

to continue, may not survive in Russia's harsh fiscal environment. Russia is propping up "a Potemkin space program," asserts Houston-based space consultant James Oberg. "It's a hollow shell."

In an effort to keep some life in that shell, the Russian Space Agency (RKA) last week backed off plans to bring the 12-year-old Mir space station down to Earth next summer. Russian government officials and legislators are now hammering out a proposal for the 1999 budget, due out next month, that would seek to fund both Mir and international space station operations. "What if there is a problem with the international space station?" asks Bogomolov. "We're very interested in keeping [Mir] as an option for research." Adds Sergei Shavich, space station manager at the Khrunichev Research Center in Moscow, "There's \$100 million worth of new equipment on Mir now."

Western experts see some merit in that argument, pointing to solid NASA-funded Russian research aboard Mir. The 3-year, \$20 million program, which wrapped up last year, served as a test-bed for research on the international station, funding peer-reviewed work involving 60 institutes (see pie chart). The program also "sustained scientists through a difficult period," says Dick Kline, director of the ANSER Center for International Aerospace Cooperation, a nonprofit think tank in Arlington, Virginia.

But Kline and others don't see how Russia can afford the estimated \$100 million to \$200 million needed next year to operate and supply Mir along with the roughly \$130 million that Russia is supposed to contribute to the international space station. "It's a good idea, if not for the fiscal realities," says Kline. NASA officials are hoping to persuade the cash-strapped RKA not to divert funds to Mir. "We want them to devote their resources only to the international space station," says NASA spokesperson Dwayne Brown.

Some of the projects begun aboard Mir, including monitoring the physiological stresses on cosmonauts performing heavy labor in space, were slated to continue aboard the service module, a Russian-built station component to be launched next summer. But now that Russia has given up its research time, "we won't be able to perform these experiments," says IBMP chief scientist Lyudmila Buravkova. In the meantime, she says, IBMP staff members are designing ground-based surrogates. But even these may have trouble finding funds in next year's budget.

A financial miracle also may be needed to save Spectrum-X-Gamma. Slow delivery of key components has delayed the astrophysics observatory, originally planned for launch in 1992. Now the question is whether Russia can afford the Proton rocket needed to put it into space. If Spectrum-X's debut

were to slip much beyond 2001, asserts Roald Sagdeev, a Russian space expert at the University of Maryland, College Park, it would be so eclipsed by three other observatories scheduled to be launched over the next 3 years—the United States' AXAF, Europe's XMM, and Japan's Astro-E—that "it would make no sense at all" to put it up.

Project officials disagree. "We believe Spectrum-X still has a role to play," says Alan Wells, director of the Space Research Center at the University of Leicester in England, pointing to its unique polarimeter for studying binary x-ray pulsars and supernovas and EUVITA, two telescopes that will explore the largely uncharted far-ultraviolet region. "Our concern is just to get it up there."

There's a glimmer of hope for space biologists, says Sagdeev: NASA could invite Russians to collaborate on U.S.-funded station projects. But one agency official complains that RKA's refusal to join a multilateral space life sciences working group has impeded joint studies. RKA officials declined to comment.

NASA, meanwhile, hasn't yet divvied up the spoils from its deal, which doubles the 5000 hours available for research during the 5 years of station construction. "It's awful to take advantage of someone else's disadvantage, but this is a unique opportunity for us to improve our science," says NASA's Neal Pellis, a station biology manager keen to study how microgravity influences gene expression.

The careers of many Russian scientists will hang in the balance as Russia decides the fate of Mir and RKA and NASA debate the terms of joint research. A lengthy delay will also threaten the Russian program's decades of expertise. As Kline puts it, "You can't suddenly say, 'Let's have world-class research again.'"

—RICHARD STONE

## JAPAN'S BUDGET

### Science Gets Share Of Stimulus Package

**TOKYO**—A new housing complex for exchange students, renovated research labs and equipment, and a faster track for some big new science projects are expected to be elements in Japan's latest, and largest, attempt to spend itself out of a prolonged recession.

