



# East Valley

## Astronomy Club

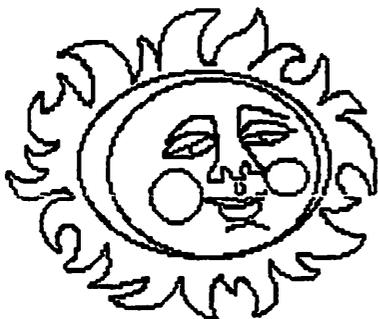
President	Tom Harvey	998-0035
Vice-President	Ted Heckens	827-1524
Treasurer	Bob Kelley	451-7319
Newsletter	Bill Smith/Roy Halverson	831-1520/844-9563

September

Newsletter

1992

### EDITOR'S NOTES



Summer is on the wane - yes, believe it or not the days are getting shorter, if not cooler. Certainly this will be a summer to soon forget. That is, when it comes to using amateur telescopes on crystal clear nights!

We can all hope that with fall will come the skies we brag about. Maybe that's part of the problem - we take our typically great skies for granted and don't realize how the rest of the U.S. amateurs live. No wonder you hear of armchair astronomers if this is the typical kind of weather they have to put up with.

Speaking of armchair astronomers--have we got a deal! Carl Lorson, our club librarian, has been very busy cataloging our books. He's ready to serve your needs. See page 3 for details on how to check them out. Its nice to know that there is a pot of gold at the end of these storms.

Michael Janes, former editor and frequent contributor to EVAC newsletters, has done it again!

Michael is a member of AAVSO (The American Association of Variable Star Observers) and has passed along two recent articles from them about a new project for amateur astronomers to become involved in research.

The first article begins on page 5 and is about the launch in June of the EUVE (Extreme Ultraviolet Explorer) satellite. The mission is to map the complete sky in extreme ultraviolet light. Upon completion of its primary mission, the satellite will make spectroscopic observations of specific sources. Amateur astronomers worldwide are asked to support this research by visually observing these same sources from earth. Amateurs from 43 countries will contribute their time to monitoring a list of variable stars. Many of these stars are visible in smaller telescopes. Almost anyone in EVAC with a telescope can be a part of this program. See the letter from AASVO in the newsletter for more information. Michael will lend his support to anyone wanting to contribute to this program. All the data you need is already in Michael's possession. Call him at 945-5431 for further information.

# SALE

8 inch f/6 Newtonian, Dobsonian mount, Truss tube, easy to transport, easy to setup. Meade mirrors, Novak Cell and Spider. Has Alt-AZ Circles to make it easy to find dim objects. Package includes a Casio Pocket Computer for calculating Alt-Az positions from the circles. Includes: Telrad zero power finder, 3 eyepieces: 32mm Erfle, 10mm Plossl and 6mm Kellner. Entire package: Scope, eyepieces, Telrad and Computer \$700. Contact Steve Coe at 878-1873.

