impact," says Choppin. "We're pleased with how the program is looking so far."

The grants are large enough to supplement researchers' meager incomes—something researchers say is crucial to stemming the brain drain. In the Czech Republic the salary for a post-graduate fellow is around $115 per month, but a secretary in a company could earn three times that, says Forstová. Similarly, in Poland a full professor earns three to four times less than a manager in a private company, says biochemist Stanislaw Zolnierowicz of the University of Gdansk. "Bright students either turn to other jobs or seek research jobs abroad," says Forstová. Most HHMI grantees are also using the money to add to their team's salaries. "A senior researcher earns $200 per month, but I can add $250 to $500 to this for 2–3 people," says Nedospasov. "Suddenly you find you can get students and post-graduates," says Forstová.

The grants have also paid off for collaborators in the West. Theoretical biologist John Tyson at Virginia State University, who works with HHMI grantee Béla Novák at the Technical University of Budapest, says that the award frees his collaborators up from the search for many small grants. The grant "means we can explore our theoretical work in many more biological systems than previously would have been possible," he says.

A key worry for HHMI planners was that providing grantees with relatively large sums of money would backfire and cash-strapped national agencies would then cut back on other support. When the Polish government rejected a grant application from Zolnierowicz, he was told that the Hughes grant was the reason. HHMI's Choppin says little can be done about the problem, but he believes it is not widespread.

Indeed, HHMI grants can sometimes have the opposite effect: shaking loose government funds by providing an endorsement of the recipient. Molecular biologist Michal Novák of the Slovak Academy of Sciences in Bratislava had solicited government funds to help establish a new Institute of Neuroimmunology at the Academy and won support after getting the HHMI grant. "I'm sure the prestige of the grant helped us," he says. And Forstová, who applied to the Czech government's competitive scheme for funds to boost research infrastructure in universities after winning her HHMI grant, was successful against stiff, nationwide competition, she says.

From the gloom of a year ago, Forstová—like the small company of other Hughes grantees—is now looking forward. "I'm keen to get on with research and make something from these awards," she says.

–Nigel Williams

INTERNATIONAL COLLABORATION

European Labs Brace for German Cuts

Scientists at five of Europe's major international research centers have reacted with dismay to news that Germany intends to make deep cuts in its contributions to their budgets next year. The costs of running these labs—which include the CERN particle physics center near Geneva, the European Synchrotron Radiation Facility (ESRF) at Grenoble, and Heidelberg's European Molecular Biology Laboratory (EMBL)—are generally divided up among member countries according to their gross national product. That makes Germany, as Europe's wealthiest nation, the biggest contributor to these organizations, and the cuts—part of an austere federal budget, some details of which were announced last month (*Science*, 19 July, p. 306)—will consequently be very damaging if they go ahead. "It's a huge cut," says Christof Kunz, a research director at the 12-member ESRF, which is slated for an 8.6% cut from Germany, which currently provides about a quarter of its funds.

Full details of the budget have yet to be officially announced, but in the outline released last month, the ministry of research, technology, and education was dealt a 2.5% overall cut. Most domestic R&D programs—with the notable exceptions of the Max Planck and Fraunhofer Institutes—would be trimmed, but the international labs would be hit much harder: It appears that Germany's contributions would be slashed on average by about 8%. And the cuts would come at a particularly bad time for many of the facilities. CERN is gearing up for the construction of its next big accelerator, the Large Hadron Collider (LHC), and is trying to persuade the likes of Japan and the United States to contribute; ESRF still has nine of its total of 30 beamlines under construction; the European Southern Observatory is in the middle of building its Very Large Telescope (VLT) array in Chile; and the Institut Laue-Langevin (ILL) in Grenoble, a research reactor for neutron scattering studies, is already working below full capacity, following cuts by the United Kingdom in 1991. "It would be quite dramatic after the earlier cut. It could be extremely severe," says Reinhard Scherm, director of ILL, which is facing a 7.2% cut.

