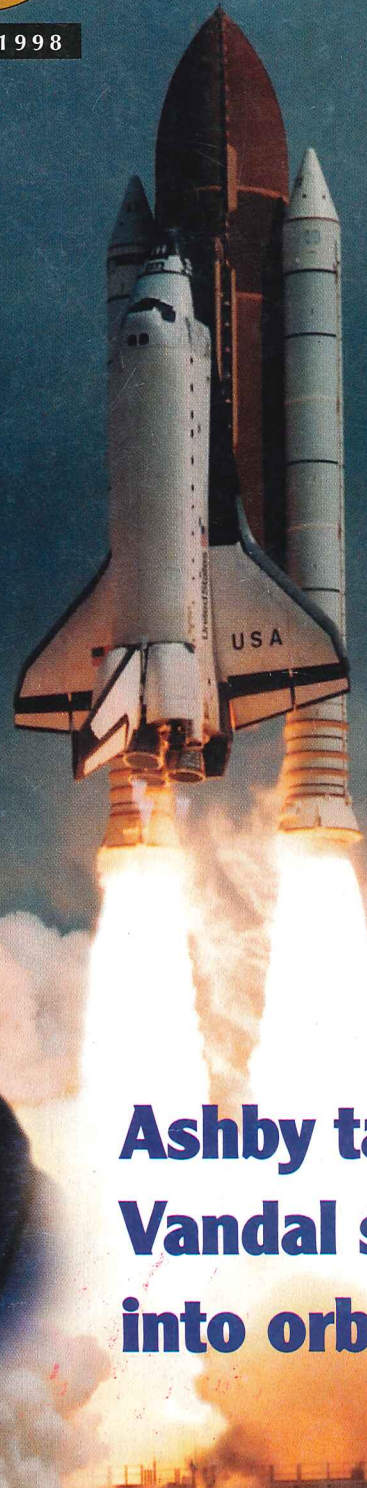


Here we have
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**Ashby takes
Vandal spirit
into orbit**

