



*"The Milky Way" was the star of Col MARK Lee's latest shuttle mission.*

**T**he Angus breed's popularity is reaching new orbital heights, thanks to astronaut Mark Lee and an outstanding photograph of an Angus calf, entitled "The Milky Way."

After a spectacular launch Sept. 9 at Kennedy Space Center, Cape Canaveral, Fla., Colonel Lee made history as he completed an untethered spacewalk and assisted with a laser atmospheric research project on NASA's STS-64 Discovery Shuttle Mission.

Angus history was made when Lee carried on board the shuttle the winning entry in the "Out of This World Photo Contest." NASA Mission Control scientists in Houston as well as viewers of NASA's telecast watched Lee show off this photograph during a break in the crew's shuttle duties.

Lee volunteered to carry out this special mission to help the American Angus Association create more interest in Angus photography. He, and his wife and fellow astronaut, Jan Davis, are Association members and own an Angus farm in Wisconsin.

This was Lee's third space flight. His first flight was as a mission specialist on STS-30 in May 1989, a mission that launched the Magellan planetary probe to map Venus. Lee next flew as the payload commander and a mission specialist on STS-47 in September 1992. STS-47 was a cooperative Spacelab mission between the United States and Japan. He and Davis also made history on that flight as the first married astronauts in space.

## DISCOVERY Meets The Milky Way

*Mission accomplished!*

*Astronaut/Angus breeder Mark Lee and the winning photograph from "Out of This World Photo Contest" complete an 11-day shuttle flight.*



NASA PHOTOS

The Discovery shuttle heads for it's 19th-orbital mission.



STS-64 Discovery crew members are (clockwise) Richard Richards, Carl Meade, susan Helms,. L. Blaine Hammond Mark Lee and Jerry Linenger.



Astronaut Mark Lee tests the new Simplified Aid for EVA Rescue (SAFER) system 130 nautical miles above Earth



**First Place— "The MilkyWay"**

*Photographer: Gale Sunderland*

Serving as judges for the contest were Keith Evans, communications and public relations director for American Angus Association, and Jerilyn Johnson, Angus Journal editor. Sunderland's entry, a closeup of a bull calf captured soon after nursing its mother, caught the judges eye right away.

"It's a difficult shot that was done very well," says Evans. "Perfect light exposure and sharp focus were needed to bring out the black calf's face against the black background of the cow."

"When we saw the title of our top selection was "The Milky Way," we knew it was meant to be," says Johnson. "Mark Lee and the Discovery crew got a big kick out of it, too."



**Honorable Mention — "Buddies"**

*Photographer: Gale Sunderkand*



**Best Scenic Shot —  
"Winter at Autumn Mist Farm"**

*Photographer: Michelle Sepiol, Woodhull, N.Y.*



**Honorable Mention — "Don't Worry, Son"**

*Photographer: Gale Sunderland*



**Best Action Shot — "Follow the Angus"**

*Photographer: Mary Anne Harmon, Washington, Pa*

# Laser Lights, Robots and Space Walk Highlight Discovery STS-64 Mission

**N**ASA's fifth flight of 1994 included two firsts when the Orbiter Discovery and her six-person crew performed atmospheric research using a laser and conducted robotic processing of semiconductor materials during Shuttle Mission STS-64.

The mission also saw the deployment and retrieval of a free flying astronomical observer and the first untethered spacewalk by astronauts in more than 10 years.

Leading the STS-64 crew was mission commander Dick Richards. Pilot for the mission was L. Blaine Hammond Jr. The four mission specialists aboard Discovery were Mark Lee, Jerry Linenger, Susan Helms and Carl Meade.

## Laser Light Show

The STS-64 mission saw the first flight of the Lidar In-Space Technology Experiment (LITE) payload. The LITE is primarily a technology test. Discovery carried a laboratory laser into space, pointed it toward the Earth and beamed narrow pulses of laser light through the atmosphere. The LITE used a telescope to measure the laser's light as it was reflected from clouds, suspended particles in the air, and from the Earth's surface. Engineers will use information from LITE in the development of future remote-sensing instruments, including elements of NASA's Earth Observing System, a series of environmental satellites scheduled to launch in 1998.

LITE collected atmospheric data and collected valuable information about the Earth's



Col. Mark Lee performs his famous spacewalk above Earth.

NASA PHOTO

atmosphere — crucial for a better understanding of our climate. Information gained from LITE can help explain the impact of human activity on the atmosphere as well as provide a new tool for improved measurements of clouds, particles in the atmosphere and Earth's surface.

On the fifth day of the STS-64 mission, Susan Helms used the shuttle's mechanical arm to deploy the Shuttle Pointed Autonomous Research Tool for Astronomy-201 (SPARTAN-201) payload. It flew free of Discovery for 40 hours and studied the acceleration and velocity of the solar wind and measured aspects of the Sun's corona. The corona is difficult to study because it is so dim relative to the rest of the Sun. On flight day seven, the shuttle rendezvoused with SPARTAN-201 and was retrieved

and stowed in Discovery's cargo bay for return to Earth.

## Robots in Space

Discovery's cargo bay also carried the Robot Operated Processing System (ROMPS) payload, which is the first U.S. robotics system to be used in space. The purpose of ROMPS is to utilize the microgravity environment to develop commercially valuable methods of processing semiconductor materials. Another objective is to advance automation and robotics for material processing in ways that can lower the costs of developing and manufacturing semiconductors.

## SAFER Space Walk

STS-64 crew members Mark Lee and Carl Meade performed a 6 1/2 hour spacewalk on flight day eight of the

mission. Their goal was to evaluate the Simplified Aid for EVA Rescue (SAFER) several spacewalking tools, and an electronic cuff checklist developed to allow spacewalkers greater and easier access to information.

SAFER is a small, self-contained, propulsive backpack device that can provide free-flying mobility for a spacewalker in an emergency,

## Agricultural Research

Research on the development and differentiation of a major food crop family that provides half of the world's calorie intake from plants, was the subject of a biological research in canisters experiment on STS-64.

Microgravity research on orchardgrass, a cool-season forage and part of the plant family that includes wheat, rice and corn was conducted by the NASA crew. The research project goal was to provide critical insight into the reproductive biology of the world's major food crops.

## School Lessons in Space

The STS-64 crew took on the role of teachers as they educated students in the United States and other countries about mission objectives. Using the Shuttle Amateur Radio Experiment-II (SAREX-II), astronauts aboard Discovery discussed with students what it was like to live and work in space. Several universities, high schools and grade schools had their own research experiments on board.

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