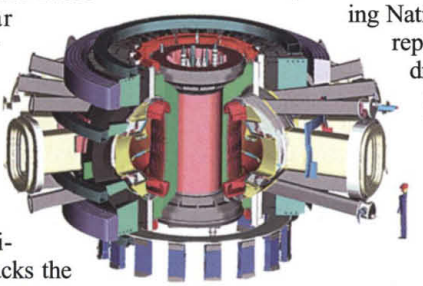
FUSION RESEARCH

Energy Panel Asks U.S. To Rejoin ITER

GAITHERSBURG, MARYLAND—U.S. fusion researchers are trying to reignite their field. A panel of scientists meeting here last week recommended that the United States rejoin negotiations to build the International Thermonuclear Experimental Reactor (ITER), a multibillion-dollar international project that the Americans abandoned in 1998. But they also argued that the country should initiate its own fusion experiment if the government lacks the budgetary will to return to the ITER fold. "The consensus is that we're ready to build a machine and do the science," says Stewart Prager of the University of Wisconsin, Madison, one of 17 members of the Department of Energy's (DOE's) Fusion Energy Sciences Advisory Committee (FESAC).



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Flame on? FIRE fusion project could win out if ITER fails.

The consensus emerged at a July meeting of fusion scientists in Snowmass, Colorado (*Science*, 2 August, p. 751). Last month a group met in Austin, Texas, to concoct a strategy. As endorsed by FESAC, the strategy is two-pronged: Try to join ITER, and begin design work on a less expensive domestic experiment, the $1.2 billion Fusion Ignition Research Experiment (FIRE). If DOE does not get a seat at the ITER table by mid-2004, the report recommends, the United States should proceed with the FIRE project instead. The FIRE alternative "shows the international partners that we're serious about the discussion and that ITER is not the only game in town," says Vincent Chan, a FESAC member who works at General Atomics in San Diego, California.

Full U.S. partnership in the ITER collaboration would cost an additional $100 million a year, most likely for a decade or more. DOE has set aside $1 million to estimate the costs of the project, which is currently pegged at $5 billion–plus.

Ray Orbach, director of DOE's Office of Science, is enthusiastic about the twin tracks, saying his office "is committed to implementing the work of Snowmass and the recommendations of the panel and the committee." But $100 million a year is likely to be a stretch. "I think the U.S. can afford $50 million [per year]," says Anne Davies, associate director for fusion energy sciences.

Congress has left open the door to a U.S. return to ITER but has not signaled that it would cross the threshold. Language in energy bills going through both houses directs DOE to develop a plan to build a magnetic fusion experiment but is silent on creating such a facility. "It's hard for Congress to take the long view when there are so many immediate problems," says Representative Zoe Lofgren (D–CA), a key congressional backer of fusion research.

Orbach acknowledges that "political as well as scientific issues play a key role" in any decision. But he hopes an upcoming National Research Council report on fusion power, a draft of which might be ready in early December, will help him make a case. "I would like to give the president, by mid-December, the full scientific view of how to get from here to there," Orbach says.

This week the ITER partners—Europe, Japan, Canada, and Russia—met in Toronto to discuss a timetable for selecting a site and to hear technical reports on Canada's site. A final agreement is expected sometime in 2004.

–CHARLES SEIFE

SPACE STATION

NASA Plans Expansion, New Research Agenda

PASADENA, CALIFORNIA—The international space station might be going off its diet. In a sign that 18 months of turmoil is ending, NASA last week quietly laid out plans to expand the station beyond a stripped-down version that was the product of large cost overruns and management problems.

The new plan would increase the number of shuttle flights to the station, start design on a spacecraft that could return a larger crew, and make room down the line for additional pressurized space for experiments. Officials also proposed new research priorities, slashing funding for structural and evolutionary biology in favor of studies into radiation health and advanced life-support systems. Yet even as a new U.S. program takes shape, some international partners in the program are struggling with budget troubles that hinder their ability to participate.

Neither the expanded station nor the research plan will be official for many months, and both are certain to engender controversy. But the briefings to NASA's advisory council meeting here at the Jet Propulsion Laboratory were concrete evidence that NASA Administrator Sean O'Keefe and his team are preparing to move beyond a truncated design—due for comple-

ScienceScope

Close Call for Boehlert One of the science community's favorite members of Congress has barely survived a primary election. House Science Committee chair Sherwood Boehlert, a moderate Republican from upstate New York, squeaked out a 52% to 48% win over a conservative challenger in a 10 September vote.

