

Europe moves closer to open-access publishing

More than 20% of physical sciences journals offer a form of open access. New rules in Europe may increase that number.

When two papers describing evidence of a Higgs boson-like particle at CERN's Large Hadron Collider were submitted in July to *Physics Letters B*, both were published under a new open-access (OA) agreement. In fact, CERN officials hope to make nearly all papers in high-energy particle physics OA through SCOAP³ (Sponsoring Consortium for Open Access Publishing in Particle Physics), an international group of funding agencies, laboratories, and libraries that have committed to paying for converting 12 journals from 7 publishers to OA article by article. "We are starting the process for libraries to redirect their subscriptions to SCOAP³ as of 2013," says CERN's head of OA, Salvatore Meles. If the process works on a large scale, and if the budget balances, then SCOAP³ hopes to launch in 2014.

Whereas SCOAP³ affects a relatively small field of physics, two other July announcements have more far-reaching implications. The UK government declared that all papers funded by its research agencies would have to be OA by April 2013, and the European Commis-

sion (EC) made a similar announcement for 2014 regarding its billion-euro Horizon 2020 research program. The EC also asked member states to consider making "60% of European publicly funded research" OA by 2016. The main EC push for OA "is to enable wider access to academic research to the vast majority who do not have access to research libraries," says Tony Doyle, chair of CERN's ATLAS Publications Committee. An additional attraction, says Victor Henning, CEO of information company Mendeley, is that OA "will allow more effective data mining. Third-party research apps are querying Mendeley's database more than 100 million times per month, and this number would explode if we could offer more open-access articles."

Which strategy?

There are two main types of OA: With "gold," the publisher receives a fee—often called an article processing charge (APC)—from the author or author's institution, and the article is made free at the point of publication. In the "green" strategy, no fee is paid and the pub-

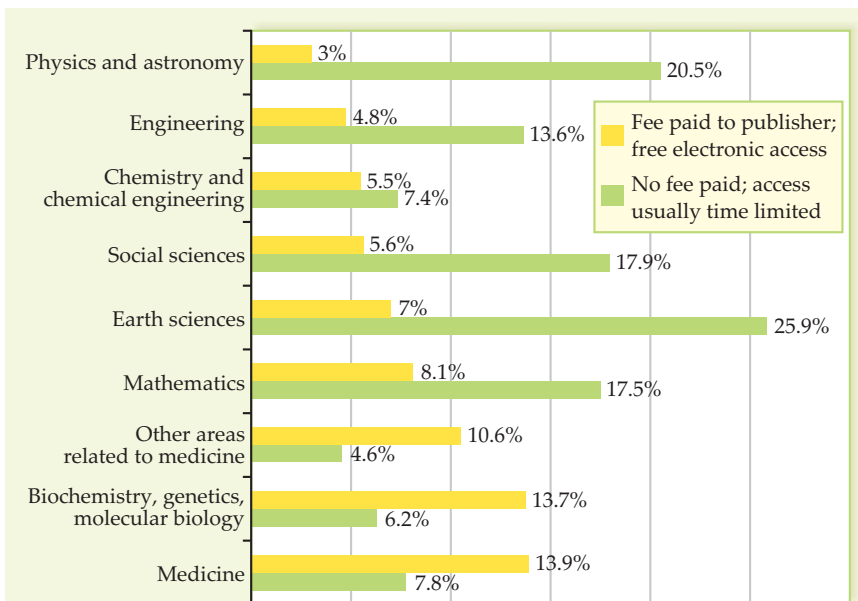
lisher's PDF or author's final version is placed on a freely accessible website. For example, the American Institute of Physics (AIP) and the American Physical Society (APS) both have journal copyright policies that allow authors to post the publisher's PDF on their personal websites, in their institution's repository, or on arXiv, with no embargo. Other journals will ask for an embargo, usually of some months, before the paper can be posted to an approved repository, such as the EC's OpenAIRE or PubMed Central in the US.

Last year UK institutions paid £200 million (\$300 million) for journal subscriptions. To balance cost and access and to maintain peer review, the UK government formed a working group with librarians, nonprofit and commercial publishers, and other stakeholders. The group's report, named after chair Janet Finch, a sociologist and former academic administrator, made several key recommendations, including a preference for gold OA, with green being an acceptable option only if gold is not offered by the journal; the government is now implementing that policy. Researchers are not allowed to publish in journals that do not offer OA.

The EC's Horizon 2020 guidelines, which should be approved next year, allow an author to submit to any OA journal. Under the green strategy established by EC and UK rules, all physical sciences and engineering papers are to be available at no charge after six months, but some publishers worry about the viability of their journal subscriptions in that case; they would have preferred a 12-month embargo. Robert Parker, CEO of the Royal Society of Chemistry (RSC), says, "We do have concern with the shorter embargo period."

