Pioneer 10 begins journey to Jupiter

Pioneer F (renamed Pioneer 10 after launch) finally got off on its 22-month journey to Jupiter March 2 after a four-day delay. The launch was delayed three nights by sheer winds above Cape Kennedy and one night by an Air Force launch.

Other planetary payloads have been launched, but Pioneer 10 has a special ring to it (SN; 11/13/71, p. 330). It will be the first craft to navigate through the asteroid belt (beginning in early July), and on to a rendezvous with Jupiter Dec. 3, 1973. It will then cross the orbit of Uranus in 1980 and at some point beyond the orbit of Pluto (about 5.8 billion kilometers from the sun) leave the solar system. Carl Sagan and Frank Drake of Cornell University estimate that with a residual interstellar velocity of 11.5 kilometers per second, it will take Pioneer 10 some 80,000 years to travel one parsec—about the distance to the nearest star. After mid-course correction burns early this week, Charles F. Hall, project manager of Pioneer, said the craft would exit the trailing edge of the solar system (in relation to the solar system’s direction of rotation within the Milky Way galaxy). It is thought now that the craft will be headed in the general direction of the star Aldebaran. Should Pioneer 10 head for that star, it could take an estimated 1.7 million years to get there.

The spacecraft carries a plaque designed to show any intelligent civilization from another system that might intercept Pioneer 10 from what part of the galaxy and from which planet in the solar system it came and when it was launched (SN: 2/26/72, p. 135).

The Jupiter probe left earth at a speed of 51,800 kilometers per hour—the fastest that any manmade object has ever flown. It passed the moon in 11 hours.

As a result of this week’s mid-course corrections, Pioneer 10 is expected to pass within 135,000 kilometers of the surface of Jupiter and within 400,000 kilometers of Io, 300,000 kilometers of Europa and 500,000 kilometers of Ganymede, all moons of Jupiter. Three instruments aboard recorded data as the craft went through the earth’s radiation belt and crossed the boundary of the earth’s magnetic field.

A hexagonal surprise in superconductivity

It took 50 years after the experimental discovery of superconductivity for theoretical physicists to reconcile the phenomenon with the laws of physics. There is still no reliable theory that predicts where and when superconductivity should appear, and its appearance occasionally surprises experimenters.

Such a surprise has come to a group working at Bell Telephone Laboratories in Murray Hill, N.J. The investigators, H. E. Barz, A. S. Cooper, E. Corenzwit, M. Mareejo, B. T. Matthias (also of the University of California at San Diego) and P. H. Schmidt, have found superconductivity at quite high temperatures in lithium titanium sulfides. It was, reports Matthias, “an entirely new and quite unexpected phenomenon.”

The transition temperatures for complete superconductivity in these compounds ranged between 10 and 13 de-