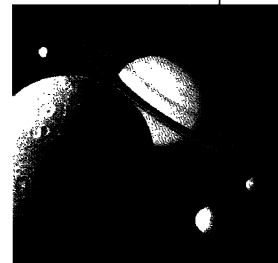
The \$195 billion package, the outlines of which were approved by the cabinet on 16 November, includes \$145 billion in stimulus spending and another \$50 billion in tax breaks. It eclipses the \$138 billion stimulus package enacted just last April (*Science*, 1 May, p. 669). In reality, however, both packages are likely to fall short of those totals because they depend in part on loans to consumers and small businesses and contributions from financially strapped local govern-

## ScienceScope

### NASA TAPS SPACE COMMANDER

NASA has a new chief space scientist. On Monday, agency Administrator Dan Goldin named Edward Weiler as associate administrator for the Office of Space Science. Weiler had served as acting head since late September, when his popular predecessor Wes Huntress stepped down. Weiler takes control of a \$2.1 billion R&D program that includes high-profile research on extraterrestrial life and the origins of the solar system.

NASA scientists are giving Weiler a warm welcome. "Ed Weiler will be a very effective champion for space science," says Scott Hubbard, deputy director of space at the Ames Research Center in Mountain View, California. Researchers credit Weiler with injecting new energy into NASA's astrobiology program and spearheading efforts to recover and repair the Hubble Space Telescope.



### ETHICS PANEL URGES SCRUTINY OF MENTAL HEALTH RESEARCH

Brushing aside research agencies' worries about increasing regulation, a presidential panel this week called for tighter control of the way mental patients and other people with impaired judgment are enrolled in drug tests and other experiments that don't directly benefit them.

In a final report approved on 17 November, as this issue of *Science* went to press, the National Bioethics Advisory Commission (NBAC) urged the federal government to create a new standing committee to act as a kind of permanent rulemaker and appeals board in this field. NBAC also proposed that the Institute of Medicine conduct a thorough study of the ethics and science of controversial types of mental health research—including trials in which patients are exposed to "challenges" that exaggerate their symptoms or in which medication is abruptly withdrawn.

The National Institutes of Health objected last month that some of these recommendations would impede research (*Science*, 30 October, p. 857). But NBAC's chair, Princeton University President Harold Shapiro, disagrees. He says he's heard "many assertions" but seen "no convincing evidence" that research would be hurt by such changes.

**Contributors:** Jennifer Couzin and Eliot Marshall

ments. And many of the details of the latest package, including amounts for science-related projects, are yet to be worked out. The Science and Technology Agency (STA) has requested \$2.3 billion.

One new project high on the list is a \$2.9 billion International University Village, a joint effort of STA and the ministries of Education (Monbusho) and International Trade and Industry to encourage more international exchange students and scholars to spend time in Japan. The collection of midrise buildings on a Tokyo site will include housing, a library, and other amenities for international exchange students and visiting researchers. It will also feature laboratories for venture businesses and for such research schemes as STA's ERATO program, under which research teams are assembled for 5 years. The three agencies are hoping for as much as half the total construction cost of the project, to be completed in early 2001.

Both Monbusho and STA have also requested significant amounts from the stimulus package to upgrade lab equipment and refurbish laboratories, as well as to accelerate big science projects already under way. The Institute of Physical and Chemical Research (RIKEN), an STA affiliate just outside Tokyo, could get as much as \$52.5 million for its Radioactive Isotope Beam Factory, a \$200 million facility with a superconducting synchrotron that would produce the world's most intense beams of unstable nuclei.

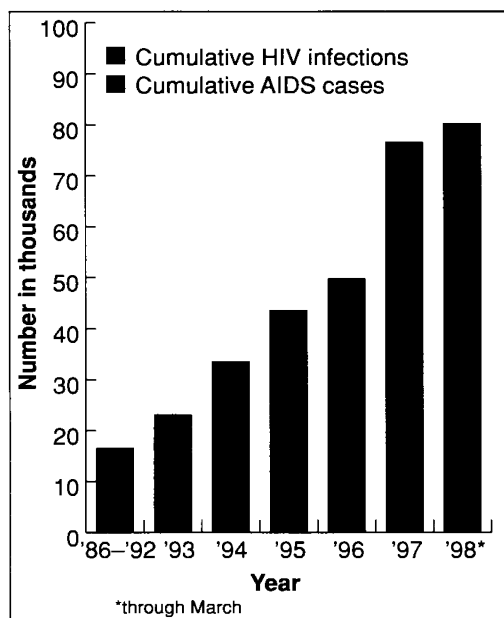
Yasushige Yano, the RIKEN physicist heading the project, says that the extra funding would restore the project's completion date of 2003 after cuts in this year's regular budget pushed that timetable back by 2 years. "It means we can meet our original completion plans," Yano says. Ocean research is another big winner. STA's wish list includes a proposed \$113 million for the deployment of instrumented buoys and the addition of various instruments to Japan's fleet of research vessels to facilitate studies of global climate change and to monitor sea-floor seismic activity.

