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
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”


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
• 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?

- 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
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 advantages in HEP

Visibility
Acceleration
Impact
Open Access advantages in HEP

Visibility
Acceleration
Impact
Where do HEP scientists look for info?

- 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 advantage
  - Five times more citations for articles in arXiv
  - 20% of 2-year citations occur before publication

arxiv:0906.5418
Gentil-Beccot, Mele, Brooks
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Open Access publishing in HEP

A conundrum
Experiments
SCOAP3
A conundrum
Experiments
SCOAP3

Open Access publishing in HEP
97% of HEP journals’ content is in arXiv
Do HEP scientists read journals?

Clicks to DOIs and arXiv from Spires database in October 2008

- 30,000 clicks (choice between arXiv and journal)

- arXiv 82%
- Publisher server 18%

(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 experiments in HEP
(and percentage of HEP literature)

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%)

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%)

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**:

  - experimental HEP articles and all HEP letters
- **EPS: Europhys. Lett.**
  - all HEP articles
  - HEP articles from the LHC
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

- United States 24.3%
- Other Countries 9.5%
- Germany 9.1%
- Japan 7.1%
- Italy 6.9%
- United Kingdom 6.6%
- China 5.6%
- France 3.8%
- Spain 3.1%
- Russia 3.4%
- Canada 2.8%
- Brazil 2.7%
- CERN 2.1%
- India 2.7%
- Korea 1.8%
- Switzerland 1.3%
- Poland 1.3%
- Israel 1.0%
- Iran 0.9%
- Portugal 0.9%
- Mexico 0.8%
- Taiwan 0.8%
- Sweden 0.8%
- Other Countries 9.5%
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

<table>
<thead>
<tr>
<th>Country</th>
<th>Amount</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Austria</td>
<td>300k€</td>
<td>(3%)</td>
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<tr>
<td>Belgium</td>
<td>1.8 cr INR</td>
<td>(3%)</td>
</tr>
<tr>
<td>CERN</td>
<td></td>
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<tr>
<td>Denmark</td>
<td></td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>6.8M€</td>
<td>(68%)</td>
</tr>
<tr>
<td>Finland</td>
<td>3.8M€</td>
<td>(32%)</td>
</tr>
<tr>
<td>Germany</td>
<td>300k€</td>
<td>(3%)</td>
</tr>
<tr>
<td>Greece</td>
<td>1.8 cr INR</td>
<td>(3%)</td>
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<tr>
<td>Hungary</td>
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<td>Italy</td>
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<td>Netherlands</td>
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<td>Romania</td>
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<td>Slovakia</td>
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<tr>
<td>Spain</td>
<td></td>
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<tr>
<td>JISC (UK)</td>
<td></td>
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</tr>
<tr>
<td>Australia</td>
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<td></td>
</tr>
<tr>
<td>&gt;200 U.S. libraries</td>
<td></td>
<td>(90%)</td>
</tr>
<tr>
<td>Canada</td>
<td></td>
<td></td>
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<tr>
<td>Israel, Turkey</td>
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</tbody>
</table>
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!

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scoap3.org

Additional resources:
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”

"Traditional" Subscription Journals
Open Access Journals

“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

SCOAP3

Publisher of Journal A

Publisher of Journal B

Publisher of Journal K

Publisher of Journal Z

1500 $

2500 $

2000 $

1800 $
The SCOAP3 tender concept - 2

Rank by a combination of (high) quality and (low) price

<table>
<thead>
<tr>
<th>Journal</th>
<th>Price</th>
<th>Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Journal A</td>
<td>1500 $</td>
<td>Quality A</td>
</tr>
<tr>
<td>Journal B</td>
<td>2500 $</td>
<td>Quality B</td>
</tr>
<tr>
<td>Journal C</td>
<td>4000 $</td>
<td>Quality C</td>
</tr>
<tr>
<td>Journal K</td>
<td>2000 $</td>
<td>Quality K</td>
</tr>
<tr>
<td>Journal Z</td>
<td>1800 $</td>
<td>Quality Z</td>
</tr>
</tbody>
</table>

...
The SCOAP3 tender concept - 3

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

Ranked by (high) quality and (low) price

...
Asian participation in SCOAP3

Discussions and negotiations in progress

- Japan 7.1%
- China 5.6%
- India 2.7%
- Korea 1.8%
- Iran 0.9%
- Israel 1.0%
- Turkey 0.6%
- Australia 0.6%
- Pakistan < 0.1%
- Vietnam 0.1%
- New Zealand 0.1%
- Taiwan 0.8%