drafted 10 years ago for a Caribbean theoretical sciences institute modeled after the Institute for Advanced Study in Princeton, New Jersey. "It's cheap to do that kind of science," says Alexander.

"The real Achilles' heel for the Caribbean [countries] is that they don't have enough scientists on the ground," says Khotso Mokhele, former president and CEO of South Africa's National Research Foundation. It was a 2006 report commissioned by the United Nations Educational, Scientific and Cultural Organization and CARICOM and authored by Mokhele that catalyzed the formation of the CSF. "The Caribbean diaspora is so huge that [CADSTI] could make a major contribution to science and technology in the region if they properly organize themselves," says Mokhele. But the university system, especially graduate research, also needs more support from the region's governments, "or the [diaspora] model won't work," he says.

One-legged stool

Regional universities and other existing scientific organizations can help get the CSF off the ground, says Harold Ramkissoon, a UWI professor emeritus of applied mathematics who also cofounded the CSF and sits on its board. For example, "If CSF gets funding for science education projects, it could delegate [coordination of those projects] to Cariscience [a network of the region's university research departments] or the Caribbean Academy of Sciences," he says. The CSF has offered a spot on its board of directors to the Caribbean Council for Science and Technology, which coordinates CARICOM's science and technology policies.

Warde says he hopes to meet with the CARICOM heads of state to present his case for the CSF as a means of diversifying the region's economy. "Our economies in the Caribbean are like a stool with one leg," says Warde. Countries like Brazil and Singapore "are eating our lunch. They're gaining market share by developing advanced devices and products that are based on science and technology, and I think it's time we do something about that."

Jermey N. A. Matthews

US budget pact signals end to R&D growth

Additional spending cuts loom as lawmakers consider competing budget blueprints from Obama and the Republicans.

Federal R&D programs were spared major hits, and in some cases did quite well, under the last-minute spending agreement that was hammered out in April to avert a government shutdown. The accord reached between the Republican-led House of Representatives and President Obama nominally will reduce federal discretionary spending for fiscal year 2011 by $37.6 billion, compared with FY 2010 appropriations. The compromise measure signed into law all but erased many of the dramatic reductions to basic research that the House had demanded in H. R. 1, the version of the continuing resolution (CR) that it had passed in February.

But the final CR that Obama signed into law marks the end of the sizable growth in federal research programs that the president had pushed through during his first two years in office, mainly through the stimulus spending of the American Recovery and Reinvestment Act. With his FY 2011 budget request, the president had hoped to squeeze through one more significant annual increase for science and technology (S&T). Congress never completed consideration of that request, and until the mid-April pact, federal spending was left to continue at FY 2010 levels through a succession of short-term extensions. (See PHYSICS TODAY, April 2011, page 29.) But dozens of freshman House members forced that chamber, and ultimately the Senate and White House, to accept unprecedented budget cuts.

Many of the reductions that became law bore little resemblance to what the House budget cutters had proposed back in February. Nowhere was the vicissitude of the process more apparent than with the turn of fortune for the Department of Energy's (DOE's) $4.9 billion Office of Science budget. Targeted by H. R. 1 for a cut of nearly $900 million below FY 2010 levels, the basic research programs wound up trimmed just $20 million. But the FY 2010 budget had included $76 million in congressional earmarks. In the baseline budgeting process used by appropriators, that $76 million was carried forward into FY 2011, even though lawmakers imposed a moratorium on earmarking. The net effect is that the Office of Science budget actually

increased by $56 million.

The CR's impact on DOE varied widely by program area. The nuclear weapons programs operated by the National Nuclear Security Administration were boosted 7%, or nearly $700 million, above their FY 2010 appropriations, to an even $7 billion. But DOE's applied research programs in renewable energy and energy efficiency were slashed by 18%, or $408 million, to $1.8 billion; the use of earmarked funds, however, will limit the actual reduction to $116 million. Fossil energy R&D was cut by $226 million, or 34%, to $434 million.

