

a theoretical physicist, says he could see “all the more clearly” the differences that the Excellence Initiative has made. LMU’s four clusters of excellence, two of which are in physics, created “an enormous burst of creativity and influx of money,” he says.

Mobilizing universities

Universities that are successful in the Excellence Initiative also find it easier to attract other money and to form industrial partnerships. With the creation of KIT, third-party contributions doubled over five years to about €340 million annually, says institute president Eberhard Umbach. “And industry is queuing up to cooperate with us. We have several companies that want to build labs on our campus.” KIT’s international contacts increased 10-fold. In the latest round of the Excellence Initiative, the institution’s strategy got high marks, but its sole cluster of excellence, in nanosciences, was not renewed, spelling the end of KIT’s eligibility for “elite” status. Despite that setback, Umbach says, “we will keep on the success track.”

For the University of Technology Dresden, which in the first round won a cluster and a graduate school, hitting the jackpot this time was “crucial,” says chemistry professor Rainer Jordan. “Basic funding from the state of Saxony was low here, so the impact of the initiative is important.” Also important, he says, is that the awards were not politically motivated. They were “based not on the fact that Dresden is in the East but on the quality of our proposals.” Dresden had its cluster on regenerative therapies renewed, and it won a new cluster in advanced electronics and a new graduate school in biomedicine and bioengineering. The awards benefit the university as a whole, says Marlene Odenbach, who coordinated Dresden’s institutional strategy proposal. “It gives a boost to our reputation. We are much more visible now.”

More than anything, though, the initiative has mobilized universities to think about where they are and where

they want to go. “In terms of strategy building within universities, [working on proposals for] these last two years [has] been extremely fruitful,” says Georg Krausch, a physicist and president of Johannes Gutenberg University Mainz. Although Mainz lost in its bid for an institutional strategy award, it got a new cluster in nuclear physics. And, he says, “the university has changed. The whole university supports its goals. I believe that overall, research has benefited from the initiative.”

Polarization

How much differentiation is really occurring among German universities? Schollwöck notes that the LMU nanoscience cluster, which got a thumbs up, is not so different from the one at KIT that was nixed. And he says that while a university labeled excellent may attract better people, “there is overlap [in quality], for example, with our neighbors in Augsburg who don’t have that label.” It can be a problem, says Krausch, when people outside of Germany say “11 universities are elite and the others are not. Why, then, should we cooperate with Mainz?” Krausch blames the media for spreading misleading interpretations that “shape our image in the international community. Those German research universities that do not belong to the group of 11 now need to convincingly stress the academic strengths they have been developing for decades or even centuries.”

Not surprisingly, the increased competition among universities—and among fields within each university—has downsides. With its institutional strategy award, Freimuth says, Cologne is “making a big attempt to be integrative so that it’s not that 20% get something and 80% are left behind.” But the Excellence Initiative “has caused some polarization” between those in fields that did win awards and those that did not, says Dieter Schmeisser, a physicist at the Brandenburg University of Technology Cottbus. “There are fields that

are not in the club, so to speak.” And, he says, “a lot of smaller universities don’t have a chance to participate” in the competition because they lack access “to the same large scientific communities” available in Dresden, Berlin, or Munich.

By extension, the differentiation would eventually lead to separate teaching and research institutions. That would be a good thing, says Freimuth. “A system has grown in Germany which has nearly 100 universities that all claim to be research universities. Can we support that?” Still, he says, “I don’t like the ‘excellence’ phrasing. It’s more a question of developing different profiles for different institutions. And then in your profile, you should try to be excellent.”

Differentiating among universities “starts out on the psychological level,” says Schollwöck. “In the past it was not acceptable to advance the argument that some universities are better than others.” There are obviously losers in the Excellence Initiative. “But I would argue that this is the price for any reform. Progress rests on creative destruction.”

Ideas, a natural resource

The Excellence Initiative “has been a huge effort for the entire system, and we can’t do such an impulse too often,” says the German Research Foundation’s Wehrberger. “We hope that impulse will change a lot in the right direction, and that other more continuous mechanisms can take over.” Keeping the additional funding in the system, he adds, “is necessary to keep Germany strong in an increasingly competitive world.”

