

Japan aims at Mauna Kea for big telescope

The latest entrant in the push to build new big telescopes is Japan. On Aug. 22 Japanese astronomers submitted a plan to their government to build a telescope larger than any now in the world. According to a statement by Keiichi Kodaira of Tokyo National Observatory, the new telescope would be a reflector 7 meters in diameter or 1 meter larger than the present world's largest single mirror, which is located at the Crimean Astrophysical Observatory in the Soviet Union.

The site chosen by the Japanese astronomers is Mauna Kea, a 13,796-foot mountain on the island of Hawaii. Don Hall, director of the Institute for Astronomy at the University of Hawaii in Honolulu, who has been involved in the negotiations on the American side, says there is strong support for the project both

Satellite retrieval by shuttle planned

In April, the space shuttle passed its test as a repair van when it enabled astronauts to fix the ailing Solar Maximum Mission satellite and put it back in space. Now NASA has announced that the shuttle will become a tow truck, when it picks up an incorrectly orbited communications satellite—and possibly a second—for return to earth, where the now-useless devices can be refurbished and relaunched into proper orbits.

The two satellites — Indonesia's Palapa B-2 and Western Union's Westar 6 — were properly deployed from the shuttle in February, but near-identical malfunctions with the built-in rockets that should have carried them up to their assigned duty stations more than 22,000 miles above the earth left them instead in much lower paths only a few hundred miles up. The plan for shuttle mission 51-A, now set for launching on Nov. 2, calls for astronauts using jet-propelled backpacks to maneuver over to one or both satellites and bring them back to within reach of the shuttle's grappling arm. The arm would lift each satellite into the shuttle's cargo bay, where it would make the trip home. The Palapa retrieval got the go-ahead last week, and Westar approval was expected soon.

The \$4.8 million cost of the operation is to be borne by insurance underwriters, who paid a total of \$180 million to the Indonesian government and Western Union following the original misdeployment. As the used satellites' new owners, the underwriters are expected to sell them, refurbished, at a discount to the highest bidders.

—J. Eberhart

in the U.S. government and in the state of Hawaii, which has a large population of Japanese origin. Hall believes the Japanese government is very near to granting the funds. According to Kodaira the cost would be about \$82.6 million. The telescope would be fully automated, and equipped for both optical and infrared observation. Completion is expected in the early 1990s.

Mauna Kea already houses several telescopes, including another example of international cooperation, the Canada-France-Hawaii telescope. It is the site chosen by the University of California for its projected 10-meter telescope, and is one of the sites under consideration by the National Optical Astronomy Observatories for the projected 15-meter National New Technology Telescope. About the only current large telescope project that is spurning Mauna Kea entirely is that of the University of Texas, which plans to use a site near its present observatory at Ft. Davis, Tex.

—D. E. Thomsen

AMPTE: 3 for 3 and ready to go

On Sept. 7, scientists plan for the first time to generate a huge artificial cloud of lithium ions outside the earth's magnetosphere, in part to find out how much of the solar wind actually gets through the magnetosphere's boundary to help form the Van Allen radiation belts that circle the planet.

The test, together with a similar one to follow by Sept. 22, is the first goal of AMPTE, the Active Magnetospheric Particle Tracer Explorers (SN: 7/28/84, p. 52), an elaborate research project involving satellites from the United States, West Germany and the United Kingdom. The three probes were launched from a single U.S. rocket on Aug. 16, and were separated by their own individual rocket motors during the next two days into the widely differing orbits required by the complex plan.

Over the next seven months, the AMPTE team will produce rapidly ionizing clouds of lithium and barium first in the solar wind, then in the form of an "artificial comet" in the geomagnetic field's boundary region, or magnetosheath (probably in late December), and next spring down the geomagnetic "tail."

The various clouds will be generated by the German satellite, called the Ion Release Module, which carries a cluster of converted scuba tanks holding the lithium and barium. Flying about 150 kilometers away is the U.K. Subsatellite, instrumented to study the clouds as they develop, while the U.S. Charge Composition Explorer will seek signs of the clouds' effect on the magnetosphere's lower regions.

—J. Eberhart

Agent Orange and birth defects risk

A massive epidemiological study has just been completed by the Centers for Disease Control (CDC) in Atlanta investigating the risk of birth defects posed by exposure in Vietnam to the dioxin-tainted herbicide Agent Orange. It concludes that Vietnam veterans in general experienced no increased risk of fathering babies with birth defects. However, although there was no elevation in the total incidence of birth defects among children born to those Vietnam veterans potentially exposed to the herbicide, a few specific defects occurred among this group with unusual frequency. And in several cases, the highest frequency of the affected children occurred among those veterans who appeared to have the greatest likelihood of Agent Orange exposure.

The researchers, reporting in the Aug. 17 JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, focused on nearly 8,000 babies born in the Atlanta metropolitan area from 1968 through 1980 — more than 4,800 of whom were chosen because they had birth defects. Vietnam veterans fathered 696 of those children, including 428 with birth defects.

A statistically increased risk of spina bifida (imperfectly formed spinal cord) was found among children of veterans in the higher exposure groups. The study's authors calculated that for those veterans who believed they had the highest likelihood of having been exposed to Agent Orange, there was almost a threefold increased risk for this defect, relative to the rest of the study population. Similarly, the study calculated almost a fourfold increase in risk for congenital tumors among children born to servicemen having the greatest likelihood of Agent Orange exposure.

According to University of Illinois Medical Center (in Chicago) researcher Samuel Epstein, a specialist in environmental and occupational medicine, findings such as these make it "difficult to avoid any conclusion other than the fact that the study is highly suggestive of an association between paternally mediated birth defects and exposure to Agent Orange."

Moreover, he discounts the authors' reassuring comments about there being no overall increase in the number of reported birth defects, because "overall increase in birth defects is, with due respect, a meaningless index": It requires lumping together lethal and trivial defects bearing no relation to one another.

The study's authors acknowledge that though much of their work is "based on relatively strong evidence," serious uncertainty plagues its herbicide exposure estimates. As a result, they say only "weak" conclusions about Agent Orange-related risk are possible.

—J. Raloff