

**Senate Passes Broad-Based Research Funding Bill**

By unanimous consent, the Senate on October 8 approved legislation that would double the Federal Government's level of civilian research and development funding over a 12-year period. The bill, S. 2217, called the Federal Research Investment Act (FRIA), was sponsored by Sens. Bill Frist (R-Tenn.) and Jay Rockefeller (D-W.Va.). It is considered a landmark piece of legislation because it attempts to protect the government's role in funding basic research—deemed essential for continued economic leadership by the United States—in an environment of increasingly "limited public resources." The bill's authors consider this endeavor "a problem of national urgency."

While the bill carries considerable bipartisan support—including the leadership of both political parties—it did not reach the House in time for action this year. House staff members believe FRIA will probably receive quick resumption of action as soon as the 106th Congress convenes next January, although no scheduling commitment has been made. Speaker Newt Gingrich (R-Ga.) has given his full support to the House version of the bill, H.R. 4514, which was introduced by Rep. Heather Wilson (R-N.M.). Its complexity required it to be referred to five different House committees—Science, Commerce, National Security, Resources, and Agriculture—but the latter three committees waived full consideration at the Speaker's request.

Assuming FRIA passes the House early in the new session, according to both congressional and administration staffers, it figures to provide a blanket framework for research funding decisions for the next decade and perhaps beyond. But it is not intended to influence priorities among individual research areas, such as materials. It also will not necessarily change the mix of funding levels by agency or program. Those decisions will continue to be made by the Executive Branch or by less comprehensive legislation.

Instead, the legislation calls for the government to encourage broad-based research initiatives, especially involving overlapping disciplines. Such partnerships are critical, the legislation states, and the government should provide numerous "opportunities for interdisciplinary projects that foster collaboration among fields of research."

Such an approach has not been followed consistently in the past, however, and the result has been "funding disparities" among disciplines as well as geographic regions that "underparticipate in the national science and technology enterprise." The legislation's authors are critical of the existing federal funding structure, which they see as reinforcing "the increasingly artificial distinctions between basic and applied activities."

There "too often is a set of discrete programs that each support a narrow phase of research or development and are not coordinated with one another." Therefore, the government should "maximize its investment by encouraging the progression of science, engineering, and technology from the earliest stages of research up to a pre-commercialization stage, through funding agencies and vehicles appropriate for each stage." The idea is to ensure "that promising technology is not lost in a bureaucratic maze."

FRIA attempts to rectify these perceived national deficiencies by setting forth broad policy goals for federal science, engineering, and technology research. Most important, it requires a doubling—in real-dollar terms—by Fiscal Year 2011, specified as a 2.5% annual increase above the inflation rate. The funding increase was supposed to begin in the current fiscal year, but the delay in getting FRIA through both houses means its provisions will not go into effect until next October 1, in FY 2000.

The bill also calls for "investing in the future of the United States and (its) people"; enhancing the quality of life of all citizens; guaranteeing U.S. leadership in "science, engineering, medicine, and technology"; and spreading research dollars across geographically diverse areas. Part of the bill's funding strategy is to create more balance among university research efforts. Another part involves

plans "to better utilize the community college system to prepare many students for vocational opportunities in an increasingly technical workplace."

The bill's language mandates four guiding principles for continued and expanded federal research funding:

- Federal programs should include "both knowledge-driven science together with its applications, and mission-driven, science-based requirements." Such programs must be "focused, peer- and merit-reviewed, and not unnecessarily duplicative."

- Program and project funding levels should become "predictable across several years to enable better project planning." The goal, according to FRIA's current language, is to allow Congress better oversight "through comparisons of a project's and program's progress against carefully planned milestones."

- Although the government must ensure that funded programs reach their goals, and that a process must be in place "for gauging program effectiveness, selecting criteria based on sound scientific judgment and avoiding unnecessary bureaucracy," the legislation warns against "the trap of measuring the effectiveness of a program by passing judgment on individual projects." It urges Congress to "recognize that a negative result in a well-conceived and executed project or program may still be critically important."

- Federal funding must continue to reflect the two U.S. traditional research and development priorities: basic research and mission-driven research investments—"that is, investments in research that derive from necessary public functions, such as defense, health, education, environmental protection, and raising the standard of living."

Responsibility for developing new criteria to evaluate federally funded research programs will fall on the National Academy of Sciences under the supervision of the White House Office of Science and Technology Policy (OSTP). The academy is supposed

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Proposals may be for ground-based research investigation.

