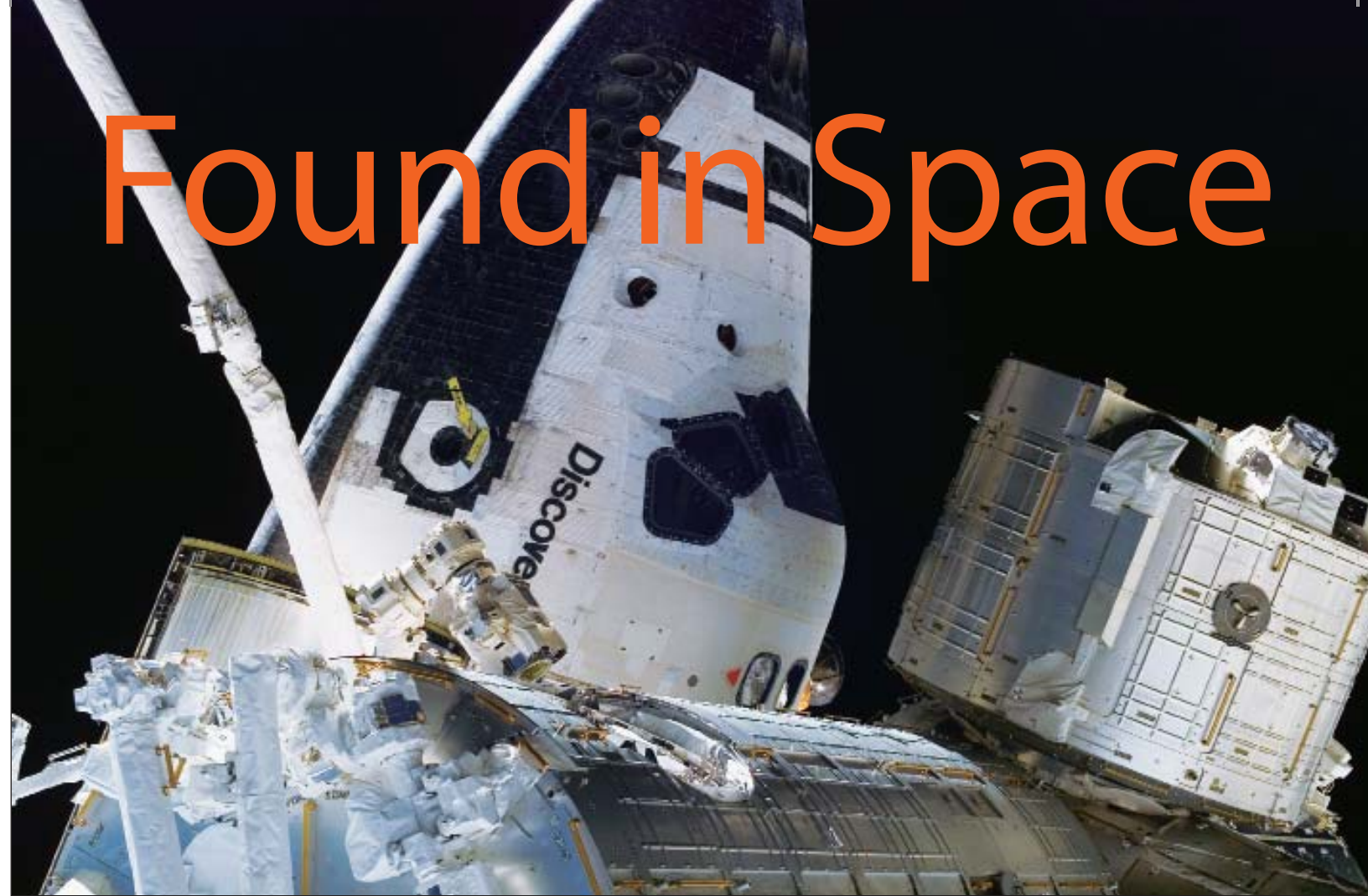


Found in Space



A photo taken during an Extra Vehicular Activity during shuttle mission STS-124. Shuttle Discovery is visible behind components of the Japanese Experiment Module Kibo. The largest section of Kibo, seen in the bottom of the photo, was delivered to the International Space Station during this mission.

RIT grads pursue rewarding careers at NASA

John Glenn, Eileen Collins and Rochester's Pamela Melroy are among the public faces of space exploration. It takes the dedication of thousands, many who work inconspicuously, to support these astronauts and their flights.

RIT alumni at NASA's Johnson Space Center in Houston are part of the team making those missions possible.