### MARK YOUR CALENDAR

#### EVAC BUSINESS MEETINGS

Sept. 9th - SCC Room PS 170

Oct. 14th                      Nov. 11th

#### DEEP SKY STAR PARTIES

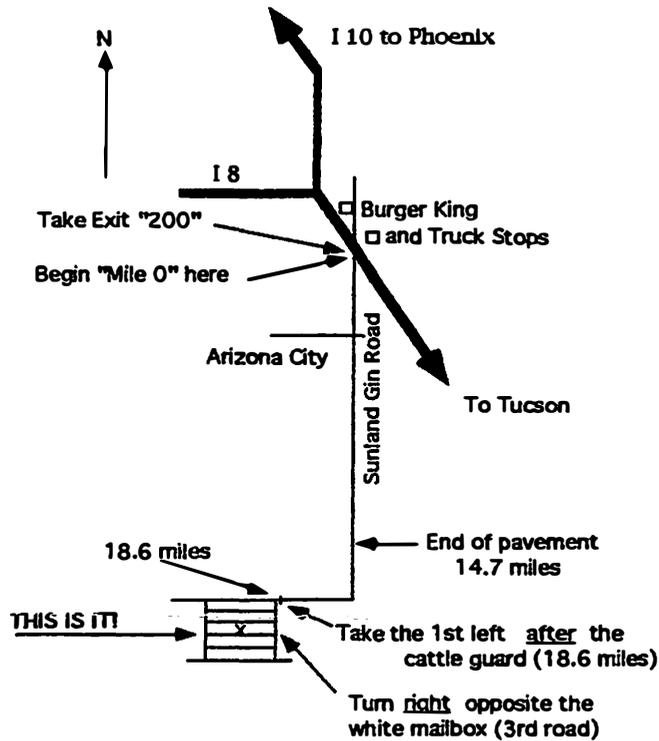
Aug. 29      Sept. 26      Oct. 23-24

Southern site-see map inside.

#### LOCAL STAR PARTIES

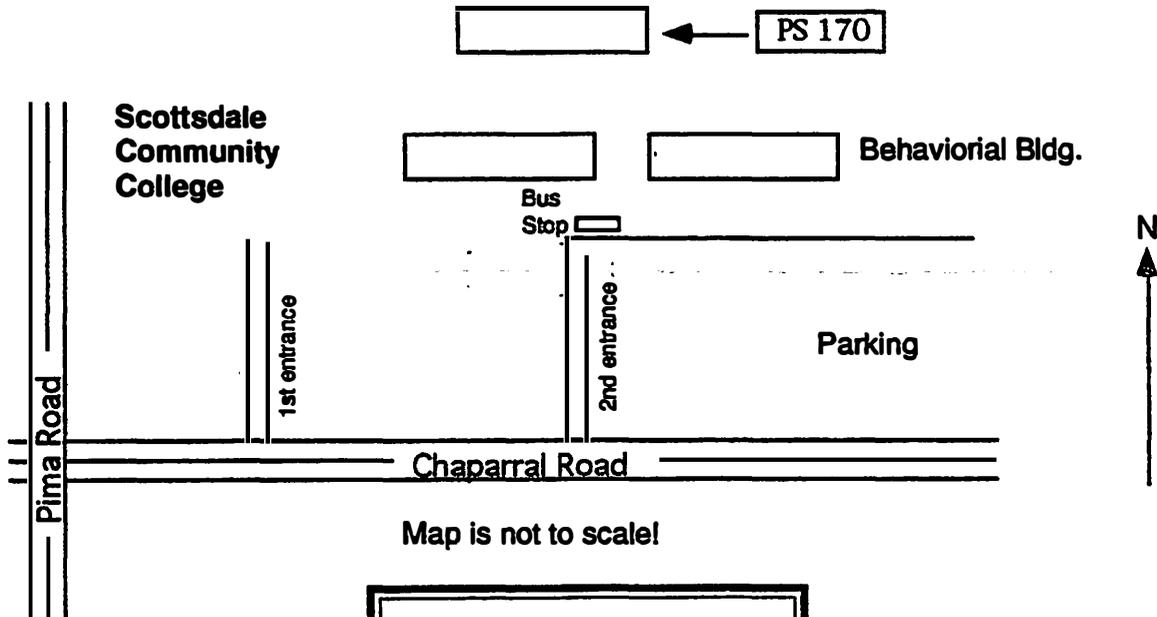
Sept. 19th - Carefree Site- Oct. 17th

Call Bob Kelley for instructions.

