Mike Shull, professor of astrophysics at the University of Colorado at Boulder, sits in front of a photo taken by Hubble as CU and Ball Aerospace staffs celebrate NASA's decision to service the scope.

CU, BALL GIVEN STARRING ROLE
NASA decision authorizes new "eyes" for Hubble telescope

By Katy Human
Denver Post Staff Writer

Boulder — Space shuttle astronauts will repair the Hubble Space Telescope in 2002 and install $645 million in Colorado-built instruments to sharpen Hubble's vision, NASA announced Tuesday.

Astronomers applauded the decision, which also gives the University of Colorado about $20 million in research grants to study the origin of the universe, exploding stars and the birth of galaxies.

"This will allow us to hire 10 Ph.D.s, 10 graduate students, at least 10 undergraduates who will spend five more years solving the problems of the universe," said CU astrophysicist Mike Shull.

The decision by Michael Griffin, head of the National Aeronautics and Space Administration, reverses his predecessor, Sean O'Keefe, who ruled a rescue mission too risky after the shuttle Columbia exploded in 2003, killing seven astronauts.

Launched in 1990, Hubble's batteries and gyroscopes are aging, and the telescope would likely die by 2009 without servicing, NASA said.

Servicing should keep Hubble alive until 2013.

The mission will also install two new devices built by CU and Boulder-based Ball Aerospace and Technologies Corp.

The equipment has been sitting and waiting for three years to be added to Hubble. CU and Ball collaborated on the $70 million Cosmic Origins Spectrograph, designed to detect light from the universe's earliest times.

Ball also built the $25 million Widefield Planetary Camera 3, which can shoot images of other planets, newborn stars and distant galaxies.

NASA's Griffin estimated the total cost of the mission at $900 million, which will be pulled from NASA's current budget.

"We are very, very pleased," said Harold Reitsema, deputy director of civil space at Ball.

Using Hubble, scientists have proved the existence of massive black holes and shown that the universe is about 13.7 billion years old and expanding.

Hubble scientists have been able to study the atmosphere of planets orbiting stars other than the sun.

They have also shot pictures of some of the universe's earliest objects, which formed less than 1 billion years after the Big Bang.

Reitsema and others call Hubble "the people's telescope," because any scientist can request Hubble time for research.

"More than 1,000 astronomers are actively using data from Hubble," Reitsema said. "It is, by far, the largest supplier of astronomical observations."

Spectacular images shot by Hubble also inspire nonscientists, said Shellah Andrews, a volunteer at CU's Fiske Planetarium.

"I'm here because of awe, because of wonder, because I have a reverence for space," Andrews said. "Hubble has given us so much insight and clarity about our universe. To have let it go would have been such a shame."

Hubble's new instruments may help solve what Shull called the "missing matter and missing metals problems."

By pointing Hubble at distant quasars, researchers should be able to see if low-density intergalactic gas can account for some matter that astronomers believe is in the universe, but haven't been able to locate.

At the end of the next servicing mission, all of Hubble's instruments will have been built by Ball engineers, Reitsema said.

"We're taking ownership of Hubble," Reitsema quipped.

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Hubble's troubles

Astronauts will repair the aging Hubble Space Telescope in 2008, NASA officials said Tuesday, to the delight of astronomers and engineers in Colorado. Without a rescue mission, Hubble was expected to die by 2009. With repairs, it could last until about 2013. Here’s a look at some of its components and problems.

**Space Telescope Imaging Spectrograph**

Built by Ball Aerospace and Technologies Corp., it was installed on Hubble in 1997 and was the telescope's black-hole hunter. It died in 2004.

**Cosmic Origins Spectrograph**

Ball Aerospace and University of Colorado experts finished this instrument at a cost of about $70 million. It will be installed on the next servicing mission.

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**Near Infrared Camera and Multi-Object Spectrometer**

Built by Ball, it was installed in 1997.

**Advanced Camera for Surveys**

Built mostly by Ball engineers in Boulder, it is Hubble’s most up-to-date instrument. It was installed in 2002.

**Widefield Planetary Camera 2**

Built in California, it dates to 1993 and is the Hubble’s workhorse, producing many of the space telescope’s most famous images. It will be replaced by version 3, built in Boulder by Ball Aerospace.

**Gyrosopes**

Of Hubble’s original six gyroscopes, which point the telescope, only two are working reliably. Shuttle astronauts will replace the failing devices.

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Photo courtesy of NASA

Size: About the size of a tractor-trailer truck
Length: 43.5 feet
Weight: 25,000 pounds
Maximum diameter: 14 feet

Sources: NASA; European Space Agency; Space Telescope Science Institute

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