

Russians now in space too

On Dec. 19, for the first time, Soviet and American astronauts orbited the earth at the same time. At 6:55 a.m. EST, with the Skylab 3 crew on its thirty-third day in space, Soyuz 13 lifted off carrying cosmonauts Pyotr Klimuk and Valentin Lebedev toward a mission that seems to have been designed with Skylab in mind.

Science, apart from biomedical information on the responses of humans and other animals to the space environment, has never been a highly publicized part of the Soviet manned space program. As long ago as 1968, Soyuz 3 pilot Georgy Beregovoy was reported as making astronomical observations as well as spotting hurricanes, forest fires and other features on the earth below

Science photo of 1973

Much of the beauty—the physical, artistic beauty—in science lies beyond the eye of the casual beholder. Sights too big, too small, too far away or at the wrong wavelengths for the unaided eye spring into view with the scientist's tools. Candidates for the 1973 Science News Photo of the Year were numerous, from a photomicrograph of antibodies preventing conception (SN: 2/10/73, p. 81) to the first pictures taken on the scene of the Mid-Atlantic Ridge, 9,000 feet below the ocean surface.

The editors' choice, however, is on this week's cover: mighty Jupiter, swathed in brilliant stripes, highlighted by the famous red spot and punctuated by the shadow of Io, the planet's second nearest and third largest moon. Taken from 1,580,000 miles away by Pioneer 10, the picture was reconstructed on earth from scan lines of the probe's imaging photopolarimeter, built by a team at the Santa Barbara Research Center and operated by Tom Gehrels of the University of Arizona. Impressive though it be as a photo, the fact of its making is the true milestone, symbolic of man's passage to the outer worlds.



NASA

U.S. and Soviet officials have met 10 times planning 1975 joint rendezvous.

him, and photography has been a part of the program since its early days. But references to scientific—as opposed to technological—achievement have been few in the official Soviet press.

Western observers of the Soviet space effort have pointed out, however, that Russian citizens have been intrigued by the scientific accomplishments of Skylab, a factor which an image-conscious Soviet government might well interpret as disillusionment and a feeling of being left behind. Thus on Soyuz 13, science is, at least compared with previous missions, conspicuously present.

Instrumented telescopes were included—and announced—for studies of the ultraviolet spectra of stars “and other space objects.” Some of Skylab's most spectacular work has been its observations of the sun and other stars. Also in a Skylab vein, Soyuz 13 was scheduled to carry out “spectral analyses” of various parts of the earth, photographing them by different wavelengths of light to seek deposits of valuable geological resources. The cosmonauts were also to gather spectral and other data useful in developing long-range weather prediction as well as in studying the physical processes of the upper atmosphere.

The flight's predecessor, Soyuz 12, which orbited the earth for less than two days in September, was the first Soviet manned mission in 27 months, and was intended to check out the redesigned version of the spacecraft in which three cosmonauts died during re-entry in June of 1971. The major change was the redesign of the interior to hold two crewmen in spacesuits rather than three in simple coveralls. During that flight there was little time for scientific experiments, but U.S. space officials who have been visiting the Soviet Union periodically in preparation for the Apollo-Soyuz rendezvous mission in 1975 have since expressed “full confidence” in the modified spacecraft.

Within five orbits after its launching, Soyuz 13 raised its path around the earth to an ellipse ranging from 140 to 169 miles above the ground, an orbit similar to previous flights in which the

spacecraft docked with an unmanned Salyut space station. Prior to Soyuz 12, however, which reached a Soyuz record altitude of 214 miles, no other spacecraft in the series had gotten much above docking altitude. This was one of the numerous factors involved in planning the complex joint rendezvous, in which the U.S. and Soviet spacecraft will dock at a height of about 167 miles. (Skylab docked at about 270.)

The Soyuz 13 cosmonauts also have something in common with the Skylab 3 crewmen in that all are rookies in space. Klimuk, the mission pilot and an air force major, and Lebedev, a spacecraft systems designer, are on their first orbital flight, though Klimuk has been in the cosmonaut program for eight years. Soviet space planners, however, have been less reluctant than their U.S. counterparts to send all-rookie crews into orbit. Of the 30 U.S. manned space flights, only 10 have included an astronaut who has flown one or more times before. Three astronauts, in fact—John Young, Charles Conrad and James Lovell—have flown on four missions each. Only six of the 20 manned Soviet flights have carried a “veteran.”

There was no indication, beyond the inferences of the orbit, of whether Soyuz 13 would be joined by a Salyut or another Soyuz for docking maneuvers. Four days before it was launched, however, there returned to earth an unidentified Soviet space object that some observers believe to have been an unmanned Salyut station, which spent two weeks in orbit. In addition, a Soviet space official predicted early this month that there would be more of both individual and docked missions before the 1975 rendezvous flight. □

Oil and water do mix! And it saves fuel

Everyone knows water and oil don't mix—usually. But ultrasonic sound vibrations can intersperse tiny droplets of the two liquids to form an emulsion that will not separate and can have some interesting uses. The most common such emulsion, of course, is homogenized milk, with its finely dispersed