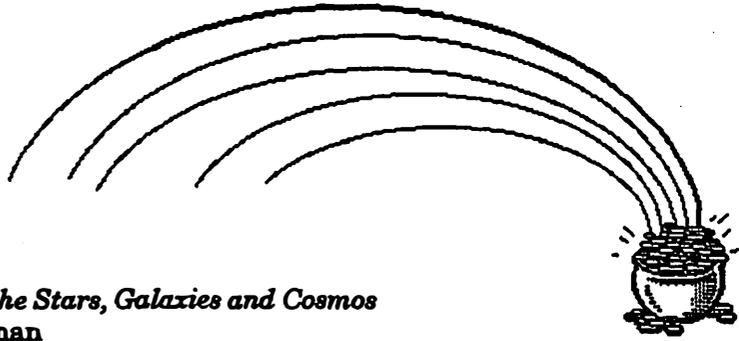


Believe it or not, they named the street opposite the white mailbox:  
**MOON CHILD!!**

**- DEEP SKY -**  
**AUGUST 29th - SEPTEMBER 26th**



Next business meeting 9/9/92.  
 Room PS 170



## **EVAC LIBRARY**

- Astronomer's Universe: The Stars, Galaxies and Cosmos*  
by Herbert Friedman
- Astronomy From the Earth To The Universe*  
by Jay M. Pasachoff
- Astronomy Structure of the Universe*  
by A. E. Roy & D. Clarke
- Astronomy With A Small Telescope*  
by James Muirden
- Astrophotography For the Amateur*  
by Michael Covington
- Atoms of Silence - An Exploration of Cosmic Evolution*  
by Hubert Reeves
- Burnham's Celestial Handbooks:*  
Vol. 1 Andromeda - Cetus  
Vol. 2 Chamaeleon - Orion  
Vol. 3 Pavo - Vulpecula
- Deep Sky Objects: A Guide for the Amateur Astronomer*  
by Jack Newton
- Peterson Field Guide to the Stars and Planets*  
by Donald H. Menzel
- How to Make a Telescope*  
by Jean Texereau
- How to Use An Astronomical Telescope*  
by James Muirden
- Introductory Astronomy & Astrophysics*  
by Zeilik & Smith
- Star Guide - A Unique System for Identifying the Brightest Stars In the Night Sky*  
by Steven L. Beyer
- Turn Left At Orion*  
by Guy Consolmagno & Dan Davis
- Universe From Your Backyard*  
by David J. Eicher
- Universe Guide To Stars and Planets:*  
by Ian Ridpath & Wil Tirion
- Whitney's Star Finder*  
by Charles A. Whitney
- The X-Ray Universe*  
by Wallace Tucker & Ricardo Giacconi

**SPECIAL THANKS TO DICK SIMMONS AND ROBERT KERWIN WHO  
DONATED THE ABOVE BOOKS TO START OUR NEW LIBRARY!**

To check out a book from the EVAC library contact Carl Lorson (834-6864) prior to the next business meeting. Let him know which book you would like and he will bring it to the next business meeting. If you have books to donate, please see Carl at the meeting and we will include an updated list in future newsletters.

# The Deep Sky Notebook

by Robert Kerwin

## The Wonders of Cygnus

The constellation Cygnus, also known as the "Northern Cross" lies in one of the most beautiful regions of the northern Milky Way. Because of its northerly declination, Cygnus graces the skies of late summer and autumn long after the brilliant star clouds of Sagittarius and Scorpius have set. Its brightest star is Deneb, magnitude 1.26. Deneb lies at a distance of about 1600 light years and is one of the most luminous stars in the sky, at absolute magnitude -7.1.

A good place to start our tour of Cygnus is with the bright open cluster M39. M39 is located about nine degrees northeast of Deneb and is visible to the unaided eye. Moderate-size telescopes should reveal a large, scattered group of about 50 stars without a central condensation. Just three degrees east of Deneb lies one of the showpieces of the northern sky, NGC 7000, the North America Nebula. This object has the reputation of being faint and difficult. Actually, NGC 7000 is visible in binoculars from a dark sky site. Since this object is large (100 arc-minutes across), you will need to use a low-power, wide-field eyepiece. Point your telescope to the proper location, then begin a series of slow, smooth sweeps across the nebula. This sweeping technique will allow you to see the entire object and will also enhance your eye's ability to detect the subtle contrasts. The most prominent area of the nebula is the "Mexico" region which stand out well against the darker background, especially to the west. If you have a UHC filter (or similar), use it—the UHC works very well on this object. While you are in the area, look for NGC 6996 on the western edge of the nebula. This cluster appears as a clump of about 25 stars in a 12 arc-minute area.

