

Lively Start for UV Astronomy Satellite

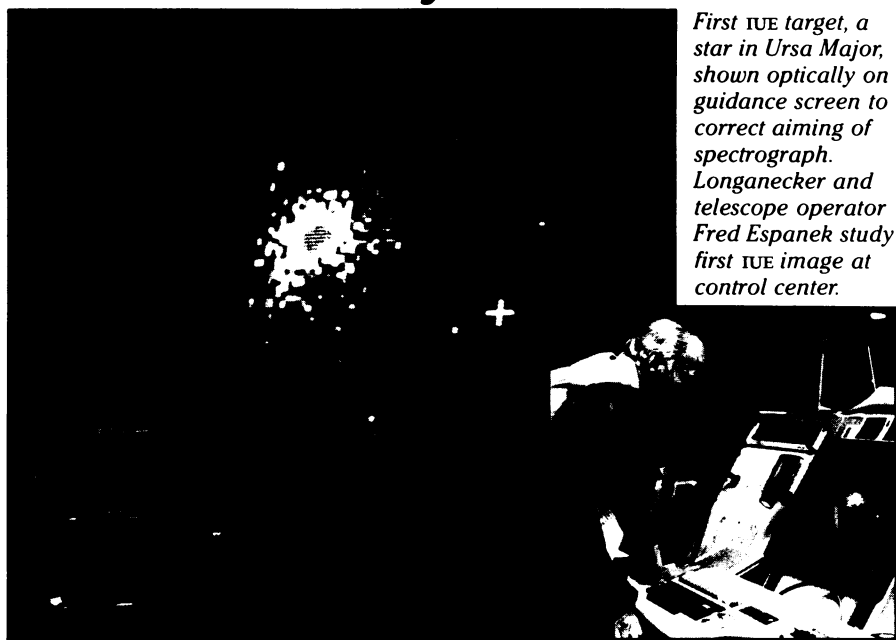
One of the newest observational "windows" on the sky is the ultraviolet, a waveband that some astronomers once feared would be forever closed to them because of absorption by the interstellar medium. A UV experiment during the 1975 Apollo-Soyuz rendezvous showed emphatically that the window was open—the 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 refocused from its prelaunch setting—but early results in the checkout phase have already proved valuable to observers from three countries.

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.



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.

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 Davidson 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,

that 35 percent of the women had abnormalities in the cells lining the vagina. Leonard T. Kurland of the Mayo Clinic in Rochester, Minn., the project coordinator, told the advisory committee of the National Cancer Institute's Division of Cancer Control and Rehabilitation that it is unknown if these changes portend a greater risk of cancer in later life. The study was begun in 1974 and will run through 1983.

Medical authorities estimate that between 500,000 and two million pregnant women were exposed to DES, mostly in the 1940s and 1950s. About 200 cases of vaginal cancer in their daughters were recorded by the National Tumor Registry. □

Girth of the earth has not changed

A number of cosmologists and geophysicists have floated the suggestion that the size of the earth may have slowly increased as millions of years went by. Cosmologically such a result is expected by those who believe in theories of the universe in which the force of gravity weakens as time goes on. If gravity weakens, the attraction of the different parts of the earth for each other lessens, and so an increase in size results. In the view of some geophysicists such an expansion would be useful in explaining the continental motions apparent in plate tectonics.

A study of paleomagnetic data, reported in the Jan. 26 *NATURE* by M. W. McElhinny, S. R. Taylor and D. J. Stevenson of the Australian National University has determined, they say, that the expansion hasn't happened. Paleomagnetic data concern the orientation of the earth's magnetic field in past epochs. The orientation of the field that happens to be present when rock is liquid gets frozen in as the rock solidifies and can be determined millions of years later. Such data are used to trace the wanderings of the magnetic poles and with enough of them, the change over time of the difference in latitude between two points on the same ancient magnetic meridian can be calculated. Such a change should occur if the earth's radius has changed, and by using all the data from a given continental block in one calculation, the investigators could discount any changes due to plate motion.

