

discover new phenomena, such as states involving gluonic excitation.

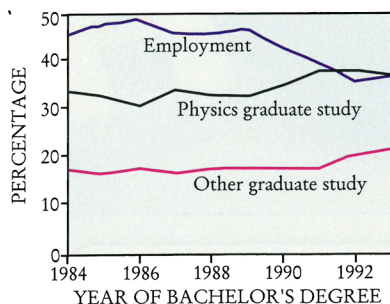
The latest research-proposal review, completed in February, brings the number of approved experiments to 76, with more than 500 participants from 20 countries and more than 100 institutions. Because these experiments will investigate the internal particle structure of protons and neutrons, John Domingo, associate director for physics at CEBAF, says that the distinction between nuclear and particle physics is "now rather arbitrary," reflecting a maturation of both science and technology.

In explaining the ability to keep to the revised budget and schedule, CEBAF Director Hermann Gruner said that the project's built-in contingencies were tight but realistic, and that the scientists recognized "that as much as you might like, there are things you can't do" if you expect to stay within the budget. For example, users wanted a high-powered (500–1000 watts) cryogenic target but will have to settle for 250 watts, at least in the early days.

Hendrie said that he expects "great physics" from the new machine. Further information about CEBAF can be found on the World Wide Web at <http://www.cebaf.gov/>.

Report Shows Directions of 1992–93 Physics Bachelors

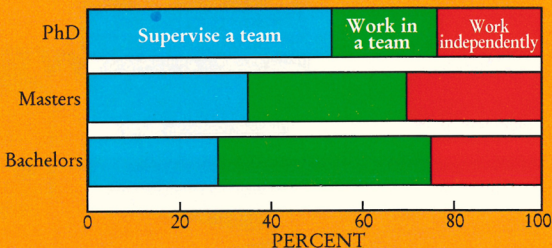
The latest study from the education and employment statistics division of the American Institute of Physics reports an end to the decline in the percentage of physics bachelors going directly into employment. This change is illustrated by the accompanying graph, taken from the "1992–93 Bachelor's Degree Recipients Report,"



POSTBACCALAUREATE PLANS of physics bachelors, 1984–93. The number of graduates has remained relatively flat, averaging about 4900 since 1984.

STAT OF THE MONTH

Environment of industrial physicists by highest degree



In general, physicists in industry use interpersonal skills extensively and report that working with people is among the most rewarding aspects of their jobs.

Source: AIP Education and Employment division (stats@aip.org).

by Patrick J. Mulvey. Tying the work to findings from other surveys, Mulvey told PHYSICS TODAY that he expects a continuing increase in the percentage choosing the job market after obtaining an undergraduate degree.

The report, which contains other statistical information about 1992–93 physics and astronomy graduates, may be obtained from AIP, Education and Employment Statistics Division, One Physics Ellipse, College Park MD 20740-3843. Single copies are free, and multiple copies may be provided on request.

Despite Sabotage, LEP Expected on Schedule at CERN

During the weekend nights of 11–12 February, a technically sophisticated staff member at the European Laboratory for Particle Physics surreptitiously removed about 1300 electronic components from the control systems of CERN's Proton Synchrotron and Proton Synchrotron Booster. According to news accounts of the event, the employee initially demanded that his ex-wife, who also works at CERN, be fired. The culprit admitted his actions early on the following Monday morning, and after several days' searching the missing equipment was found on the site, undamaged.

CERN management reports that reassembly is proceeding well. Although the formal start-ups of the machines themselves will be delayed one or two weeks, the PS is already accelerating protons, and the program of the Large Electron Positron collider "will almost certainly go ahead on schedule," according to CERN Direc-

tor General Christopher Llewellyn Smith.

The two accelerators had been down since mid-December for routine maintenance and upgrading, and the sabotage caused no additional equipment damage or danger to personnel. Reattachment of the many disconnected cables—more than 5000 in the PSB alone, with some 200 actually cut—means that careful readjustment and calibration will be necessary.

Dupree Will Lead AAS in 1996

As of 1 June, Andrea K. Dupree will be the president-elect of the American Astronomical Society. After completing a one-year term in that position, she will serve a two-year term as AAS president. Dupree, who holds a PhD from Harvard University, is a senior astrophysicist at the Smithsonian Astrophysical Observatory, part of the Harvard-Smithsonian Center for Astrophysics.