Approximately 11 degrees northwest of Deneb is the bright planetary nebula NGC 6826. This nebula is slightly oval and appears somewhat soft-edged. The 11th magnitude central star is prominent, as is the blue-green color. Four degrees south of NGC 6826 lies NGC 6811. This bright cluster contains about 50 members in a 20 arc-minute area and should be resolvable in almost any telescope. Moving further south by six degrees, look for NGC 6819, another cluster. This cluster is more condensed than NGC 6811, containing about the same number of stars, but

in a 7 arc-minute circle. Two strings of stars lead to the north.

The Veil Nebula is a fascinating complex of nebulosity located about three degrees south of Epsilon Cygni, which forms the eastern arm of the cross. The western portion of the Veil is NGC 6960 and passes across 52 Cygni. Under low to moderate powers, this object appears as a delicate, curved wisp of nebulosity that is narrower and more distinct to the north of 52. Toward the south, the band grows wider and more diffuse. 52 Cygni is a double star, magnitudes 4.2 and 9.4, separated by 6.2 arc-seconds. Two degrees east of NGC 6960 is NGC 6992-5. This portion of the Veil appears as a faint, curved band of nebulosity. In my 8-inch telescope with averted vision, I have seen a wealth of subtle, complex filamentary detail. A UHC filter makes the filamentary structure easier to see. If you want a challenge, try looking for the patches of nebulosity in the north-central part of the complex (the easternmost of the two is labeled NGC 6979-4 on Tirion). Several years ago, under ideal conditions I suspected seeing the westernmost, triangular patch, but I have not been able to repeat the observation (was it just wishful thinking?).

Before putting your scope away for the night, don't forget to spend some time scanning some of the rich Milky Way fields, especially around Gamma Cygni and southward.

### Cygnus

Tirion chart: 3, 8, 9

U2000 charts: 54-57, 83-87, 118-122

Name	Type	Mag	Size	R.A.	Dec.
M39	oc	4.6	32'	21h 32m	+48.4
NGC 7000	dn	—	100'	20h 59m	+44.3
NGC 6826	pn	8.8	27"	19h 45m	+50.5
NGC 6811	oc	6.8	20'	19h 38m	+46.6
NGC 6819	oc	7.3	10'	19h 41m	+40.2
NGC 6960	dn	—	100'	20h 46m	+30.7
NGC 6992-5	dn	—	70"	20h 56m	+31.7

---

---

# EUVE Technical Bulletin

## AAVSO Special Edition

---

---

### ***EUVE Launch and Operations***

On Sunday June 7, 1992, at 12:40 p.m. EDT on a sunny and warm Florida day, the Extreme Ultraviolet Explorer was launched from Cape Canaveral Air Force Station on a Delta II rocket into a "near-perfect" orbit. To the delight of the crowds, white smoke and yellow flames engulfed Launch Pad 17A and the trim white and blue rocket shot into the sky and arched out over the ocean, shrugging the chains of gravity to fulfill its singular purpose of putting the EUVE satellite into orbit around the earth.

