

gation “team” consisted of just two people: the MCO navigator and Esposito). With these failures in mind, the board has recommended changes in the operation of the Mars Polar Lander, due to reach Mars on 3 December. They include beefing up navigation staffing and using a second, independent means of determining the spacecraft’s trajectory.

NASA officials denied that their recent strategy of flying more, smaller missions at lower overall cost affected MCO. “We have to remember faster, better, cheaper includes following the rules,” says Edward Weiler, NASA associate administrator for space science. “They weren’t followed this time.” Noel Hinners, vice president for flight systems at Lockheed Martin, begs to differ. “There is a faster, better, cheaper effect here,” he told *Science*. It’s a matter of sufficient staffing—perhaps 10% more—to make sure the checks and balances work, he says. “It’s nothing big, but it takes time and money.” —RICHARD A. KERR

## PUBLISHING

## Journals Launch Private Reference Network

Most of the world’s biggest scientific publishers have so far shown little interest in participating in a U.S. government plan to provide free access to scientific articles through a Web site called PubMed Central. Now they’ve responded with a plan of their own. On 16 November, 12 private and nonprofit organizations unveiled a scheme designed to cross-link

The lead organizers of the new project are Academic Press, a Harcourt Science and Technology company based in San Diego, California, and John Wiley & Sons Inc. of New York City. They worked with the International Digital Object Identifier (DOI) Foundation near Oxford, U.K.—established in 1998 with the help of major publishers—to devise “tags” that can be used to find and track journal articles. Others in the group supporting this venture are the American Association for the Advancement of Science (publisher of *Science*), *Nature*, the American Institute of Physics, the Association for Computing Machinery, Blackwell Science, Elsevier Science, the Institute of Electrical and Electronics Engineers Inc., Kluwer Academic Publishers, Oxford University Press, and Springer-Verlag. At press time, the sponsors had not settled on a name.

This high-profile group plans to spend an undisclosed sum to create a new, not-for-profit digital information service. Publishers who participate will send articles to the new service to be tagged with universal identifiers. The goal, according to Charles Ellis—chair of the DOI Foundation and Wiley’s former CEO and president—is to enable readers to use a mouse-click to leap from a footnote in an article on one publisher’s Web site to the text of the article being cited, even if it’s on a different site. The mechanism will be largely invisible to readers, but access to the full text may require a password or a fee. “The beauty of the system,” Ellis says, “is that it permits a kind of one-stop shopping that gives access to all the journals” participating in the scheme.

The publishers have consulted their legal advisers and concluded that they will not run afoul of antitrust laws, which prohibit collusion among competitors, as long as “we don’t try to exclude anyone,” says Ellis. Indeed, the founding members are eager to have many other publishers join. However, those who do so must agree to use a standard data format devised by the DOI Foundation. It requires publishers to provide summary information on every article, such as the author’s name, a short description of the work, and the

name of the journal. But each publisher can decide whether to make abstracts or full-text articles available for free.

Susan Spilka, a spokesperson for Wiley, says the plan is to label more than 3 million current journal articles with DOI tags immediately and to have them up and available on the system early next year. After that, more

than half a million new articles will be added to the collection every year.

David Lipman, director of the National Center for Biotechnology Information, who has chief responsibility for developing PubMed Central, says this private network is very different from PubMed Central: “It in no way provides barrier-free access to the primary research literature.” But, he adds, it’s “great” that publishers are trying to improve access to online information, and “I hope they move forward with this.” —ELIOT MARSHALL

## SPACE TELESCOPE

## Gyroscope Failure Closes Down Hubble

The stream of science data from the Hubble Space Telescope stopped last weekend after the fourth of the instrument’s six gyroscopes failed. The \$2 billion telescope will remain in a “safe mode” until astronauts arrive next month for a scheduled service mission to the orbiting spacecraft. Even if all goes well, however, agency officials say it will take another month to get the telescope back on line.

The gyroscopes, which keep the telescope pointed properly, have bedeviled NASA engineers since the Hubble’s launch in 1990. Four have been replaced on previous space-shuttle missions. But the devices have continued to fail, and because Hubble needs three working gyros to make observations, the latest failure, on 13 November, caused NASA to suspend all scientific operations. The shuttle was slated to rendezvous with Hubble in October to replace all six gyros and conduct other maintenance tasks, but problems with the Discovery shuttle have delayed the mission. Space agency officials are eager to meet the 6 December launch date because some of the software for the Hubble servicing mission is not Y2K compliant.

Space science chief Ed Weiler says that the delay poses no danger to Hubble. And because a servicing mission is imminent, “the timing [of the gyro failure] is not so bad,” Weiler notes. “We have to just sit and wait.” The shutdown interrupted researchers’ plans to examine the turbulent upper atmosphere of Jupiter and Saturn’s rings and put on hold the search for binary brown dwarfs and a survey of galaxies with high redshifts, according to the Space Telescope Science Institute in Baltimore, which oversees the Hubble’s science program. The research will be rescheduled.

On the servicing mission, the shuttle crew will install replacement gyros modified to make them more reliable. The crew will make a total of four spacewalks—replacing a host of other equipment besides the gyros—before returning to Earth. The mission should keep Hubble operating through 2003.

—ANDREW LAWLER

## PUBLISHERS’ REFERENCE SERVICE

Publisher	No. of publications
AAAS ( <i>Science</i> )	1
Academic Press	235
American Institute of Physics	>50
Association for Computing Machinery	21
Blackwell Science	200
Elsevier Science	1200
Inst. of Electrical and Electronics Engineers	105
John Wiley & Sons	>300
Kluwer Academic Publishers	>400
<i>Nature</i>	7
Oxford University Press	100
Springer-Verlag	400

journal articles through their reference lists, making it easy for researchers to locate and obtain the text of a referenced article through the Internet. Unlike PubMed Central, the plan will allow publishers to retain full-text material on their own Web sites and control access to it. PubMed Central, in contrast, would turn archived texts into public property.