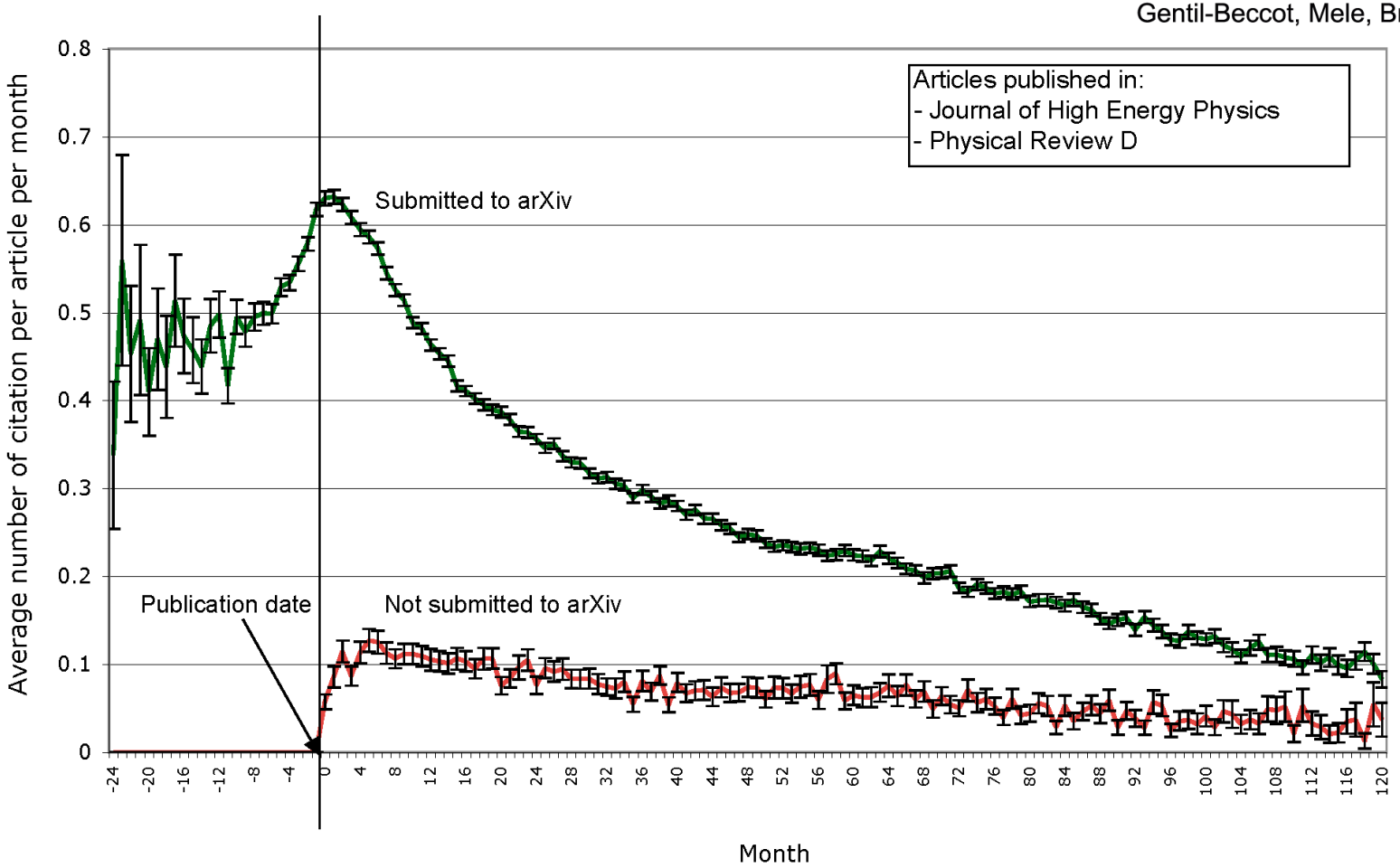
Impact



Ten years in the life of a HEP article

- SPIRES counts: citations to/from preprints/articles
- Citation peak **before** publications
- Scientific discourse proceeds on discipline repository