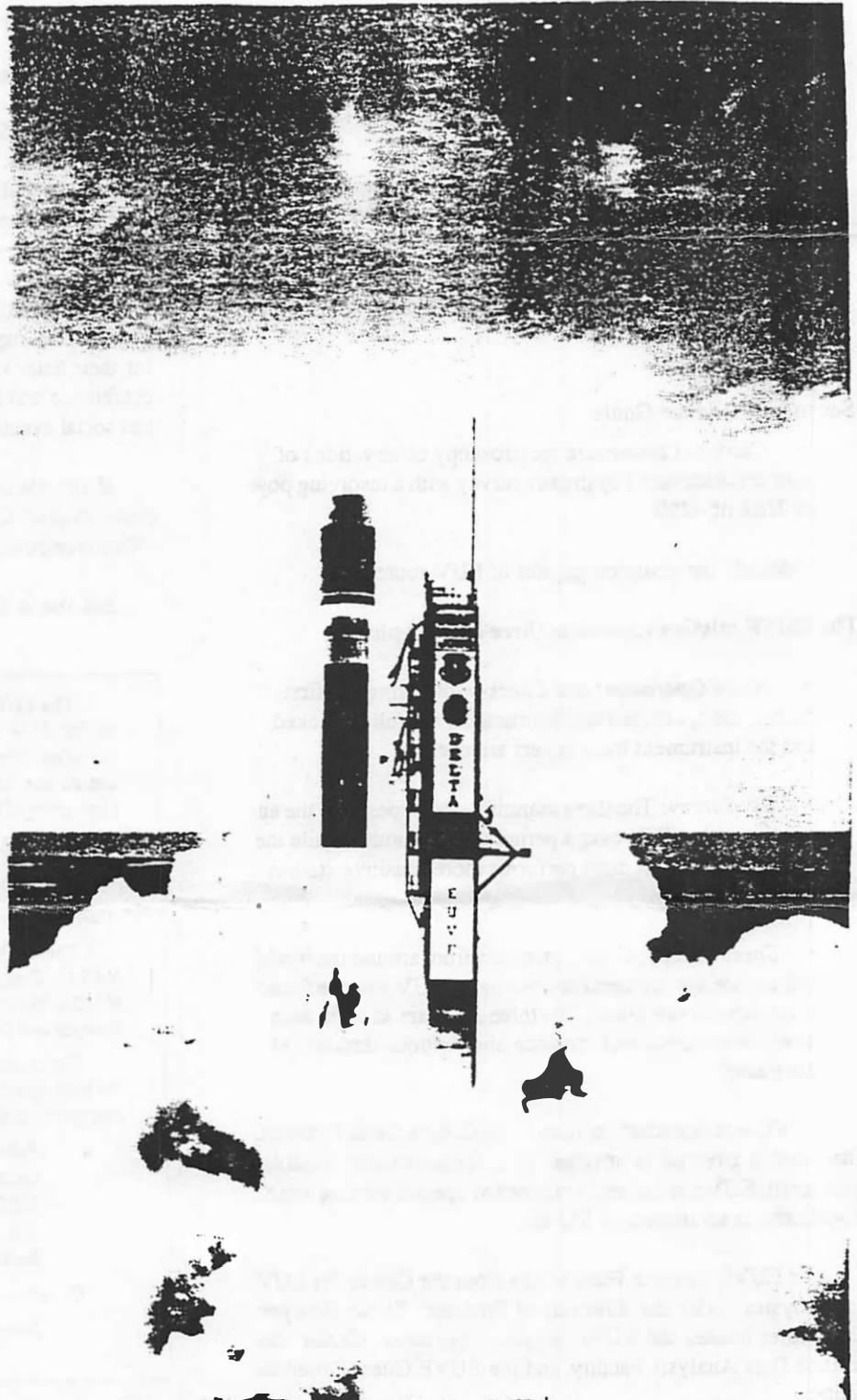
★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

On June 21, the seven detector doors were opened and the EUVE detectors saw their first light. The following day, June 22, the calibration phase of the mission was initiated as the Scanners were pointed towards the white dwarf known as WD 1254+223 and the detectors observed a target in the field of view. Calibration and Check-Out were completely successful and all instruments function perfectly.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

The EUVE All-Sky Survey began on July 29. The three Scanning Telescopes began their six-month mission of creating the first complete sky-map in the extreme ultraviolet. Sweeping the sky in bands five degrees wide, they will cover the entire sky over a period of six months. At the same time, the Deep Survey instrument will take images along the ecliptic plane. These will utilize longer exposure times and much higher sensitivity, operating in Earth's shadow cone.