Jeff Ashby '76



Eileen Collins



Steve Hawley



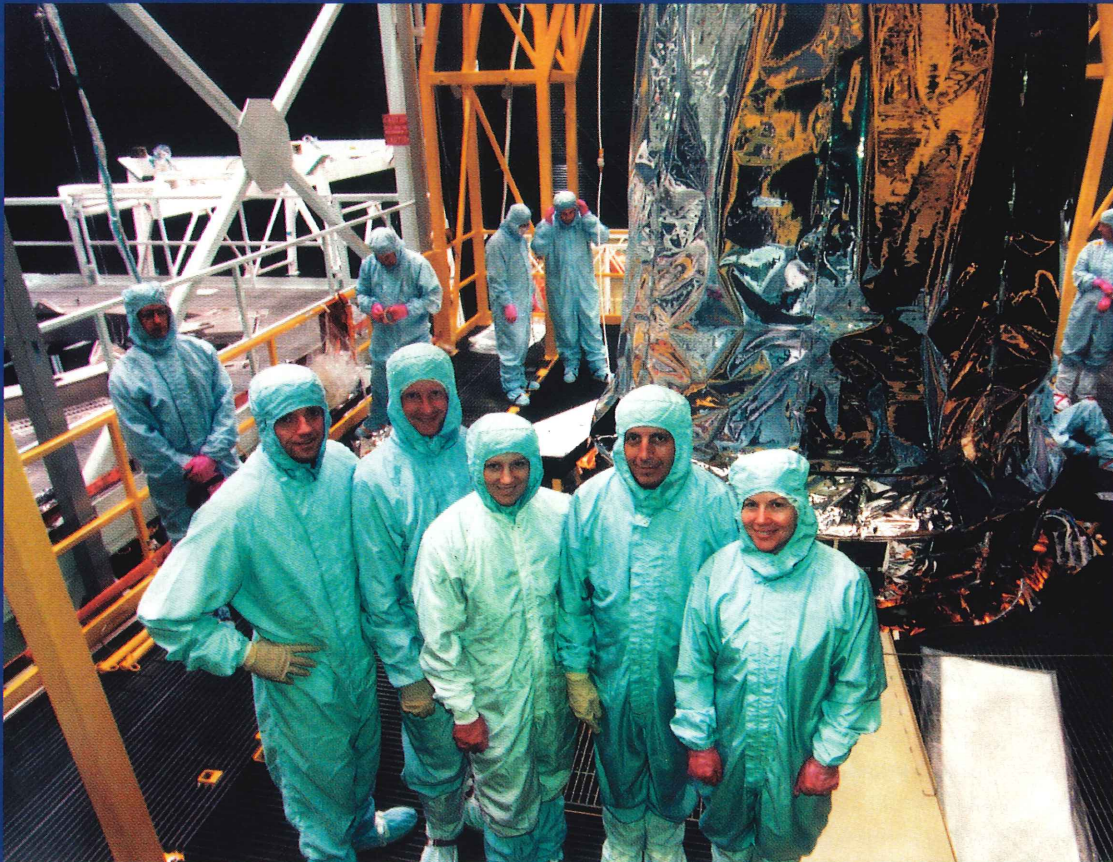
Cady Coleman



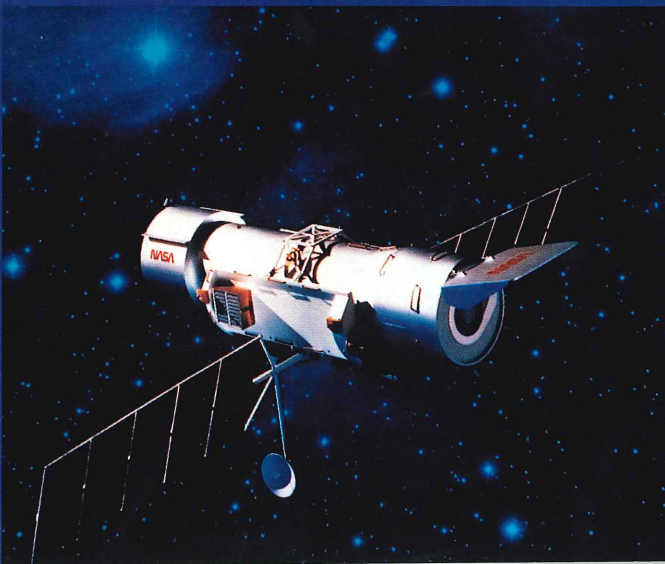
Michel Tognini



Vandal astronaut counts down to orbit



(Above) STS-93 crew members -Ashby at far left- toured the Advanced X-ray Astrophysics Facility Operations Control Center in Cambridge, Mass., to learn how critical data will be monitored while AXAF is in the shuttle bay. (Below) A model of AXAF. Photos courtesy of AXAF Science Center and the Lyndon B. Johnson Space Center Media Service Corp., Houston, Texas.



**Mission
deploys
most
powerful
X-ray
observatory
ever**

By Marla Kale

University of Idaho alumni, you'll want to pay special attention to the five-day Space Shuttle STS-93 mission this winter. One of your own will be piloting the orbiter.

Navy Captain Jeff Ashby '76, a rookie to space flight, is currently in training for the 26th mission of the Space Shuttle Columbia, tentatively scheduled to launch this January from the Kennedy Space Center. Ashby's mission will be credited with having the first U.S. woman commander, Eileen Collins, an astronaut since 1990, who served as pilot on two previous shuttles. Other crew members are mission specialists Cady Coleman, Steve Hawley and Michel Tognini of France.

STS-93 is the deployment mission for the Advanced X-ray Astrophysics Facility (AXAF), the largest and most powerful X-ray observatory ever constructed. AXAF is the third of NASA's observatories, after the Hubble Space Telescope and the Compton Gamma Ray Observatory. Its images will be more than 10 times sharper than any previous telescope, and it can precisely measure the energies of X-rays coming from cosmic sources such as exploding stars, black holes and clouds of hot gas.

