

XE128,0036869
REVISED
10-13-68

SOUTHWEST CENTER FOR ADVANCED STUDIES

POST OFFICE BOX 30365
DALLAS, TEXAS 75230

(214) ADAMS 1-1471

SUB FOR OCTOBER 11 RELEASE "THREE ROCKET LAUNCHES X X X" Al Mitchell - Director of
October 13, 1968 Public Affairs - Ext. 215

THREE ROCKET LAUNCHES AHEAD FOR SPACE SCIENTISTS -- WALLOPS
ISLAND, CAPE KENNEDY, VANDENBERG ARE NOVEMBER-DECEMBER SITES

DALLAS --

A double play in Dallas-based space research may come off in November.

Two flights may go the same day, or within a two-day span. One of these is a Cape Kennedy launch scheduled Nov. 6, to put a fourth cosmic ray experiment from the Southwest Center for Advanced Studies into orbit around the Sun. The Pioneer 9 spacecraft will move out ahead of the Earth to an orbit distance of about 72 million miles (between the Earth and Venus).

Also scheduled for Nov. 6-7 is an Upper F Ionospheric Probe flight from Wallops Island, Va. This will be the third of a series. It will reach an altitude of about 600 miles, returning to a splashdown in the Atlantic Ocean.

Still another experiment flight is scheduled for mid-December, this time from the Western Test Range, Vandenberg AFB, Cal. The third flight will be a polar-orbit satellite, ISIS (International Satellite for Ionospheric Studies). The research project is a joint effort by United States and Canadian scientists.

Both the Cape Kennedy and the Western Range launches involve good-sized boosters, the 92-foot-tall Thor Delta. For the interplanetary Pioneer 9 flight, three strap-on engines add still more thrust.

Dr. Robert P. Bukata heads the scientific team from SCAS for the Pioneer launch at Cape Kennedy. Prof. William B. Hanson is principal investigator in the Upper F Probe program, and Prof. Walter J. Heikkila is the SCAS member of the international working group for the ISIS-A experiment.

-more-

All are members of the Atmospheric and Space Sciences division research staff and faculty at the SCAS. The entire 11-man faculty also holds adjunct appointments in the Southern Methodist University Institute of Technology, as graduate teachers in the Space Science center. The SCAS-SMU group is the largest research-teaching faculty for space sciences in the southwest region.

*

Pioneer flights carrying SCAS cosmic ray experiments have been launched at Cape Kennedy on Dec. 16, 1965, Aug. 17, 1966, and Dec. 13, 1967. Experiment life, expected to be about six months in each case, has turned out much better than hoped. The earlier Pioneers 6, 7 and 8 are all "walking and talking," as Doctor Bukata puts it, with a total time of 72 months in orbit. Their radio data voices are being heard all the way around the Sun, at 200 million mile distances, through the 210-foot NASA tracking antenna at Goldstone, Cal.

The F Region Probes are to be linked in time to the passage of still another satellite, the Alouette, which looks at the top of the Earth's ionosphere. As the topside-sounder swings by in its Earth orbit, the SCAS probes take vertical profiles of electron and ion temperatures, concentrations, and ion composition.

The ISIS satellite travels through the upper F region of the ionosphere, and measures relative composition; previous ISIS research has shown that oxygen ions are the dominant species below 600 miles' altitude, with hydrogen at higher levels, but as many as 10 different ions have been observed. Polar ionospheric regions at higher altitudes show oxygen and nitrogen domination, with small counts of helium ions.

All the experiments are basically designed to record particle structures moving about the Earth and streaming from the Sun. The ionosphere is a plasma, or mixture of scattered particles surrounding the Earth in several layers that flow generally toward the poles. Some of the layers reflect certain radio -more-

waves like a mirror, to aid in long-distance communications.

The ionosphere gets its energetic particle supply from the Sun in a huge physical chemistry process. The Sun streams energetic particles in massive spirals -- two million miles wide as they sweep past the Earth -- at million-mile-an-hour speeds.

This is the basic cosmic radiation that Pioneer flights record and measure. The Sun also produces large explosions of high-energy particles that can break away from the magnetic spirals and reach the Earth in 20 minutes.

A solar storm disturbs the steady chemistry of the ionosphere, first as X-rays and ultraviolet radiation arrive; later, powerful protons batter the elements of the ionospheric plasma and produce a literal rain of particle products. Large and rapid variations in the Earth's magnetic field may be produced -- as well as effects on communications.

The SCAS experimenters are seeking information on all these events and related processes of a complex system.

National Aeronautics and Space Administration is the grant and contract agency for all three programs. Graduate students are involved in the research.

-30-

EDS: THIS SUBS FOR EARLIER STORY BECAUSE THE SMALL ROCKET/MODULAR AURORAL PROBE SERIES AT FORT CHURCHILL, CANADA, HAS NOW BEEN SCHEDULED FOR JANUARY. PROFESSOR HEIKKILA IS PRINCIPAL INVESTIGATOR FOR BOTH "MAP" AND "ISIS" PROGRAMS.

-am