Will the UK scheme work?

Not everyone is convinced that gold OA is the right move. "When the financial bottom line of a journal depends directly on the number of articles published," says Ilya Kapovich, a mathematician at the University of Illinois at Urbana-Champaign, "the pressure to accept and publish papers faster and in greater quantities can easily compromise the integrity of the editorial and peer-review processes, even at good



The availability of gold and green options for open-access papers, by scientific discipline. The disciplines are shown by the gold ratio in ascending order. (Adapted from B.-C. Björk et al., *PLoS ONE* 5(6), e11273, 2010.)

journals." Publishers argue that in the longer term, publishing more articles that produce fewer citations will be counterproductive as it will lower a key motivator for authors to submit to a given journal.

Funding for gold OA in the UK will come from the Research Councils UK (RCUK), which distributes academic funding for the government. As PHYSICS TODAY went to press, the RCUK was publishing details about its implementation policy and how much money will be available. Beginning in April the RCUK will provide block grants to universities, says Alexandra Saxon, head of communications at RCUK. The universities in turn will pass the money on to researchers. Publisher APCs will be up to \$10 000 per article, with most physics APCs around \$1500–\$3000. UK Science Minister David Willetts says that the eventual cost will be "roughly 1% of the [£3 billion] national science and research budget." But the transition will likely take a long time, according to the Finch report, and will cost more than £50 million per year. For example, only 21% of the papers in the *Monthly Notices of the Royal Astronomical Society* are from UK authors. Access to the other papers will require a subscription or license unless other countries or the journal also adopt OA as a policy.

The transition cost of paying for subscriptions as well as APCs might mean fewer UK research papers being published, says Parker, especially from the most productive institutions. In response to the transition-cost concern, an additional £10 million was made available in September to prime the system for OA, says Saxon. The RSC is experimenting with offering OA credit equal in value to an institution's 2012 subscription. The scheme is "to help researchers make their articles open access during a period when funding to support this model is still relatively unclear," says James Milne, RSC Publishing's managing director.

"In physics, many people assume that all physics papers are freely available because of the eprint server arXiv," says AIP vice president of publishing John Haynes, "but this isn't the full picture, as a significant part of [the physics community] does not use arXiv." Haynes adds that only a very small fraction of authors have taken advantage of AIP's gold hybrid OA options, by which authors can make their papers free through most AIP journals. "We've found offering an OA-specific journal

to be much more attractive to authors," he says.

In fact, although a small number of gold OA journals in physics have been publishing for about 15 years (*Optics Express*, *New Journal of Physics*, *Physical Review Special Topics—Accelerators and Beams*), many new journals are being created because of OA demands. The Optical Society just launched *Photonics Research* and will issue a formal public-access policy this month; AIP has *AIP Advances* and will shortly launch *APL Materials*; APS launched *Physical Review X*; and *Nature* has its new journal *Scientific Reports*. Most of those journals promise rapid publishing and either traditional peer review (*Physical Review X*) or a more contemporary approach in which referees are asked to judge on technical correctness alone (*AIP Advances*).

The view from abroad

In the US, the European OA initiatives are not seen as problematic, even by societies that depend on revenues from publishing. "This move is intrinsically in concert with our long-standing directions," says SPIE CEO Eugene Arthurs. "The proposals acknowledge that there are both value and cost involved in the publisher's role of developing, feeding, and maintaining peer-reviewed journals and conference proceedings." The society is launching a new gold OA program for all its journals in January 2013.

"This won't be a big impact on us because our society derives no profits from our journals for society activities," says Kevin Marvel, executive officer of the American Astronomical Society. "But we like our current blended model that spreads the costs equally between authors and readers and insulates [the journals] from fluctuating R&D budgets. . . . This [UK model] puts the costs wholly on the author." Many details still need to be worked out, he adds. "What happens if it's a UK researcher working in the US or they have international coauthors? Who pays the APCs then?"

"The beauty of the subscription model is that the costs are spread out among a large group of readers," says H. Frederick Dylla, CEO of AIP (which also publishes PHYSICS TODAY). The UK OA move is interesting, he says, "but it would be much more difficult to implement in the US, with wide-ranging implications for the sustainability of some journals." Dylla says AIP will continue with a mixed approach, offering gold and green options, subscriptions, and

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the ability to rent articles for an “attractive” price. “In my experience, publishers are pleased to meet the increasing demands for open access, as long as there are viable and sustainable business models,” he adds.

At the American Geophysical Union, CEO Christine McEntee says that AGU “is closely monitoring these developments.” In August AGU announced that it was moving its journal program to Wiley-Blackwell to ramp up its OA efforts. “Currently, only a small percentage of our authors choose to make their papers open access,” says McEntee. “We were pleased to see that

the mandate recognized the need for funding to support OA options. . . . The goal of our publishing program was, is, and will always be to best serve the needs of the scientific community worldwide.” APS publisher Joseph Serene also thinks the UK’s OA initiative will have minimal effect on APS publications; he notes that the UK’s goal of wider access to research papers is consistent with the society’s official policy. He says “the growth in author-pays open-access articles should not hurt our journals.”