X-rays are a high energy, invisible

form of light, produced in the cosmos by gas that's been heated to millions of degrees by violent and extreme conditions. Much of the matter in the universe is so hot it can be observed only with telescopes. Because X-rays from space are absorbed by the earth's atmosphere, observations must be done in orbit above the Earth.

After deployment from the Space Shuttle Columbia's cargo bay, a built-in rocket system will boost AXAF into a high, elliptical Earth orbit from which it will explore regions of the universe where X-rays are produced. The AXAF telescope's mirrors will focus X-rays from celestial objects, and instruments housed on AXAF will record the number, position and energy of the cosmic X-rays, enabling scientists to study the sources' other properties.

Information produced by AXAF could reveal more about the mysteries of supernovas; the extreme gravity around black holes; and the inner workings of starlike quasars. Data is expected to show

how clusters of galaxies evolve and will be used to test theories on the origin and evolution of the universe. The telescope is expected to provide new information to scientists around the world for at least five years.

Ashby said Columbia was chosen for this particular mission because it's the "oddball" shuttle not configured

for use with the international space station, which leaves it with more payload space needed to house the 45,000-pound AXAF spacecraft (telescope and rocket engine) prior to its deployment.

Because of the AXAF spacecraft's weight, the Columbia astronauts will take fewer on-board experiments with them than previous missions have. Columbia mission specialists will work with some 20 experiments with objectives that range from materials processing to medical research.

Ashby's responsibilities will be to manage the orbiter's electrical, hydraulic and environmental systems.

"Eileen has some of the systems on her side of the cockpit, and I have many of them on mine," said Ashby. "We monitor the systems primarily on ascent because it's pretty much automatic, and then, we have some computer input to make and some switches to throw for different functions. Once we get into orbit, I continue to maintain the vehicle.

"It's kind of an interesting role reversal. Eileen's in charge of running the place, and I'm doing the vacuuming and washing the windows and taking care of the toilet and those day-to-day chores that are part of taking care of the vehicle so the scientists onboard can conduct their experiments."

The UI alum explained that on orbit *everything* floats.

"Dust doesn't drop to the floor like it does here, so it's in the air, and the crumbs and the pencils and the pens and the socks... all that stuff moves with the air flow into the filters. Everything has filter screens on it, so a couple of times a day, I have to go around and literally vacuum the filters and pull the pens and socks out and re-stow them where they're supposed to be. There is some maintenance."

Because the vehicle is very reliable, Ashby said he can look forward to some "time to look out the window." He's in charge of the mission's Earth observations and making sure the

"We will focus on and execute the details, but overlaying that is the great sense of responsibility and a real excitement about seeing this view of our planet."



COVER STORY

cameras are set up to take both pre-planned photographs as well as the unplanned shots, such as the volcano eruptions captured on film by past shuttle astronauts.

“Our training certainly focuses on the details, such as which global sites we’ll photograph and the deployment of the telescope itself, but it is very easy to keep sight of the bigger picture. For me, that bigger picture is the personal experience of being able to get into space and

look back on our planet and wonder about what our future holds.

“There’s also a bigger element in terms of releasing this telescope, which will provide knowledge for our children and grandchildren and for many generations to come. So there are different components to it, but the experiences will not be lost on me, or on the others – that’s for sure. We will focus and execute the details, but overlaying that is the great sense of responsibility and a real excitement about seeing this view of our planet.”

At the mission’s conclusion, Collins will land the orbiter manually – a one-chance operation – and Ashby trains as a backup for those duties in the event that Collins cannot perform them due to such difficulties as a shattered windscreen or broken control stick. He will assist in the 240 m.p.h.-landing by throwing switches, lowering the landing gear and putting out the parachute.

Being an astronaut has been Ashby’s goal since he was 15 years old. “I was working as a dishwasher in a restaurant in Colorado the day the Apollo astronauts landed on the

moon. The manager came back into the kitchen and told us to come out and watch the landing with the

customers. I have wanted to be an astronaut since I saw Neil Armstrong walk down that ladder. I think it became a dream as I grew up, and I recognized it as a dream that night. It became a goal toward which I steadily worked myself. When I finally saw myself as being in a position to be competitive enough to submit an application, I did. But that was a 25-year process.”