“That is particularly important for Germany, which doesn’t have much else in resources besides good education and good research,” Wehrberger says. “We don’t have gas or oil. Coal is out. We don’t want nuclear power, so we need good ideas.” Just how money may be distributed in the future, he says, “will be debated a lot in the next few years.”

Toni Feder

Costs for polar-orbiting weather satellites climb again

Delay in launch of spacecraft is expected to cause deteriorated forecasts.

Fed up with an escalating price-tag and schedule delays on the next-generation polar-orbiting weather satellite system, Senate appropriators have ordered that the development of weather satellites—and the \$1.6 billion

budgeted for it—be moved from the National Oceanic and Atmospheric Administration to NASA. In the report that accompanied the Senate bill, the Appropriations subcommittee, chaired by Barbara Mikulski (D-MD), asserted that

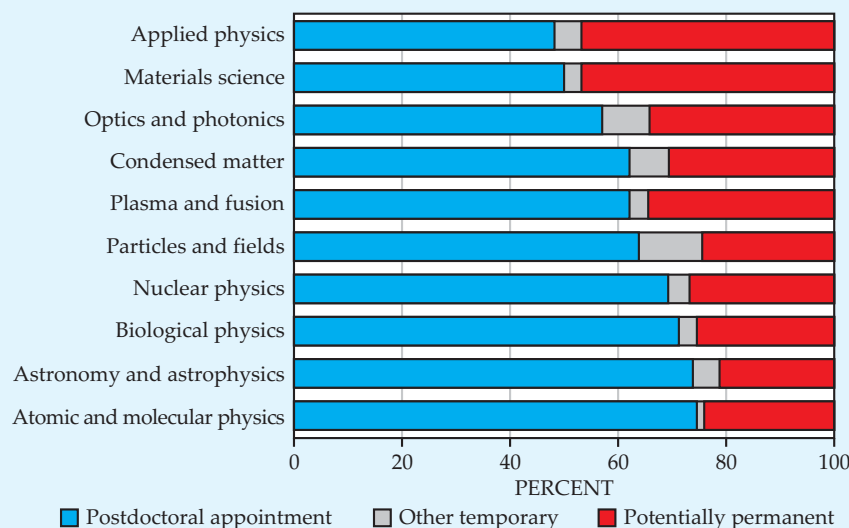
removing NOAA as “middle brokers” in the development and acquisition of weather satellites will save \$117 million in fiscal year 2013. Noting that NASA has long managed the acquisition contracts for NOAA satellites, the report said the additional layer of bureaucracy that NOAA creates “only adds to the communication disconnect and compli-

Jobs for physics doctorates

Some 61% of freshly minted US physics and astronomy PhDs from the classes of 2009 and 2010 took postdocs, and 30% of them found potentially permanent jobs. That's up—and down, respectively—from 56% and 33% from the classes of 2007 and 2008, changes due at least in part to the economic slump. Not surprisingly, a higher proportion of people in applied fields found potentially permanent work (red bars) than did those in fundamental research, who took postdocs in greater numbers (blue bars). These and related data are discussed in *Physics Doctorates One Year Later*, a recent report by the Statistical Research Center of the American Institute of Physics; see <http://aip.org/statistics/trends/emptrends.html>.

Toni Feder

Initial employment of physics and astronomy PhDs by subfield of dissertation, classes of 2009 and 2010 combined



cates the decision-making process." Under the proposed reorganization, the satellites would become NOAA's responsibility once they are in orbit and their systems checked out, the committee report said.

Kathryn Sullivan, NOAA deputy administrator, told members of the House Committee on Science, Space, and Technology on 27 June that the White House is carefully considering whether to go along with the Senate bill's instructions. A House-passed version of the appropriations bill has no comparable provision. Assuming the full Senate approves the bill, the two versions will be reconciled by a House-Senate conference committee this autumn or later.

