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# Roundup

*In one of the most detailed astronomical images ever produced, NASA's Hubble Space Telescope captured an unprecedented look at the Orion Nebula. This turbulent star formation region is one of astronomy's most dramatic and photogenic celestial objects. More than 3,000 stars of various sizes appear in this image, and some of them have never been seen in visible light.*

*The crisp image is a tapestry of star formation. It varies from jets fired by stars still embedded in their dust and gas cocoons to disks of material encircling young stars that could be the building blocks of future solar systems.*



Photo credit: NASA, ESA, M. Robberto (Space Telescope Science Institute), Hubble Space Telescope Orion Treasury Project Team

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## Space Center Roundup

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# A pioneer says goodbye

# FROM THE director

A MESSAGE FROM CENTER DIRECTOR MICHAEL L. COATS



## The Exploration Wellness Program

The Exploration Wellness Program at the Gilruth Center has been a fantastic success. I'm delighted to see that over 4,800 members of our space team have joined the program and are trying to wear out the exercise equipment at Beak's Body Shop. I know I'm pointing out the obvious, but let me emphasize again that even a little bit of exercise has significant health benefits.

What may not be quite so obvious is that we also have to take care of our mental and emotional health. The space program is an exciting and satisfying profession, and we attract the best and brightest hard-chargers in the world, but it can also be a job with long hours and a great deal of stress. During my cardiac rehabilitation I heard several physicians and nurses refer to aerospace as the "widow-maker business." The same type of success-oriented and highly motivated personalities attracted to this work are also the type of people who have a hard time admitting mistakes or admitting they are over-stressed. We're all proud of the comment that "failure is not an option," but the reality is that we're human beings and occasionally we do make mistakes and we do fail. I believe strongly that if we don't fail now and then, we're not reaching far enough. But we also have to learn from our mistakes, let go of them and get on with the new challenge and opportunities (and new failures occasionally). We are all susceptible to stress, and occasionally depression, and it's critical to understand there are times when we may need help in dealing with the pressures of our increasingly hyper society. There is not and should not be any stigma attached to asking for help with *any* physical, mental or emotional problem. Feelings of helplessness or being overwhelmed should not be ignored. Help is available, and we all need to be alert to signs of chronic stress in our coworkers.

Stress is part of our lives, and some of it is actually good for us, but we all need to build resilience to stress with good physical and mental health. We have an outstanding Employee Assistance Program here at JSC, available to everyone. It is located in Building 32, Room 132, and the phone number is (281) 483-6130. The program has well-trained and experienced people who can help. Most of us love to fix things and make them work better. That should include ourselves and each other.

## Aircraft Operations helps shuttles get off the ground

by Kendra Phipps

Most people get their weather reports by turning on the local news, or by searching a weather Web site.

In Florida, there's another option: just ask your friendly neighborhood pilot to jump in a high-tech aircraft and check things out.

To be fair, these are not ordinary five-day forecasts. These "weather reconnaissance flights" are performed by JSC's Aircraft Operations Division (AOD) using the Shuttle Training Aircraft (STA). The flights help determine whether the weather conditions at Kennedy Space Center (KSC) are right for a space shuttle launch, and are just one of the many tasks that AOD performs for each shuttle mission.

"We do weather flights starting about an hour prior to launch," said Alyson Hickey, STA flight simulation engineer. "Usually, the head of the Astronaut Office will be the pilot, giving feedback on sun angle, crosswinds, clouds in the area—anything the (shuttle) pilot might want to know."

Weather flights are also done a couple of hours before a shuttle landing.

The STA's primary function has more to do with runways than raindrops: The aircraft is used to train astronauts to land the shuttle, which acts like a glider on its descent to Earth. The shuttle has been compared to a falling brick—a sensation that the STA, a modified Gulfstream-2, is designed to replicate.

Hickey is part of the AOD team that works on the STA's software requirements.



JSC's Aircraft Operations Division maintains a fleet of aircraft, including the T-38 shown here, that helps support space shuttle missions.

"Our own software runs the simulation, so we keep up with any shuttle changes that would affect the landing portion," she said. "When the shuttle world makes a change, we have to make the same change in our software."

To keep the astronauts current in their landing skills, STA training is a year-round job for AOD. A shuttle pilot may fly in the STA as close as two days before launch.

"As you can imagine, you want to get up-to-the-minute training so it's as close as possible to the mission," said Ken Cockrell, AOD's WB-57 program manager.

As important as STA training is, all of the aircraft in AOD's fleet play important roles in shuttle missions.

To get to and from STA training sessions, which are often held in New Mexico, AOD relies on the T-38 aircraft. T-38s are also used to transport astronauts to KSC prior to launch, while mission managers and crew families hitch a ride to Florida on a Gulfstream-2.

The WB-57 planes were given an important task for STS-114: getting images of *Discovery* during its ascent to check for tile damage.

"It's called the WAVE: WB-57 Ascent Visualization Experiment," said Cockrell.

"Using one or both WB-57s, we fly at 52,000 feet in the vicinity of the path the shuttle takes during ascent to get high-quality imagery." WAVE is scheduled to be repeated for STS-121.

The Shuttle Carrier Aircraft (SCA) is also on standby during each mission in case the shuttle lands somewhere other than KSC and needs a ride home.

"If the shuttle lands at Edwards (Air Force Base), we operate the SCA, which ferries shuttle back to KSC," said Ken Baker, chief of the Flight Operations Branch. Baker said that multiple factors affect how long it takes to get a shuttle from Edwards to KSC—for instance, the weight of an orbiter varies with each mission's payloads and affects how quickly the SCA will use up fuel.

The AOD team strives to keep JSC's entire aircraft fleet ready for any tasks that come its way, Baker said.

"For every mission, we have to be ready. Every plane has to be ready," he said.

"Supporting the space program is always exciting."