Ashby earned a bachelor of science degree in mechanical engineering from UI in 1976 and a master of science degree in aviation systems from the University of Tennessee in 1993. During his more than 21 years in the Navy, he spent 18 years as a

Ashby’s responsibilities will be to manage the orbiter’s electrical, hydraulic and environmental systems.

To learn more

For more information on Jeff Ashby’s mission aboard the Space Shuttle Columbia, you may want to visit these and other web sites:

www.jsc.nasa.gov – Johnson Space Center homepage

www.ksc.nasa.gov/shuttle/missions/sts-90/vrtour – a virtual tour of the Columbia

www.jsc.nasa.gov/Bios/ – the NASA Internet biography homepage, with information on the crew or any individual astronaut

www.xrtpub.harvard.edu/Xray/xastro.html – a history of X-ray astronomy

www.xrtpub.harvard.edu/Press/fact.html – an AXAF fact sheet

Navy fleet pilot and earned many honors including the Distinguished Flying Cross and the Meritorious Service Medal. He is a graduate of the Naval Test Pilot School and the Naval Fighter Weapons School (Top Gun, 1986). He was the Navy Attack Aviator of the Year in 1991.

Astronaut Jeff Ashby '76 visited the UI Moscow campus in May for the 1998 Idaho Engineering Design Exposition. In this photo he talks to exhibitor Jeff Daniels '98, who met Ashby when he and other UI students conducted an experiment in zero gravity aboard the “Vomit Comet” (NASA’s KC135 airplane) used in training astronauts.

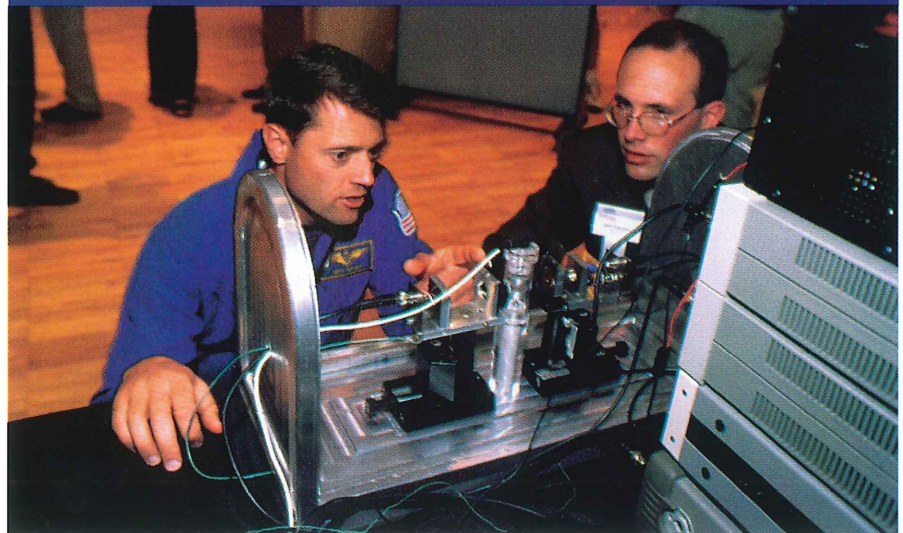


Photo by Phil Schofield



Photo courtesy of Johnson Space Center

Training for space shuttle flights usually takes from eight months to a year, at about 40 hours weekly, including learning about orbiter procedures and payloads. In addition, astronauts engage in physical training, self study, administrative tasks, and for some, keeping up their flying skills. Ashby trains at both the Johnson and Kennedy space centers. The crew meets two to three times a week in a simulator, all learning different aspects of the mission.

He was selected by NASA in December 1994 and reported to the Johnson Space Center in March 1995. He has had technical assignments and has served as an assistant to the director of Flight Crew Operations. He was assigned to the SPS-93 mission in March 1998 and has been in training since that time.