Graduates first launched careers at Johnson Space Center more than 20 years ago and the RIT family there has steadily grown. NASA recruiters visited campus in 1987, hiring seniors Mark Sowa '87 and Sheri Dunnette Locke '87, both from the imaging and photographic technology program in the College of Imaging Arts and Sciences.

Sowa heads the six-person Imagery Acquisition Group. No two days are alike. Their daily photo assignments may include taking group and individual astronaut portraits, shooting aerials for the U.S. Coast Guard, documenting participants on the

"Vomit Comet" (see related story, page 16), shadowing astronauts at water survival training in Pensacola, Fla., and shooting photos and video of a parachute drop test in Yuma, Ariz., for NASA's Constellation program.

"I tell my staff what they see through their viewfinders is what will be seen by historians for generations to come," says Sowa. "We always wonder, 'What if Christopher Columbus had a photo staff?' Imagine the images that would have been captured – the building of the ships, the cargo, and the journey itself. Our jobs are no different as we document this great effort of space exploration."

Locke also started as a photographer, but is now part of the astronaut office in the information technology group. She is an IT lead who ensures that the astronauts have the computers and software they need while training for space flight. Her office also assists the astronauts in culling the photos they shoot in space.



Sheri Dunnette Locke '87 is certified to fly as a backseat photographer aboard NASA's T-38 jets.



Paul Reichert '01, left, explains the Extra Vehicular Activity camera to astronauts Matt Abbott (lead space shuttle flight director, upper left corner), Dave Williams, center, Tracy Caldwell and Rick Mastracchio. They're in the orbiter processing facility at Kennedy Space Center in Florida.

"They don't have time while on orbit to do it themselves so we pick out their best images," says Locke. "It's my goal to make their jobs easier. The astronauts work so hard and put in so many hours. It's important for me to make it as easy as possible to help them be productive."

Even though Locke no longer shoots full-

time, making images is still a passion. She is certified to fly as a backseat photographer aboard NASA's T-38 jets shooting air-to-air photographs.

Imagery obtained in space is the focus of recent graduates from RIT's imaging and photographic technology program.

Steve Marchiando '97, Paul Reichert '01 and Katrina Willoughby '04 train the astronauts to use the cameras and video systems on board the space shuttles and International Space Station (ISS).

Marchiando and Willoughby support flights to the International Space Station and Reichert works with the crews on the shuttle missions.

As part of the Photo TV Group, they teach classes, write the crews' procedures and support the flights while in orbit. Their preparations begin 18 months prior to a scheduled mission.

"The training is a huge job," says Reichert. "We teach 70 to 80 imaging classes for each mission's training flow. We'll add sessions if any of the astronauts needs extra training. We spend a significant amount of time with the crews."

When one of the remaining orbiters in the fleet – Discovery, Endeavour or Atlantis – flies to the International Space Station, there is only one opportunity to photograph certain vantage points of the shuttle during the rendezvous. It's at this time that the shuttle does a back flip, allowing the crew to photograph critical thermal protection surfaces.

"The International Space Station crew takes photos and documents all degrees of the orbiter," says Willoughby. "We teach them how to do photo documentation



Robert Scharf '94 at the Thermal Protection System Imagery coordinator console in the Shuttle Mission Evaluation Room at Johnson Space Center during a mission in March 2008.

when the shuttle flips over, what is called an R-bar pitch maneuver. Their window to get those images lasts just six minutes. It's a very nerve-racking event because it could potentially be the safety of their friends going home on that orbiter."

Examining those images to determine if there is potential damage is where the expertise of Robert Scharf '94 (imaging science) and his team in the Image Science & Analysis Group is called upon.

Scharf supports the daily operations of the ISS with ISS exterior imagery analysis support and is called in to consult on imagery if there are any anomalous concerns on the exterior of the ISS. When one of the shuttles is in flight, his role changes.

"I wear a different hat," says Scharf. "I'm managing the receipt of imagery, making sure it gets to our labs, and then reporting results of the analysis back up to management. So I become a focal point of communications during the mission."

Scharf's group was created as a result of the 1986 Challenger accident. On the day of a shuttle launch, his team gathers in the laboratory to watch the launch in real time and then on high-speed films running at up to 400 frames per second, looking for anything abnormal.

Scharf, of Horseheads, N.Y., came to Johnson Space Center in 1995. On his first day, he found himself in a meeting with Eileen Collins, the first woman to pilot a space shuttle, who grew up in nearby Elmira, N.Y.

"We were reviewing technical photos taken after her shuttle mission to the Russian space station Mir," says Scharf. "Here I was sitting behind Eileen and just a month before I was at my parents' house, watching the mission on television, knowing I was coming to work here, but not knowing what it would all be about."

Adds Reichert, "When you first start out you are a little star struck because it's like 'Wow, this person flies in space.' After a while though, they become your colleagues and your friends. They are helping us and we are helping them. We are all trying to reach the same goal."