arxiv:0906.5418
Gentil-Beccot, Mele, Brooks

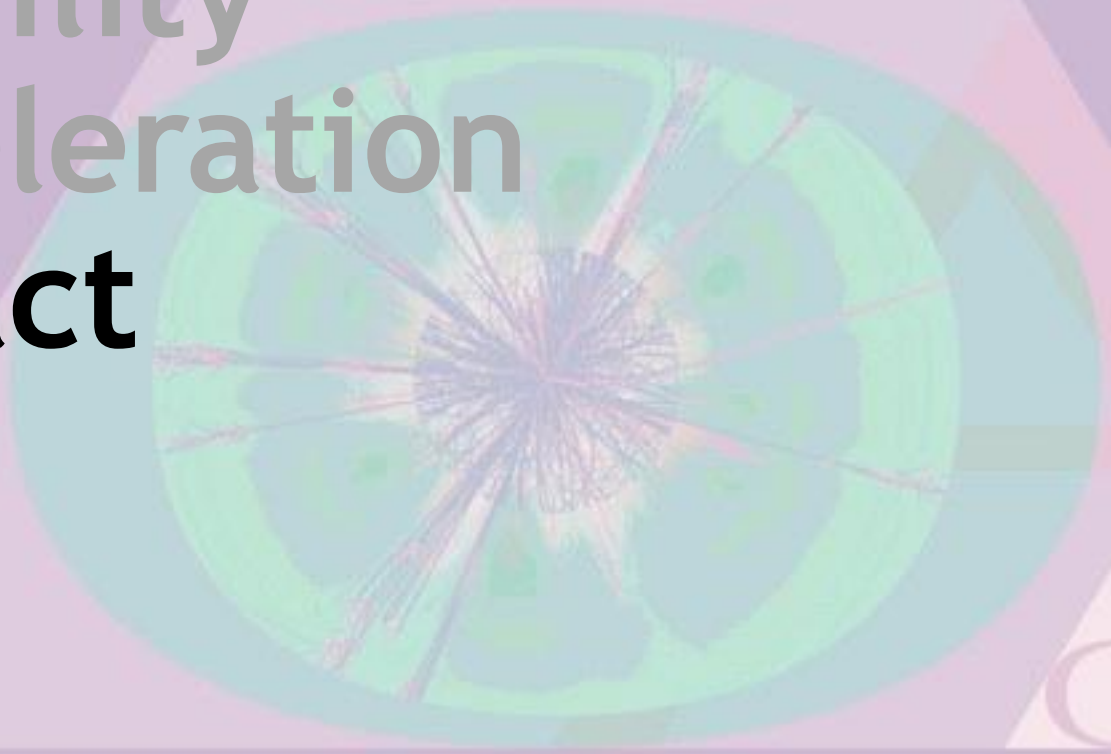


Open Access advantages in HEP

Visibility

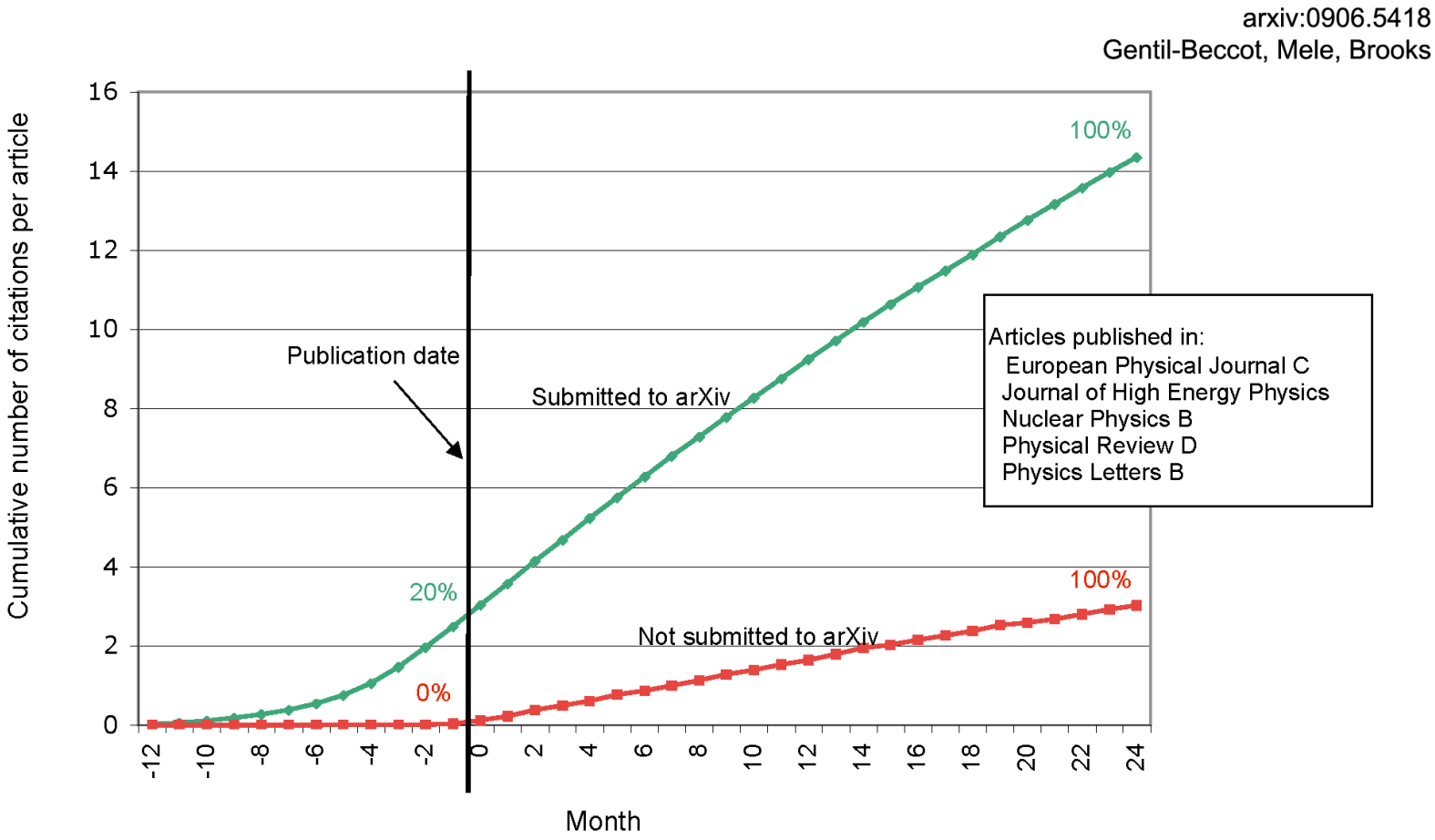
Acceleration

Impact



Citation augmentation

- Discipline repository yields immense avantage
  - Five times more citations for articles in arXiv
  - 20% of 2-year citations occur before publication



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Open Access publishing in HEP

