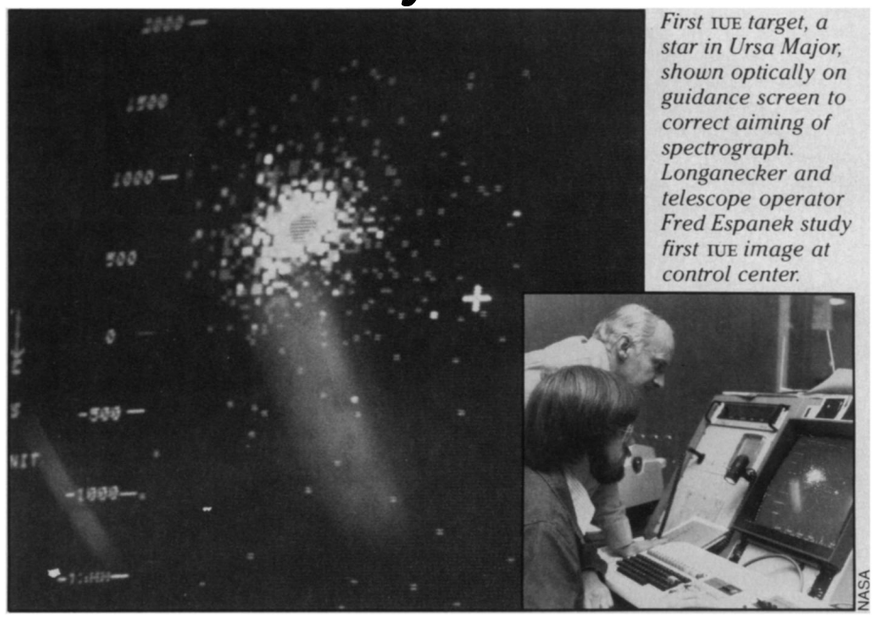
Lively Start for UV Astronomy Satellite

One of the newest observational "windows" on the sky is the ultraviolet, a waveband that some astronomers once feared would be forever closed to them because of absorption by the interstellar medium. A UV experiment during the 1975 Apollo-Soyuz rendezvous showed emphatically that the window was open — the very first sighting "blew us off the console panel," said the astronomer in charge — but the newest UV observing tool on the scene has gone further still, yielding diverse and significant results in only its first week.

The International Ultraviolet Explorer satellite was launched on Jan. 26, under the combined auspices of NASA, the European Space Agency and the British Science Research Council (SN: 2/4/78, p. 71). It will not become "officially operational" until early April — its telescope has not yet even been refocussed from its prelaunch setting — but early results in the checkout phase have already proved valuable to observers from three countries.



First IUE target, a star in Ursa Major, shown optically on guidance screen to correct aiming of spectrograph. Longanecker and telescope operator Fred Espanek study first IUE image at control center.

The first observations, made on Feb. 7, were of a bright and a dim star (Eta Ursa Majoris and HD 137389), chosen because of their well-known spectral characteristics and because disparate magnitudes would help in calibrating the instrument. Both the sensitivity of the spectrograph and the aiming accuracy of the telescope, says IUE project manager Gerald Longanecker of NASA, "match or exceed" predictions. Then, after the calibration runs, came the first series of scientific observations, representing the project's six general areas of research:

1. Cool stars: Seated at the NASA Goddard Space Flight Center beside a telescope operator who provided the nearly real-time instructions to the satellite, Jeff Linsky of the University of Colorado looked at the first target, the double star Cappella or Alpha Aurigae. About 10 times larger than the sun, it has a sunlike corona and chromosphere, but their Doppler shifts suggest that the star is losing its mass at perhaps twice the sun's rate. The spectra provided by IUE, says project scientist Albert Boggess of Goddard, include previously unidentifiable features originating in the chromosphere, or outer atmosphere. This could yield information about the dynamic region from which the mass loss is taking place.

2. Hot stars: The bluish, rather hot, highly evolved subdwarf star BD+75°325 was then observed by Goddard's Sarah Heap. Among other features, says Boggess, the spectra showed strong signs of the presence of carbon 2. "That's an element," he says, "that absolutely should not occur in stars of this kind." Heap's study of the star's atmosphere thus starts right from scratch with a puzzle.

3. Galaxies: The brightest of the so-called Seyfert galaxies, NGC 4151, was the target of Alec Boksenberg of University College, London, observing from a Madrid control center that is the European twin of the Goddard installation. He'll have other new data to compare with his own, since NGC 4151 was also observed barely three days before from a sounding rocket, using an instrument controlled by Arthur Davidsen of Johns Hopkins University.

4. X-ray sources: "A very rich spectrum, full of emission lines and absorption lines," says Andrea Dupree of Harvard, showed up in her observations of HD 153919, a binary with a large optical primary object and a small X-ray secondary. In such pairs, streams of mass are believed to be pulled from the primary by the strong gravitational attraction of the secondary, and optical and UV data have shown signs of this process in non-X-ray pairs such as Beta Lyrae. Those data, however, says Dupree, show only spectral lines from deep in the primary's interior; IUE offers the chance to study the hotter region in the star's upper reaches, with the prospect even of observing the "accretion disks" and other possible signs of mass transfer at the secondary object. The interstellar medium itself also shows up in Dupree's and Linsky's data, valuable both in its own right and in correcting data on discrete UV sources that must be seen through it.

5. The interstellar medium: The star Zeta Ophiuchi was the target of the University of Bonn's Michael Grewing, but it was chosen largely because previous observations have noted dense interstellar "clouds" between it and the earth.

6. Planets: Mars was the first, in observations conducted by Arthur Lane of Jet Propulsion Laboratory. Lane was particularly excited about being scheduled so early in IUE's operations because of reports from ground-based observers that a bright spot, possibly representing dust storm activity, had been reported by several earth-based observers a few weeks before. With the Martian atmosphere's capability of keeping dust aloft for months, there was the possibility of being able to study the dust spectra, as well as atmospheric composition and the UV reflectivity of the surface.

The initial IUE scientists, including those in the first nine-month series of "operational" studies, to begin in April, were selected as long ago as 1972. Their plans include numerous stellar sources, as well as Jupiter's Great Red Spot, its unusual moon Io (with its veils of sodium, hydrogen, etc.) and other planetary targets. The initial results promise a rich harvest during the satellite's planned three-year lifetime, and the project is already preparing to solicit new observers for 1979. □

DES daughters and cancer

At last, perhaps, some heartening news about DES-related cancers. Preliminary results from the most extensive study ever undertaken of young women whose mothers took the synthetic hormone diethylstilbestrol (DES) while pregnant have not uncovered any cases of cancer. The federally sponsored study found, however, after examining 1,500 daughters,