Pointed observations begin in January through the EUVE Guest Observer program.



# The EUVE Mission

The Extreme Ultraviolet Explorer (EUVE) is a NASA-funded astronomy mission operating in the 70–760 Å band. The science payload, designed and built at the Center for EUV Astrophysics and Space Sciences Laboratory at the University of California, Berkeley, under the direction of Dr. Roger F. Malina, consists of three grazing incidence scanning telescopes and an EUV spectrometer/deep survey instrument.

## Primary Science Goals

- Carry out an all-sky, all-band survey in the extreme ultraviolet (70–760 Å) in four bandpasses in pixels of 6 × 6 arc minutes
- Carry out a deep survey in the EUV in two bandpasses along the ecliptic
- Probe whether new science can be done with the next increase in sensitivity provided by the Deep Survey instrument

## Secondary Science Goals

- Carry out systematic spectroscopy observations of sources discovered by the sky survey with a resolving power  $\lambda/\Delta\lambda$  of ~250
- Identify the emission physics of EUV sources

## The EUVE mission comprises three distinct phases:

- **Initial Operations and Check-out:** During the first month, the spacecraft and instruments are fully checked and the instrument front covers are opened.
- **Sky Survey:** The three scanning telescopes map the entire sky in the EUV over a period of six months, while the Deep Survey instrument performs more sensitive studies along the ecliptic.
- **Spectroscopy:** Guest Observers from around the world will use the spectrometer to investigate EUV sources found in the sky-survey phase. The three scanners and the deep survey instrument will continue observations throughout this phase.

EUVE was launched on June 7, 1992, by a Delta II rocket. The science payload is attached to a Multi-mission Modular Spacecraft. EUVE is currently planned to operate for four years. It will orbit at an altitude of 550 km.

The EUVE Science Team works from the Center for EUV Astrophysics under the direction of Professor Stuart Bowyer. The Center houses the EUVE Science Operations Center, the Science Data Analysis Facility, and the EUVE Guest Observer Center.

# 1993 Berkeley Meetings

Berkeley is the place to be in June, 1993.

The AAVSO will be meeting at Berkeley's Shattuck Hotel on Thursday through Sunday, June 4–6, 1993. Details are available from the AAVSO at (617) 354-0484.

The following week, Sunday through Thursday, June 6–10, the Center for EUV Astrophysics will be a host for the American Astronomical Society meeting on the UC Berkeley Campus. More than 1000 astronomers from all over the world are expected to attend this exciting bi-annual event.

Professor Stuart Bowyer is the chair of the Local Organizing Committee. A special session is planned on the EUVE mission and its findings, along with opportunities to tour the Center for EUV Astrophysics and the EUVE Science Operations Center.

Volunteers are needed to help with registration, set-up, audio-visual support and other general assistance. In exchange for their help, volunteers will receive free registration for the conference and the opportunity to attend many of the sessions and social events. Low-cost lodging is also available.

If you are interested in volunteering for the AAS meeting, please contact Camille Trentacoste at the CEA Public Affairs Office (see box, below).

See you in Berkeley!

The *EUVE Technical Bulletin* is published by the Center for EUV Astrophysics at the University of California, Berkeley. The opinions expressed are those of the writers, and do not necessarily reflect the opinions of NASA or the University of California.

Editors: Roger F. Malina, C. Stuart Bowyer

Managing Editor: Camille Trentacoste

Business Manager: Trish Dobson

The *EUVE Technical Bulletin* is funded in part by NASA Contract #NAS5-30180 and NASA Contract #NAS5-29298. Principal Investigators for EUVE are Prof. S. Bowyer and Dr. R. F. Malina.