Mikulski's proposal would be the latest shakeup in the nearly two-decade-old multiagency struggle to develop and deploy new polar-orbiting satellites. The troubles date to 1994, when as an economizing step that was supposed to save \$1.3 billion, President Bill Clinton ordered the Department of Defense and NOAA to combine what

were then separate polar-orbiting satellite programs. The combined program was estimated to cost \$6.5 billion over 24 years and consist of six satellites, the first due for launch in 2008. But after billions of dollars were spent with no satellites to show, and amid interagency squabbles over the number and types of sensors to carry aboard, the White House Office of Science and Technology Policy separated the military and civilian programs again in 2010 (see PHYSICS TODAY, November 2011, page 28).

Downsized program

Representative Paul Broun (R-GA), who chaired a 27 June hearing on the status of the civilian program known as the Joint Polar Satellite System (JPSS), complained that its cost had climbed by \$1 billion just since the previous hearing on the program last fall, and the schedule had slipped another three months. The JPSS now consists of just two operational satellites, the first one to be launched in March 2017. A third satellite, a precursor known as

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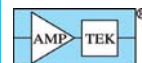
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Fifteen orbits around Earth's poles provided sufficient data for the NOAA *Suomi NPP* polar-orbiting satellite to produce this composite image. The satellite is a precursor to two from the Joint Polar Satellite System.

Suomi NPP, was launched in October 2011. Its mission is to test the five instruments that will be flown on the operational polar orbiters. But it will also supply weather-forecasting data for as long as it holds up; NOAA has projected a five-year lifetime, though NASA engineers have warned it may lose capabilities after three. Once *Suomi NPP* fails, NOAA officials expect that the quality of three- to seven-day weather forecasts will deteriorate from their current level.

The life-cycle cost estimate for the JPSS program has ballooned to \$14.6 billion, according to the Government Accountability Office (GAO)—\$1.7 billion above the life-cycle cost cap of \$12.9 billion that the White House imposed in 2010. Sullivan assured the lawmakers that NOAA can complete the JPSS program in its entirety without exceeding the cap, including placing into orbit several instruments that had initially been planned for the weather satellites. Those sensors are now to be tacked onto unspecified future launch vehicles.

David Powner, director of information technology management issues at GAO, said NOAA may still have to jettison some of the five instruments, eliminate an associated ground monitoring station, or forego providing new

JPSS data-processing facilities for the DOD in order to stay within the cap. The loss of additional instruments, he warned, will hinder efforts by climatologists and meteorologists to understand changes in Earth's ozone coverage and radiation budget.

Each of the instruments aboard the precursor satellite has been commissioned and is working properly, Sullivan said. Those instruments are a microwave radiometer; a Michelson interferometer to monitor moisture and pressure; imaging spectrometers to measure ozone levels; a 22-band radiometer to collect IR and visible-light data to observe wildfires, ice movement, and changes in

landforms; and a system to measure the effect of clouds on Earth's energy balance, one of the largest sources of uncertainty in climate modeling.

David Kramer

news notes

Plasma record in China. On 27 June, the Experimental Advanced Superconducting Tokamak (EAST), in Hefei, China, sustained a plasma for a record 411 seconds. The long lifetime was achieved by replacing the inductive current with an RF-driven current and by coating the tokamak wall with lithium, explains General Atomics's Vincent Chan, who is familiar with the experiment.

Jiangang Li, director of EAST, says the demonstration of "plasma control, sustained stability, safe handling of superconducting coils, and plasma-wall interactions under steady-state conditions" is an important step toward building ITER, the international fusion test reactor under construction in Cadarache, France.

Completed in 2006, EAST is one of a generation of new superconducting tokamaks in Asia. South Korea's KSTAR is, like EAST, about one-quarter the size of ITER; a smaller one in India and a larger one in Japan are currently being built. Those facilities all use deuterium, not ITER's combination of deuterium and tritium, and they work at lower plasma density, temperature, current, and magnetic field. But, says Chan, "what you do is [conduct] experiments on these machines and then translate the knowledge to optimize ITER operation." TF ■

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