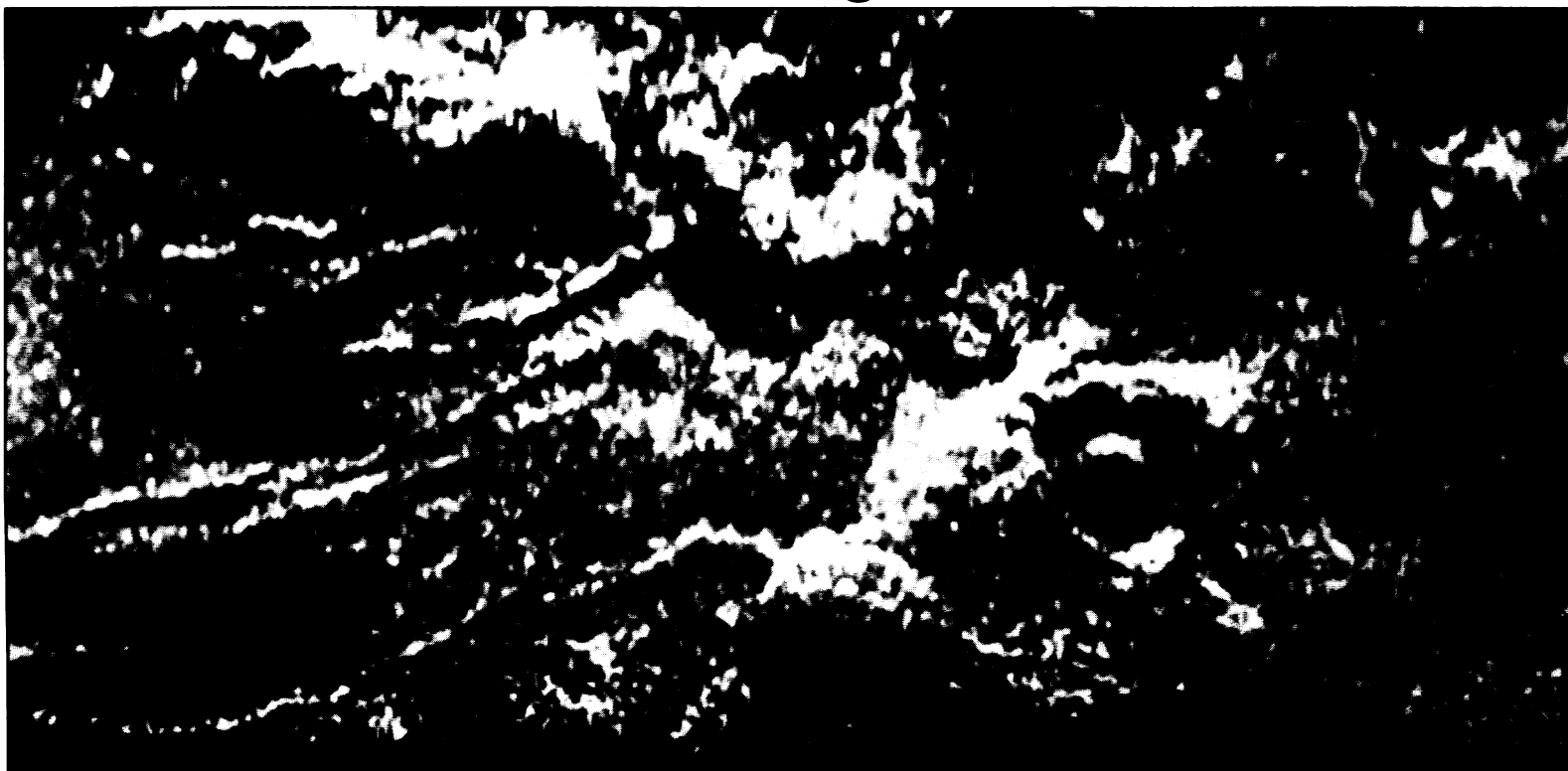


Soviet Radar Craft Scanning Northern Venus



Planetary scientists in the United States have been waiting in frustration for a look at early results from two Soviet spacecraft that have been orbiting the planet Venus since mid-October (SN: 10/22/83, p. 263). Launched in June, Venera 15 and 16 carry synthetic-aperture radar systems similar to the one aboard the U.S. Pioneer Venus orbiter that provided the first global maps of the haze-hidden world's surface. Only a few details of the dual mission — some of them essential in interpreting the resulting images — have been announced, but at least a few of the images themselves have been shown.

The image above, the first released to the Western press, shows a portion of a region that Soviet sources call "Metida." This presumably corresponds to a feature listed on Pioneer Venus map as "Metis Regio," a highland area about 500 kilometers across at about 72° north latitude. Metis is near the northern limit of the Pioneer orbiter's radar coverage, where its resolution is least sharp, but the two Veneras are concentrating on the

north polar region.

Tass/Wide World

Judging only from this image with no supporting information, any firm interpretation is difficult, says Harold Masursky of the U.S. Geological Survey in Flagstaff, Ariz., but there do seem to be signs of some volcanic forms. The brightness variations of the linear features in the image's left half, he says, suggest possible tectonic scarps and faults, with some indications of volcanic modification. The double streak about a third of the way up from the bottom could turn out to be a "ramped" valley, with raised edges formed by thrust-faulting. The conspicuous round feature just right of center may be a volcanic crater, with what appears to be a domed center topped by a smaller depression containing a central bump or peak.

The territory still farther north, meanwhile, has not been seen at all except by the Veneras, which are just beginning their work, and U.S. researchers are eagerly awaiting the results.

—J. Eberhart

IRAS runs out of gas

The end came quickly and without warning. The Infrared Astronomy Satellite (IRAS) had been working perfectly for nearly 10 months, well beyond the seven anticipated at the time of its Jan. 25 launching. It was even expected to have another six weeks left, when, on Nov. 21, the supply of helium refrigerant that had enabled it to work abruptly ran out.

There had been no way to be sure when it would happen. The coolant was "superfluid" helium, only 2°C above absolute zero, held within the walls of a doughnut-shaped container that surrounded the satellite's telescope and kept its detectors cold enough to spot the faint, long-wave-

length emissions of IR sources in the sky (SN: 11/19/83, p. 324). As IRAS orbited the earth, the heat of the sun and of IRAS itself gradually turned the superfluid to a gas, which was vented through a porous plug, but the remaining superfluid retained its full cooling (heat-conducting) efficiency as long as there was enough to keep even a thin film on the container walls. There was no direct way to measure the amount of superfluid remaining in the container; engineers could only monitor the escape rate of the gaseous helium and subtract the calculated amount of gas from their best estimate of the amount of superfluid put in before launch. And from the time the superfluid got too low to keep the walls covered, the rest was gone in minutes. The telescope's detectors warmed to uselessness in less than a day.

—J. Eberhart

Cosmonauts finally return

After nearly five months aboard the orbiting Salyut 7 space station, Soviet cosmonauts Vladimir Lyakhov and Aleksandr Aleksandrov returned safely to earth last week in the same Soyuz T-9 craft that had carried them into space. There had been speculation that the Soviets might be concerned about using Soyuz T-9 (launched June 27) for the homecoming, since no previous Soyuz had waited more than 115 days for its reentry. Atypically, the crew had no visitors during their stay—a Sept. 27 launchpad accident forced two other cosmonauts to make an emergency exit from their craft on the ground. (In April, before Lyakhov and Aleksandrov reached the station, another crew failed in a docking attempt and returned to earth.) □