A staunch environmentalist and abortion-rights supporter, Boehlert is often at odds with Republican leaders and has drawn increasingly stiff challenges from his party's conservative wing. Two years ago, a conservative challenger won 43% of the vote in the contest to choose the Republican nominee. This year, changes in the boundaries of Boehlert's district helped David Walrath, a state legislator and medical director of a drug-treatment center, come within 1427 votes of a major upset.

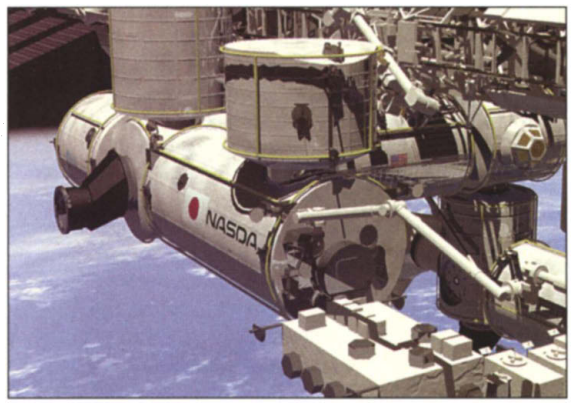
"It was surprisingly close; I'm still shaking," says one science-group lobbyist, noting that Boehlert has earned a reputation as an enthusiastic—but tough-minded—advocate for research spending. Boehlert is expected to easily win another 2-year term in the 5 November general election, as he should draw votes from Democrats and independent voters, who can't participate in the Republican primary.

Unwanted Advice? The Bush Administration let two scientific advisory groups die in recent weeks, one on genetic testing standards and the other on the use of human subjects in research. Both dealt with hot topics; both advised the Department of Health and Human Services (HHS); and both included holdover members from the Clinton White House. But after a story in this week's *Washington Post* suggested that the panels were killed in response to complaints from industry or conservative groups, HHS spokesperson William Pierce hastened to explain that the committees will be recreated "very soon" with new members and "broadened" mandates.

That explanation didn't satisfy Representative Edward Markey (D–MA) and other Democrats on the House Energy and Commerce Committee. In a 17 September letter to HHS Secretary Tommy Thompson, the group wrote that it was "deeply disturbed" by these and other changes—such as a shakeup of an environmental health panel (*Science*, 30 August, p. 1456)—and demanded a total accounting of any changes since January 2001 to "scientific advisory groups, committees or task forces." HHS's response is due by 4 October.

Contributors: Jennifer Couzin, Andrew Lawler, David Malakoff, Eliot Marshall

tion in 2004 and labeled "core complete"—imposed by the Bush Administration in 2001 after the discovery of $4 billion in cost overruns. "We have to plan further than core complete," NASA's new deputy administrator, Frederick Gregory, told *Science*.



Grounded. Japan's research module for the station will be launched up to 2 years later than planned.

NASA's new research plans have been heavily influenced by the recommendations of a recent independent panel (*Science*, 19 July, p. 316). Although its report won a lukewarm response from many researchers and from the advisory council, Mary Kicza, who leads NASA's biological and physical sciences program, says NASA agrees with its recommendation to phase out funds for those areas rated low priority, such as materials processing, environmental health, and structural and evolutionary biology. Areas that fell in the panel's set of highest priorities—such as clinical medicine, fluid dynamics, and cell and molecular biology—would receive roughly stable funding or some increase. NASA is also adopting the panel's suggestion to create the position of science officer aboard the station, which Kicza says "will make a difference in forging a scientific agenda." At the same time, Kicza plans to boost funding for radiation protection—which the panel ranked as a lower priority—because of its importance to astronaut safety.

Although the plan would eventually help set a new course for science on the station, two international contributions to that effort are now in question. Japan surprised NASA recently by announcing a delay of up to 2 years in the launch of its pressurized module, which is the centerpiece of Japanese space research. Although the laboratory is nearly complete, the country's space agency can't afford to launch the module in 2004 as planned. "NASDA [National Air and Space Development Agency] is being required to reduce its budget by about 10% in the next 3 or 4 years," says Masato Koyama, director of NASDA's Washington, D.C., office. The delay postpones delivery of a large chunk of research space, including an exposed work deck with a sophisticated robotic system.