A conundrum
Experiments
SCOAP3

Open Access publishing in HEP

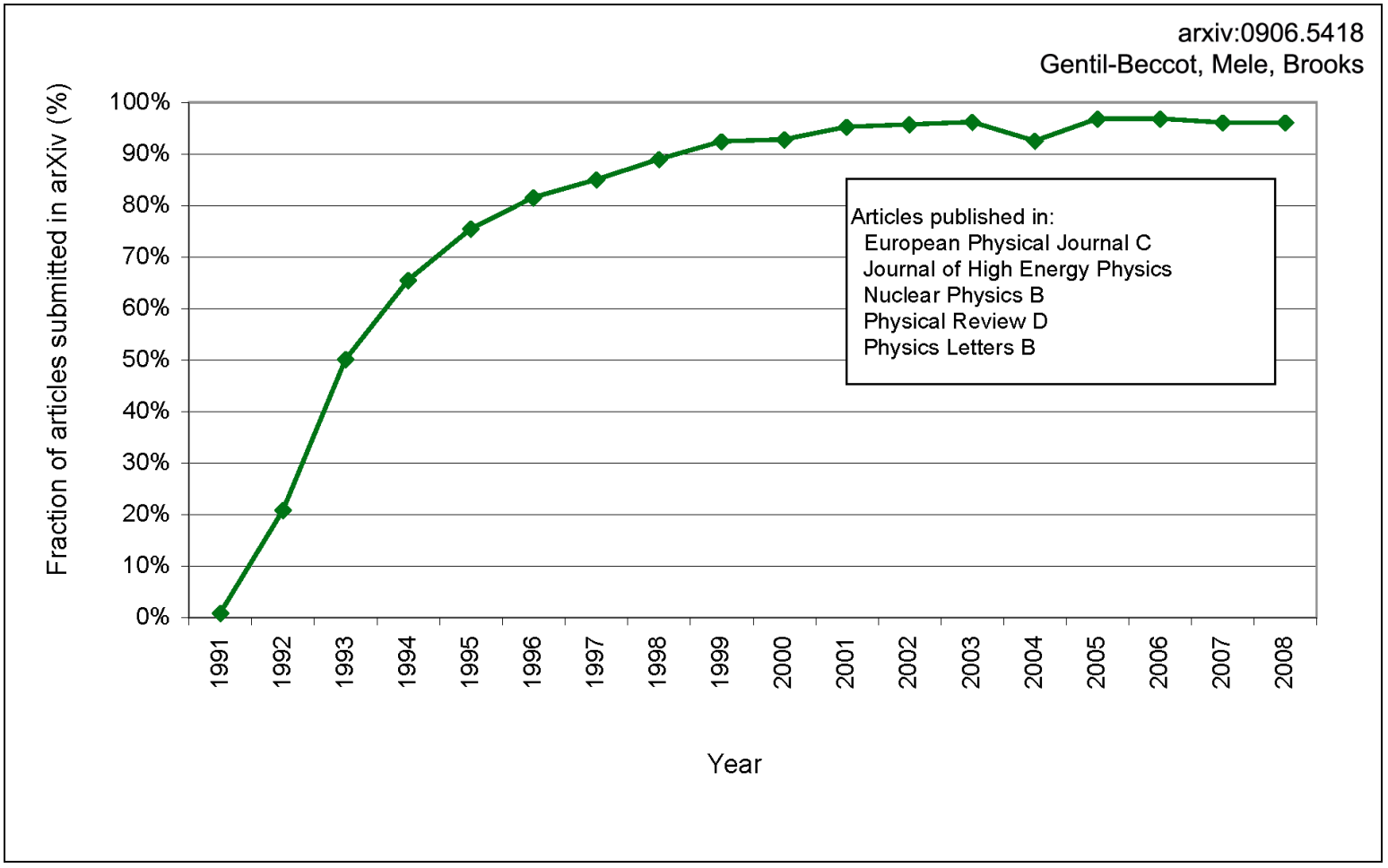
A conundrum

Experiments

SCOAP3



97% of HEP journals' content is in arXiv



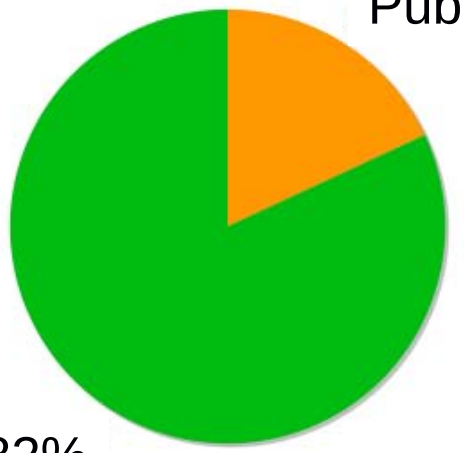


Do HEP scientists read journals ?

Gentil-Beccot *et al.* arxiv:0906.5418

Clicks to DOIs and arXiv from Spires database in October 2008

30,000 clicks (choice between arXiv and journal)



(As many scientists as analyzed here go straight to arXiv)



HEP and its 6-8 journals: a conundrum

- Scientists do not read journals, they read arXiv
- Journals are for peer-review and officialdom
- Strong request for OA from scientists
- Libraries' subscriptions implicitly support the system rather than buying access



Open Access publishing in HEP

A conundrum

Experiments

SCOAP3



Open Access experiments in HEP

(and percentage of HEP literature)

Springer Open Choice

APS physics FREE TO READ

ELSEVIER SPONSORED ARTICLE

epl

Hybrid model: Per-article OA fee on top of subscriptions

- Negligible success in HEP. Author FAQ: why pay something (peer-review) you can get for free (the library pays subscriptions) (<<1%)

DEUTSCHE PHYSIKALISCHE GESELLSCHAFT | IOP Institute of Physics

New Journal of Physics

The open-access journal for physics

PMC Physics A

Hindawi Publishing

Hindawi

Advances in High Energy Physics

Author-pays: No subscriptions. Authors (institutions) pay per-article journals processing fees

- Model in its infancy in HEP. Author FAQ: why pay something you can get for free elsewhere (the library pays subscriptions) (<<1%)

Journal of High Energy Physics

A refereed journal, written, run and distributed by electronic means

info About JHEP for Readers for Authors for Referees for Editors

Journal of Instrumentation

an IOP and SISSA journal

info About JINST for Readers for Authors for Referees for Editors

Institutional membership: for a (small) fee in addition to subscriptions, all articles with at least one author from the institution are OA

- Leading laboratories and the entire France trying this scheme.
- Authors like OA without financial barriers in high-IF journals (~4%)

Community support for OA publishing

- LHC scientists (8000 scientists from 54 countries):
  "We strongly […] support the principles of Open Access Publishing, which includes granting free access of our publications to all. Furthermore, we encourage all our members to publish papers in easily accessible journals, following the principles of the Open Access Paradigm."
- Seminal articles on LHC construction published OA *Journal of Instrumentation*
  - 7 articles/1600 pages/8000 authors.
  - 60'000+ downloads from journal site in two months!
- 3000-scientists CMS collaboration at LHC votes to "privilege SCOAP3-friendly journals" for its articles

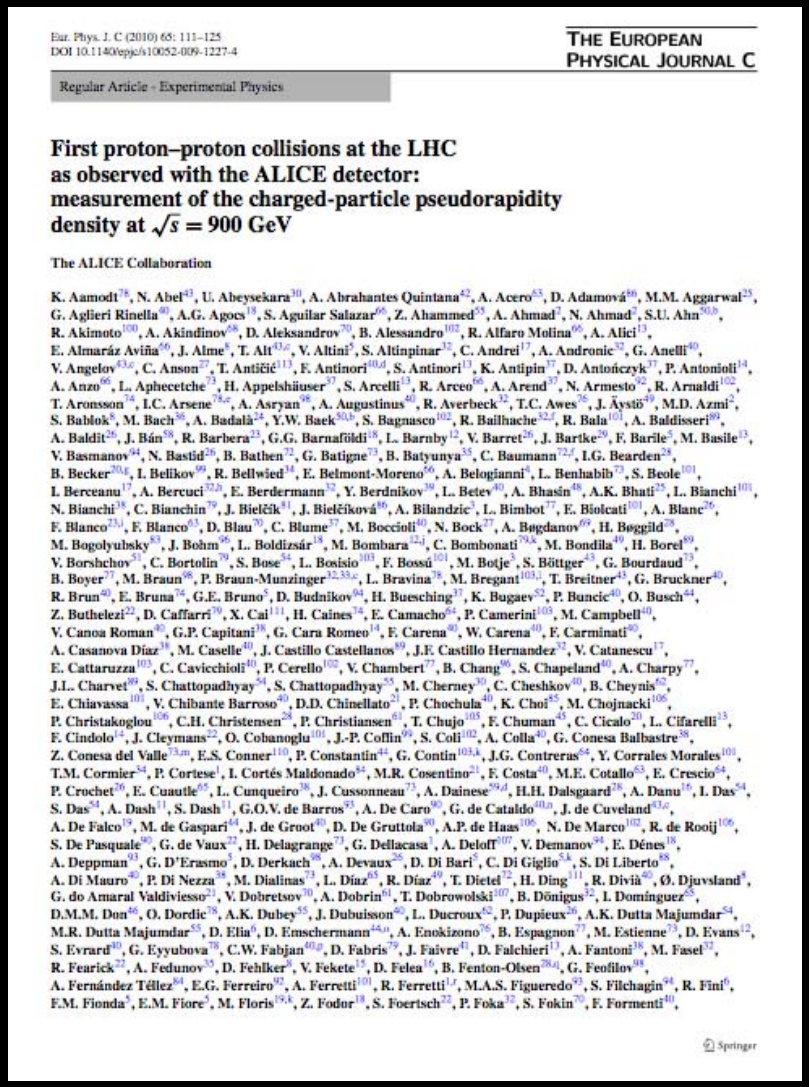


Recent Open Access developments in HEP

Waiting for SCOAP3 publishers offer **free** OA:

- Springer: *Eur. Phys. Jour. C*
  - experimental HEP articles and all HEP letters
- EPS: *Europhys. Lett.*
  - all HEP articles
- Elsevier: *Phys. Lett. B* and *Nucl. Phys. B*
  - HEP articles from the LHC





Eur. Phys. J. C (2010) 65: 111–125
DOI 10.1140/epjc/s10052-009-1227-4

THE EUROPEAN PHYSICAL JOURNAL C

Regular Article - Experimental Physics

First proton–proton collisions at the LHC as observed with the ALICE detector: measurement of the charged-particle pseudorapidity density at $\sqrt{s} = 900$ GeV