Winners amid the austerity

Ironically, the CR gave DOE's Advanced Research Projects Agency–Energy (ARPA–E) its first-ever annual appropriation—$180 million. Since its inception in 2009 to provide grants in support of high-risk clean-energy technologies, ARPA–E has dispensed most of the $400 million it got from the American Recovery and Reinvestment Act. Days after the CR was finalized, Energy Secretary Steven Chu announced a new $130 million ARPA–E solicitation for research proposals.

Also coming out ahead in the CR is NASA's science program, whose budget was increased 10%, or $448 million, over its FY 2010 appropriation of $4.9 billion. The space agency's aeronautics research got a $38 million increase, or 8%, over last year's $497 million appropriation. But no funds were provided for the administration's proposed space technology program, which would house technology development activities to support exploration and other future NASA programs. Obama's FY 2012 budget request reiterates that proposal.

Basic research programs at the Department of Defense, which the Pentagon designates as 6.1 programs, were increased by 7%, or $130 million, from last year, to a level of $1.9 billion. The budget for NSF was trimmed 1%, or $67 million, to $6.8 billion. But the agency's $5.5 billion research and related activities program, which provides the bulk of NSF research grants, was up $11 million compared with last year. H. R. 1 would have cut NSF by $307 million more. NIST was funded at $752 million, which is 12% below its FY 2010 budget.

The Environmental Protection Agency lost $1.5 billion of its FY 2010 appropriation and wound up with $8.8 billion for this year. But the Obama administration has been planning to cut EPA's size and is requesting just $9 billion for the agency in FY 2012. The S&T programs at EPA received $815 million from the CR, compared with $848 million in FY 2010. Obama is seeking $826 million for EPA S&T next year.

More chances for cuts

As PHYSICS TODAY went to press, further budget battles and doubtless further spending cuts lay ahead. The president proposed a freeze on domestic discretionary spending for next year, although increases for some S&T programs were requested within the overall cap. The House-passed budget resolution crafted by Representative Paul Ryan (R-WI) built on the cuts that were proposed in H. R. 1, with the goal of curtailing nondefense discretionary spending to 2008, pre-Obama levels.

In the normal course of events, the budget process takes place through consideration of the 12 annual appropriation bills that fund federal operations for the forthcoming fiscal year. But this year the need to raise the ceiling on the national debt has provided an additional timely opportunity for resurgent budget cutters to call for further reductions. Though R&D spending seems not to be a particular target of either party, the diffusion of S&T throughout the federal agencies has made it difficult to shield it from the budget axe.

Mindful of that dynamic, in late

March a coalition of academic and business organizations urged that Congress and the administration look to entitlement programs, rather than to the one-sixth of the federal budget that comprises nondefense discretionary expenditures, as targets for additional reductions. The Association of Public and Land-grant Universities, the Association of American Universities, the Business Roundtable, the Council on Competitiveness, and the National Academy of Engineering issued a statement that said, in part, "Concentrating exclusively on reducing discretionary expenditures threatens to undermine the human capital and the physical, technological and scientific infrastructure upon which our future economy, health, and security depend." In addition to entitlement reform, the groups said, an effective deficit reduction plan must also include tax reform, spending prioritization, and actions to spur economic growth.

David Kramer

news notes

Surveying physicists. Stark differences exist for men and women in physics, according to a mammoth international survey led by the American Institute of Physics (AIP). Nearly 15 000 physicists from 130 countries participated in the survey, which asked in eight languages about education, careers, and home life.

Among the survey's findings is that women's careers are more likely than those of men to be negatively affected by having children; only 32% of women but 65% of men said their work or career did not change significantly because of being a parent.

Around the world, female physicists are disadvantaged in a wide range of measures of professional success—indeed, in every measure probed. Women have less office and lab space and less funding than men. They are less likely to be the editor of a journal, serve on committees for grant agencies, or give invited talks at conferences. The survey found that women were less likely than men to rate their relationship with their doctoral adviser as "excellent."

"We have known that women face difficulties. Now we know what the problems are," says survey coauthor Rachel Ivie of AIP. In April she presented preliminary findings in South Africa at the fourth International Conference on Women in Physics, which was sponsored by the International Union of Pure and Applied Physics.

For an overview of the *Global Survey of Physicists*, see http://www.aip.org/statistics/trends/intltrends.html. TF ■