COMMISSION 27 OF THE I.A.U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 3441

Konkoly Observatory
Budapest
8 March 1990
HU ISSN 0374 - 0676

GROUND-BASED OBSERVATIONS TO SUPPORT ASTRO-1

According to the current schedule, the Astro-1 payload (the Broad Band X-Ray Telescope (BBXRT), the Hopkins Ultraviolet Telescope (HUT), the Ultraviolet Imaging Telescope (UIT), and the Wisconsin Ultraviolet PhotoPolarimeter Experiment (WUPPE)) will be carried, by shuttle, into orbit on 9 May 1990 for what is expected to be a 10-day mission.

The target list for these instruments (about 300 targets for BBXRT, about 100 each for HUT, UIT, and WUPPE) includes stars (normal and super- giant), cataclysmic variables (CVs), Low-Mass X-Ray Binaries (LMXRBs), High-Mass X-Ray Binaries (HMXRBs), SuperNova Remnants (SNRs), globular cluster sources, normal galaxies, Active Galactic Nuclei (AGNs), and galaxy clusters. Good quality optical and infrared imaging, photometry, spectroscopy, spectrophotometry, polarimetry, and spectropolarimetry, as well as radio observations, will enhance the scientific usefulness of the data obtained. Some of the targets are time-variable, and multi-wavelength studies will be needed to help disentangle the physics of these sources. As an example, a recent result of a simultaneous, multi-wavelength campaign on several CVs has shown that the accretion disks present in these systems flare in the optical BEFORE showing the flare's effects in the UV. This result is a big clue in understanding the accretion disk behavior. Not all of the targets need be studied with simultaneous, ground-based observations. The SNRs, for example, will benefit from more complete wavelength coverage, but quasi-simultaneous observations will be quite sufficient.

All observers who are interested are encouraged to contact the Astro-1 coordinator listed below. Please be advised that this IS a shuttle mission, and the observing timeline may change with VERY short notice. As such, I am requesting that any observer interested in this program please supply an e-mail address. Rapid communication will be essential, particularly for any simultaneous observations which will be made. Furthermore, the timeline is specified in MET (Mission Elapsed Time), and the zero point in a useful time frame (e.g., GMT) will have to be distributed. Finally, when contacting the coordinator, please send a list of the types of observations you can make, or a subset of the target list in which you are interested.

To make this coordinated observation effort at all successful, I request that observers be prepared to summarize, VERY briefly, their observations immediately after the shuttle mission ends. I intend to e-mail a suggested format to all participants, thereby allowing me to collate who observed what. This will aid the individual scientists who are part of the mission. Specifically, I intend to assemble all the observation summaries so that an individual on any of the instrument teams can find out what other observations have been made, and who to contact.

There is the issue of data rights. The data obtained from the shuttle instruments

will be retained by each team for the exclusive period stipulated in the instrument proposal (for example, for BBXRT, the exclusive data rights period works out to be about 20 months: 12 months for data analysis, 6 months for instrument calibration checks, and 2 months in the immediate post-shuttle return phase). Collaborations between the various instrument scientists and any ground-based observers contributing data at other bandpasses will undoubtedly occur, and will be encouraged. Such collaborations cannot be guaranteed. A prime purpose of the post-mission observation summary will be to connect the mission scientists with the corresponding ground-based observers.

All observers are encouraged to participate. The value of multi-wavelength studies cannot be emphasized too strongly (see, for example, *Multiwavelength Astrophysics*, ed. F. Cordova).

Contact: Eric M. Schlegel
Code 666
Laboratory for High Energy Astrophysics
NASA-GSFC
Greenbelt, MD 20771

E-mail SPAN: 6197::SCHLEGEL
Internet: eric@heasfs.gsfc.nasa.gov

FAX: (301) 286-3391

Accessing the On-line Mission List

FTP

```
ftp nssdca.gsfc.nasa.gov
username anonymous
cd astro-1
ls
get astro_1.timeline
get astro_1.news
quit
```

default DECnet

```
directory nssdca::[anonymous.astro-1]
copy nssdca::[anonymous.astro-1]astro_1.timeline *.*
copy nssdca::[anonymous.astro-1]astro_1.news *.*
```

Instrument-specific Descriptions

BBXRT

BBXRT will cover the 0.3 to 12keV band, with an effective area of 765 cm^2 at 1.5keV, and 300 cm^2 at 7keV. The energy resolution is 0.09keV at 1.5keV, and 0.15keV at 6keV. The typical observing time will be about 2 to 4 ksecs.

The observing list for BBXRT is the largest of the Astro-1 instruments, and includes a representative of nearly every class of x-ray emitting objects. A current mission list should be consulted for the targets. Time-variable targets should be monitored at ground-observable wavelengths to provide a broader wavelength coverage.

HUT

HUT is a UV spectroscopy experiment, covering the 850Å to 1850Å range in first order (425Å to 925Å in second order) at a spectral resolution of 3Å. The telescope has a 0.9m f/2 primary.

The target list for HUT is varied, including bright stars, cataclysmic variables and other interacting binary stars, supernova remnants, galaxies, and quasars. A current mission list should be consulted for the targets.

UIT

UIT is a UV photography experiment, covering the 1400Å to 3200Å range. It has a magnitude limit of about 25 (maximum exposure time ~30 minutes), with its 38 cm, f/9 mirror. The field of view is 40 arcmin, and the angular resolution is 2 arcsec.

As might be expected, the UIT mission list contains objects which will show extended emission in the UV (galaxies, SNRs, etc.). Images of the same objects, taken at other bandpasses with a comparable image scale, would be valuable for comparative studies.

WUPPE

WUPPE is a UV polarimetry experiment, covering the 1400Å to 3200Å range at a resolution of about 6Å. The magnitude limit is about 16, with a primary area of 1800 cm^2 (mirror diameter is 50 cm). The field of view is 3.3 by 4.4 arcmin.

Monitoring observations of variables on the WUPPE target list are urged. The targets include cataclysmic variables, symbiotic stars, pulsators, and Be stars in both hemispheres. In addition, photometry of selected BL Lac objects will be necessary. WUPPE is capable of observing these faint objects only in outburst.

ERIC M. SCHLEGEL

Code 666
Laboratory for High Energy Astrophysics
NASA-GSFC
Greenbelt, MD 20771