The ALICE Collaboration

K. Aamodt[78], N. Abel[43], U. Abeysekara[30], A. Abrahantes Quintana[42], A. Acero[63], D. Adamová[86], M.M. Aggarwal[25], G. Aglieri Rinella[40], A.G. Agocs[18], S. Aguilar Salazar[66], Z. Ahammed[55], A. Ahmad[2], N. Ahmad[2], S.U. Ahn[50,b], R. Akimoto[100], A. Akindinov[68], D. Aleksandrov[70], B. Alessandro[102], R. Alfaro Molina[66], A. Alici[13], E. Almaráz Aviña[66], J. Alme[8], T. Alt[43,c], V. Altini[5], S. Altinpinar[32], C. Andrei[17], A. Andronic[32], G. Anelli[40], V. Angelov[43,c], C. Anson[27], T. Antičić[113], F. Antinori[40,d], S. Antinori[13], K. Antipin[37], D. Antończyk[37], P. Antonioli[14], A. Anzo[66], L. Aphecetche[73], H. Appelshäuser[37], S. Arcelli[13], R. Arceo[66], A. Arend[37], N. Armesto[62], R. Arnaldi[102], T. Aronsson[74], I.C. Arsene[78,e], A. Asryan[98], A. Augustinus[40], R. Averbeck[32], T.C. Awes[76], J. Äystö[49], M.D. Azmi[2], S. Bablok[8], M. Bach[36], A. Badalà[24], Y.W. Baek[50,b], S. Bagnasco[102], R. Bailhache[32,f], R. Bala[101], A. Baldisseri[89], A. Baldit[26], J. Bán[58], R. Barbera[23], G.G. Barnaföldi[18], L. Barnby[12], V. Barret[26], J. Bartke[29], F. Barile[5], M. Basile[13], V. Basmanov[94], N. Bastid[26], B. Bathen[72], G. Batigne[73], B. Batyunya[55], C. Baumann[72,f], I.G. Bearden[28], B. Becker[30,g], I. Belikov[99], R. Bellwied[34], E. Belmont-Moreno[60], A. Belogianni[4], L. Benhabib[73], S. Beole[101], I. Berceanu[17], A. Bercuci[72,h], E. Berdermann[32], Y. Berdnikov[39], L. Betev[40], A. Bhasin[48], A.K. Bhati[25], L. Bianchi[101], N. Bianchi[38], C. Bianchin[79], J. Bielčík[81], J. Bielčíková[86], A. Bilandzic[3], L. Bimbot[77], E. Biolcati[101], A. Blanc[26], F. Blanco[23,i], F. Blanco[63], D. Blau[70], C. Blume[37], M. Boccioli[40], N. Bock[27], A. Bøgdanov[69], H. Bøggild[28], M. Bogolyubsky[83], J. Bohm[96], L. Boldizsár[18], M. Bombara[12,j], C. Bombonati[79,k], M. Bondila[49], H. Borel[89], V. Borshchov[53], C. Bortolin[79], S. Bose[54], L. Bosisio[103], F. Bossú[101], M. Botje[3], S. 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Fiore[5], M. Floris[18,k], Z. Fodor[18], S. Foertsch[22], P. Foka[32], S. Fokin[70], F. Formenti[40],

Springer

First LHC physics results:

- OA, no fees
- (C) CERN (later CC-BY)
- 2 more experiments soon
- (in two other journals)

Open Access publishing in HEP

A conundrum

Experiments

SCOAP3

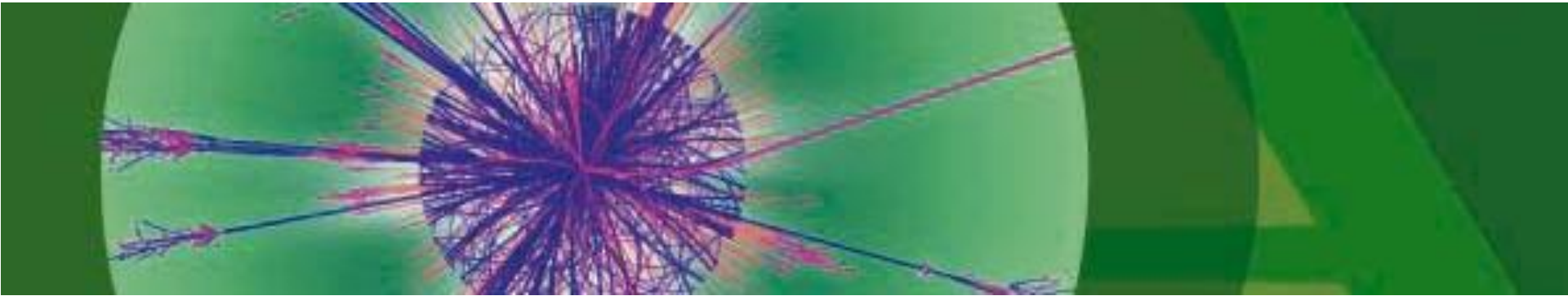


The SCOAP3 model

An international consortium to convert existing (and new) top-quality HEP journals to OA

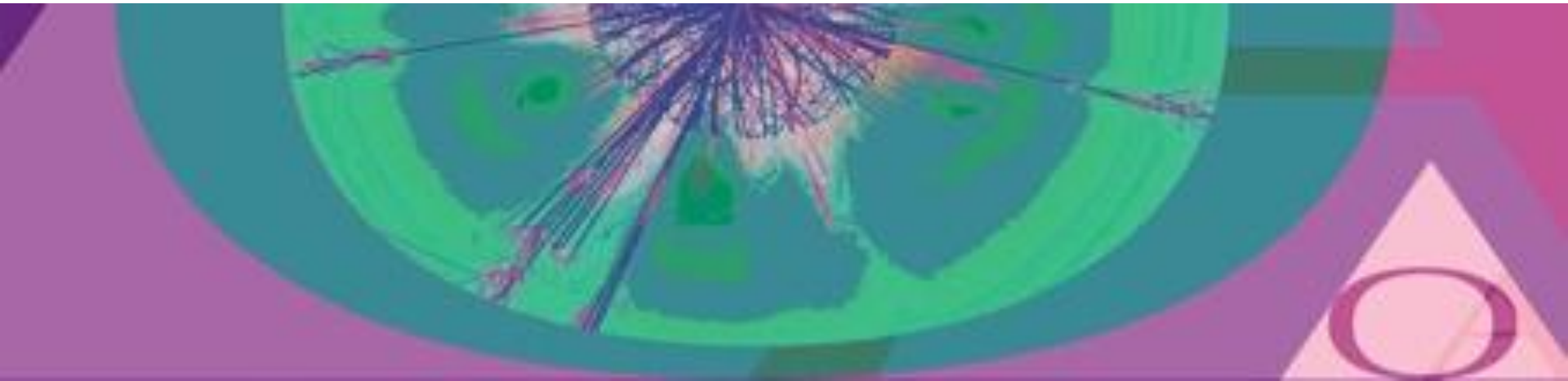
- Libraries re-direct subscriptions to SCOAP3
- SCOAP3 pays centrally for peer-review service
- Price-per-article established by call for tender
- Articles are (free and libre) Open Access

OA and publishing novelties



Publishing novelties of SCOAP3

- Link price and quality through call for tender
- Correlate volume and price through contracts
- Experiment in a field at a confluence:
  - OA, repositories, peer-review



OA novelties of SCOAP3

- No additional expenses for OA article fees
  - for anyone: authors, libraries, funders
- Discipline-wide re-direction of subscriptions
- Transparently provide scientists with:
  - OA; academic freedom; quality; prestige

Advantages for Libraries in SCOAP3

- Mechanism for global price control.
- Do more with articles:
  - Host local copies of entire field.
  - Automatic harvest institute's output in repositories.
  - Author's rights. Re-use rights.
- Experiment for later expansion to other fields.