The reductions in Germany's contributions would be painful enough on their own, but what really has lab directors worried is the possibility that other member countries might follow suit. Contributions to these laboratories are governed by international treaties and so any budget cuts would have to be negotiated with all members of each facility. "One [CERN] member state cannot simply reduce its contribution at will," explains CERN spokesperson Neil Calder. Countries such as the United Kingdom and Italy are also keen to reduce their commitments to international labs, and "If the Germans propose anything like this, the British are going to follow," predicts CERN physicist Maurice Jacob.

Until the formal announcement of the budget, CERN is making no official comment on its possible 9.3% cut. If such a cut really were to be implemented it "would be very difficult" to sustain, says Jacob. But CERN staff are already voicing concern that potential participants in the LHC project from outside Europe will be scared off. "It is absolutely clear ... that this would send the wrong signal," says director of accelerators Kurt Hübner.

CERN's 19 member states approved the construction of the LHC in December 1994, with the proviso that the contributions of member states would not be increased to pay for it and its construction would not rely on nonmember contributions. This meant that the 14 tera-electron volt accelerator, which will be the world's most powerful, would not be completed before 2008. However, if nonmembers did contribute, the schedule could be speeded up; if enough money was raised outside Europe, the LHC could be completed by 2005, and that decision will be made next year. Japan is expected to contribute 60 million Swiss Francs ($50 million) and Russia a further 134 million SFr ($112 million), with the United States expected to chip in $530 million subject to Congressional approval. But such promises may evaporate if cost cutting delays the project. "If the machine is too much delayed, the non-

GERMANY'S SPENDING ON INTERNATIONAL LABS
(millions of Deutschemarks)

	1996 Budget	1997 Proposed	Reduction
European Laboratory for Particle Physics (CERN)	265.7	240.9	–9.3%
European Molecular Biology Laboratory (EMBL)	22.15	21.2	–4.3%
European Southern Observatory (ESO)	38.6	37.5	–2.9%
European Synchrotron Radiation Facility (ESRF)	30.3	27.7	–8.6%
Institut Laue-Langevin (ILL)	32.9	30.5	–7.2%
Total	**389.7**	**357.8**	**–8.2%**

SOURCE: MINISTRY OF RESEARCH, TECHNOLOGY, AND EDUCATION

member states may say we were ready to give that money to speed up the project, but if it is not sped up why should we give it?" says Jacob.

For the time being, potential overseas contributors are watching with interest. "Right now I have no clue as to what this all means ... It is going to take a while to play out," says James Decker, deputy energy research director at the U.S. Department of Energy, adding that he has yet to hear anything officially from the German government. He did, however, categorically rule out the possibility that the United States would up its contribution to make up for the German shortfall. According to a delegate to CERN's finance committee, U.S. involvement is "here to spin up the project, make it better, but not to compensate for member states."

ESRF officials are particularly angered that the planned cuts would come just as the facility is about to reap the rewards of years of planning and construction. Kunz points out that ESRF has far outstripped its design specification—the brilliance of its x-ray beam is 100 times its design value—and it has stayed on schedule and within budget. "We've done nothing wrong," he says, "then just at the last minute before we are fully operational we get a heavy budget cut." Kunz says there will be "heavy discussions" at the next meeting of the ESRF council, and a special meeting may even be convened. If the council decides to accept Germany's cut, he says, then other countries will be within their legal rights to cut by the same percentage. "We are very concerned," says physicist Catherine Césarsky of France's Atomic Energy Commission, who is a member of both the ESRF and the ILL councils.

According to Hans Riotte, a spokesperson at the German research ministry, the German parliament will begin debating the proposed budget on 12 September, and a final decision will be reached by the end of November. Over the next few weeks the fate of much of Europe's international science will lie in the hands of Germany's lawmakers.

