

physical sciences

Gathered at the 14th Plenary Meeting of the Committee on Space Research of the International Council of Scientific Unions last week in Seattle

Venera 7 results

Space probes that drop into the atmosphere of Venus and attempt to land have become something of specialty of the Soviet Union space effort in recent years. The probes called Venera 5 and 6 penetrated the Venus atmosphere to a depth where the temperature was 600 degrees K. and the pressure equal to 27 earth atmospheres before they were crushed.

The crushing of the earlier probes before they landed left open the question of the structure of Venus's lower atmosphere from the 600-degree point to the surface, says Dr. M. Ya. Marov, who presented a report of the work of Drs. V. S. Avduevsky, M. K. Roshdestvensky, N. F. Borodin, V. V. Kerzhanovich and himself. The Venera 7 probe was designed to answer these questions. It was made to withstand temperatures to 800 degrees K. and pressures to 180 atmospheres.

Venera 7 landed Dec. 15, 1970. It should have taken independent measurements of temperature and pressure all the way down, but Dr. Marov says the pressure sensors didn't function properly.

The recorded temperature rose more or less steadily to the surface, where the probe recorded 747 degrees K. The point of landing was near the line of sunrise.

If the Venus atmosphere is assumed to be thermally adiabatic, says Dr. Marov, the pressures can be calculated from the temperature measurements. On this basis the pressure at the landing point comes out to be 90 plus or minus 15 atmospheres. For the atmosphere to be in adiabatic equilibrium in this temperature range, he says, the landing point has to be 1.8 kilometers lower than it was expected to be.

X-ray astronomy from the moon

In addition to all its other missions, the automated Soviet moon vehicle Lunakhod 1 carried an X-ray telescope. The telescope had counters for the wavelength range between 2 and 10 angstroms. Its width of view was 3.6 degrees.

The X-ray telescope was turned on between the times of radio communication with earth stations when Lunakhod was not moving. The rotation of the moon provided the telescope with a scan of the sky. About a hundred different regions of the sky were investigated during three lunar days.

Some X-ray sources of low and medium intensity lying in directions outside the plane of the Milky Way were found, Drs. I. L. Beigman, V. D. Ivanov, V. G. Kurt, S. L. Mandelshtam, A. I. Shuryghin, I. P. Tindo, L. A. Vainshtein and B. N. Vasiliev report.

Cometary fragments around the sun

From time to time, in the 19th century, astronomers reported the existence of a planet whose orbit lay within the orbit of Mercury. At one time the intra-mercuric planet even acquired the name Vulcan, but all such reports were ultimately proven false and it is now fairly certain that there is no large body within the orbit of Mercury.

But the search for small bodies, cometary fragments

that may have been captured into intra-mercuric orbits, goes on. The best time to look for such sungrazers is during total solar eclipses when their images should show up on photographic plates. The results of such a search during the 1970 solar eclipse are reported by Drs. H. Courten of Dowling College, B. B. Albert of Adelphi University, D. W. Brown of Grumman Aerospace Corp. and Mihran Miranian of the U.S. Naval Observatory.

Pictures taken at Miahuatlan, Mexico, and in North Carolina show various possible images but only one image is common to both locations. Efforts to fit the 1970 images to orbits of those seen in previous eclipses are under way.

Astronauts not keen on joint missions

In recent months the United States and the Soviet Union have been discussing the possibilities of cooperation in space. Probably the most serious thing to come out of this so far are efforts toward making United States and Soviet docking mechanisms compatible to facilitate rescue of spacemen who happen to get into trouble.

But the cooperative atmosphere has brought up speculations about the prospects of joint manned flight. At the COSPAR meeting, spacemen of both countries showed themselves extremely reluctant to undertake any such thing. Problems of communication seem to be the most serious impediment in the view of both Soviet Cosmonaut Ye. V. Khrunov and American Astronaut John D. Young. Both pointed out that learning to operate a particular spacecraft takes months of briefing and rehearsal. The Soviets do this in Russian; the Americans in English. The crew of a joint ship would have to know the words in both languages, and both spacemen felt this to be an unnecessary time-consuming imposition.

Furthermore, Khrunov said, each country has enough men and equipment to do whatever missions it wants, so he saw no benefit from joint missions.

Soyuz 10: Rehearsal or failure?

Although the tragedy of the deaths of the Soyuz 11 cosmonauts last week now overshadows events of the Soyuz 10 mission, it nevertheless had been assumed by Western observers that the Soyuz 10 mission was terminated early. The Soviets had put the experimental station Salyut into orbit and then sent Soyuz 10 to couple with it. Observers generally believe that the intention was to have the three-man crew of Soyuz 10 enter the Salyut station and stay in it. When this did not happen, a failure was assumed.

Not so, says Russian Cosmonaut Yevgeniy V. Khrunov. According to him, the Soyuz 10 crew was not intended to enter the Salyut. Soyuz 10 was a dress rehearsal for Soyuz 11, Khrunov maintained. Its purpose was to test the systems and pave the way for the Soyuz mission that would follow, he contended. In that, it was a success. His comments were made prior to the Soyuz 11 disaster.