To be added to the mailing list, to request reprints from the bibliography, or to receive future *Technical Bulletins* via electronic mail, write to:

Public Affairs Office  
Center for EUV Astrophysics  
2150 Kinredge Street  
University of California  
Berkeley, CA 94720 USA

Or send electronic mail to:

Internet: pub@cea.berkeley.edu



## THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS

25 Birch Street, Cambridge, Massachusetts 02138-1205, USA

Phone: (617) 354-0484 Fax: (617) 354-0665

e-mail: BITNET: aavso@cfa8 SPAN: cfa8::aavso

August, 1992

Dear Observer:

You are invited to participate in a pioneering space research project with NASA's Extreme Ultraviolet Explorer (EUVE) - a "satellite that opens the last wavelength window to the universe", as noted by Dr. E. J. Weiler, head of the Ultraviolet Branch of NASA's Astrophysics Division. This satellite, launched from Cape Canaveral on June 7, saw first light on June 22 and is operating successfully. Data from EUVE will provide new insight into objects such as cataclysmic variables, flare stars, active galactic nuclei, and overall stellar evolution.

Enclosed is a special EUVE Technical Bulletin for our observers, prepared by the Center for EUV Astrophysics at University of California, Berkeley. For more information on EUVE and the observing program for variable stars please see the following articles:

K. Mukai, J. V. Vallerger, R. F. Malina, S. Bowyer in *JAAVSO*, 19, 111, 1990;  
K. Mukai in *AAVSO Newsletter*, No. 9, 3, 1992;  
P. Chien in *Sky and Telescope*, 83, 161, 1992.

The first task of the EUVE is to carry out a six-month, all-sky survey in the 70 - 760 Angstroms extreme ultraviolet band. Later the satellite will make pointed spectroscopic observations of specific sources. Amateur astronomers worldwide are invited to participate in providing vital data support with visual observations of known or potential variable star candidates for EUV sources both during the survey mode and later during the pointed phase. The AAVSO is coordinating the participation of amateur astronomers worldwide in 43 countries. We are grateful for the financial support of NASA through the Center for EUV for making this participation and coordination possible.

This coordinated observation of EUVE Variable Stars has been designated an official program for the International Space Year, 1992.

There are 79 variable sources that we are monitoring during the survey mode. These sources were selected, after much discussion, by the EUVE Science Team and I during our recent meeting. These objects either were detected as EUV sources with the ROSAT (ROentgen SATellite) or are potential candidates to be EUV sources. You will notice that a large percentage of the objects are cataclysmic variables, followed by flare stars, RS Canum Venaticorum stars, and active galactic nuclei.

The sources that we are monitoring are shown in the enclosed EUVE Variable Star List For Amateur Astronomers, Coordinated by AAVSO. This list gives the designation, star name, visual magnitude range of variability (taken from the *General Catalogue of Variable Stars* or the AAVSO data files), type of variable star, chart information, and Chart Set (Northern or Southern).

The finder charts of a significant number of the stars in the EUVE Variable Star List needed revisions. New charts were also needed for objects that were not in the regular AAVSO Visual or Photoelectric Observing Programs. Thus our New Charts Committee members Charles E. Scovil and Robert Leitner have been very busy revising or making new charts. This project is still going on.

It is essential that observers use the most recently issued charts. Therefore, to provide the most recent charts and to give the fastest and the most efficient service to you our observers, we have decided to distribute the EUVE charts in two sets, rather than star by star. The northern set covers charts of stars of declination  $+90^{\circ}$  to  $-40^{\circ}$  and the southern set of declination  $+25^{\circ}$  to  $-90^{\circ}$ .

Please decide which set of charts is appropriate for you i.e., northern or southern, and order it from AAVSO Headquarters as soon as possible using the enclosed form. Each set costs \$5.00 to cover partially the postage and handling. Upon the receipt of the chart set, **please replace your old charts with these and use only these replacement charts.**

Observers outside of the United States should not send any money. Instead, the AAVSO will trade the charts for \$5.00 worth of telephone calls reporting EUVE observations. (See below for telephone reporting procedure.)

