ate and $1.1 billion, or 8.5%, in the House—would far exceed the White House's 2000 request for the $15.6 billion agency and sustain the biomedical community's drive to double the agency's budget by 2004.

It may take at least another month, however, for Congress and the White House to agree on the exact size of NIH's raise, as Republicans and Democrats engage in last-minute budget negotiations. Still, "the omens are very good for biomedical scientists," says an aide to one House Democrat, who predicts that "the final number will probably be at or near the Senate's mark."

That outcome would delight biomedical lobbyists, who have been struggling to repeat last year's record-setting $2 billion increase for NIH (*Science*, 23 October 1998, p. 598). Their campaign had an early setback in February, when President Bill Clinton requested only 2.1% more, some $320 million, in his budget proposal to Congress. The outlook dimmed further in recent weeks after Republican leaders shifted nearly $20 billion from the massive appropriations bill that funds NIH and a host of politically sensitive education and welfare programs to other spending measures. The borrowing allowed congressional leaders to claim that they were adhering to strict spending caps imposed by a 1997 budget-balancing law, but left Representative John Porter (R–IL) and Senator Arlen Specter (R–PA)—who lead the House and Senate subcommittees responsible for approving NIH's budget—with the nearly impossible task of recouping the funds with offsetting cuts elsewhere. Both lawmakers had repeatedly delayed scheduled votes on their bills in the hope of finding budgetary gimmicks—such as "forward funding" programs by borrowing money from the 2001 budget—that would allow Congress to break the spending caps without having to admit it.

The fruits of that labor were revealed 23 September, as Porter won approval, by an 8–6 party line vote, for an $89.4 billion Labor–Health and Human Services (HHS) spending bill that bought the $1.1 billion NIH boost by forward funding some programs and designating other spending as "emergencies." But some fiscal conservatives chafed at the additional spending, and the White House threatened to veto the bill because it would cancel a program to hire 100,000 new precollege teachers and cut welfare programs. Representative David Obey (D–WI), the appropriation panel's ranking Democrat, praised Porter for his hard work but said the bill was "a fantasy" that would never survive.

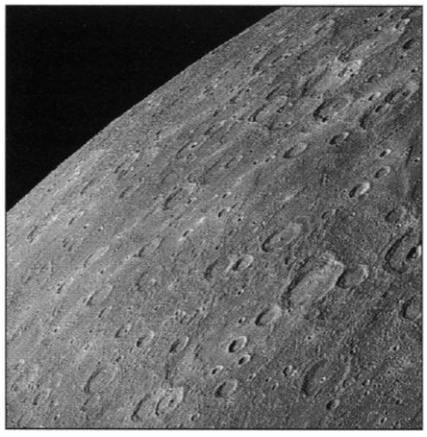
Similar predictions accompany the Senate's version of the bill, a $91.7 billion measure that would give NIH's two dozen institutes increases ranging from 11% to 13%. Specter's subcommittee was pushing to finish its work as *Science* went to press, but Senator Tom Harkin (D–IA), the subcommittee's ranking Democrat, predicted that the final bill would be a "heck of a lot better" than the House version. Still, staffers were pessimistic that it would ever reach the Senate floor. Instead, they say, Congress and the White House are likely to roll the Labor-HHS bill into a huge spending measure later this year with at least six of the 13 appropriations bills needed to fund government operations.

The coming weeks also give legislators time to ponder how to reconcile differences in their bills. The House, for instance, called for a 36% boost for NIH's controversial $50 million center for alternative medicine, to $68 million, while the Senate added only $6 million. One aide predicted that sorting out this and other differences could "take until Thanksgiving." **–DAVID MALAKOFF**

SPACE SCIENCE

ESA Gets Flexible To Cut Costs

NAPLES, ITALY—As NASA braces itself for the possibility of deep cuts in its science budget next year, its counterpart across the Atlantic, the European Space Agency (ESA), is already dealing with the reality of diminishing funds. For ESA, the ax fell in the spring when a meeting of government ministers from its 14 member states voted to maintain a fixed rate of science funding that had been in place since 1995: Inflation, which has already eaten into the budget for 4 years, will continue to do so (*Science*, 21 May, p. 1242). Last week, both ESA's decision-making Science Program Committee (SPC) and the Space Science Advisory Committee met here to discuss how to deal with their shrinking resources.



CREDIT: NASA

Hot destination. First it was Mars; now everyone wants to go to Mercury.