Likewise, fiscal troubles have forced Brazil to cancel plans to develop a small research pallet that would have attached to the outside of the station for experiments that don't require precious pressurized space. NASA hopes that the U.S. Department of Defense will step in to fund the racks, says NASA's space station program manager, Bill Gerstenmaier, even though the military's involvement could draw objections from international partners.

At the same time, those partners are sure to be pleased with NASA's decision to lift its ban on a larger station design. Gregory says the agency has found ways to solve the $4 billion shortfall and provide for additional hardware beyond core complete. Although reports detailing station costs won't be released until the end of the year, NASA has asked the White House to include seed money for an expanded station in the president's 2004 budget request now being drawn up.

"It's a move in the right direction," says advisory council member John Logsdon, a political science professor at George Washington University in Washington, D.C., a feeling echoed by other council members. NASA managers will now take their show on the road, and not a moment too soon. This week the National Research Council and the National Academy of Public Administration issued a report harshly criticizing the core-complete design. Without more crew, the study warns, the station "can never achieve the status of a world-class research laboratory."

–ANDREW LAWLER

ASTRONOMY

Hubble Successor Finds Builder and New Name

The successor to the Hubble Space Telescope passed a major milestone last week when NASA announced that the company TRW in Redondo Beach, California, will lead construction of the $1.8 billion observatory. But it's not all plain sailing from here. TRW's competitor for the contract is considering whether to contest the decision, and delicate negotiations are going on with the European Space Agency over the exact nature of ESA's 15% contribution to the project. And NASA surprised everyone involved by breaking with tradition and naming the scope not after a pioneering scientist but after a former NASA administrator.

The James Webb Space Telescope (JWST), formerly known as the Next Generation Space Telescope and managed by NASA's Goddard Space Flight Center in Greenbelt, Maryland, is due to be launched in June 2010. To avoid infrared glare from Earth, it will be dispatched to a point in space 1.5 million kilometers distant, directly away from the sun. Once there, the scope's segmented 6-meter primary mirror will unfurl, along with a tennis court–sized sunshade. Working at near- and midinfrared wavelengths, JWST will peer into the very early history of the universe and study the formation of galaxies, stars, and planets.

TRW, which also built the Compton Gamma Ray Observatory (launched in 1991) and the Chandra X-ray Observatory (1999), will design and build the spacecraft and its revolutionary mirror, integrate the science instruments, and perform prelaunch and in-orbit tests and checks. NASA's JWST project manager Bernard Seery declined to reveal details of why the TRW design won the $824.8 million contract, but he suggested that the company's design for deploying the segmented mirror in space might have played a role.

Officials at the unsuccessful bidder, Lockheed Martin Missiles & Space in Sunnyvale, California, are "extremely disappointed and surprised" by NASA's decision, says spokesperson Buddy Nelson, pointing out that the company last year won an award from Goddard for contractor excellence. "We are confident we had a competitive proposal," he says. A meeting with the two bidders is imminent, says Seery, and Lockheed Martin will have 10 days after that to file an official protest.

Peter Jakobsen, ESA's project scientist for JWST, says the two agencies are still "heavily negotiating the exact nature of ESA's noninstrument contribution. It's a very delicate issue, which hopefully will be settled later this year." ESA had hoped to provide the main spacecraft module, but Seery says NASA would prefer ESA to launch the scope using Europe's Ariane 5 launcher: "That would make the negotia-

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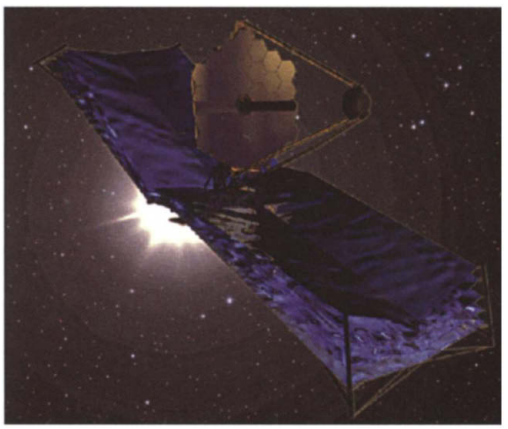

Looking up. TRW's winning design for the $1.8 billion James Webb Space Telescope.