

A road long travelled: is SCOAP³ now arriving?

The relatively small and specialized international scholarly community of high energy physics (HEP) is leading the way to the 'gold' model of open access (OA). With the leadership and substantial support of CERN, the community's Geneva-based hub, the Sponsoring Consortium for Open Access Publishing in Particle Physics (SCOAP³) has created an innovative model for OA publishing. Whereas the journal subscriptions of today implicitly support the important process of peer review, the new model federates funding agencies and libraries to cover journals' professional publication costs explicitly, while publishers make the electronic versions of their journals free to read. Authors are not directly charged to publish their articles OA. Each SCOAP³ partner will finance its contribution by canceling journal subscriptions, and each country will contribute according to its share of HEP publishing. The project is now embarked on a complex finessing process on the route to the projected 2014 launch.

The uncluttered goal of the open access (OA) movement is to grant free access to the results of scholarly research to all comers. This initiative has some grounding in the issue of the ever-increasing costs of journal subscriptions, the so-called serials crisis whose baleful effect is to exhaust library budgets and thereby curtail researchers' access to crucially important scientific literature. The OA concept is also visible in emergent government policies that seek to rebalance the contract between research funding and access to research papers; this impulse becomes futile to resist in the world of cheap digital information transmission. Pragmatism aside, however, it is worth bearing in mind the higher-level perspective on OA: that its very essence is to enable the timely sharing of scholarly communication. In response to these issues, the relatively small and specialized world of high energy physics (HEP), also known as particle physics, has – over a decade or so – been transforming the status of OA from concept to reality.



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The scholarly community of HEP had already set foot on 'the green road', demonstrating a tradition of access through the self-archiving of over 90% of preprint articles (i.e., journal submissions) in the now Cornell-based arXiv repository¹, where they are freely accessible online. Particle physics papers number approximately 7,000 a year. Useful though these preprint pieces are, the scientific community still articulated a robust consensus about the value and contribution of high-quality published journals: specifically, for the quality control that emanates from their processes of peer review and editing, and for their role as vehicles for career development of individuals and for assessing the outputs of research groups.

Going for gold

The HEP community's impulse was thus to progress to the gold model of access. Consultation began in 2005, and a master plan was published in 2007. A consortium of interested parties was formed of members drawn from the funding agencies (including governments) and laboratories involved in the field, along with leading national and international libraries and library consortia. The emergent consortium stabilized as SCOAP³*, the Sponsoring Consortium for Open Access Publishing in Particle Physics.² CERN³, the Geneva-based hub of the global HEP community, has had a leadership role in the formation of the group and continues to provide infrastructure and management

"... transforming the status of OA from concept to reality."

* NB: The superscript three following SCOAP throughout is not a reference but forms part of the acronym

136 resources in service of the project. A Steering Committee was tasked with co-ordinating the SCOAP³ tendering process, as well as designing the consortium's governance and launching the initiative into its operational phase, and stakeholders from around the world were called upon to submit their expressions of interest. Meanwhile, a Technical Working Group focused on addressing the key question of the price reduction for content in today's large-scale subscription packages that would eventually be converted by SCOAP³ to open access. Within a couple of years of its formation, this consortium was reaching out to build consensus for its business model among both international partners and publishers.

SCOAP³'s long labours in coalition building with diverse stakeholders across research, funding, publishing and libraries have produced a model for open access whose objective is to convert the content of high-quality journals from the current subscription-based access to open access, without relinquishing the qualities that are offered by such publishers and valued by the research community. The two ambitious goals are to provide open and unrestricted access to all HEP research literature in its final, peer-reviewed form; and to contain the overall cost of journal publishing by increasing competition while assuring sustainability. The international consortium of libraries and funding agencies will contract centrally via CERN with HEP journal publishers, thereby saving individual research groups the trouble of arranging OA for their work. The services provided will be the administration of peer review, editing, and open access article dissemination. Articles funded by SCOAP³ will be available via open access in perpetuity, under a Creative Commons CC BY licence⁶, enabling users to copy, distribute, transmit and adapt the works as needed, with proper attribution.

"Articles funded by SCOAP³ will be available via open access in perpetuity ..."

Reallocating the funds for peer-reviewed publishing

Most publishers that offer a gold open access option quote a price in the range of €1,000–€2,000 as processing charges per published article. Given HEP's annual publication tally of approximately 7,000 articles, it was therefore estimated that the annual budget for the transition of HEP publishing to OA would amount to a maximum of €10 million. As a benchmark, the annual institutional subscription list price of a single 'core' HEP journal used to be as high as €10,000, representing for the 500 institutes worldwide that are actively involved in HEP an annual expenditure of €5 million. SCOAP³'s funding concept is built on the understanding that there is already enough money available in the system for OA to become a reality, once funds that are currently locked into journal subscriptions are unbundled from the journal package-deals and redirected to SCOAP³ and savings on subscriptions are reinvested in publishing. For publishers, subscription income from the numerous institutions that they dealt with in the past is replaced by a single income stream from SCOAP³; participant-partner libraries enjoy a risk-free operation, in the sense that their costs would not be higher than before, since their contribution to SCOAP³ is the conceptually simple reallocation of subscriptions funds along a differently-specified channel. Authors benefit from an OA model in which they are spared numerous discrete deals and in which they are not directly charged for publication.