Robert Markowitz '89 photographing astronaut John Young. During his 18 years at NASA, Markowitz has photographed many astronauts and shot John Glenn's official portrait for Glenn's shuttle flight in 1998. One of his favorite assignments was serving as still photographer during the filming of Apollo 13 aboard NASA's vomit comet.

RIT and JSC

Many RIT graduates are working at NASA's Johnson Space Center in Houston. Some are employed by NASA; others work for companies that contract with NASA. This list was provided by Mark Sowa '87 (imaging and photographic technology), who works in the Imagery Acquisition Group.

- Kevin Beaulieu '02 (imaging science) – Image Science & Analysis Group
- David Bretz '95 (imaging science) – Image Science & Analysis Group
- Lauren Harnett '07 (imaging and photographic technology)
 - Imagery Acquisition Group
- Andy Klausman '86 (computer engineering) – Flight Software (off site)
- Sheryl Dunnette Locke '87 (imaging and photographic technology)
 - Astronaut Office IT Support
- Steve Marchiando '97 (imaging and photographic technology)
 - Photo/TV Training
- Robert Markowitz '89 (imaging and photographic technology)
 - Imagery Acquisition Group
- Thomas Oziomek '05 (packaging science)
 - Space Food Systems Laboratory
- Paul Reichert '01 (imaging and photographic technology)
 - Photo/TV Training
- Thomas Scarsella '91 (imaging science)
 - Photographic Operations Group
- Robert Scharf '94 (imaging science) – Image Science & Analysis Group
- Crystal Schroeder '98 (imaging and photographic technology)
 - Photographic Operations Group
- Richard Slater '77 (photo processing and finishing management), '89 (instructional technology) – Information Technology Services
- Katrina Willoughby '04 (imaging and photographic technology)
 - Photo/TV Training

Kelly Downs



Greg Sharp '08, right, and Jarret Whetstone '08 celebrate the success of their experiment aboard NASA's Weightless Wonder.

RIT team rides 'Vomit Comet' in the name of science

Three recent graduates and one student from RIT's imaging and photographic technology program experienced human space flight without leaving Earth's orbit last July.

James Craven '08, Greg Sharp '08, fourth-year student Christopher Ubelacker and Jarret Whetstone '08 earned an opportunity to fly aboard NASA's Weightless Wonder, a C-9 aircraft that climbs to a 45-degree angle over the Gulf of Mexico and then nosedives to simulate zero gravity.

RIT's team spent a week at NASA's Johnson Space Center in Houston as part of its Reduced Gravity Student Flight Opportunities Program. Student teams from other top universities including Brown University, University of Michigan, University of Kansas and University of Texas were also accepted. The program allows undergraduate students to propose, build and fly a reduced gravity scientific experiment. RIT was one of 40 selected from more than 80 submissions.

"I am really excited I got to go," says Sharp. "It was a lot of fun. I had to keep grabbing onto things to keep myself from floating all over uncontrollably."

The aircraft, popularly known as the "Vomit Comet," follows a parabolic flight path over the Gulf of Mexico, providing

short periods of free fall in which people experience reduced gravity or weightlessness, similar to a ride on a rollercoaster. During

"Weightlessness is quite an interesting experience — along with the nausea that comes with it."

Jarret Whetstone '08

the 90-minute flight, participants experience more than 30 free falls, each lasting between 18 and 25 seconds.

The RIT team's experiment looked at the feasibility of inkjet printing in a microgravity environment, focusing on print heads, ink drop characteristics, ink drop flight and printing accuracy.

"We tested thermal and piezo electric methods of inkjet printing, printing out standard targets to see if there were changes in quality," says Craven. "We also used a high-speed camera to image an inkjet droplet to determine if there were differences in size, shape, speed and amount."

One potential application of the inkjet technology for long-term space missions would be creating circuit boards.

"Our experiment found the technology is capable of working in a microgravity environment. However, for optimum results,

the printers' moving parts would need to be modified to compensate for those conditions," says Ubelacker. "The movement

degraded their effectiveness."

Team members got to meet astronaut Barbara Morgan and present their experiment. They also toured mission control for the International Space Station.

This is the second time since NASA began the program that an RIT proposal made the cut. A student team flew in 1997.

So did the Vomit Comet live up to its reputation? For some, not all.

"Weightlessness is quite an interesting experience — along with the nausea that comes with it," says Whetstone. "Luckily for me, I did not expel anything."

Kelly Downs

W Web extra:

To watch a video of the team's flights, go to www.rit.edu/news and click on Latest Podcasts.

To learn more about the program, go to <http://imaging.rit.edu>.