

Hubble fix a boost for CU, Ball

NASA plans repair project

By Todd Neff

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Space-shuttle astronauts will repair the Hubble Space Telescope and install two Boulder-built instruments in 2008, extending the 16-year-old observatory's life until 2013 or longer, NASA Chief Michael Griffin announced Tuesday.

The action ends 2½ years of uncertainty facing the University of Colorado team behind one of those instruments, the Cosmic Origins Spectrograph. CU astrophysicist James Green designed the device; Ball Aerospace & Technologies Corp. built it.

Chief Hubble scientist David Leckrone called the spectrograph and the Wide Field Camera 3, also built by Ball Aerospace, "crown jewels" that would push the limits of what Hubble was designed to do.

But the decision to fix Hubble extended beyond its prospects for advancing science, said Douglas Duncan, CU's director of astronomical observatories, at a Fiske Planetarium event Tuesday morning.

"I think without the enormous public support for Hubble, this wouldn't be happening," Duncan said.

CU estimates that all told, NASA will spend between \$70 million and \$80 million on the spectrograph program. About \$20 million of that will pay for science work based at CU and elsewhere in the coming years, said Michael Shull, a CU astrophysicist and spectrograph science team member. He said the official go-ahead means CU will hire about 10 postdoctoral researchers and 10 graduate students in the coming years.

The two Boulder-built instruments have been waiting for a lift to Hubble since January 2004, when NASA's previous

administrator, Sean O'Keefe, scrapped a planned repair mission. He was worried about astronaut safety in the wake of the January 2003 Columbia space shuttle disaster.

Hubble is too far from the International Space Station to seek shelter if disaster strikes. The \$900 million repair mission will have a second shuttle standing by for launch within the 25 days an orbiting shuttle can sustain itself, NASA says.

CU's Cosmic Origins Spectrograph will be able to detect ultraviolet light 30 times fainter than Hubble's Space Telescope Imaging Spectrograph, installed on Hubble in 1998. That instrument failed in August 2004 and also is slated for repair during the \$900-million Hubble reserving mission, which will be the fifth time a space shuttle has visited the telescope.

NASA chief Griffin said the agency is planning on a May 2008 launch, and that Hubble should still be doing science even if the launch slips to October.

Charles Danforth, a postdoctoral researcher working on the CU instrument, said the spectrograph's flight will let him continue working in ultraviolet astronomy.

"I've been in ostrich mode, hiding my head in the sand and hoping it will all work out," Danforth said.

In addition to instrument work, the repair mission will replace Hubble's six gyroscopes and six batteries; add insulation to instrument compartments; and prepare Hubble for a smooth plunge back to Earth when the telescope fails sometime after 2013. The space shuttle will lug 22,000 pounds of equipment into orbit for the mission, NASA officials say, and it will take alternating pairs

of astronauts five space walks lasting six hours each to get the work done.

Once the mission is complete, Ball Aerospace will have built all the working Hubble instruments — either five or six of them, depending on the success of the Space Telescope Imaging Spectrograph fix.

"It's about a lot of hard work bearing fruit and seeing scientists make use of it to make future discoveries," said Harold Reitsem, Ball Aerospace's deputy for advanced systems and program performance.

The delay led to improvements to the Wide Field Camera 3, he said, due to technological advances since Ball Aerospace first finished the camera in 2002. The instrument's 16-megapixel sensor now has newer electronics to help boost the camera's sensitivity, Reitsem said.

Ball also built the corrective optics to fix Hubble's blurred vision in 1993, which U.S. Sen.

Barbara Mikulski, D-Md., called "the most expensive contact lens in world history" at NASA's Tuesday announcement.

Mikulski has been a champion of Hubble and other science missions. U.S. Rep. Mark Udall, D-Eldorado Springs and a member of the House Committee on Science, has also supported a Hubble repair mission.

"Today's decision is a victory for science, for exploration, and for Colorado," Udall said in a statement.

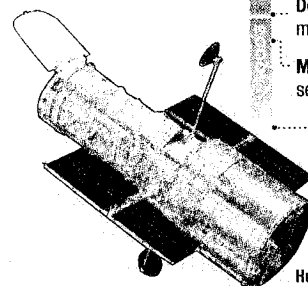
CU scientist Steven Penton has worked on the Cosmic Origins Spectrograph since 1999. Despite the project's uncertainty, he and other scientists have been testing the instrument and planning the spectrograph's action in orbit.

"It's like Christmas on Halloween," Penton said.

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Focus on the future

NASA will launch a final manned space shuttle mission, likely in May 2008, to replace aging batteries, guidance sensors and gyroscopes on the 16-year-old Hubble Space Telescope.



- 1977 Congress approves funding
- 1981 Operations begin in Baltimore
- **April 24, 1990** Launch of shuttle Discovery
- **April 25** – Hubble Space Telescope deployed into orbit
- **December 1993** – Hubble Servicing Mission 1 is launched to conduct maintenance, install new instruments and correct the optics in the primary mirror
- **Feb. 11, 1997** – The second servicing mission to install new instruments and replace spacecraft components
- **Dec. 19, 1999** – The first part of third servicing mission is launched
- **March 1-12, 2002** – Second part of the third servicing mission is completed
- **May 2008** – Possible servicing mission to take place. Mission would add two new camera instruments, upgrade aging batteries and stabilizing equipment, add new sensors and repair a light-separating spectrograph.

Hubble Space Telescope