SCOAP³'s financing and governance will be modelled on large research collaborations (of which CERN has ample experience). Financial contributions are expected to flow from each participating country on the basis of a 'fair share' principle that is based on the number of its HEP publications (see Figure 1), with a small budget to underwrite publications from scientists from countries that cannot be reasonably expected to contribute to the consortium at this time. This is perceived to be a fairer model than one in which access is paid for without regard to actual or feasible use.

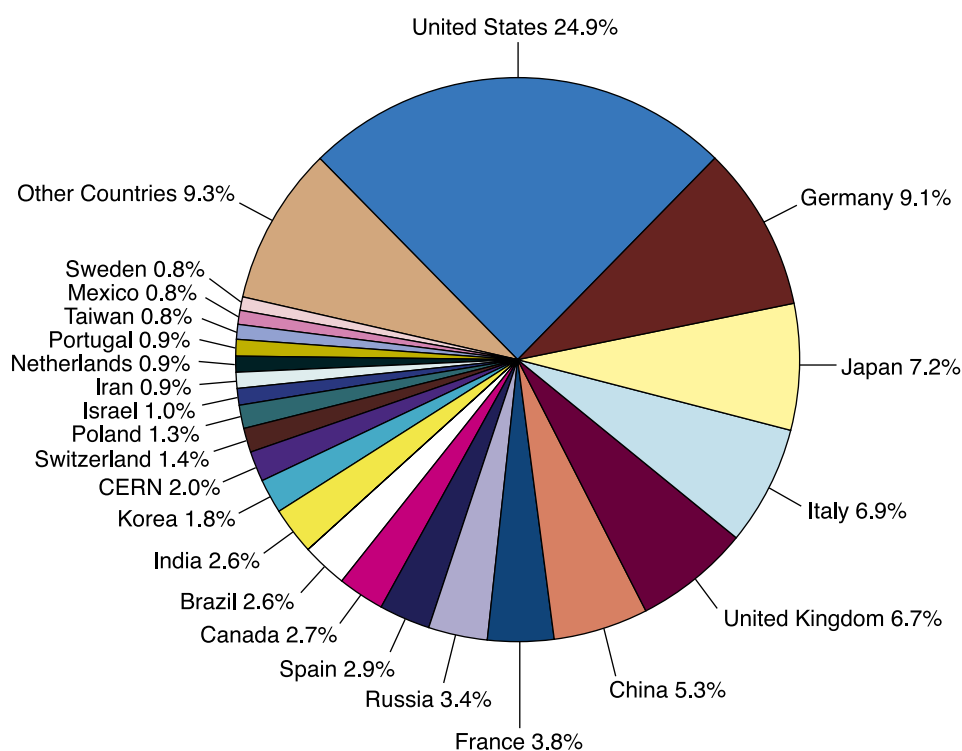


Figure 1. Average 2005-2006 distribution of HEP articles by country.

Source: Krause, J et al⁵

Inviting publishers' participation in a new model

The SCOAP³ business model can be seen as a game-changing initiative in its manifestation of a centralized alternative to the process by which libraries had hitherto negotiated their costs of access via individual or consortial subscriptions. The new approach involves an open tender process – for commercial or not-for-profit publishers – organized by CERN with the support of an international team of experts; the specification and framework were published in June 2012 on the SCOAP³ news pages.⁶ To identify the publishing partners, CERN reviewed the bids and adjudicated on the selection of the journals for which a contract for peer review, open access and other publishing services could be awarded. The evaluation criteria – aiming for ‘best value for money’ – had three principal elements: the price per article quoted by the publisher (based on 2011 article volume, the price to hold steady during the period 2014–2016); a notion of quality that included both journal impact factor and the quality of the services provided (as measured by re-use licences and delivery formats); and an agreement to reduce subscription prices, according to the volume of articles converted to OA. In this model, contracts will link quality and price as well as volume and total price, features that do not form part of the current subscription model.

The results of the SCOAP³ tender were published in various stages up to September 2012.⁷ It is now clear that, by 2014, 90% of HEP papers will be available through OA on the basis of contracts with 12 journals from seven publishers (see Table 1). In practice, most HEP articles are published in six peer-reviewed journals from four publishers with three learned societies behind them. Five of those six journals focus on HEP; the remaining one has broader coverage. In addition, CERN and SCOAP³ will collaborate with leading publishers to foster open access to additional selected articles of relevance for HEP, including the American Physical Society (APS)'s high-impact-factor journal, *Physics Review Letters*.