How much will it cost?

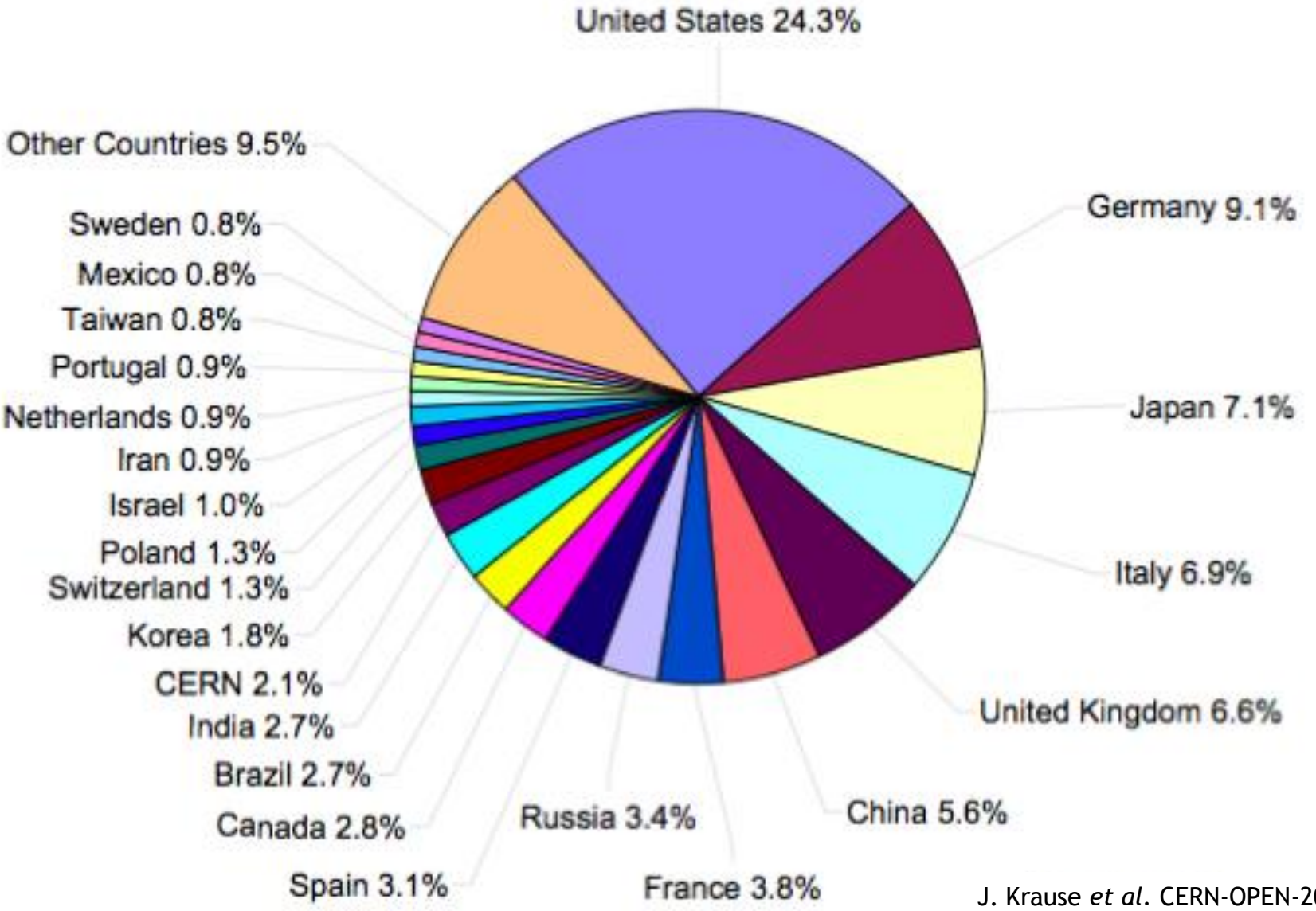
No more than we spend today!

- Worldwide budget envelope:
  - Today learned society prices
    - JHEP ~1M€ for 20% of HEP
    - APS ~2000$/article
  - 5000-7000 articles/year in 6-8 journals
- Total: 10M€/year



SCOAP3 funding

Fair-share: contribute as per peer-review usage



J. Krause *et al*. CERN-OPEN-2007-014

International consensus

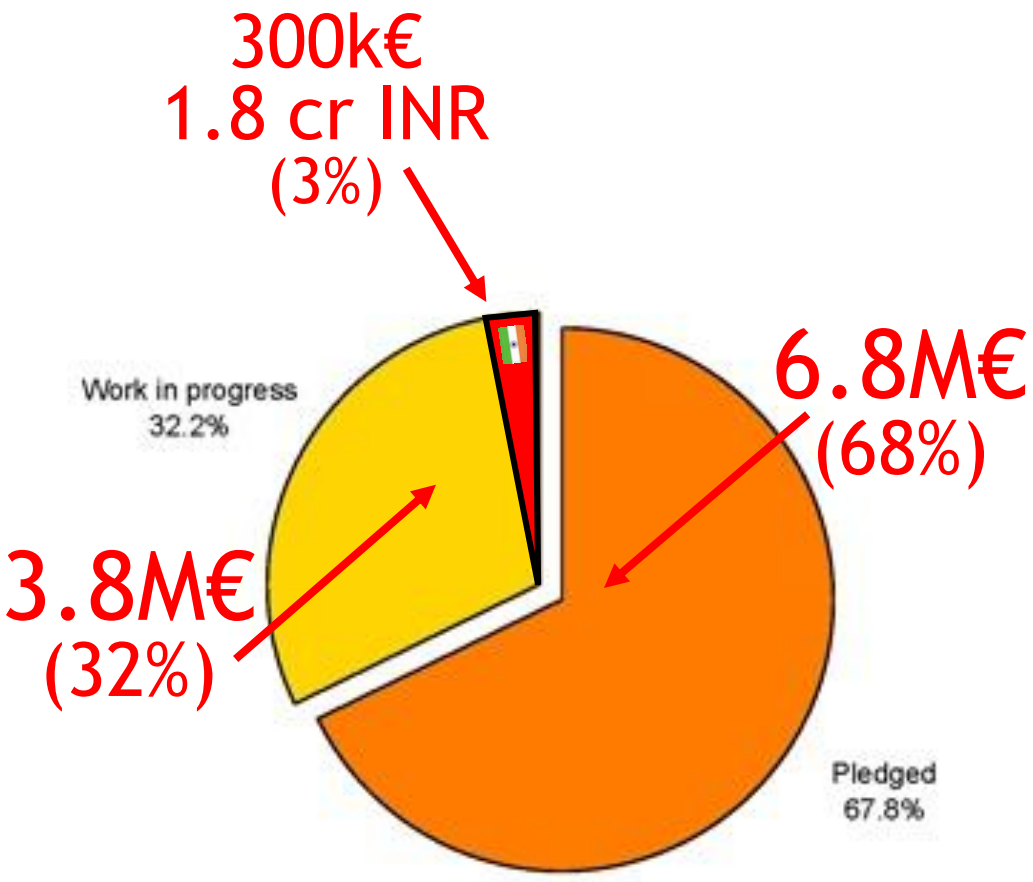
- Only viable if every country is on board!
- Go beyond majority and well-wishing
- Success through consensus and unanimity
- Not a weakness: a strength!

