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Can the Heavens Wait?

By Michael Benson

About two-and-a-half miles above the Pacific, the world's biggest observatory complex dominates the summit of Mauna Kea in Hawaii. Among other instruments at this site are the Kecks, the largest optical telescopes in the world; each possesses a mirror that is more than 30 feet wide. Mauna Kea is without question one of the nation's leading scientific research facilities.

One can therefore imagine the outcry that would follow if the University of Hawaii, which manages Mauna Kea, announced one day that the telescopes would be demolished because of budgetary constraints. It's expensive to maintain all that fancy equipment under the stars, the university might say; what's more, other programs require increased financing.

Ridiculous? In the case of Mauna Kea, the answer is, thankfully, yes. But virtually the same thing is happening to another, even more valuable observatory: the Hubble Space Telescope, which the National Aeronautics and Space Administration recently sentenced to a slow death.

Launched in 1990, the Hubble is surely the most important instrument in modern astronomy. Because it orbits outside the Earth's atmosphere, it sees things ground-based observatories can't. In the telescope's photographs, for example, the earliest galaxies can

be seen careering at the edge of space-time like candy-colored pinwheels. These and other pictures have turned the Hubble into our national time machine — a device capable of peering back to epochs that far predate the formation of the Earth.

In fact, the pictures the Hubble has given us rank in importance with Apollo's canonical Earthrise over the Moon. And the telescope has done all this for a reasonable price: it consumes only 2 percent of NASA's annual operating budget.

Nevertheless, just days after President George W. Bush directed NASA to focus on missions to the Moon and Mars, the agency said it would drop plans to send the space shuttle on one of its periodic Hubble servicing missions — even though more than \$200 million worth of new instruments for the telescope had already been built. The decision spells an early demise for the observatory, which will now most likely stop functioning by about 2007. In the past, shuttle missions have rejuvenated the Hubble — creating, in effect, a new telescope every time. With consistent servicing, it could operate for decades more.

NASA said that its Hubble decision was based on safety, not budgetary concerns. The agency was following the recommendations of the Columbia accident investigation commission, which suggested that future shuttle missions go to the International Space Station. That way, if the shuttle sustains damage — broken tiles, for instance — its crew can take refuge in the station. Because the Hubble is on a different orbit from the space station, a crew aboard a wounded shuttle would have nowhere to go.

This week, however, under pressure

from Senator Barbara A. Mikulski, Democrat of Maryland, NASA said it would ask Adm. Harold W. Gehman Jr., head of the Columbia commission, to examine whether it is safe for astronauts to visit the Hubble. Let's hope Admiral Gehman recommends to NASA that it reverse its decision. After all, there is good reason to do so. NASA has three remaining shuttles. Two could be prepared simultaneously — one to visit the Hubble and the other to be ready to go in the event that spare parts or a rescue is needed in space. If the second shuttle isn't used, it will be all set for its next flight.

NASA's deeper, less advertised worry is probably its budget. With many new objectives, the agency needs to trim as much fat as possible, and a Hubble repair mission costs about \$500 million. But the Hubble long ago proved it was worth every cent. In recent years, it has generated more positive press for NASA than the astro-

can't allow a 24,000-pound telescope to land just anywhere. So the agency will have to design and build a robotic rocket that would attach itself to the Hubble and bring it safely down in the ocean.

And here lies the fiscal absurdity: the price of that rocket is estimated by NASA at \$300 million — and given that the Hubble wasn't designed for automated docking, new technology would have to be developed, perhaps pushing the cost even higher. Add to this the \$200 million in new gizmos already built for the Hubble and you get a woeeful picture. By not spending \$500 million to service the telescope (and add many more years to its life), we will probably have to spend the same amount to bring the telescope crashing down. (A servicing mission could attach rockets for eventual controlled re-entry far more easily and cheaply than a robotic mission.)

In fairness to NASA, the agency is in a bind. It has been directed to write a new chapter in human space exploration. But it has also been asked to undertake this mission on the cheap. Although it might sound reasonable to prod the agency to find a less valuable program to cut, under these circumstances that won't be so easy.

Thankfully, there's a way to save the Hubble. The solution is similar to one that might have been devised had the University of Hawaii gone off its rocker and decided to dynamite Mauna Kea. The answer is a Congressional grant. In this case, Congress should give the Hubble two more shuttle missions and another decade or more of discoveries. A billion dollars isn't peanuts, but it would be of incalculable value in our quest to understand the universe and our place within it. □

It's a mistake to let the Hubble Space Telescope die.

nant program. It's also the source of important science. In 2002, more than 3,500 published scientific papers grew out of Hubble observations.

More to the point, scrapping the Hubble could be as expensive as saving it. Without servicing by the shuttle, it will inevitably fall to Earth, and NASA