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publisher	journal	SCOAP³ articles (2011)	SCOAP³ percentage of journal (2011)	per-article processing charge
American Physical Society	<i>Physical Review C</i>	107	9.9%	US\$1,900
American Physical Society	<i>Physical Review D</i>	2989	100%	US\$1,900
Elsevier	<i>Physics Letters B</i>	1010	100%	US\$1,800
Elsevier	<i>Nuclear Physics B</i>	284	100%	US\$2,000
Hindawi	<i>Advances in High Energy Physics</i>	28	100%	US\$1,000
Institute of Physics Publishing/Chinese Academy of Sciences	<i>Chinese Physics C</i>	16	7.2%	£1,000
Institute of Physics Publishing/Deutsche Physikalische Gesellschaft	<i>New Journal of Physics</i>	20	2.7%	£1,200
Institute of Physics Publishing/SISSA	<i>Journal of Cosmology and Astroparticle Physics</i>	138	30.9%	£1,400
Jagiellonian University	<i>Acta Physica Polonica B</i>	23	22.1%	€500
Oxford University Press/Physical Society of Japan	<i>Progress of Theoretical Physics (to become PTEP)</i>	46	36.2%	£1,000
Springer/Societ� Italiana di Fisica	<i>European Physical Journal C</i>	326	100%	€1,500
Springer/SISSA	<i>Journal of High Energy Physics</i>	1652	100%	€1,200

Table 1. Journals identified by the SCOAP³ tender process (by alphabetical list of the publishers)

Fine-tuning the implementation

As part of the fine-tuning in the run-up to launch in January 2014, an essential and now urgent step is to manage a rationalization of the net flow of funds between the participating publishers and each country. The key collaborators for CERN and SCOAP³ in the participating countries are the so-called National Contact Points (NCPs). Their role is to identify the SCOAP³ partner institutions, libraries and consortia in their countries, manage all communication and education in these jurisdictions, organize the reduction-calculations for journal subscriptions at the national level, and establish a legal framework for the signature of the Memorandum of Understanding with CERN. For the UK, JISC Collections⁸ is acting as NCP for SCOAP³. The NCPs' success in mediating the necessary reconciliation process is contingent on the parties reaching a shared understanding of the appropriate reductions in subscription costs for the journals that are covered by SCOAP³. Managing the reductions is a five-step process, with implementation supported by reference documents and tools, particularly the 'SCOAP³ Reconciliation Facility' software.

The first stage is for the NCPs to identify the SCOAP³ partner libraries in each country, a task enabled by a mapping template that cross-references libraries/consortia with their locations and subscriptions. Second, the publishers propose reductions for each of them and, as a third step, the libraries/consortia calculate or verify the expected reductions. SCOAP³ (represented contractually by CERN) had defined various cost-reduction scenarios in the Annex to the Invitation to Tender⁹; depending on a subscriber's circumstances, it is feasible for more than one scenario to apply. The cost-reduction scenarios cover all major contract types around the world: individual subscriptions, packages with known or with historical subscriptions, or fixed-cost packages of subscribed or non-subscribed journals.

139 They may apply to individual libraries, library consortia and national-level contracts. The subscription reductions have been engineered in line with the principle of 'no double-dipping', whereby no content paid for by SCOAP³ shall be charged twice; it is thus expected that libraries and other subscribing institutions will pay no more than they currently pay for subscriptions to their particular journals. SCOAP³ has created a simple 'cost-reduction calculator' tool, with detailed instructions to guide data entry, that can be used by the libraries, consortia, or the NCPs. Built-in formulas automatically calculate the amount of a particular reduction in response to basic contract information. For example, a particular subscription's reduction could be calculated on the basis of currency, price and the number of subscriptions.

As SCOAP³'s legal representative, CERN monitors the process and, in a fourth step, reconciles potential discrepancies in the figures with the support of a controlled-access spreadsheet that is generated automatically from the 'mapping' information. The fifth and final step is that the publishers implement the reduction, as is their legal obligation. Provided that SCOAP³ funding partners are finally prepared to engage in long-term commitments and to sign Memoranda of Understanding with CERN, the final contracts with the publishers will then be awarded so that operations can start in 2014.

Offering a replicable model?

It has taken quite some time to manifest this OA strategy, moving the project from a plan, through expressions of interest, and then to a complex tender process that has been followed by an even more complex redirection and reconciliation process. Now that we are entering the home stretch, it remains to be seen whether this innovative and ambitious initiative will be consolidated, and whether the SCOAP³ journal content will be made open access as of 2014. Looking ahead, it seems feasible that the extensive work done to bring OA to the HEP domain could rapidly be replicated in other fields, especially those – such as nuclear physics and astro-particle physics – that are directly related to HEP, and are similarly compact and organized with a manageable number of journals. Even in subject areas where this approach cannot be directly reproduced, SCOAP³'s success will certainly be perceived as an inspiring model with the potential to be adapted to those fields.

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