XXIst century problem-solving strategy



Partnerships established so far

68% of the SCOAP3 budget envelope pledged by libraries, consortia and funders worldwide



Austria	Italy
Belgium	Netherlands
CERN	Norway
Denmark	Romania
France	Slovakia
Finland	Sweden
Germany	Switzerland
Greece	Spain
Hungary	JISC (UK)
Australia	Israel, Turkey
Canada	
>200 U.S. libraries (90%)	

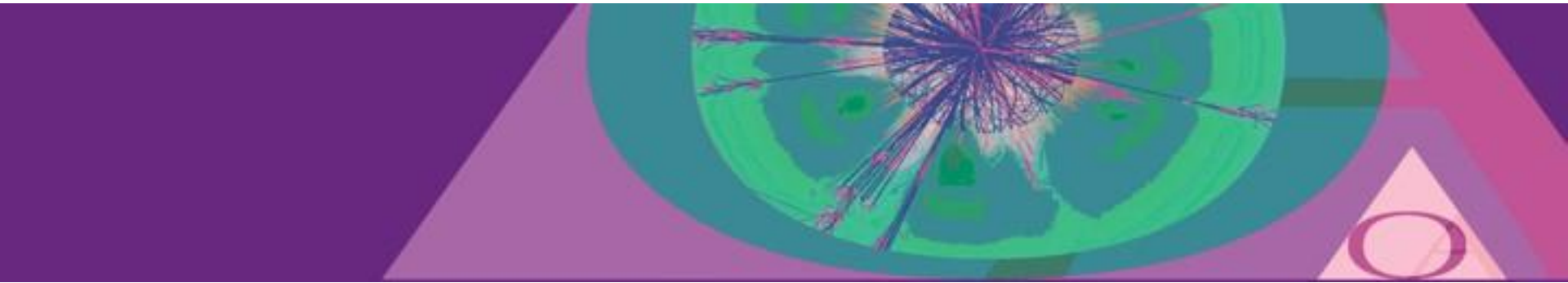
SCOAP3 Call for Tender to publishers

- Request price-per-article for peer-review & OA
  - OA conditions
    - Irreversible OA
    - Author rights
    - Push into repositories
  - Financial conditions:
    - Unbundling of journal packages
    - Reduction of subscription prices
    - No double payment



SCOAP3 Outlook

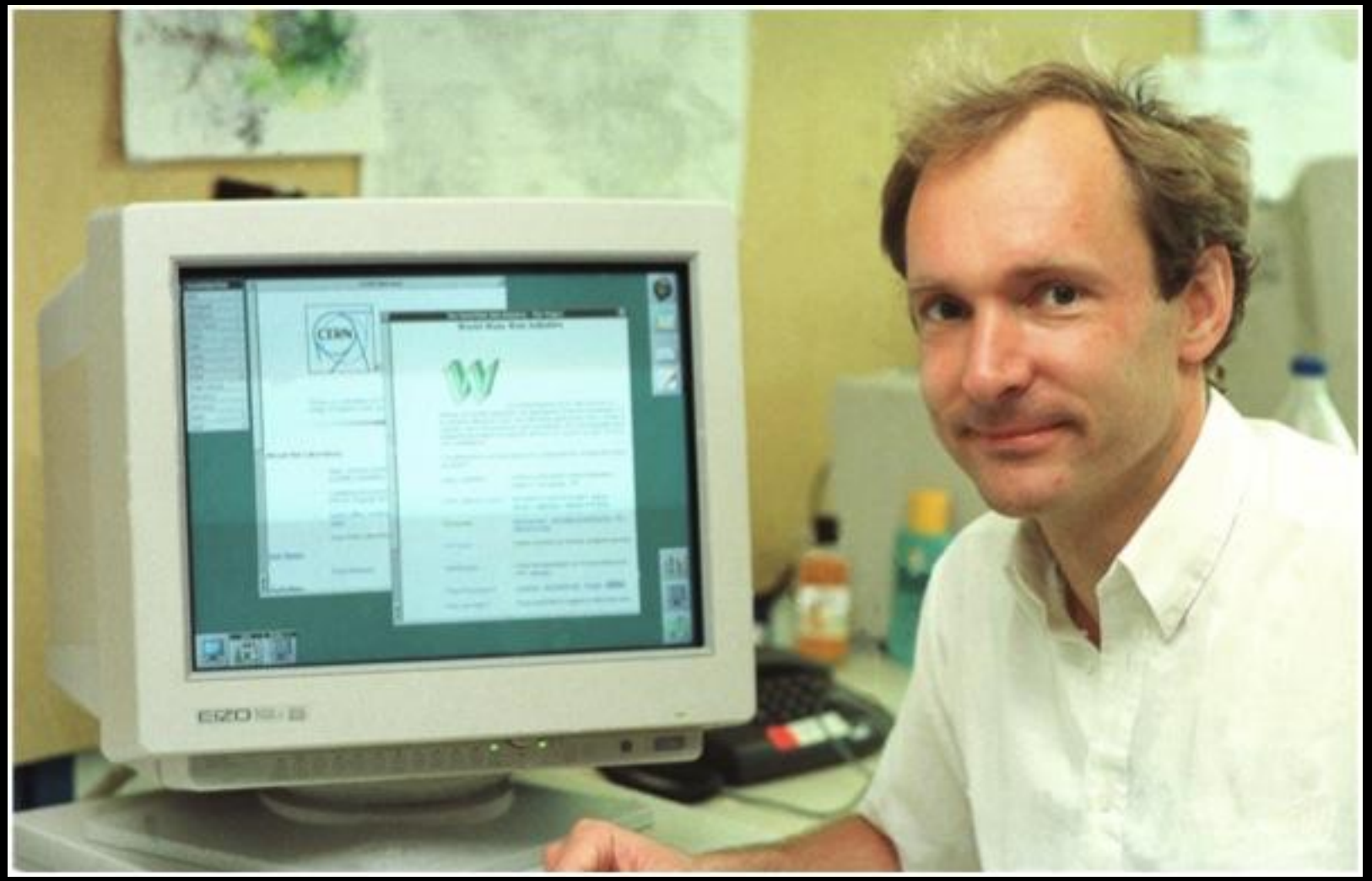
1. Reach critical mass
   (Hope to establish a partnership in India)
2. Engage publishers in a call for tender
3. Go/No-Go decision
4. Transfer experience to other fields
   (Astro* anyone?)