"Training is a full-time job with very little time off, and it's going to get busier as the mission date approaches," he said. "Every bit of it is truly enjoyable."

When the mission blasts off in January, Ashby expects the ride to orbit to be quite a "rush," going from zero to 17,000 m.p.h. in eight and a half minutes.

His explanation is enough to give you a rush. "It's fire and thunder and shaking and the changing of the sky from gray to blue to deep blue to black, and obviously, the excitement about all this fire coming out the back — and that's where you want it to stay — and all the contingencies that we have for engine failures and things like that. These are all the things we train for.

"So until you hit eight and a half minutes and evaluate your velocity, you

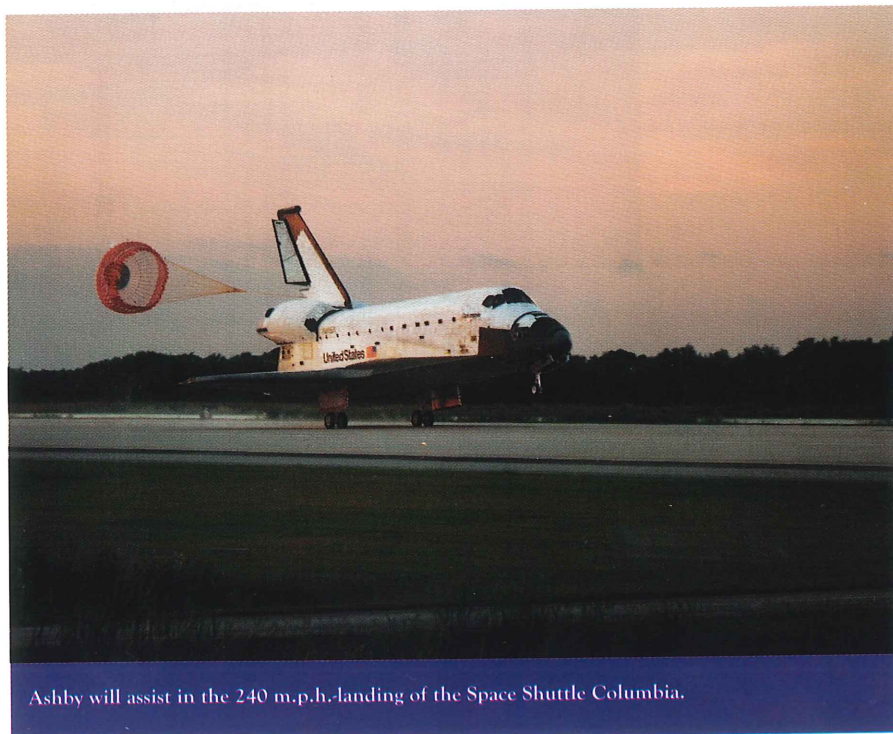
don't really know if you've made it to orbit. So there's a certain excitement associated with that. The training helps to give us a lot of confidence, and we're very confident in the engineers and the scientists. I'm excited about it, but I'll be more excited when the day comes. My

mother is much more excited than I am."

When he does lift off, he'll carry a University of Idaho memento onboard with him — a silver President's Medallion. "We are allowed to take a handful of items for organizations, and generally, schools, non-profit organizations and foundations qualify." In addition to the medallion, Ashby will carry items from Navy organizations and something special from the Melanoma Research Foundation, an organization founded by his late wife, Diana. The items will be vacuum packed and stored beneath the crew compartment floor.

As he prepares for his first space flight, Ashby said he is proud to be a NASA astronaut.

"For me, life is much more meaningful having the ability to wonder what is out there and to explore and develop our knowledge of where it is our universe came from and where it is we're going. For me, those things are very exciting, and they make my life more meaningful. I'm very happy to be a part of the space program and to pass this wonder and knowledge on to future generations."



Ashby will assist in the 240 m.p.h.-landing of the Space Shuttle Columbia.

Photo courtesy of Johnson Space Center