The solicitation will also be available via the Internet at:

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to undertake an 18-month study of the entire process by which all federal agencies evaluate the success of their research and development funding, including efforts "which are unsuccessful or unproductive." The White House Office of Management

and Budget (OMB) must identify all civilian programs that fall into the unsuccessful category and report them to Congress. Programs that remain in the category two years in a row would be targeted by OMB for restructuring or termination.

The academy study was supposed to begin October 1, but will be rescheduled when FRIA emerges from the House and the inevitable House-Senate conference committee.

PHIL BERARDELLI

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## Federal Research Investment Act (S. 2217) Presents Opportunities for Scientists to Communicate with Elected Officials

For the last 40 years national security has provided a reason for the federal government's support of research and development efforts. Over the years, even "civilian" agencies such as the National Science Foundation and the National Institutes of Health have benefited from this battle cry. However, the cold war is over and the global economic war is starting. Fortunately, the current U.S. economic situation, although tenuous, provides the United States with a balanced budget for the first time in 29 years. What is lost on many people outside of science, engineering, and technology circles is that high-tech has been one of the driving forces behind the country's recent economic success. One has to only look at the front page of the newspaper to see how the World Wide Web—based on new, faster computers and hardware—is changing the way many industries do business. Faster, easier, and more efficient data manipulation and storage technology allows access to information that was unthought of even five years ago and advances in materials, modeling, and fuel cell technology lead us toward safer, less expensive, more efficient, and environmentally cleaner vehicles. None of this would be possible without federally funded R&D. In fact, half of the economic growth since World War II and one-third of the United States' current economic output are due to high tech. However, at the start of Fiscal Year 1998 Congressional Research Service out-year predictions had federal funding for R&D declining in real dollars. Something is wrong with this picture.

One of the most painful lessons that I learned during my year as a Congressional Fellow in Sen. Jay Rockefeller's (D-W.Va.) office was that scientists and engineers do not spend much time explaining to the government or the public what they do, why they do it, or why someone besides another scientist or engineer should care. This is detrimental to maintaining or increasing support for science and technology. Elected officials are unlikely to put their name and energy behind issues important to the scientific community if they do not under-

stand what scientists do; why it is important on a local, state, and national level; and have confidence that supporting science and technology—perhaps at the cost of other projects or programs—will be supported by their constituents. Stated another way, if scientists want support from the government they need to make the effort to explain themselves in ways the government and the general public understand.

For years individual cliques within the S&T community have supported various agencies and programs within the bureaucracy. However, very little broad support has come from the community for S&T funding in general. Fortunately some members of Congress understand this situation and are trying to take steps to support science, engineering, and technology. In order to try to build support for S&T in Congress and provide a vehicle for scientists and engineers to contact their elected officials Sens. Rockefeller and Bill Frist (R-Tenn.) co-authored S. 2217, the Federal Research Investment Act, or FRIA. This bill, passed in the Senate with 36 bipartisan cosponsors, calls for a near doubling of scientific and precompetitive engineering R&D funding over the next 12 years, presents a legislative argument why this funding is important to the country, and establishes language to ensure that the funding should be implemented in a balanced way so that all disciplines benefit (see Washington News in this issue).

As Rockefeller warned in April at a hearing on Federal Research and Development, "What we need is for the various components [of science and technology] to come together, not just to fight for their particular part, but to come together in sort of a common providing ground." I think that S. 2217 is an opportunity for this to happen. I hope that this bill can serve as a catalyst to encourage scientists and engineers to contact their elected officials at the local, state, and especially federal level in order to have a discussion on why S&T funding is important personally, professionally, and as a member of the community and why it

should be important to elected officials. It is also a great chance for scientists and engineers to build a mutual relationship with their elected officials and learn more about what they do and how they do it. Bill S. 2217 is also a great test case for members of professional and industrial societies to decide at what level they are comfortable being involved in the discussions of ideas which are contained in legislation, or in legislation itself. Members of these societies, Materials Research Society and others, should not hesitate to express their feelings on these matters. The issues are only going to get more complex and the decision times will only get shorter so the more infrastructure that is in place now, both in professional societies and in lines of communication between scientists and their elected officials, the easier it will be to transmit information on future subjects.

I would love to take all the credit and say that it was my boss's hard work and dedication that led to the success of S. 2217 last session, but that would not be totally true. Without the official endorsement of professional societies such as the American Physical Society and the American Chemical Society and hours of supportive phone calls and personal visits by representatives of many different professional and industrial societies, universities, companies, and interested individuals, S. 2217 would have gone nowhere. Our success this year was a great start, but we need even more effort to make S. 2217 become law. We also need to use S. 2217 to start building the infrastructure that will provide more and better information to decision makers in the future. The scientific community has tremendous political potential because of the critical role that S&T is playing in the U.S. economy. It is time to turn that potential into activity.

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