In fact, says Serene, gold OA is probably the only long-term global solution

for researchers, governments, and publishers. He adds that there is no other viable way of providing universal access while still funding publishers with sufficient revenue to cover the costs. “A move to full gold OA publishing is a decades-long, or at least decade-long, challenge. Only the UK has grappled seriously with how to pay for it, and the UK is actually a rather small player on the global research stage,” he says. “Lots of people are thinking hard about how one could make this happen without damaging the research enterprise, and there are no simple solutions in most cases.”

Paul Guinnessy

As its renaissance recedes, US nuclear industry looks abroad

With nuclear energy’s economic picture souring, advocates say the US government has a responsibility to ensure the industry’s ongoing viability.

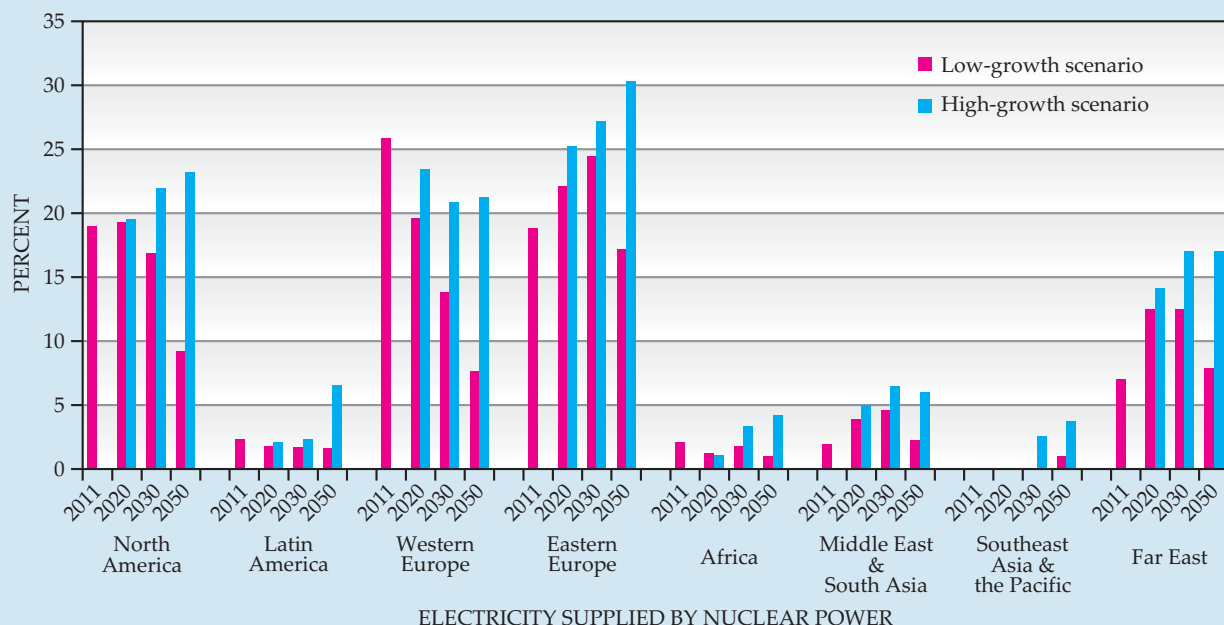
A combination of prohibitively large capital costs, aftershocks from last year’s catastrophe at the Fukushima Daiichi nuclear plant, and the recently discovered wealth of cheap natural gas has added up to a bleak outlook for the US nuclear energy sector. With that in mind, three recent reports from Washington, DC, think tanks have urged that the federal government help

shore up the US industry on national security grounds. They warn that loss of the longtime US leadership position will do great harm to the international effort to stave off nuclear proliferation.

“We are going to have no ability to deal with the proliferation issues that are attendant to the development of nuclear power if we are not a participant in the business,” former national secu-

rity adviser Brent Scowcroft warned at an 18 September conference on nuclear energy in Washington, DC. He noted that 60 or more nations have shown interest in acquiring nuclear energy. “Having US [nuclear] exports successfully deployed in other countries increases not just our safety footprint, but . . . our nonproliferation blueprint,” agreed Marvin Fertel, president of the Nuclear Energy Institute, the US nuclear industry’s trade association.

Only a few years ago, as pressure grew for action to curtail carbon emissions from fossil-fuel generation, the



INTERNATIONAL ATOMIC ENERGY AGENCY

The International Atomic Energy Agency sees a wide range in nuclear energy’s potential share of total electricity generation in the coming decades.