–Daniel Clery and Andrew Watson

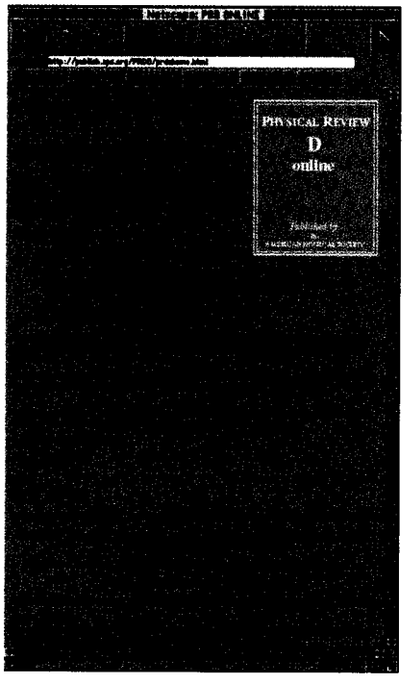
With additional reporting by Alexander Hellemans and Andrew Lawler.

ELECTRONIC PUBLISHING

E-journal: Delayed But Still a Force

It could become the most influential journal never to publish an issue. The first exclusively electronic physics journal had aimed to take advantage of the convenience and cost savings of purely electronic submissions, refereeing, and publishing (*Science*, 9 February, p. 767). Now, says the journal's chief architect, Andrew Cohen of Boston University, after a series of what he characterizes as minor technical and administrative delays, "we may never go online." Cohen says he is still optimistic. But in the meantime, the prospect of this radical new journal has prompted changes among traditional physics publications, accelerating their own efforts to go online and rethink their futures.

Conceived a year ago, the journal would be an "overlay" to the vast electronic archives at Los Alamos National Laboratory, where physicists in many different fields post preprints of their papers. Although the archives are the "primary source for information on developments in my field," says Michael Peskin, a particle physicist at the Stanford Linear Accelerator Center, the preprints are generally unrefereed. The idea behind the new electronic journal, Cohen says, is to submit a subset of those papers to peer review, and after any necessary revisions, post them with a tag indicating that they had been refereed.



Up and running. Unpublished journal speeded online debut of *Phys. Rev. D.*

The journal is supposed to squeeze costs, says another of its organizers, Martin Einhorn of the University of Michigan, by handling all submissions, referee reports, and revisions electronically. In addition, submissions could come in any format and—providing they were comprehensible—would receive no editing for things like spelling or grammar, eliminating "staffs of people to read articles for those qualities, independent of scientific content," says Einhorn. "It's a useful experiment," says Columbia University's Erick Weinberg, who since 1 July has been editor of *Physical Review D*, a journal published by the American Physical Society (APS) that covers particle physics.

But it's an experiment "we had hoped to get going 6 months ago," says Einhorn. For one thing, Cohen says, "We're searching for the solution to this problem that I'm a physicist first," not a full-time editor or publisher. The software he has written to implement the journal will need to be debugged and improved, for example, and Cohen would like "an individual who will be able to take over some of the technical work." He also attributes much of the delay to unfinished negotiations with APS, which he hopes will lend a statement of support for the project. Ben Bederson, editor-in-chief at APS, told *Science* that any agreement with the group could also include "some modest start-up funds" to help with the practical issues.

Einhorn and others add that organizers underestimated what a full-fledged journal would require—everything from legal advice to secretarial help. "My own feeling is that initially they were a bit naive," says Columbia's Frank Sciulli, chair of the division of particles and fields at APS, who notes that he supports the concept of an electronic journal.

Cohen still hopes for a solution to these problems, and several other organizers are optimistic as well. But whether or not the group succeeds, says Jonathan Bagger of Johns Hopkins University, "they've served a tremendous purpose in raising the awareness of the [physics] community in electronic publishing." A case in point, says Weinberg, is *Phys. Rev. D*, whose own online version went on the World Wide Web just last week. "Certainly I don't think *Phys. Rev. D* would be online on August 1 if it weren't for [Cohen's] journal," says Weinberg. "It's competition."

Unlike Cohen's brainchild, says Weinberg, *Phys. Rev. D* will publish both paper and online versions, as will the other APS journals that have started publishing online over the past year. Maria Lebrón, associate publisher at APS, says, however, that exclusively on-line publishing is "a logical extension in the future." Cohen himself is critical of all of these efforts because they aren't linked closely enough to the Los Alamos archive, where so many physicists now get their information. But these projects will owe more than a little to his journal, whether it is ever published or not.

–James Glanz