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**HEADLINE:** Doomed Hubble's Fans Flood NASA With Ideas

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**BODY:**

One devotee wants to send a "giant clamshell" into space to pluck the telescope from the ether and bring it home. Several others suggest sending it to the moon. Or maybe selling it to Coca-Cola to pay for a rescue. And if all it took were donations or volunteers, the job would probably already be done:

"I am broke . . . but I will send $50.00 right now, if it will help save Hubble," read one message that fluttered in over NASA's Hubblesite Web page a couple of weeks ago. "If you need someone to take a chance riding the shuttle and help fix it, I am your guy. You should know that I am almost 50. Kind of makes me a long-shot candidate."

Two months have elapsed since NASA Administrator Sean O'Keefe announced that the agency was canceling the Hubble Space Telescope's fourth space shuttle servicing mission, essentially sentencing the orbiting observatory to death sometime in the next few years.

The news was divulged almost as a by-the-way amid the fanfare accompanying President Bush's new moon-Mars initiative, but it has provoked a level of anguish and outrage that has overwhelmed whatever excitement the administration may have hoped to kindle with proposed new ventures in space.

Hubble's distress touched a national nerve. It has become the people's telescope, its fate of vital interest to everyone from the scientists who use it and minister to its needs to amateur astronomers to breakfast-table enthusiasts who marvel at Hubble's spectacular images.

"Let me get this straight. We are going to take the greatest telescope ever conceived . . . and then we are going to blow it up?" one man wrote on Hubblesite. "Do you people have a clue? . . . The American People own the Hubble. How dare you even consider blowing her up?"

"Within our own Hubble community, we've had nothing but shock and outrage," said Steven Beckwith, director of the Space Telescope Science Institute (STSI) here, which supervises Hubble's observations. "The public outpouring has been extraordinary."

Beckwith said he has received hundreds of e-mails of support and suggestions for saving Hubble. O'Keefe has acknowledged to reporters that his "e-mail system is clogged every day."

Other NASA offices also report a brisk traffic in Hubble mail, and Hubblesite has received thousands of messages, Beckwith said. Institute officials agreed to let The Washington Post quote from the January and February Hubblesite traffic as long as the writers were not identified.

What emerges from this outpouring is an "us-vs.-them" truculence that views the Hubble's demise as collateral damage in what many see as the administration's misguided march to the moon and Mars, an idea opposed by 62 percent of Americans, according to a Jan. 18 Washington Post-ABC News poll.

"Hubble is the only truly useful piece of work NASA has done in years," one man wrote to Hubblesite in January. "Moon-or-Mars-men are . . . a waste of taxpayer money. Do real science. Do Astronomy!"

What has happened, said University of Michigan psychologist Daniel J. Kruger, is that Hubble has become a national treasure. "It doesn't need a publicist, because it speaks for itself," said Kruger, who studies the spread of ideas and culture. "When we have something like the Hubble sacrificed, people want to know, 'What do we get out of this?' We may eventually get to do [the moon and Mars], but at what price?"

The dismay wells up at all levels. At an institute news briefing earlier this month to unveil a Hubble deep space image, the usually circumspect Beckwith suddenly remarked in anguished wonderment that "never in the history of telescopes have we developed an observing capability and given it up."

Scientists and staff at the same meeting broke into cheers and applause when Sen. Barbara A. Mikulski (D-Md.) promised "to stand up for Hubble" and seek reconsideration of O'Keefe's decision. "I believe that the future of Hubble should not be made by one man in a back room," she said.

Later that week, after a mostly cordial encounter with O'Keefe during a Senate hearing, Mikulski said she would ask the National Academy of Sciences to do a "risk-value" study on a space shuttle mission to service the Hubble. When it became apparent that O'Keefe did not share her views, she sent him a letter threatening to continue funding the telescope "until an informed decision" on Hubble's future could be made.

Meanwhile, on the other side of the Capitol, Rep. Mark Udall (D-Colo.) is circulating a proposed resolution calling for a review of O'Keefe's decision and continuation of plans for a servicing mission until Hubble's fate is resolved.

"I didn't know the interest was there, but we're getting hundreds of letters and e-mails," Udall said in a telephone interview. "People are saying, 'Wait a minute, this is penny-wise and pound-foolish. With a little gumption and hard work, we can get the service mission up there.' "

Probably not. Despite the cascade of bad publicity, O'Keefe has remained steadfast in his view that the shuttle will not travel to Hubble unless the mission complies with new safety measures recommended after the space shuttle Columbia disintegrated on reentry last year.

The likelihood that a Hubble mission could comply is virtually nil, O'Keefe said to reporters recently. NASA would have to develop special technologies allowing a shuttle crew to make repairs to the spacecraft without assistance. This might be done, but not in time to get a shuttle to the telescope before its batteries wear out and its gyroscopes spin down.

"Could we [send the shuttle early] and take the risk? Sure," O'Keefe said. "But somebody else will have to make that decision. Not me." Hubble, he acknowledged, "is a real gem of an instrument. But you have to think about reality."

The hope now is that a Feb. 20 "request for information" put out by NASA will elicit fresh thoughts on how an unmanned mission might travel to Hubble and somehow service the telescope.

"There's no shortage of ideas," said Hubble project manager Preston Burch, of the Goddard Space Flight Center in Greenbelt, in charge of Hubble hardware and servicing. Among the potentially feasible ones are suggestions that a robot spacecraft might grapple Hubble and attach external power packs and gyroscopes to keep it operating.

Not plausible so far, however, is the idea that the shuttle might somehow tow the telescope to the international space station for periodic servicing. This engineering exploit, a favorite on the Internet, would require a change in the inclination and height of Hubble's orbit.

"It would take a tremendous amount of power to do that," Burch said in a telephone interview. "And if you bring it down to the space station, how do you get it back up?"

While these options percolate, Goddard is also working on the grimmer business of prolonging Hubble's life, and eventually pushing the dead telescope into a higher graveyard "parking orbit" or steering it into Earth's atmosphere on a trajectory that would guide its fiery remains to crash into an uninhabited area.

At best, the batteries and gyros will last until about 2008, but Goddard engineers say they may be able to squeeze out an extra year or two by running the telescope on two, or even one, gyroscope, adopting battery-saving measures and, finally, triage.

"You have to have enough battery power to run the equipment at night and have a backup for emergencies," explained David S. Leckrone, Hubble's senior project scientist. "At some point, the batteries will no longer be able to fully charge during the day, and when that happens, we'll have to turn off equipment."

For a public in denial, however, the focus is on cures, not hospice care. "Wouldn't it be easier to robotically go up there with a giant clamshell made from those fancy reentry tiles and just bring it back?" asked one man on Hubblesite in January.

Or have the telescope "contract with Coca-Cola or Pepsi, etc. to pay the Russians to repair HST in return for a small Coke, Pepsi, etc. logo in the corner of each Hubble picture," another message said.

Other correspondents suggested that NASA "put it on eBay," "issue Hubble bonds," "get schoolchildren involved in collecting donations," or "land your telescope on the moon and build abservatorium there."

But above all, "please don't can the Hubble," one fan wrote. "I made Ds in high school science, and a D in college science. Until the Hubble, I thought the only galaxy was the Milky Way."

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