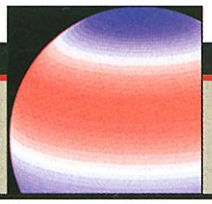
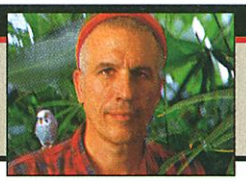








Others, meanwhile, say they're staying the course. Art Ramirez, a physicist at Los Alamos National Laboratory in New Mexico, for example, says his group isn't planning any drastic shifts. Ramirez has about five people working directly on extending Schön's results using high electric fields produced by transistors to explore new physics in organic materials. Ramirez created a buzz at the American Physical Society meeting in March when he reported that his team had used the transistor setup to trigger a normally insulating crystal of $C_{60}$ to behave like a metal. Schön and colleagues had previously reported using the same setup to coax $C_{60}$ to go one step further and superconduct. Ramirez's team hasn't duplicated that result. But he believes he's close and therefore is reluctant to alter his focus. "Things will just change overnight if we can duplicate this," Ramirez says. Perhaps no one is pulling for him to succeed more than Hendrik Schön. **–ROBERT F. SERVICE**

SPACE SCIENCE

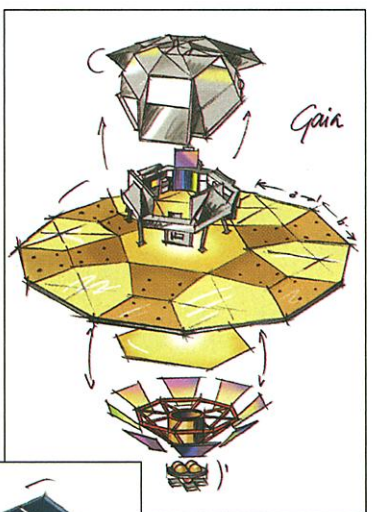
## Europe Does More With Less

**PARIS**—Last November, Europe's space scientists faced a grim future. Ministers meeting in Edinburgh had capped the European Space Agency's (ESA's) science budget over 3 years, forcing about $460 million in savings in the next decade. It seemed certain that one large mission would have to be scrapped, most likely a galaxy-charting satellite called Gaia. It was, according to David Southwood, ESA's science director, "a rather dismal picture."

At a press conference here on 27 May, Southwood and his team emerged from a 6-month huddle to unveil an ambitiously revised slate of missions. By reshuffling schedules, squeezing money from existing programs, and weaving together the development of missions as tightly as possible, they have transformed a program of 12 launches in 11 years into one of 16 launches in 10 years. They even managed to save Gaia and introduce a new mission into the $3.4 billion mix. Despite the axing of one planetary mission, "the final result is the best of the possible solutions," says Bo Andersen of the Norwegian Space Centre in Oslo, chair of ESA's Science Programme Committee.

Over the next decade, Southwood's "cosmic vision" program calls for, among other goals, landing spacecraft on Mars, Mercury, Saturn's moon Titan, and a comet; observing the birth, evolution, and death of stars and galaxies at gamma ray and infrared wavelengths; studying the afterglow of the big bang; and mapping the positions and motions of nearly every star in the Milky Way. ESA will also join NASA in building Hubble's successor, the Next Generation Space Telescope, and LISA, a gravitational wave observatory in space.

The program's transformation squeezes many missions to the limit. For example, Gaia is now $140 million cheaper thanks to a less costly spacecraft that will fit on a smaller launch vehicle. For the BepiColombo mission to Mercury, ESA is hoping to cut a deal with Russia on a less expensive lander and launcher. Also to cut costs, BepiColombo will be delayed a few years and developed in tandem with the Solar Orbiter, a mission to study the sun. All this leaves little slack in the program. "You can do this only once," says Southwood. "[ESA ministers shouldn't] ask me to repeat the trick. I'm not a magician."




