LIFE SCIENCE

NASA Slices Biology Program on Station

NASA has cut by half its planned funding of gravitational biology—the scientific centerpiece of the international space station—in an effort to find enough money to build the station itself. The sharp reduction in the $500 million program has evoked cries of outrage from U.S. life scientists, who say their research has fallen victim to unexpected construction costs and technical problems. "It's ludicrous," says Marty Fettman, a professor of veterinary and biological sciences at Colorado State University and chair of a NASA advisory panel on the space station's biology program. "They want us to reprioritize the science we've been working on for 10 years—and they want it done right away."

The dispute is further corroding the already disintegrating relationship between program managers at the Johnson Space Center in Houston and researchers at Ames Research Center in California and in the life sciences community. Facing cost overruns after they were put in charge of overseeing the station's $2.1 billion-a-year budget, Johnson managers have shifted money set aside for science facilities into buying hardware for the station, the first components of which are scheduled to be launched at the end of next year. To save money, NASA has asked Japan to build key elements of the orbiting laboratory devoted to life sciences.

The gravitational biology program includes a module containing a centrifuge, habitats, a glove box, and other research equipment. NASA's John Givens, who runs the Ames program, says that he has been asked to draw up a plan by February that keeps the proposed research plan largely intact. "It does hurt," he says about the cuts, which were levied over the past several weeks. Indeed, Fettman says the cuts could eliminate some of the four habitats specially built for animals, plants, cell cultures, and eggs, as well as reshuffling their launch schedules. NASA also intends to cancel test flights of the equipment, he adds.

NASA hopes that Japan will help it out of its funding crunch by building the centrifuge and glove box, along with the module to house it, in return for space aboard U.S. launches for other Japanese components of the space station. Yuichi Yamaura, space station management and integration manager for Japan's National Space Development Agency, says his country has made no decision pending resolution of a host of issues. "They can't commit to something blind," says Lynn Cline, who handles NASA's international relations for the space flight office.

That prospect of some sort of agreement next spring is little solace to Givens or Fettman. "I don't know what we'll do" if negotiations fall through, says Givens, noting that the money already has been pulled from the budget plan. Fettman adds that "even if Japan accepts the job, there is no way they can deliver anywhere near the scheduled time" of 2002. However, NASA officials insist that Japan should be able to meet both schedule and technical specifications. They also say that delays in conducting research aboard the station may be necessary.

Fettman says researchers have been willing to go along with slips in schedules and cuts in funding to accommodate the tight budgets of the engineers. But those cuts and slips have now gone too far, he adds. "Engineers are coming up with ideas to save money without thinking about the impact on the science," he says. "It may be time to go public with a demand for accountability." In an August memo to other advisory panel members, he asked "whether the time has come for us to solicit the participation of professional scientific societies ... in lobbying for greater protection of scientific interests" in the space station. Unless the internal grumbling translates into an effective lobbying effort, however, NASA appears unlikely to alter its course.

–Andrew Lawler

With additional reporting by Dennis Normile in Tokyo.

ASTRONOMY

Planets Galore, But No Place Like Home

BALTIMORE—Since astronomers reported sighting the first planet outside the solar system 4 years ago, the pace of discovery has quickened, to an average of two every 3 months over the last year. At a workshop here last week,* observers turned up the pace another notch with reports and rumors of several new planets and planetlike objects. And they discussed plans for new instruments and search strategies that may bring them closer to their Grail: an Earth-like planet elsewhere in the universe. At this rate, says William Borucki of NASA's Ames Research Center in Mountain View, California, "the first Earth-like planet orbiting a sunlike star may be detected as early as the year 2001."

The "sunlike star" part is already a reality. In a finding that was officially announced this week at a meeting of the American Astronomical Society's Division for Planetary Sciences in Tucson, but was discussed at the Baltimore conference, William Cochran of the University of Texas, Geoff Marcy of San Francisco State University, and their colleagues have detected a planet orbiting 16 Cygni B. This star is a virtual twin of the sun in size, temperature, and composition.

The planet is no Earth, however. The standard technique for finding exoplanets, watching for wobbles of the parent star, is sensitive only to bodies far more massive than our planet, and this one is no exception, at a minimum of 540 times Earth's mass. Seasons and days on this new world must also be peculiar. It follows a highly eccentric orbit, ranging from 110 million to 403 million kilometers from its star (0.73 and 2.68 times Earth's distance from the sun, respectively), and it has a second, distant sun: 16 Cygni A, 16 Cygni B's companion star.

Even less Earth-like is an object around the young variable star AB Doradus, announced by Dayton Jones of the Jet Propulsion Laboratory in Pasadena, California, from radio observations in Australia. Data analysis by Jose Carlos Guirado (now at the University of Valencia in Spain) showed that the object, in an orbit of about 12 years, weighs in at 0.08 solar masses, making it a brown dwarf—a star too small to shine—rather than a planet. The same observations also hint at a 15-Jupiter-mass planet in a 5.4-year orbit around Rositter 137B, a red dwarf star that is probably a loose companion to AB Doradus. Jones says more observations are needed to confirm this tentative discovery, however.

Meanwhile, the kind of exoplanet first discovered—objects circling the collapsed stars called pulsars (*Science*, 17 January 1992, p. 290)—continues to proliferate. Alexander Wolszczan of Pennsylvania State University, who found three planets orbiting the pulsar PSR B1257+12, presented evidence of a fourth planet in the same system. Wolszczan calls it "a Saturn-like planet in a Pluto-like orbit": Its orbital radius is approximately 35 times Earth's, and it has a mass 95 times larger.

Robert Noyes of the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts, is planning to announce at least one new exoplanet before the end of the year, and other planets are sure to come within range of sensitive new detectors. It may not be long before exoplanet discoveries become as frequent as issues of *Science*.

–Govert Schilling

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

* Planets Beyond the Solar System and the Next Generation of Space Missions, Space Telescope Science Institute, 16–18 October.