But the largess doesn't stretch to big projects still in the planning stages. For example, the Japan Hadron Project at the High-Energy Accelerator Research Organization (KEK), the former National Laboratory for High-Energy Physics, is not in line for any of the stimulus spending because it requires further development and testing before it can move into the construction phase. "It's extremely disappointing," says KEK Director-General Hirotaka Sugawara. But KEK officials aren't standing still: They are looking for help in the regular 1999 budget, which will be finalized in the next 6 weeks.

—DENNIS NORMILE

## India Prepares to Join U.S., World Teams

**NEW DELHI**—India is drawing up plans to participate in global efforts to develop and test vaccines against AIDS. The decision, made at the end of a meeting here earlier this month of AIDS scientists and government officials from India and the United States, represents a major step for a country traditionally very sensitive about its status in international medical research projects. But Indian officials say it will likely take a few years to decide how to marshal the country's R&D resources and link them with ongoing activities around the world.



**Crisis ahead.** Number of Indian cases of HIV infection and AIDS is rising rapidly.

"A good collaboration will really cut [development] time," says Seth Berkley, president of the New York-based International Aids Vaccine Initiative. India, he says, is one of only a handful of countries in the developing world that has both the scientific base and the technological capability to produce vaccines commercially. In addition, Berkley says, India is facing "a real emergency" based on a rising number of reported cases of HIV and AIDS (see graph).

A low-cost vaccine is seen as the only realistic way to combat AIDS in countries that cannot afford the expensive multidrug treatments now available in the industrial world. "Vaccines are absolutely essential to interrupt this epidemic in developing countries," says Anthony Fauci, the head of the U.S. delegation and director of the National Institute of Allergy and Infectious Diseases. "India should definitely take a leadership role

in this area," he adds, estimating that it might be 3 to 5 years until a vaccine suitable for India is ready to be tested.

Toward that goal, Fauci and other National Institutes of Health (NIH) officials invited Indian scientists to participate in two upcoming grants competitions for vaccine clinical trials, as well as to take advantage of existing U.S.-Indian agreements for collaborative research. Indian officials pledged their "deep commitment" to such joint efforts, adding that they hope NIH will provide much of the funding once they draw up a detailed plan. "We can take advantage by learning from the failures of others," says J. V. R. Prasad Rao, project director for the National AIDS Control Organization (NACO) of India.

The most advanced trials of a candidate vaccine, performed by Vaxgen of San Francisco, began at 15 U.S. sites this summer. Two other candidate vaccines also produced in the developed world are being tested for safety in Thailand and Uganda. Indian officials say their participation in future vaccine development is predicated upon getting in on the ground floor. "Unless India is made a full and equal partner in the development of a vaccine, and unless the candidate vaccine has been developed collaboratively, India will never allow the testing of a vaccine," says Manju Sharma, secretary of India's department of biotechnology. Officials also want to ensure that the vaccine protects against strains of the virus common in India rather than in Europe or North America.

U.S. and Indian scientists are already collaborating on a \$750,000 project involving India's National AIDS Research Institute in Pune and Johns Hopkins University in Baltimore. Researchers are collecting baseline data that could be used as part of a larger vaccine trial at Pune and other sites in India. "We are willing and enthusiastic about accepting Indian collaborations in vaccine development [in the hope that] it might lead to a quicker solution," says Fauci. Its absence, he adds, "will surely slow down" the global effort to control AIDS. —PALLAVA BAGLA  
Pallava Bagla is a correspondent in New Delhi.

## Can IL-2 Smoke Out HIV Reservoirs?

**NEW DELHI**—Potent cocktails of anti-HIV drugs have been enormously successful in keeping AIDS at bay in HIV-infected people. But although these combination therapies can knock the virus back to undetectable levels in patients' blood, HIV continues to lurk in

CREDIT: NACO, INDIA