**Double save.** Europe's new plan preserves Gaia (*top*) and includes Eddington.

The savings have allowed Southwood to pull one extra mission out of the hat. Previously just a backup mission, Eddington will study the composition and structure of stars by measuring seismic vibrations at their surfaces, a technique known as asteroseismology (see p. 1595). It will also look for small extrasolar planets moving across the disks of parent stars. Eddington is a step toward a proposed mission called Darwin, pegged for 2015, that would study the atmospheres of extrasolar planets and search for life. "I can't imagine a human being not interested in this," Southwood says.

The drastic pruning of the program budget did nip one bud, however. ESA's planned mission to Venus, called Venus Express, was dropped last week because "not everybody could commit to the necessary schedule," says Southwood, who warns that future missions that don't stick to tight schedules might suffer the same fate.

Some scientists rue the loss of Venus Express. "It's tragic that we now have a scientifically very interesting mission without an option of really flying it," says Michael Grewing of the Institute for Millimeter Radio Astronomy in Grenoble, France, chair of ESA's Space Science Advisory Committee. But Southwood's sword of Damocles hanging over future missions might end up saving Venus Express in the end. Grewing says that Venus Express could get a second chance if another mission is dropped from the roster. According to Joop Hovenier of the Free University in Amsterdam, the decision to cancel Venus Express came like a bolt from the blue. "It's a pity," he says. "It was a cheap mission, because it would use the same platform as Mars Express. You would expect projects like that to be applauded." **–GOVERT SCHILLING**

Govert Schilling is an astronomy writer in Utrecht, the Netherlands.

BIOTERRORISM

## Congress Adopts Tough Rules for Labs

Biomedical and agricultural researchers working with potential bioweapons face an array of new regulations under a new U.S. law aimed at combating bioterrorism. Science lobbyists say that the rules, passed overwhelmingly last week by Congress, are more reasonable than earlier drafts developed last fall immediately after a wave of anthrax-tainted letters killed five people. But they remain cautious until the Bush Administration spells out how it plans to implement the law.

The Public Health Security and Bio-

CREDITS: ESA

terrorism Preparedness and Response Act (H.R. 3448; energycommerce.house.gov) will require tighter laboratory security, government registration, and background checks for scientists and others handling more than three dozen potential bioterror agents identified by the government. The $4.6 billion measure, which addresses everything from food and water supply safety to prescription drug testing, also calls for more money for research, upgrading labs, and developing better systems for tracking and detecting threats to human health and agriculture. "Congress did a good job of providing clarity to researchers about their responsibilities," says George Leventhal, a lobbyist with the Association of American Universities in Washington, D.C. But "the development of sound regulations will be extremely important," adds Janet Shoemaker of the American Society for Microbiology, also in Washington.

**United front.** HHS Secretary Tommy Thompson, far right, joins legislators from both parties at briefing on bioterrorism bill.

CREDIT: THE COMMITTEE ON ENERGY AND COMMERCE/HOUSE OF REPRESENTATIVES

The anthrax letters triggered an immediate reaction from Congress, including calls to bar all non-U.S. citizens from working in labs that handle dangerous agents. The research community mobilized quickly against such extreme measures and gained time to make its case after the bill became bogged down over disagreements on food-safety and drug-testing provisions.

The final version reflects some of the researchers' input. It avoids a blanket ban on foreign scientists, as well as an earlier one-size-fits-all approach to regulating the 42 viruses, organisms, and toxins on the list of dangerous "select agents" compiled by the federal Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia (*Science*, 16 November 2001, p. 1438). Instead, it gives regulators with the Department of Health and Human Services (HHS, CDC's parent agency) "flexibility to impose different levels of security requirements on different select agents," according to a report accompanying the bill. The U.S. Department of Agriculture (USDA) must develop its own list of potential agroterror agents that will be subject to regulation; it will have similar leeway. Violators face fines and jail terms of up to 5 years.