Some take-home points

- OA in HEP is there (since long) to stay
- No mandates, no debates, author-driven and library-enabled advantages
- SCOAP3 a the natural evolution
- Very similar to Astro*:
  - great synergies with ADS
  - opportunities in OA publishing?

A HEP contribution to communication: “Vague but exciting”



(T. Berners-Lee at CERN, early ‘90s)

Thank you!

Salvatore.Mele@cern.ch
scoap3.org

Additional resources:

R. Heuer, S.M. *et al. Innovation in Scholarly Communication: Vision and Projects from High-Energy Physics*
http://arxiv.org/abs/0805.2739

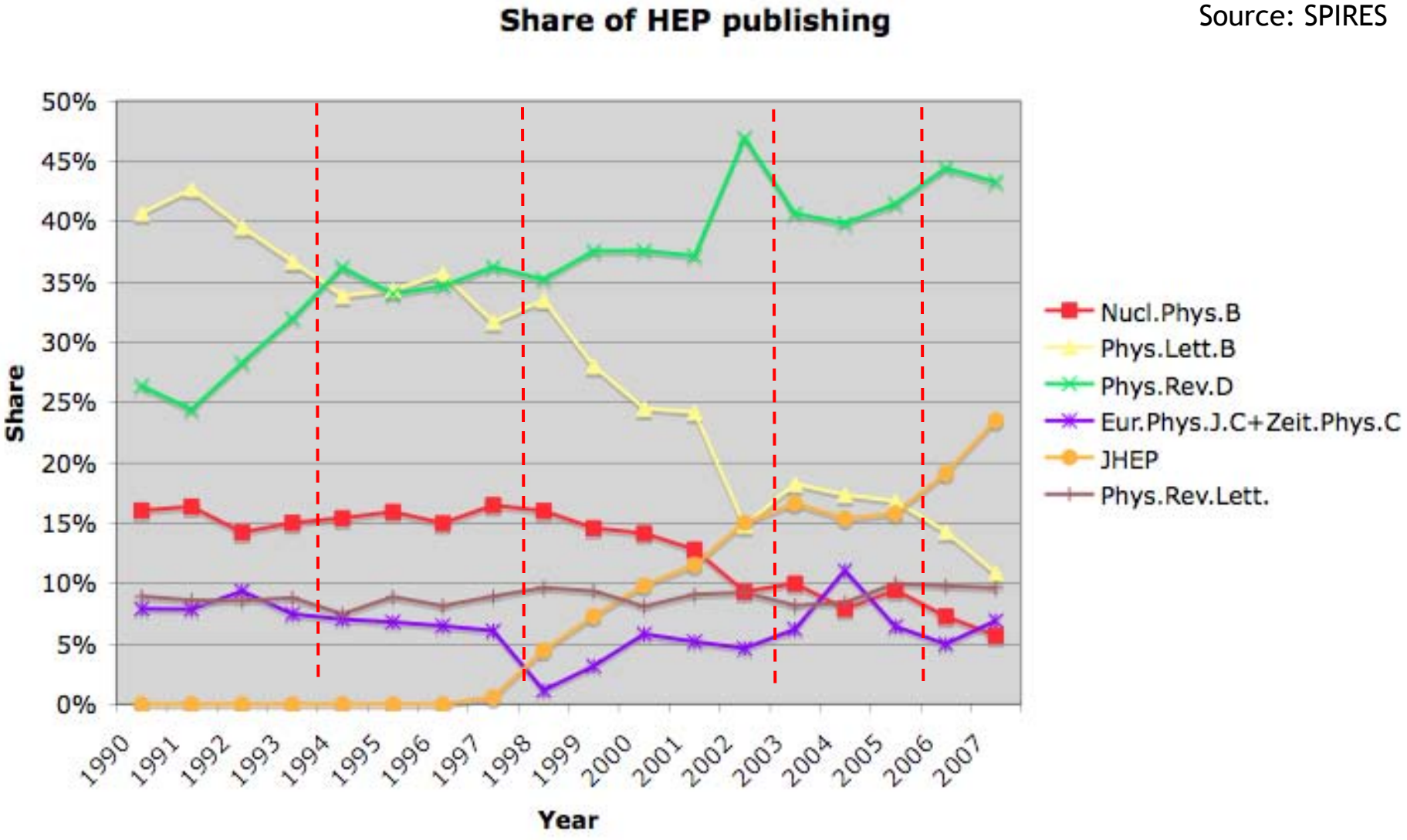
A.Gentil-Beccot, S.M. *et al. Information Resources in High-Energy Physics: Surveying the Present Landscape and Charting the Future Course*
http://arxiv.org/abs/0804.2701

A.Gentil-Beccot, S.M. *et al. Citing and Reading Behaviors in HEP: How a Community Stopped Worrying about Journals and Learned to Love Repositories*
http://arxiv.org/abs/0906.5418

