Hubble: From cosmic joke to cherished eye in space

May 10 2009, By SETH BORENSTEIN , AP Science Writer

FILE - These 1994 file images provided by NASA, show how the same galaxy core, M100, was viewed, left, by the Hubble telescope before it was repaired in 1993. At right, viewed with the Wide Field Planetary Camera-2, which is being replaced in the May 2009 Atlantis mission, the same galaxy core appears much sharper after the initial fix. (AP Photo/NASA, File)

(AP) -- Using the power of pictures, the Hubble Space Telescope has snapped away at the mystery of the universe.

For 19 years, Hubble has shown the epic violence of crashing galaxies, spied on the birth and death of stars, taught cosmic lessons, and even provided comic relief.

In Hubble's photos, believers witness the hand of God, nonbelievers see astronomy in action, and artists discover galaxies worthy of galleries.

Now, Hubble is set to get its fifth and final fix-up. If all goes as planned, space shuttle Atlantis will lift off Monday on a flight to the orbiting telescope 350 miles above Earth. In five painstaking spacewalks, astronauts will repair and replace broken instruments, add a new long-gazing camera, and then say goodbye forever to Hubble. If it all works, Hubble will get another five to seven years of life, before it is remote-control steered into a watery grave.

Hubble doesn't just illustrate the story of the universe. It has its own story, complete with failure and redemption.

Senior Hubble scientist Mario Livio rhapsodized about the drama of Hubble's own story, "turning something that could have been the biggest scientific fiasco to the biggest scientific success."

After its launch into space in 1990, the Hubble Space Telescope was stuck with blurry vision because its mirror wasn't quite right. It was the butt of jokes by late night comics; an editorial cartoon said its designer was Mr. Magoo, a nearsighted cartoon character. It seemed like a massively overbudget screw-up.

But once it was fixed three-and-a-half years later with a new set of glasses, Hubble shed its myopic reputation. It began producing far-sighted images of space that seemed more art then astronomy.

Hubble helped pinpoint the age of the universe at 13.7 billion years, explain what's in it, and show where it is going. Its photos hinted that as a planet, Earth may not be alone. Just one picture of warped distant galaxies provided visual proof of Einstein's general relativity theory.

"Hubble actually allows our human minds and spirits to travel light-years, even billions of light-years," said NASA sciences chief Ed Weiler. The photo "Hubble Ultra Deep Field" views a time when the universe

was about 700 million years old, so the stars in it are 13 billion light-years away. One light-year is 5.9 trillion miles.

A new camera to be installed in this flight should enable astronomers to look an extra 200 million light-years farther back, said Hubble chief scientist David Leckrone. He said if everything goes well with the repair mission, Hubble will be at its sharpest ever.

It was a Hubble image in 1995 that forever restored the telescope's tarnished early reputation. The picture was Eagle Nebula. It was stunning, with beautiful colors and dramatic clouds where stars formed. NASA called it "the pillars of creation."

And the public, which once snickered at Hubble, now was smitten.

Hubble has snapped 570,000 pictures, and while some catch the birth of stars and planets, others capture the other end of life - death and violence on a cosmic scale.

"We have 20 gorgeous images of stars like our sun dying," said Hubble astronomer Frank Summers. "They are just amazing. It boggles the mind to think that stars that are so similar can die in such different ways."

When age finally caught up with Hubble - it was designed to last 10 to 15 years - NASA first decided the telescope would just have to slowly die. An astronaut repair mission was deemed too risky during the time period shortly after the 2003 Columbia shuttle disaster, which claimed seven astronauts. But ultimately, public opinion and politicians persuaded NASA to change its mind. Sentiment and the promise of more stunning images beat out calculations of risk and cost.

"It has truly become an icon of American life," said Weiler, the public face of Hubble since its launch.

While the public loves Hubble from afar, those who know it up close find it has a personality.

"It's almost impossible not to start feeling like Hubble is a living being," said astronaut John Grunsfeld who has repaired the telescope twice already and is slated to get under Hubble's hood a third time. "It's just another satellite, but once you've worked in the program and are smitten with it, it is very easy to start adding personality to Hubble.

"I do feel like ... I'm going to visit an old friend that I haven't seen in a long time that will be a little bit weathered, a little bit older," Grunsfeld said in a news conference last fall. NASA hasn't visited Hubble for seven years and is expecting many signs of wear and tear, including holes from space junk.

The telescope has been anything but cheap. NASA thought it could build Hubble for $300 million, but it actually cost more than five times that. With all the fixes and upgrades and decades of use, the total cost will be close to $10 billion by the time it dies, but no one is complaining about that pricetag, Weiler said.

Astronomer Livio said certain pictures remind him of abstract paintings. The colors - added in once they reach the ground because the cameras only shoot black-and-white - can be garish. But then so is the universe.

"This is art on a grand scale," astronomer Summers said.

On the Net:

The Hubble Space Telescope site: http://hubblesite.org/