ISEE 3 diversion to comet approved

Plans to divert the International Sun Earth Explorer (ISEE 3) spacecraft to rendezvous with the comet Giacobini-Zinner have been given the go-ahead by NASA.

The comet intercept, the first ever done, will take place on Sept. 11, 1985 if a complex series of orbital maneuvers is successful over the next three years.

ISEE 3, launched in August 1978 under a cooperative program with the European Space Agency, has been studying the region between the Earth and the Sun in a delicately balanced orbit at a libration point between the two heavenly bodies.

Ground controllers at the Goddard Space Flight Center recently fired ISEE 3’s thrusters in a maneuver which has sent it back toward the Sun. The orbit was so delicately balanced, an astronaut could have flipped it this way with his finger,” an Office of Space Sciences and Applications spokesman said.

That is but the beginning of an amazing series of orbital maneuvers in which ISEE 3 will ultimately use a lunar gravity assist to send it toward a rendezvous with the comet 44 million miles from Earth.

Although not equipped with imaging instruments, the probe will be able to send back data on plasma, temperatures and the characteristics of particles in the comet’s tail. If it is successful, pass through the tail about 1,900 miles or more from the nucleus.

NASA officials hope the probe will then be in a position to aid European, Japanese and Soviet researchers who are sending a probe into inspection of Halley’s Comet in the Spring of 1986.

Comets are among the most visible and mysterious elements of our solar system. They are thought to be large bundles of ice, rock and gasses which circle the Sun in far flung orbits, some of which may take thousands of years to complete. Although not as famous as Halley’s Comet, Giacobini-Zinner, which approaches the Sun about every 13 years (Halley’s returns every 76 years), is believed to be among the most interesting members of the primordial solar system, and thus one worthy of study for the benefit of modern science on the origins of our cosmic neighborhood.

NASA announces crew for STS-10

Four of the five crew members who will man the Space Shuttle on its first dedicated Department of Defense mission, STS-10, have been selected.

They are NASA astronauts Thomas K. Mattingly, Commander; Loren J. Shriver, Pilot; Ellison S. Onizuka and James F. Buchli, Mission Specialists.

The fifth crew member, an Air Force manned spacecraft engineer, will be named at a later date.

STS-10 is currently scheduled for launch from the Kennedy Space Center in the last quarter of 1983.

Mattingly, whose last spacecraft was as commander of STS-4 in July, is a U.S. Navy captain who has been an astronaut since 1966. He served as a member of the astronaut support crews for the Apollo 8 and 11 missions and served as command module pilot of Apollo 16 in April, 1972.

With the completion of two space flights, he has logged 435 hours and two minutes in space, one hour and 13 minutes of which were spent in extravehicular activity during Apollo 16.

Shriver, a U.S. Air Force major, was selected as an astronaut candidate by NASA in 1978. In 1979, he completed his training period and became eligible for assignment to Space Shuttle flights. He graduated from the USAF Academy in 1967, attended graduate school at Purdue University and saw duty in Thailand from 1973 to 1974. He attended the USAF Pilot School and Edwards Air Force Base and in 1976 began serving as a test pilot for the F-15 Joint Test Force there. He has flown 30 different types of fixed and rotary wing aircraft, and has logged over 3,000 hours in jet aircraft.

Onizuka, a NASA captain, was selected as an astronaut candidate by NASA in 1978 and became eligible for assignment to Space Shuttle flights in 1979. He was made eligible for mission specialist. He entered active duty with the USAF in 1970 after receiving his commission at the University of Colorado through the four-year ROTC program there. He attended the USAF Test Pilot School for a year beginning in August 1974, and in July 1975 completed the U.S. Air Force Flight Test Center at Edwards, in- cluding a tour as squadron flight test engineer and later as chief of the engineering support section in the training resources branch. He has logged over 900 hours flying time.

Buchli, a U.S. Marine Corps major, is the recipient of an Air Medal, a Navy Commendation Medal, a Purple Heart, a Combat Action Ribbon, a Presidential Unit Citation, a Navy Unit Citation, a Meritorious Unit Citation and a Vietnamese Cross of Gallantry with the Silver Star. He was selected as an astronaut candidate by NASA in 1978 and became eligible for space flight as a mission specialist in 1979. He has logged more than 1,900 hours flying time, mostly in jet aircraft.

Flashlight in the heavens

Fleet of reflectors could augment national power needs, study says

It is summer in Philadelphia. The time is the near future. Dusk has come to the city as the terminator makes its slow passage from east to west across the continental United States. Millions of people have returned home from work, and the air conditioners are turned down, dinner are started and lights and televisions go on in the homes, the peak power demands on the metropolitan utility grid would normally be rising sharply.

But outside the area is cloaked in a diffuse light, even though the Sun has set, even though the Moon has yet to rise. It is a light equivalent, in fact, to 56 full moons shining at once, or about the same level as average street lighting at night.

The light comes from 16 large solar reflectors 22,300 miles above the Earth in a geo-synchronous orbit. Collectively, they train their reflected light on various American cities, progressing from one to the next as the terminator moves across the continent. By augmenting street lighting needs of large power companies in various cities, the system would be capable of saving about $285 million per year, and would pay for itself in less than five years.