In other results of the AAS election, Neta A. Bahcall of Princeton University was elected to a three-year term as vice president, and Arlo U. Landolt of Louisiana State University was elected AAS secretary. The three newly elected councilors are Leo Blitz (University of Maryland), Jeffrey L. Linsky (University of Colorado) and Anneila I. Sargent (Caltech). Jason A. Cardelli (Villanova University) and Derck Massa (Applied Research Corp) were elected to the nominating committee. Patrick S. Osmer of Ohio State University was nominated to serve on the US national committee of the International Astronomical Union. ■

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OPINION

Physicists and Politics: Strategies for the Real World

Bo Hammer

Congress watchers like to say that legislation is a lot like making sausage: What comes out of the grinder is a highly seasoned mixture of things—some good, some not so good—and the process is not especially appetizing. In December I completed a year as an American Physical Society Congressional Science Fellow, working primarily on high-energy physics policy for the Science, Space and Technology Committee of the US House of Representatives. Having been immersed in the workings of science and technology policy, I can provide some insight into the relative legislative success of high-energy physics and suggest strategies for the physics community as a whole.

The following comments will be of particular importance to physicists who are concerned about science and technology policy in the 104th Congress. Overnight last November, the dynamics among Congress, the Administration and interest groups (physicists included) changed dramatically. Not only did the Republicans gain a majority in both houses, but they also added to the ranks of one of the most inexperienced Congresses in recent history: Over 45% of House members are now freshmen or sophomores, and committee structure and staffing have been completely overhauled.

Thus to influence science and technology policy, the physics community will have to rebuild its ties to Congress and amplify its message above the noise. Furthermore, physicists need to understand that members of Congress and their staffs are obsessed with accountability: Every vote must be justifiable in terms of what it does for the good of one's district and the country. The burden of justification thus falls on the physics community if it desires Congressional support. Convincing Congress of the

importance and relevance of a broad-based program of physics research will be one of the biggest challenges.

During my year on Capitol Hill, high-energy physicists lost their beloved Superconducting Super Collider, yet revealed themselves to be quite adept at making sausage. Consider the DOE budget: In fiscal year 1995 the budget for the Department of Energy's high-energy physics program increased by 5%, while Basic Energy Sciences, which funds research in materials science, energy and geosciences, chemistry, and applied math, decreased by 3%. This occurred during a time of increasing pressure to link research funding to strategic national goals.

One explanation for these budget numbers is that members of the high-energy physics community have influenced science policy by engaging in three interrelated activities: First, they assessed the relevance of their work to society. Second, they built consensus within their community. Third, they strategically communicated this relevance and consensus to Congress.

Many in the physics community disparage decision makers who call for fundamental research to be more strategic and relevant. These pressures may be unfamiliar or unwelcome, but they are a political and fiscal reality in this time of budget-deficit politics. And while there is some indication that the 104th Congress feels otherwise, one should also be mindful that the Clinton Administration continues to link research to national goals.

The key questions

With this in mind, there are four key questions physicists should answer in attempting to place their research within the context of strategic relevance to the nation:

- ▷ "What are the missions and goals of the agency that is funding me?"
- ▷ "Why does my funding program exist?"
- ▷ "How does my research fit into

those missions and goals?"

▷ "Can I articulate the answers to those questions clearly, both in speech and in writing?"

These are the types of questions Congress asks, and they expect answers from the interest groups seeking Federal support. As a physicist, I was embarrassed to hear a staffer in our office remark, "Boy, is that guy out of touch!" after speaking to a physicist who had not considered these points. Equally bad was to hear scientists justify projects such as the space station as a weapon in the war against cancer. Disingenuousness is often transparent, and the price paid is credibility.

Relative to other physics subfields, the high-energy physics community has been generally successful at obtaining funding because it has made a convincing case that its research is vitally important to the nation and must be supported. For example, in response to the SSC's termination, a subpanel of the Department of Energy's High Energy Physics Advisory Panel drafted a document (the so-called Drell report) outlining its vision of the future for high-energy physics. (See *PHYSICS TODAY*, July 1994, page 51.) When the report appeared within half a year of the subpanel's inception, it was enthusiastically received by the House Science Committee, including lead SSC terminator Sherwood Boehlert, a Republican from New York. Members of the Science Committee converted many of the report's recommendations into an authorization bill (H. R. 4908), which passed the House. Despite this victory, there was not enough time for the Senate to take it up, leaving the bill to die as the 103rd Congress adjourned for the last time. However, President Clinton's 1996 budget request for high-energy physics does reflect some of the subpanel's funding recommendations.

As the Drell report showed, building consensus demonstrates an ability

BO HAMMER is the assistant to the executive director of the American Institute of Physics.