CFC

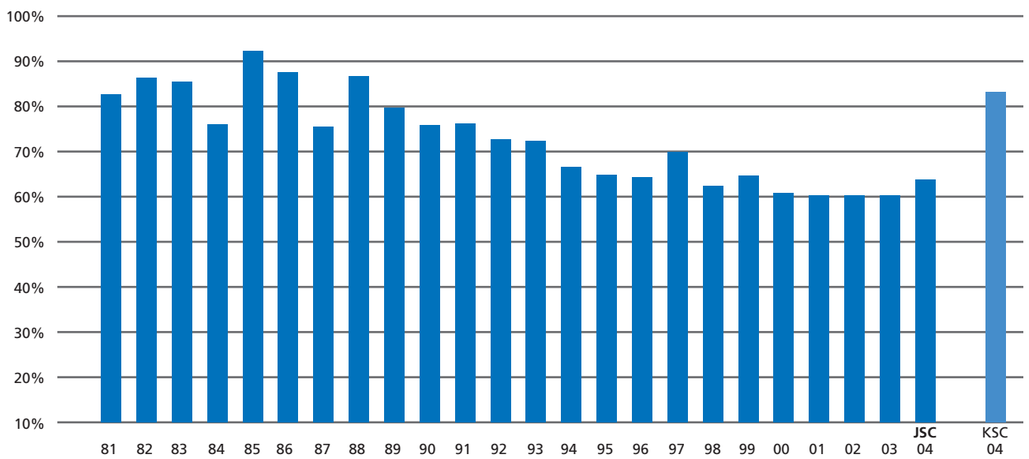
"JSC has consistently met our goal in total dollars to the campaign, but our percentage of participation has always left something to be desired," Cabana said. "Let's change that this year. Please take time to fill out your donation form and turn it in. You can even designate what specific organization in the community you want to receive your donation. Remember, it's not how much you give, but that you participate and show your support."

In addition to returning the support NASA received from a number of service agencies during the *Columbia* tragedy, employees never know when they will need such agencies for personal reasons.

"The CFC changes lives, and the need is great," Karl Schuler, acting director of human resources–CFC, said. "Whether it's emergency relief, feeding the hungry, funding medical research or providing other needed services, the CFC ensures that help will be there. As a data point, the average household income in Texas is about $40,000. With our local prosperity comes a great opportunity to help."

Please visit http://jscpeople.jsc.nasa.gov/cfc/ for more information about JSC's CFC.

JSC Combined Federal Campaign Percentage of Participation 1981-2004



Aerial shot of Chile and Argentina taken in July 2004 EarthKAM session.

NASA JSC2004E406861

DIGITAL PHOTOGRAPHY

TAKEN TO NEW HEIGHTS

By Catherine E. Borsché

Imagine having the power to control a digital camera aboard the International Space Station. What would you take pictures of? What geographical features would you want to study?

Controlling an experiment onboard the Space Station is not a fantasy for middle-school students around the globe but, rather, a reality. Thanks to an innovative project called Earth Knowledge Acquired by Middle School Students (EarthKAM), a special Space Station payload enables students to photograph and examine the Earth from a space crew's perspective.

"The main purpose of EarthKAM is to provide teachers and students with the necessary tools to target and acquire images from a space-borne camera," Brion Au, Space Station EarthKAM operations manager, said. "The visual images are then used to supplement textbook and reference data for classroom studies and projects."

To prepare for the experiment, Expedition 9 Commander Gennady Padalka and Science Officer Mike Fincke set up and activate the payload components. The EarthKAM camera is set up to operate from window five in the Zvezda Service Module and the Unity Node nadir hatch window. When the mission run time is complete, the crew shuts down, disconnects and stows the equipment. The crew changes the lens on the camera about midway through the operational period.

Using the Internet, students target areas that they would like to photograph for additional research. Requests are processed by the EarthKAM team at the University of California at San Diego and sent to Johnson Space Center to be uplinked to the Station Support Computer (SSC). The SSC activates the camera at specified times to store the needed images on a hard disk. Once complete, the images are downlinked to Earth for posting on the Internet.

During Expedition 9, two EarthKAM sessions were completed from May 11-14 and July 12-16, yielding new photographs of the Earth. More than 86 schools and over 4,000 students participated in these studies.

However, EarthKAM doesn't just benefit the school system. The program also boasts an extensive image database that in turn aids scientists studying the Earth. Geographical areas are photographed multiple times – providing a visual history of changes.

EarthKAM is operated through the University of California at San Diego, which also maintains the photo collection and Web site and provides education resources. Since the program's creation in 1996, more than 5,000 photos of the Earth have been made available as tools for students, educators and the public.

"No other NASA payload gives students such direct control of an instrument flying on a spacecraft orbiting the Earth," Au said. "And as a result of the targeting and image submittal process, the students assume an unparalleled personal ownership in the study and analysis of their Earth photographs."

EXPEDITION 10

AT A GLANCE

Crew

Astronaut Leroy Chiao will serve as commander and NASA Space Station science officer for the Expedition 10 crew. Chiao has previously flown on three Space Shuttle missions, including one dedicated to International Space Station assembly, and conducted four spacewalks. Chiao has logged more than 36 days in space and a total of 26 hours and 19 minutes of spacewalking time.

Cosmonaut Salizhan Sharipov will serve as the Soyuz commander and Space Station flight engineer for Expedition 10. Sharipov, a colonel in the Russian Air Force, has previously flown on one Space Shuttle mission. He has logged more than 950 hours of flying time and more than eight days in space.

Yuri Shargin, a lieutenant-colonel in Russia's Space Forces, will fill the third seat in the Soyuz with the Expedition 10 crewmembers. He will spend eight days aboard the Station conducting scientific experiments before returning to Earth with the Expedition 9 crew. Shargin is a test cosmonaut making his first flight into space.

Science

Many experiments from earlier Expeditions remain aboard the Space Station and will continue to benefit from the long-term research platform provided by the orbiting laboratory. These experiments include:

Protein Crystal Growth Single-locker Thermal Enclosure System, which will continue to process crystals that have been growing since Expedition 6. The facility provides a temperature-controlled environment for growing high-quality protein crystals in microgravity, which may contribute to advances in medicine, agriculture and other fields.

Earth Knowledge Acquired by Middle School Students (EarthKAM), an education experiment that allows students to program a digital camera aboard the Station to take pictures of a variety of geographical targets for study in the classroom. (For more on EarthKAM, see page 9.)

NASA/Close JSC2004E24640

NASA/Blair JSC2004E34991

NASA/Blair JSC2004E34992

Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions (InSPACE), which seeks to obtain data on magnetorheological fluids – a new class of "smart materials" that can be used to improve or develop new brake systems, seat suspensions, robotics, clutches, airplane landing gear and vibration damper systems.

In addition, the Expedition 10 crew will conduct numerous experiments using the research experiments and tools onboard the Station, including:

- The Human Research Facility, which houses and supports a variety of life sciences experiments, including equipment for lung function tests, ultrasound and many other types of computers and medical equipment.
- The Microgravity Science Glovebox, which has a large front window and built-in gloves to provide a sealed environment for conducting science and technology experiments. The Glovebox is particularly suited for handling hazardous materials when a crew is present.

Spacewalks

Two spacewalks are planned during Expedition 10. These two spacewalks are designed to continue the external outfitting of the Zvezda Service Module. The primary purpose of the first spacewalk is to install an external workstation and research experiments. The purpose of the second spacewalk is to install cameras, communications gear and navigational aids on Zvezda that will support next year's arrival of the European Space Agency's unpiloted Automated Transfer Vehicle.