They voted for flexibility: In future, sever-

ScienceScope

Home Again? Sometimes you have to go backward to make progress. That's the direction being taken by the vaccine development team within UNAIDS, the United Nations' special program on AIDS. *Science* has learned that the vaccine team, which left the World Health Organization (WHO) 4 years ago, will soon rejoin its original sponsor (*Science*, 19 June 1998, p. 1863).

Officials hope the turnaround, long discussed by UNAIDS director Peter Piot and WHO chief Gro Harlem Brundtland, will boost international AIDS vaccine efforts. In particular, the new arrangement—probably a joint UNAIDS-WHO initiative—will allow the vaccine team to tap WHO's expertise and financial backing, according to UNAIDS vaccine leader José Esparza. UNAIDS has just $2 million annually to spend on vaccine development, he notes, not enough to capitalize on the results of trials under way in the United States and Thailand. It's not clear how much more money the new setup will produce. But Esparza is confident that "we are not really going back but forward in a more intelligent way."

You're Not Listening The National Science Foundation (NSF) is finding that old habits die hard. Specifically, NSF officials are unhappy that many reviewers are ignoring the broader impact of proposed research when scoring proposals. So last week NSF director Rita Colwell sent out an "important notice" to university presidents and others asking for their help in "conveying the importance of both intellectual merit and the broader impacts of research and education" to reviewers.

In 1997, NSF changed its reviewing criteria and elevated "impact"—on everything from student learning to geographic diversity—to the same status as the quality of the proposed science. But a recent informal study of 17,000 reviews done under the new system found that just 48% addressed the nonscience criterion. NSF deputy director Joseph Bordogna says that "concern would be too strong a word" to describe the agency's reaction to the noncompliance. But Congress may feel otherwise. The Senate wants to give NSF $750,000 so that the National Academy of Public Administration (NAPA) can study the impact of the new criteria, which help legislators measure if NSF is meeting a 1993 law aimed at making sure agencies spend tax dollars wisely. NAPA is set to begin a similar study that was requested last year by the same appropriators.

Contributors: Michael Balter, Jeffrey Mervis

al options will be developed in parallel, and the decision on when to fly them will be made at a later stage in the process. Some will be put in a "mission bank" to be revived later when a launch opportunity arises. There were also calls for the world's major space agencies to coordinate missions more closely and avoid costly duplication. "With today's state of worldwide scientific budgets, we cannot afford to compete with each other," says ESA's director of science, Roger Bonnet.

ESA has requested proposals by next January for the first of these new "flexi-missions." By the summer, the SPC will select two fleximissions and one backup, which "will go forward in parallel," says Bo Anderson, director of space and earth sciences at the Norwegian Space Center and newly elected SPC chair. The order in which the fleximissions will be launched will be decided later. In this way, "we have a continuously larger selection of missions which can be implemented faster," Anderson says. This should result in projects being completed sooner, allowing the agency to disband project teams more quickly. SPC vice chair Giovanni Bignami, science director of the Italian Space Agency, says ESA's contribution to the Next Generation Space Telescope is a likely first fleximission to reach fruition.

Previously, ESA's space science program, known as Horizons 2000, has adhered to a rigid timetable of launches: A major "cornerstone" mission is lofted every few years, interspersed with medium-sized missions—all chosen by the scientific community. It may take researchers some time to get used to a more flexible approach. Hans Balsiger of the University of Bern in Switzerland, a former SPC chair, points out that scientists building scientific payloads may have to live with extended delays if their payloads sit in the mission bank. Balsiger, a principal investigator for the Rosetta cometary rendezvous mission, thinks the situation is "survivable," however.

With their minds set on cost cutting, delegates at the Naples meetings also called for better coordination between the world's space agencies. Bonnet noted, for example, that the Inter-Agency Consultative Group (IACG), which brings together NASA, ESA, and the Russian and Japanese space agencies, doesn't always work very well. As an example, he points to the various programs to explore Mercury. Although a Mercury mission has long been a prospective ESA cornerstone project—and was presented to IACG representatives in Rome in 1994—"I was surprised to find out that the Japanese had included in the program a mission to Mercury without ever telling us anything," says Bonnet. And Bonnet was "even more surprised" when he recently learned that NASA also has a Mercury mission planned, called Messenger. "This isn't justifiable in today's financial climate," says Bonnet. NASA's representative in Paris, Jeffrey Hoffman, says the Messenger mission was proposed by groups of scientists and selected by NASA. "If Europe makes a decision to select a Mercury mission as their next cornerstone, then we will do everything possible to make sure that we take advantage of whatever synergy we can have between the two missions," says Hoffman.