Their conclusion is that the earth's radius has changed by less than 0.8 percent in the last 400 million years. Furthermore, the results of the lunar exploration program and spacecraft studies of Mercury and Mars indicate no significant change in size for the moon, a small contraction for Mercury and a small increase for Mars. The earth data would seem to rule out any current theory of earth expansion. The Mercury data taken alone would rule out two of the five cosmologies with decreasing gravity and set stringent limits on the other three. □

Drug halves 2nd heart attack deaths

Of the 400,000 Americans surviving their first heart attack this year, approximately 12 percent would be expected to die of some heart-related problems in the perilous first year after the heart attack. But this situation soon may change. A drug used to relieve gout apparently reduces by almost one-half the risk of dying from a second heart attack in the months following the first. Patients who began using the antigout drug Anturane (sulfapyrazone) four to five weeks after their first heart attack had a death rate of 4.9 percent a year compared with 9.5 percent a year for patients taking a placebo.

Reports that Anturane prevented blood platelets from clumping together to form clots led to speculation that this drug could be beneficial in combatting recurrent heart attacks. Although blood clots haven't been shown conclusively to be the culprits in heart attacks, they are prime suspects. Blood clots could cause or worsen heart attacks by clogging an artery that nourishes the heart or by haywiring the heart's complex microcircuitry.

In 1975, researchers began a still-ongoing study in 26 U.S. and Canadian medical centers involving 1,475 patients—733 took Anturane, 742 the placebo. The patients have been receiving the treatments an average of 8.4 months. Placebos looked like Anturane. Neither patients nor physicians

knew which treatment was being given.

In a preliminary report of the study, published in the Feb. 9 *NEW ENGLAND JOURNAL OF MEDICINE*, the rate of decrease for sudden deaths—deaths occurring within one hour of the onset of symptoms—was even greater than the overall death rate. The sudden death rate among the Anturane patients was equal to just 2.7 percent a year compared with 6.3 percent for patients taking placebos.

Anturane didn't significantly reduce the incidence of a second heart attack or attacks of angina (a condition whose symptoms are sharp pains in the heart when its muscles are starved for oxygen); it only significantly reduced the chance of dying of a second seizure. But while it did not achieve statistical significance, Anturane treatment did tend to reduce the chances of a second attack. There were 41 nonfatal heart attacks among those taking the placebo and 31 among those taking Anturane. Further, only 14 patients taking the drug were hospitalized for heart rhythm abnormalities, compared with 25 in the placebo group.

The international group of researchers, led by Sol Sherry of Temple University Medical School in Philadelphia, decided to publish when they had amassed enough evidence that Anturane was beneficial to allow any patients to withdraw from the study. Since patients don't know whether they are receiving the drug or placebo, the medical investigators are giving the patients the option of withdrawing from the study to receive Anturane for sure. □

Foster children: Out of 'limbo'

Foster care is generally thought of as a desirable, in some cases life-saving, alternative for youngsters whose natural family situations place them in unbearable emotional turmoil. Behavioral investigators are now confirming the positive effects of foster placement, but at the same time are identifying factors that make some placements more successful than others.

In perhaps the most in-depth longitudinal study of its kind to date, a Columbia University research team has followed 624 New York City children over a five-year period. The youngsters—black, Hispanic and white—ranged from infancy to 12 years of age when they entered foster care.

Among the results are findings that challenge some widely held beliefs about foster care. The Columbia group found that foster children who are visited periodically by their natural parents—even when such visits may generate tenseness and anxiety—develop better intellectually and emotionally than youngsters who have essentially no contact with their natural mothers and fathers.

"We were looking for certain predictors of IQ and emotional adjustment," Columbia social work professor David Fanshel,

director of the study, said in an interview. IQ was recorded when each child entered a foster home, and at two and one-half and five years later. Emotional factors, measured by figure drawing and projective tests, as well as by social workers' and teachers' behavioral ratings, were also evaluated at the same points.

"Overall, we found a fairly remarkable stability of IQ [among those who had been visited]," says Fanshel, who co-authored the report with Hunter College professor Eugene B. Shinn. Many of the nonvisitees showed a drop in measured intelligence level. Emotionally, those children visited by their natural parents grew more responsible, responsive and less surly than their counterparts both at home and in school, report the researchers. And the more frequently the visits occurred (visits averaged about once a month), the more accelerated the youngsters' development, Fanshel says.

The social worker says his results question certain aspects of a 1973 Yale University study, which he calls "the most influential policy document [on foster care] to come out in the last decade." In that study, Yale researchers Albert J. Solnit and