### **Making and Reporting of Observations for EUVE Mission**

Enclosed you will also find a list for **Scheduled Observing Periods for EUVE Variable Stars**, provided by the EUVE Science Team. This list has also been published in *AAVSO Alert Notice 161*. Please check the scheduled dates for EUVE observing for each star and if possible monitor as many of them as you can during these scheduled times. Your observations during the survey mode are extremely important to provide the most comprehensive picture of the EUV sources, and to correlate the multiwavelength data.

We will compile and forward your observations periodically to the EUVE Science Team so that they may be coordinated and correlated with satellite data. Please call in your observations to AAVSO HQ daily so that we may forward your observations in a timely fashion.

In order to enable our observers in the United States to report observations regularly, for this mission, we have added an 800 (toll-free) telephone number at AAVSO Headquarters. The AAVSO's 800 number for this mission is

**800-642-EUVE (800-642-3883)**

We have limited funds for this phone line, thus we request that you use this line only to report observations, and please to call in your observations at night when the rates are the lowest. The AAVSO answering machine is on nights and weekends.

For our observers outside the United States, please use our regular telephone number (617-354-0484). The AAVSO answering machine is on for this number also. We will reimburse telephone charges for reporting observations, after the first \$5.00 worth of calls, so please send us the list of your telephone calls and the charges.

When calling in your observations, please report the time they are made in your **local time**, making sure to give the time zone and to indicate whether it is standard or daylight savings time.

### **Stars in Need of Photoelectric Observations or Other Special Procedures**

Bright stars on the EUVE Variable Star List with a small range of variation, of mostly RS Canum Venaticorum type, need photoelectric observations in order to detect small amplitude variations. I bring these stars to the attention of our photoelectric photometrists with a strong plea for their close monitoring. These stars are indicated with a check mark preceding the star name, and have special finder charts.

Flare stars, with brightening activity on a scale of minutes, need continuous observing over at least 15-minute intervals. Photometrists may also be able to monitor these stars and catch their flare activity, and photoelectric observations in V, B, and U are strongly encouraged. When reporting observations on the telephone please state the exact interval you observed (e.g., August 28, 1:36 - 1:59 AM Eastern Daylight Time). If flaring activity is observed please also report the time of flaring to the minute.

### Monthly Reporting of Observations to the AAVSO

Regardless of whether or not you called in your observations, at the end of each month please send in your monthly report as usual to AAVSO HQ. Report the time of your observations of EUVE stars, and all other cataclysmic variables, to three decimal places of the Julian day. Report the time of flare star observations to four decimal places of the Julian day. (Example: a flare star observation interval on August 28, 1:36 - 1:59 AM EDT, equals August 28, 17:36 - 17:59 GMAT, and would be reported as 2448863.7333 - .7493.) A Decimal of the Day table to help you in this will be sent with the charts.

If you observe any unusual stellar activity, such as superoutbursts of SU Ursae Majoris-type dwarf novae, changes in the brightness state of AM Herculis-type magnetic dwarf novae, onsets or ends of standstills of Z Camelopardalis-type dwarf novae, or unusual activity in any star in your observing program, even if it is not on the EUVE Variable Star List, please call in your observations so that we can inform the EUVE Science Team of these potential targets of interest.

Your participation in this program and your observations are vital to the success of the survey on variable stars and the interpretation of satellite data on these stars. You will be making a mark in EUV astronomy through your observations. I am sure you feel proud, as we do, of the recognition of the importance of your observations by astronomers at NASA and the Center for EUV Astrophysics.

I wish you clear skies and good observing, and look forward to receiving your observations.

Sincerely,



Janet A. Mattei  
Director



EVAC/Bill Smith  
1663 S. Sycamore  
Mesa, AZ 85202

