

SCIENCE NEWS OF THE WEEK

Soviet Landing Promises a Colorful Venus

Last Nov. 1, several hundred scientists met in Palo Alto, Calif., to begin a nearly week-long international conference about the environment of Venus. The researchers came from the United States, France, Germany, Israel, Italy and elsewhere, but conspicuously absent were several scheduled speakers from the Soviet Union. Although the reason was unclear, it was certainly not a matter of waning Soviet interest in earth's bizarre "twin." Only two days before, the Venera 13 spacecraft had been sent toward the seventh Soviet soft-landing on the planet (a feat never even attempted by a U.S. craft), and on Nov. 4, Venera 14 followed along behind. On board were several advances over past Venera designs, notably including improved camera systems and equipment designed to collect and analyze the first-ever direct samples of the Venus surface.

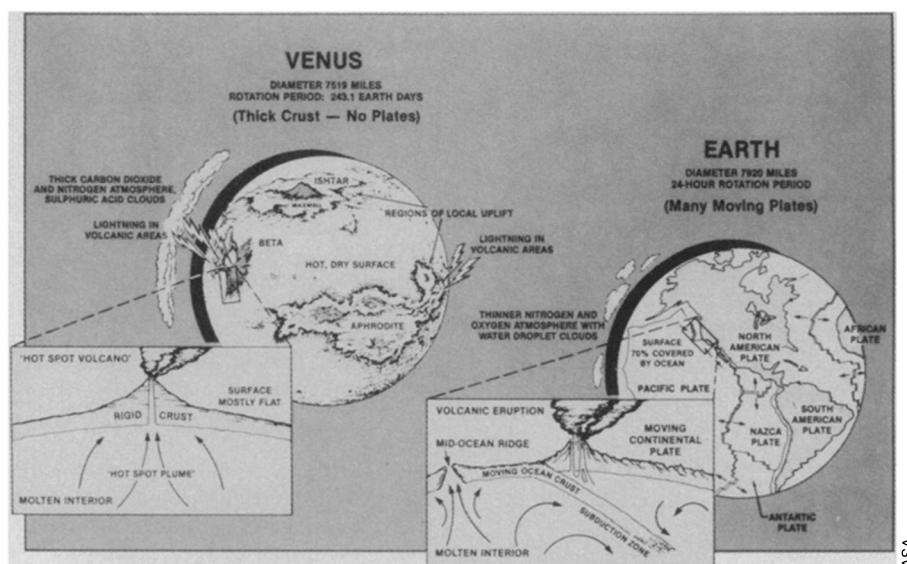
Last week, on March 1, Venera 13 arrived, with its companion due to join it four days later. On its way down through the dense atmosphere (after being dropped off by a "flyby" craft that would relay communications to earth), the lander took chemical and isotopic measurements, gathered data on the structure of the acid-rich cloud layers, monitored the spectrum of scattered sunlight and recorded electric discharges that have been associated in past studies with lightning.

The possibility of lightning on Venus has intrigued researchers for several years, but it has become particularly meaningful in recent months with a U.S. researcher's conclusion that most of the presumed lightning bursts recorded by the U.S. Pioneer Venus orbiter have been concentrated over what radar analyses suggest to be the two freshest surface areas on the planet. Such freshness could indicate a surface modified relatively recently by volcanism, and the presence there of lightning—often associated with volcanic eruptions on earth—could mean that such activity is still in progress.

The apparently youngest terrain of all is in a region known as Beta, whose topography (at the limited radar resolution) and roughness is reminiscent of a major volcanic zone. And it was just southeast of Beta that Venera 13 touched down.

The craft survived just 127 minutes, according to the Soviet news agency Tass, but that was 17 minutes longer than the previous record, set by Venera 11 in 1978. Surviving on Venus at all is quite a feat—the temperature at the new site (located at latitude 7°30'S by longitude 303°), Tass reported, was 457°C (854.6°F), an environment made all the more disagreeable by an atmospheric pressure 89 times that of earth.

Until this week, only two photos of the



Comparison of Venus and earth is based on U.S. and Soviet spacecraft data gathered before this week's arrival of Venera 13 and 14. Several lines of evidence are pointing to a possibly still-active Venus, a view which the latest additions to the armada may enhance. Venera 13 landed southeast of the region known as Beta, instrumented to take pictures in color, analyze the surface material and more.

surface of Venus had ever been taken, one each by Veneras 9 and 10 in 1975. Venera 13, said Tass, added eight more, some through multiple filters to provide color. "Sharp rocks semi-covered with fine dust and sand are scattered around," the agency reported. "One can conclude that there is a little blue color on the planet's surface. The rock is mostly brownish." The resolution was apparently sharp, with one picture showing details as small as 4 to 5 millimeters across from a distance of 1.5 meters. But just as eagerly awaited have been the results of another experiment: X-ray fluorescence spectroscopy, potentially capable of providing an element-by-element report card on the stuff of Venus. The only previous surface-composition data had come from gamma-ray meas-

One of what until this week were the only two photos of the Venus surface, this was taken in 1975 by the Venera 10 lander.



urements, indicating amounts of radioactive uranium, thorium and potassium. But the X-ray data require collecting a sample, and Venera 13 used a drill suction device to gather a single precious cubic centimeter of Venus for study in a cooled, depressurized chamber within the lander's body.

Seismic data were also gathered, according to Tass, "with the help of a detachable device." This could mean that a seismometer was placed out on "solid ground." The U.S. Viking landers on Mars had their seismometers mounted directly on the lander structure, which notably degraded the results (from the one working instrument) by causing it to shake every time the wind blew the spidery craft. With lightning, radar data and gravity analyses all consistent with at least the possibility of a still-active planet, the seismic signature of Venus could carry an exciting message.

One frustrating factor for U.S. researchers is that a long-standing U.S.-Soviet agreement on space cooperation—including the exchange of interplanetary data—expires May 24 after having been in effect for a decade. It is one of several bilateral agreements whose renewals have been temporarily blocked by President Reagan; the situation is under review by the State Department. Fortunately, says one U.S. scientist, individual contacts have not been banned. —J. Eberhart