Those are among the conclusions of a report recently released by the Langley Research Center in NASA Technical Paper 2065, "Illumination from Space With Orbiting Reflector Spacecraft," by researchers John E. Canady Jr. and John L. Allen Jr.

The concept of orbiting solar reflectors is not new, and indeed goes back to Hermann Oberth, who suggested a similar idea in 1929. But rather than functioning as a power producer such as the solar power satellite concept, these reflectors would do no more than beam sunlight on the ground.

They would not store and send energy to Earth, nor would they increase temperatures in any area being illuminated within the 390 by 220-mile ellipse of light.

"There would be absolutely no change to the environment," Allen said. "We're talking about shining a flashlight on somebody. The system would be used only to augment and reduce peak power needs, and could be used as a kind of national asset system in times of emergency and disaster, such as in land and sea rescue."

The idea is an outgrowth of earlier NASA studies, such as the Solares program at the Ames Research Center, for making use of large solar structures to help ease energy problems on Earth.

In 1976 the Energy Research and Development Administration approved the 1976 energy usage data base for Philadelphia and extrapolating to other cities, the two hours of illumination at dusk and dawn in Philadelphia, Chicago, Denver, Los Angeles and Honolulu could save about $285 million per year, paying for the system in a little less than five years. Since the

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Quasar discovered 12 billion light years away

The size of our known universe effectively increased by an incredible 15 percent recently with the discovery of the most distant object known—humankind. A team of astronomers from the United States, Great Britain and Australia has identified a stellar object, known as PKS 2000-330, as a quasar, a quasar that is 12 billion light years farther away than any other known object. Light from PKS 2000-330 is so distant on Earth that light before the Sun System was formed some 4.6 billion years ago, and probably before the Milky Way Galaxy was formed some 10 billion years ago. PKS 2000-330 was discovered through a large network of NASA's Deep Space Network, and observations of its spectrum identified emission lines of hydrogen, oxygen, nitrogen and carbon with a red shift of 3.78, greater than that of any other object ever observed. The red shift is a measurement of how much an object shifts its light to the red end of the electromagnetic spectrum when it is thought to be receding from us and moving away from Earth. The mystery which surrounds quasars such as PKS 2000-330 is that they show up as light sources exceedingly bright for their distance, and must be larger than vast amounts of energy which we do not understand. This brightness either means the red shift yardstick is incorrect, or the quasars are using up vast amounts of energy at rates we do not even begin to fathom. Some have suggested that quasars are proto-galaxies, but most scientists consider the available facts to be too inconclusive to support any one theory.

Findings indicate methane surfaces on Pluto, Triton

Scientists have found that both Pluto and Neptune's largest moon, Triton, have surfaces of frozen methane, and believe they may be cisscrossed with cracks and intricate webbings much like the Jovian moon Europa. This was the report of a team of astronomers from the Jet Propulsion Laboratory for Space Flight Center for Astrophysics and Cambridge University in England. The team used the next generation of Arizona State University’s Smithsoman to confirm their findings, and have also concluded that Pluto does indeed have a tempestuous atmosphere as well. Methane is highly volatile and can be solid to a gas with only slight thermal pressure rises. Both Triton and Pluto are close enough to the Sun for their own temperature to affect their external appearance. Scientists believe Pluto's atmosphere is caused by the vaporizing of the methane ice. When the temperature drops to around 50°C at Pluto's farthest separation, methane is greatly varied and the Sun's energy tends to thin and eventually disappear. At its closest approach to the Sun, a methane temperature of 85°C, so scientists think the atmosphere may be present for only a few years out. They will observe Pluto as it nears its closest approach in the future and hope to see over the next 20 years the birth and death cycle of the atmosphere. Voyager 2 will pass by Neptune and Triton in 1989.

Orbiter 101 used in vibration tests

Orbiters have left the test area at the Dryden Flight Research Facility in a month-long series of structural failure tests in order to identify potential structural trouble spots on the steadily emerging fleet of Shuttle Observers, subjects that Enterprise to electromagnetic shaking to study its reaction to rapidly varying forces. Some 250 accelerometers attached to the Orbiter's surface are feeding readings from those vibrations into a computer, which in turn defines the mathematical relationships between force inputs and response accelerations. The proof of theory as modal analysis is designed to show where structural degradation may occur over the lifetime of an Orbiter without damaging Enterprise or any other vehicle on which it is used. Enterprise is being used to validate the usefulness of modal analysis for future use on other Orbiters. Tests are scheduled to continue through this month.

‘Leasecraft’ memorandum signed

A mini space platform which could be orbit and commercially available to customers by 1986 was the subject of a Memorandum of Understanding between NASA Headquarters and the Fairchild Space and Electronics Co. Called Leasecraft, the platform would be capable of accepting satellites, serviced and periodically, and would be designed for a long lifetime in space. The platforms would provide various commercial payloads with power, stabilization, communications and the capability to change or fasten and would be responsible for leasing room on the platform commercially, as well as for providing technical and administrative support. Under the memorandum, NASA and Fairchild will study the potential for a Joint Endorsement Agreement of the platform. More detailed plans for Leasecraft are expected in the next several months.

