NASA
National Aeronautics and Space Administration

GODDARD NEWS

Goddard Space Flight Center Greenbelt, Md. Vol. 29 no. 4 March 10, 1982

Space Shuttle launch date set

STS-3 Insignia

The third launch of the Space Shuttle Columbia from the Kennedy Space Center, Florida, has been set for March 22, 1982, at 10 a.m. EST.

The crew for the third Shuttle mission, STS-3, is Jack Lousma, commander, and C. Gordon Fullerton, pilot.

Objectives of the STS-3 flight, the third in a series of four development flight tests, will be to continue engineering evaluation of the reusable spacecraft with particular emphasis on its thermal characteristics. In Columbia's cargo bay will be a space science payload (OSS-1) with astronomy and space plasma physics instruments. Also in the bay will be the Canadian-built remote manipulator arm which will be extensively tested for the second time.

Following seven days and three hours in Earth orbit, the Columbia is scheduled to land on a dry lake bed at Edwards Air Force Base, California, on March 29, 1982.

Goddard scientists measure cloud ascent in stereo via GOES

Looking out of an airplane window, you may suddenly see a mountain of clouds leap high into the atmosphere, sometimes at a speed of up to 60 mph. It is, say meteorologists, one of the best signals that a storm is imminent. If you could accurately measure the cloud's ascent, they add, and you knew the temperature and moisture of the air in which it was rising, you also could begin to predict how severe the storm would be.

But, accurately measuring cloud ascent, even for meteorologists, is an elusive process. Current satellite methods provide only a rough estimation of cloud altitude by using infrared sensors (of limited resolution) to detect the temperature at a cloud's top. A meteorologist compares the cloud's infrared temperature value with the known profile of local atmospheric temperatures, and obtains a "best fit" altitude for the cloud that may be several kilometers in error.

In one attempt to develop a more direct means of measure, a team of atmospheric scientists at Goddard has been experimenting since 1975 with observing clouds in stereo from two widely separated geostationary weather satellites. To date, the stereo method has successfully measured cloud heights with just 500 meters of error. It employs a technique similar to simple parallax rangefinding in photography, whereby distance can be calculated by juxtaposing two images of an object viewed from different angles.

The scientists are using the imagers aboard Geostationary Operational Environ-

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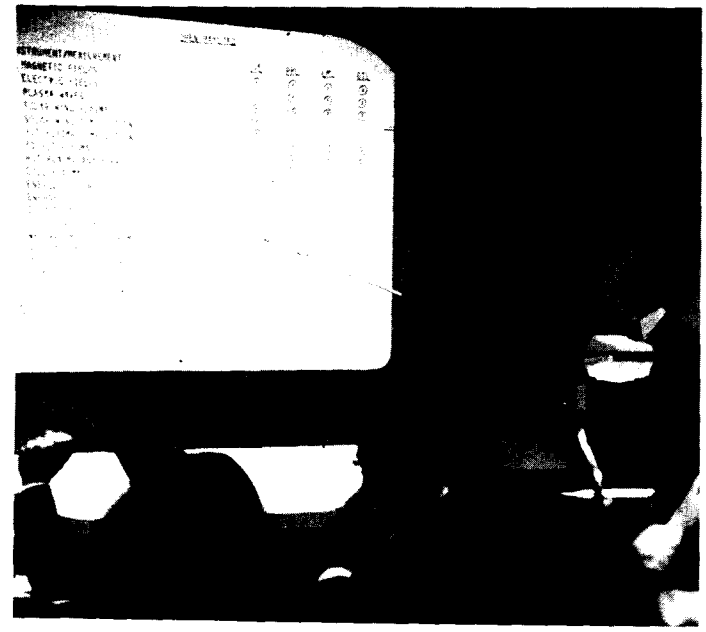
OPEN project to study Sun-Earth relationships

In an attempt to fuel the study of Sun-Earth relationships, NASA has selected the scientific team (see sidebar) for the Origin of Plasmas in the Earth's Neighborhood (OPEN) program. OPEN's goal is to obtain the first quantitative assessment of the global flow of energy through the Earth's space environment above the upper atmosphere. This goal will be accomplished with a network of four spacecraft orbiting strategically in four key locations around the Earth. These space laboratories will provide simultaneous measurements of the charged particle radiation and magnetic and electric forces that transfer, store and dissipate energy throughout the Earth's dynamic space environment.

The Sun directly controls our human surroundings by warming the Earth in a bath of visible and ultraviolet radiation. The Sun also shapes our space environment by filling the solar system with a rarefied, electrically charged gas that moves away from the Sun at supersonic speeds. The Earth's strong magnetic field acts as a blunt obstacle that impedes the flow of this "solar wind" at the Earth and creates a cavity, called the magnetosphere, that surrounds our planet and buffers it from direct exposure to the solar wind.

The OPEN Program will use measurements of the flow of electrically charged gases, called plasmas, between the two principal sources and the two major storage regions in the magnetosphere. One spacecraft, placed sunward of the Earth outside of the magnetosphere, will sample the solar wind gas flowing into the Earth's neighborhood. A second spacecraft, in a high orbit over the poles, will measure the entry of plasma from the second plasma source--the upper atmosphere--into the magnetosphere. This satellite will also obtain global pictures of the aurora. Such images provide a direct, quantitative measure of plasma energy deposited into the upper atmosphere. A third spacecraft, placed in an elongated equatorial orbit, will measure plasmas and high energy particles in one of the major magnetospheric reservoirs--a region called the equatorial ring current. The fourth spacecraft will utilize occasional gravitation "kicks" from near encounters with the Moon to keep its orbit in the second major plasma and energy storage region--the long, comet-like magnetospheric tail on the nighttime side of the Earth.

By making simultaneous measurements of the flow of plasmas between these four key regions in the Earth's environment, the four OPEN spacecraft will provide the first global view of the dynamic interaction between the critical links in the solar-terrestrial energy chain. This complex chain of interactions by which charged particles gain and lose energy while moving through the magnetosphere is a dynamic process, changing with variations of the gusty solar wind. Some solar wind particles find their way into the magnetosphere where they mingle with electrically charged gases that have come from the upper atmosphere. Many of these charged atomic particles are energized by electric and magnetic forces inside the magnetosphere, and they can then become confined in localized energy reservoirs such as the Van Allen radiation belts. Some charged particles also enter the atmosphere and deposit their energy there or even escape from the magnetosphere back into the solar wind. Within the magnetosphere, regions often react explosively to changes that occur in another part of the magnetosphere or in the solar wind



Joe Alexander, OPEN Project Scientist, briefs the scientific team on experiments selected to fly on the OPEN spacecraft.

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