The new law also calls on HHS and USDA to "minimize disruption" of existing research by setting realistic regulatory timetables. It requires "prompt" government screening of researchers and technicians working with select agents and offers an appeals process for workers who say they were improperly placed into a barred category, such as drug user or felon. But a definition of "prompt" must still be written, notes Leventhal.

The new law sets a 6-month timeline for implementing the rules, which will take effect just as the National Institutes of Health (NIH) makes a new set of awards to combat bioterrorism. With that in mind, the legislative report urges NIH officials to remind grant seekers "to begin the registration and screening process ... so as not to delay this important research."

The bill also approves $600 million over the next 2 years for CDC to address "extreme disrepair" at its laboratories and $415 million for USDA to improve agricultural security. CDC is expected to get at least $20 million to boost lab inspections and to set up a national database to help track stolen or misplaced agents back to their source. An effort to study antibiotic resistance receives $50 million. Congress has already agreed in separate bills to provide money for most of these projects.

–DAVID MALAKOFF

NEUROSCIENCE

## Redrawing the Brain's Map of the Body

One of the more distinctive images taught in introductory biology or psychology courses is the motor homunculus: a deformed map of the body drawn on the primary motor cortex, a part of the brain that guides movements. Lots of neurons in this region help control the hands and face, so these features of the homunculus are exaggerated, the lesson goes. In contrast, less nimble body parts, such as the torso, look relatively scrawny.

As is often the case, experts knew that reality was somewhat more complicated; for instance, the areas representing different body parts weren't as well defined as the picture implies. But new findings go even farther, suggesting that the role of the primary motor cortex might be fundamentally different than originally thought. Rather than simply controlling different parts of the body, it might direct a host of body parts to assume complex postures. What's more, the map appears to be organized not just according to muscle groups but by the positions in space where

## ScienceScope

**Stem Cell Hostage?** Final approval of the European Union's flagship research program has become entangled in the politics of embryo research. Several countries this week threatened to hold the $17 billion Framework program hostage to demands for stricter prohibitions on human embryo research. The 6th Framework, a 4-year program slated to begin this fall, rules out research on reproductive cloning and the creation of embryos for research. But four E.U. members—Germany, Austria, Ireland, and Italy—were hoping to add prohibitions against therapeutic cloning and the derivation of new human embryonic stem cell lines, on the grounds that such work is not permitted in their countries. Together the four would have enough votes to block the Framework's approval in the E.U. Council, which still must approve the program. But the coalition appeared to be unraveling as *Science* went to press; if it does, say officials in Austria and Germany, they will continue to push for more-restrictive language in ongoing budget debates.

**Legal Threat** The Pasteur Institute in Paris faces a potentially expensive day of reckoning. For a decade, the Pasteur and the Association France-Hypophyse, an endocrinology group, have been at the center of a controversy over cases of the fatal brain-wasting condition, Creutzfeldt-Jakob disease (CJD), linked to the use of contaminated human growth hormone (HGH). Several scientists are under criminal investigation for their roles in preparing HGH derived from cadavers tainted with aberrant prion proteins implicated in CJD. The hormone stocks were prescribed to children in 1984 and 1985, before France switched to recombinant growth hormone (*Science*, 30 July 1993, p. 543).

The French government has offered the families of 81 CJD victims, out of 1200 at-risk individuals, compensation of $250,000 each. But the family of Pascale Fachin, who died last June at age 30, is seeking greater damages—$800,000—from Pasteur and the association. A civil court will rule on its claim on 9 July.

The exact wording of the ruling will be critical. According to a Pasteur spokesperson, the institute's insurance would not cover a judgment finding it responsible as the manufacturer of the tainted preparation; but a ruling that it was merely the supplier of the raw materials would be covered. Either way, a judgment against Pasteur could spur litigation by other families.

**Contributors: Gretchen Vogel, Barbara Casassus**