Lunar Rover in the Army now

A prototype Lunar Roving Vehicle developed by the Grumman Aerospace Corporation for the Apollo program is in the Army now, at Fort Benjamin Harrison. Undergoing tests that will determine whether or not it can improve the effectiveness of soldiers. The Army will use the Lunar Rover in the next year or so to study robots on the front line. Vehicles using Lunar Rover technology and the more recent advancements in communications, detection and robotics might be able to identify targets, recognize troops performing military duties, the Army believes. The Soldier Support Center at Fort Benjamin Harrison is studying such vehicles as "force multipliers" in any future wars.

STANLEY H. GOLDSTEIN, Chief of the Employee Development Branch, who was awarded a plaque recently by the U.S. Office of Personnel Management for significant contribution to employee development and training. "The basis of the presentation is the need to develop employee and training programs which will prepare our employees for a successful transition from the space program to the real world," said Edward Vela, GPM's Regional Director.

CINE, the Council on International Non-Theatrical Events, has awarded its prestigious Golden Eagle Citation to NASA for the STS-1 flight film. "Space Shuttle: A Remarkable Flying Machine." The film produced here at JSC by the Media Services Corp. (formerly A-V Services Corp.), was chosen for its excellence and has been selected to represent the United States at international film festivals around the world. The Golden Eagle is the highest among any awards any film can earn worldwide. "A Remarkable Flying Machine" is the latest in a long series that DOT supports. The project is dedicated to the real thing. The managers who have gone to that real thing today was that today's film citation was the JSC Director and official of the media division, which manufactured the film and was used in the final awards. The film was shown in the JSC over the past fifteen years, in helping the Center meet the challenges of manned spaceflight in and making major contributions to the Center's programs and missions," said Edward Vela, GPM's Regional Director.

Graduation certificates were presented by Deputy Director Clifford E. Charlesworth recently to participants in the fifth annual Trainee-Observation Opportunity (WTO) Program. Graduates succeeded in an intensive classroom and on-the-job training as prescribed for an extensive 3-month internship. The graduates were: Michelle BREDDILOW of the EOD Department, Virginia GReeley, Kelly Nishida, Margaret Spak, Judith Stovali and Daphne Webster. This year, the director of the program, Gerald Griffin recently presented them Starline Citation Awards and a check for $5,000 each.

GLENN M. E ourt and Calvin Schamburg of the EOD Department recently presented them Starline Citation Awards and a check for $5,000 each.
Flashlight

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design lifetime of the reflector system is 15 years, that would amount to about 10 years of operation at a profit of nearly $3 billion.

The reflectors, each measuring a kilometer (6.1 miles) in diameter, would be carried aloft by the Space Shuttle. The compressed structures would be deployed from the Shuttle in low Earth orbit, and once erected in their flat circular shapes, would use solar sailing techniques — employing low thrust provided by photons from the solar wind — to slowly move to geosynchronous orbit. Allen said. One reflector could be launched by a single Shuttle mission.

Once on station, the reflectors could be commanded to change attitude by controllers on the ground, or they could do it automatically. The reflectors would also be capable of changing their positions in orbit, and could move 180° to the other side of the planet in about 10 days, by means of solar sailing, Allen said.

While cautioning that the paper does not represent a decision by NASA or any other agency to actually build and launch the system, Allen said he has been "inundated" with calls since the idea was picked up by Science Trends Newsletter and United Press International. "I hope the enthusiasm permeates," he said.

NASA, West Germany sign Spacelab agreement

West Germany has become the first country to purchase a dedicated Spacelab mission from NASA, at a cost of approximately $65 million.

A Launch Services Agreement for the D-1 Spacelab mission, scheduled for launch on the Space Shuttle in June 1985, was entered into by Lt. Gen. James Abrahamson, NASA Associate Administrator for Space Transportation Systems; Professor Dr. Hermann Jordan, Chairman of the Board of the German Aerospace Research Establishment (DFVLR); and Dr. Wolfgang Hasenclever, Vice Chairman of DFVLR.

The D-1 mission will consist of low gravity experiments in the field of materials processing in space and life sciences. The experiments are primarily sponsored by West German industry, universities and other research institutions. Scientists from other European countries and the United States are also participating in experiments to be flown on the D-1 mission. The West German Ministry for Research and Technology has overall program responsibility from the D-1 mission. The DFVLR has management responsibility for the mission.

This Launch Services Agreement continues a long history of United States-West German space cooperation. The Federal Republic of Germany has been a strong supporter to Space Transportation System utilization and contributed 64 percent of the funding for the billion-dollar European development of Spacelab. Spacelab is a major element of Space Transportation Systems with facilities and equipment similar to laboratories on Earth but adapted to zero gravity.

Shown at the launch pad recently during the Countdown Demonstration Test are STS-5 crew members William Lenoir, Vance Brand, Robert Overmyer and Joe Allen. Allen is wired with biomedical sensors as part of pre-flight testing. The crew this week participated in a full-up 56-hour simulation of their upcoming mission with the control facilities at JSC.