–ALEXANDER HELLEMANS

Alexander Hellemans writes from Naples, Italy.

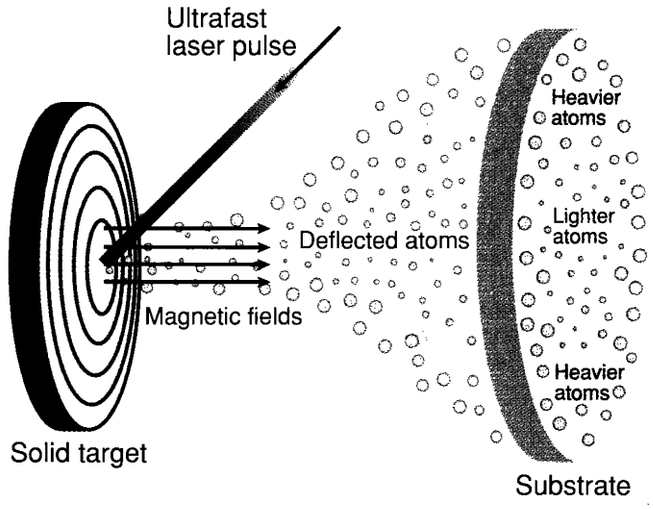
CHEMISTRY

A Cheaper Way to Separate Isotopes?

For Manhattan Project scientists racing to build the first atomic bomb during World War II, one of the biggest challenges had nothing to do with learning how to set off a nuclear explosion. They also had to devise a way to separate the fuel for the reaction, uranium-235, from its slightly heavier but far more abundant cousin, U-238. Ultimately, project scientists built a stadium-sized gaseous diffusion plant to separate the isotopes, taking advantage of the lighter isotope's tendency to float farther than heavier ones in a given time. Ever since World War II, separation of all kinds of isotopes has remained an industrial-scale operation. Now, new results with a tabletop laser could change all that.

In this week's *Physical Review Letters*, researchers at the University of Michigan, Ann Arbor, report using a laser that fires ultrashort, power-packed pulses to separate isotopes of elements ranging from boron to zinc. The technique isn't the first to use lasers to separate isotopes. But this one doesn't require the use of complex and expensive magnets, making it potentially far easier and cheaper, if the cost of the lasers comes down and the technique can be scaled up. Indeed, Todd Ditmire, a short-pulsed laser physicist at Lawrence Livermore National Laboratory in California, describes the new method as a "potentially big deal" that could provide a cheap new isotope source for research, industry, and medicine.

The Michigan researchers, physicists Peter Pronko and John Nees and graduate students Paul VanRompay and Zhiyu Zhang, were initially trying to grow thin films of boron-nitride, a superhard material. Researchers commonly make such films, which are used for high-tech optical and electronic devices, by aiming a laser at the material, vaporizing it, and depositing it onto a surface. Pronko and his colleagues, however, were trying out an unusual laser: one that delivers up to 1 quadrillion watts of power per square centimeter in extremely short pulses lasting just 150 femtoseconds, or quadrillionths of a second. Trained on a solid block of boron nitride, the laser deposited a film on a nearby silicon disk—and did much more besides.



Moving out. When vaporized by an ultrafast laser, heavier isotopes tend to concentrate at the edges of the target.

Boron comes in two isotopes, B-10 and B-11, which were randomly distributed in the solid target. But much to the researchers' surprise, when they used a device called an electrostatic energy analyzer to study the boron isotopes in the gas plume created by the laser pulse, they found that the two species of boron didn't remain mixed as they flew. "We thought our instrument was broken," says Pronko. "So we went back and did the experiment over again." Each time they looked, they found that most of the heavier borons landed in the outer portion of the circle, while the lighter ones stayed toward the middle. After a few tries, says Pronko, "we were convinced that what we were seeing was real."

Still, the result was puzzling. Not only did the isotopes separate, but the heavier isotope seemed to travel farther in the vapor than the lighter one—just the opposite of what happens when isotopes drift around in an uncharged gas. The answer, Pronko and his colleagues realized, lies in the electrical

CREDIT: PAUL VANROMPAY/UNIVERSITY OF MICHIGAN CENTER FOR ULTRAFAST OPTICAL SCIENCE