

The Honorable Shana Dale
NASA Deputy Administrator
Remarks to
The Organization of Women Executives
October 21, 2008

Thank you Cyd – for the invitation and your introduction. We talked about my speaking about myself and my journey, but I always feel funny when talking about myself. So, if you're interested in that, let's leave it for Q&A.

I focused my talk today on America's space program – something I'm passionate about – and also some of the women of NASA and their achievements.

I'll note, first of all, one who has traveled with me – Roselee Roberts, a woman I have known for many years and count as a friend. She has many years in the aerospace industry and I was thrilled when she decided to join me at NASA and share her wisdom. She recently received a high compliment from a man we all adore, Glenn Posey, who works for her. He said, "I've waited thirty years to work for a boss like her."

And Beth Sokul, who has been such a trooper at NASA. She is another woman I have known for many years. She has a superb analytical mind, a no-nonsense attitude – with a finely tuned "BS" meter – and a sharp wit. And Kathy Manuel, my executive assistant who is meticulous, thorough, and detailed-oriented. She can be nice but don't ever make the mistake of crossing her.

If you're getting the sense I'm surrounded by strong, forceful women, you'd be right. And I've only mentioned a few of them. This team, including my deputy, Charles Scales, keep me going – with their professionalism, fierce loyalty, and ability to make me laugh. That's important in an agency where we're still making remarkable culture changes. Like other industries, aerospace has not always been easy for women to break into and progress up the ranks.

For space exploration, women were contributing to its success before NASA was even established. In the 1940s and 50s, NASA's predecessor, the National Advisory Committee for Aeronautics, hired women with math

degrees to basically be human “computers.” These women were called upon to perform critical labor-intensive calculations using slide rules and mechanical calculators.

In 1960, Nancy Roman became the first woman to hold the position of Chief Astronomer for NASA. She contributed to many astronomical missions, including the Cosmic Background Explorer known as COBE and the Hubble Space Telescope.

Still, the barriers remained high during the 60s. Some of you may have heard about the Lovelace women, sometimes known as the Mercury 13. In 1961, these thirteen women pilots passed the NASA astronaut fitness tests administered at the Lovelace Foundation in Albuquerque, New Mexico. Their accomplishments were published in *Life* magazine, *Time*, *Parade*, and *Ladies Home Journal*. Despite House subcommittee hearings in 1962 investigating their cause, none of these women became a part of NASA.

Finally, in 1978, NASA did choose six female astronaut candidates that were destined to fly. Among them, Sally Ride, who would soon make history as the first American woman to fly in space on the Space Shuttle Challenger in 1983. This year marks the 25th anniversary of her historic flight.

In 1992, Dr. Mae Jemison became the first African American woman to fly in space as the Science Mission Specialist for STS-47. In 1994, Dr. Carolyn Huntoon became NASA’s first female Center Director at Johnson Space Center in Houston, Texas. Just nine years ago in 1999, Eileen Collins became the first female commander for the Space Shuttle. And in her previous mission, she served as the Space Shuttle’s first female pilot. After the tragic loss of the crew onboard the Space Shuttle Columbia, Collins stepped up again to command STS-114, the return-to-flight mission. In 2005, Lesa Roe became the first female Center Director for Langley Research Center in Hampton, Virginia, and I became the first female Deputy Administrator for NASA.

I am proud to say that recent progress with women in space has not slowed. In fact, since 2006, we have seen 11 U.S. women go to space.

Suni Williams holds the record for the most days spent in space in a single stretch by a woman, having spent over 195 days in the International Space Station. In 2007, you may remember she ran the Boston Marathon – in

orbit. In May 2008, Dr. Karen Nyberg became the 50th woman in space on the Space Shuttle Discovery during the STS-124 mission. She also made history as the first person to operate three different robotic arms in space. When asked about her milestone as the 50th woman in space, she replied “What I’m really looking forward to is a time when we’re not counting anymore.”

The women of NASA have helped this agency make amazing achievements. Space exploration has allowed us to land on the Moon, build the world’s largest orbiting laboratory – the International Space Station, fly the Space Shuttles, and obtain extraordinary images and new knowledge of the universe through the images from the Hubble Space Telescope and the rovers on Mars. These are some of our most visible accomplishments – the culmination of excellent efforts by tens of thousands of people.

But there are less visible achievements as well, like creating the key technological breakthroughs that fuel local economies and keep our Nation competitive. You may have heard of NASA spin-offs: specific technologies the agency has developed for our missions that the private sector has then picked up and refined or transformed for commercial use. There are over 1,600 documented NASA-derived technologies, ranging from better cancer detection methods to robots that clear caves and cross minefields in Iraq and Afghanistan in advance of our soldiers and Marines.

These NASA-derived technologies are all part of the Space Economy. The Space Economy consists of space-related products and services, as well as the new markets and possibilities for economic growth that space exploration encourages. The Space Economy has generated more than \$251 billion in total revenues worldwide, up 11 percent from the previous year, according to a 2008 U.S. Space Foundation report.

I’d like to note just a few of these technologies. NASA’s work has contributed in the fight against breast cancer. Breast biopsies are critical for the detection and treatment of breast cancers. And thanks to high resolution, real time imaging technology derived from the Hubble Space Telescope program, breast biopsies can be performed with a needle instead of a scalpel. The needle biopsies leave only a small mark instead of a large scar, cost significantly less than traditional biopsies, and can be performed in a doctor’s office as opposed to an operating room. Algorithms developed to analyze images from Mars have been adapted to an advanced diagnostic tool

for heart disease that can detect arterial blockage earlier and more effectively than other techniques. The best part is that scalpels are not needed, and the patient is not exposed unnecessarily to radiation, since the new tool is non-invasive. Critically-ill heart patients waiting for heart transplants are now being kept alive by implanted heart pumps developed by engineers from the NASA Johnson Space Center and supercomputer experts from the Ames Research Center up in Mountain View. The team analyzed blood flow through the heart pump using the same methodologies we've been employing to analyze fuel and oxidizer flow through rocket engines. To date, more than 400 of these extraordinary heart pumps have been implanted in people worldwide, giving them a second chance at life.

While these technologies are not highly visible achievements of America's space program, they are critically important, in and of themselves, but also because they help to fuel local economies and strengthen U.S. economic competitiveness. That's because technology advancement does not recognize boundaries. The same capabilities that apply "out there" in space also apply directly to our most critical needs back here.

NASA's investments driving these innovations are happening on a budget with a funding level that is less than six-tenths of one percent of the Federal budget. With this budget, we invest in and accomplish amazing missions, such as embarking on the human journey back to the Moon for a mission that is vastly different from Apollo. About twelve years from now, we'll live on the surface of that world, and learn enough to take the next steps out into our solar system.

In closing, I want to leave you with a mental image of how far we've come as women. It starts with a simple handshake in October 2007, a simple handshake that became quite extraordinary, one with profoundly optimistic implications for all of us as women. For one thing, the handshake took place in space while orbiting the Earth at a speed of 17,500 miles per hour, and it was between two women: Pam Melroy, the commander of the Space Shuttle Discovery, and Peggy Whitson, the commander of Expedition 16, the crew aboard the International Space Station. When the hatch between the Space Shuttle and the International Space Station was opened, their handshake marked the first time in NASA's history that there has been a female commander of both the Shuttle and the Space Station at the same time. I believe it says a lot about the power of hopes and dreams and the great

things that can come from them – for women, for our Nation and for our world.