Additional information



Evolving publication habits

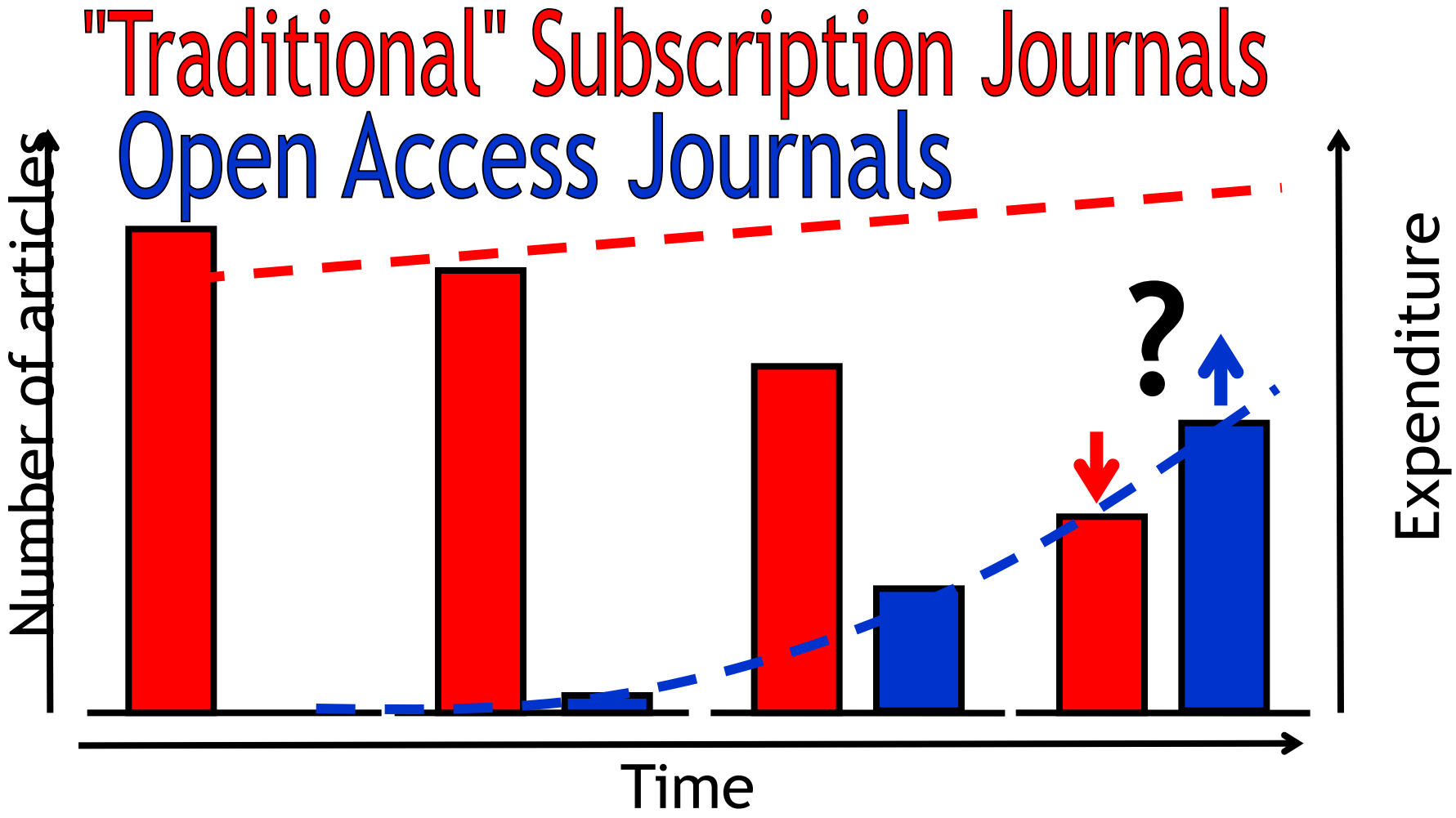


Phases of stability alternated with fast growth/decline

N.B. Only articles which appeared in the six largest HEP journals are considered. ☐

Novelties of the SCOAP³ model

Converting an entire field by re-directing subscription funds avoids "paying more for OA"



"Flipping" the entire volume avoids surprises!

Practicalities and budget envelope

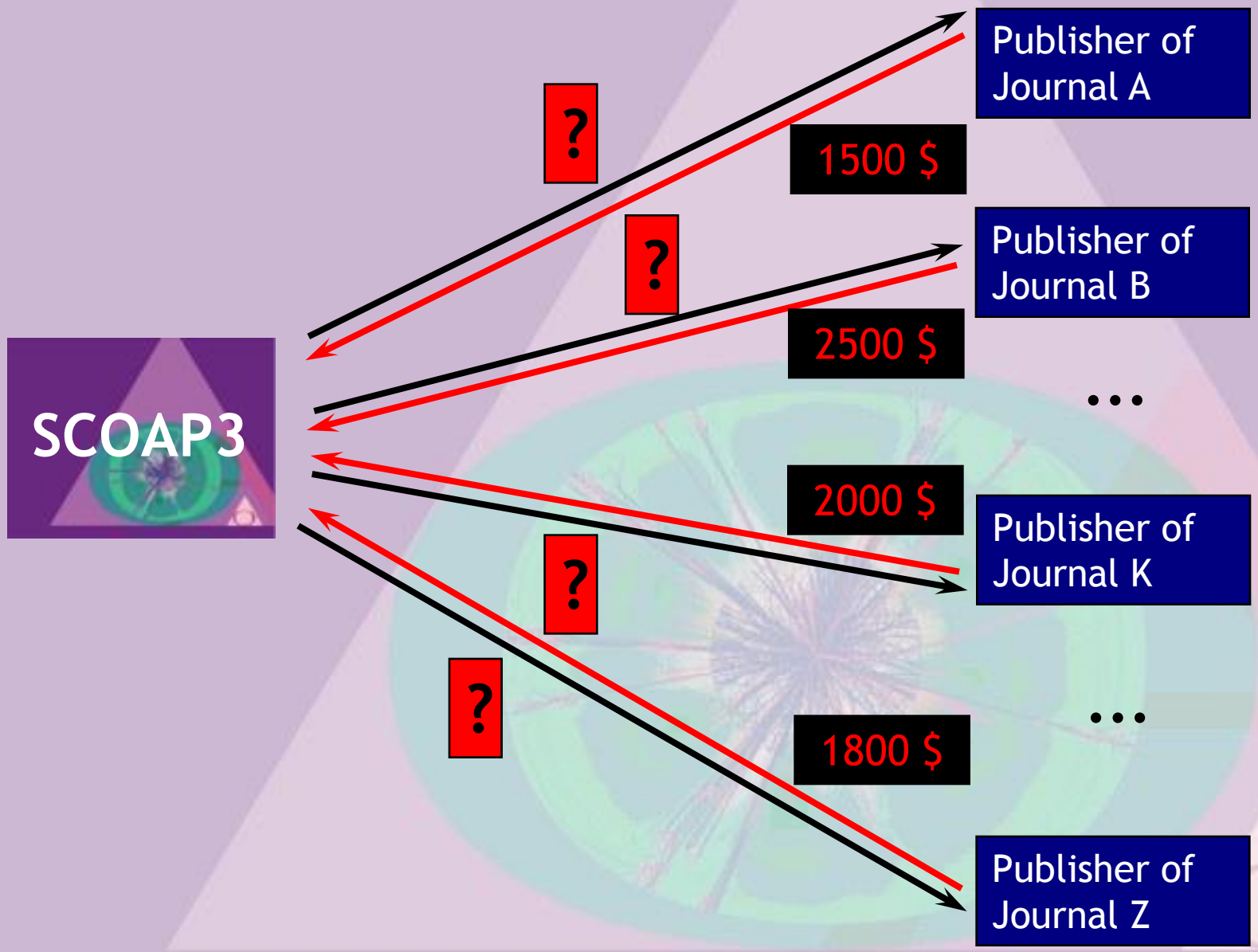
- Five "core" journals: PRD, JHEP, PLB, NPB, EPJC
  - Carry a majority of HEP content: aim to convert entirely to Open Access
- Two "broadband" journal: PRL, NIM
  - 10%,25% and 50% HEP: conversion to Open Access of this fraction
- Other, lower-volume, high-quality HEP journals
  - conversion to Open Access of the HEP content

Guesstimating the costs...

- *Physical Review D* (APS) income ~3.9M$/year (31% of arXiv:hep)
- *Journal of High Energy Physics* (SISSA/IOP) income ~1.3M$/year (19% of arXiv:hep)
- A published PRD article costs APS ~2000$
- 6-8 journals publish 5000-7000 articles/year

HEP Open Access price tag: 14M$/year

The SCOAP3 tender concept - 1



The SCOAP3 tender concept - 2



The SCOAP3 tender concept - 3

Ranked by (high) quality and (low) price

Journal	Price	Volume	Contract	Expenditure
Journal K	2000 $	1300	2.6 Mln $	2.6 Mln $
Journal A	1500 $	2000	3.0 Mln $	5.6 Mln $
Journal Z	1800 $	1000	1.8 Mln $	7.4 Mln $
Journal F	4000 $	300	1.2 Mln $	8.6 Mln $
Journal L	2000 $	1000	2.0 Mln $	10.6 Mln $
Journal R	1800 $	1000	1.8 Mln $	12.4 Mln $
Journal Q	3000 $	200	0.6 Mln $	13.0 Mln $
Journal P	800 $	50		
Journal W	5000 $	100		
...	...	...		

Asian participation in SCOAP3

