Abstracts of Papers and Posters Presented at the 93rd Spring Meeting of the AAVSO, Held in Berkeley, California, July 22–23, 2004

Secular Evolution in Mira Variables (paper)

Matthew Templeton
Janet A. Mattei
AAVSO, 25 Birch Street, Cambridge, MA 02138

Lee Anne Willson
Iowa State University, Department of Physics and Astronomy, Ames, IA 50011

Abstract Stellar evolution theory predicts that stars on the asymptotic giant branch (AGB) undergo a series of short thermal pulses that significantly change the luminosities and masses of these stars on timescales of a few thousand years. These changes may be observable as changes in period for pulsating AGB stars such as the Mira and semiregular variables. It is known that a small fraction of these stars exhibit secular period change. In our project, we examined the light curves of 547 Mira variables from the AAVSO International Database to search for and quantify these secular changes. Approximately 10 percent of stars showed evidence of secular period change at the two-sigma level, and eight stars showed large period changes at the six-sigma level or greater. The largest measured values of dlnP/dt are consistent with those predicted to occur during thermal pulses on the AGB. A number of other stars exhibit non-monotonic period change on long timescales, the cause of which is not yet understood. In the overwhelming majority of cases, the period variations appear to be small and essentially random.

[Ed. note: The complete version of this paper has been published in the Astronomical Journal *(Vol. 130, p. 776, 2005), and is available from the author upon request.]*

BZ UMa and Var Her 04: Keeping Us Up At Night (paper)

Aaron Price
AAVSO Headquarters, 25 Birch Street, Cambridge, MA 02138

In 2004 the AAVSO conducted two intensive observing campaigns of peculiar cataclysmic variables. BZ UMa was observed for four nights in outburst in February and again for two nights during quiescence in April. Results (lack of superhumps) do not support its official classification as a UGSU star. Var Her 04 was discovered in late June and observed for about a month. Originally suggested as a rare UGWZ type star, its classification is also in doubt. We present early results from and lessons learned during these two campaigns.

Observing Cataclysmic Variables (paper)

Arto Oksanen
Jyväskylän Sirius ry, Kyllikinkatu 1, FIN-40100 Jyväskylä, Finland

Observing techniques for cataclysmic variables (getting alerts of outbursts, performing time-series CCD observations, and measuring photometry) are discussed and several light curves are presented.

Unexpected Benefits (Preliminary Research Results From the AAVSO Chart and Sequence Teams) (paper)

Michael A. Simonsen
2615 S. Summers Road, Imlay City, MI 48444

In the course of checking existing and new AAVSO charts since 2002, many questions and discrepancies have come to light regarding the basic information pertaining to many known and suspected variables.

Amateurs with training and access to publicly available databases on the Internet have been able to resolve unanswered questions as basic as the identity, position, variability, range and type of numerous variables and suspected variables.

Presented here are three interesting cases. EV Aqr, TY Sge and suspected variables in the field of U Geminorum.

The AAVSO Data Validation Project: Opening the Treasure Chest (paper)

Elizabeth O. Waagen
AAVSO Headquarters, 25 Birch Street, Cambridge, MA 02138

The AAVSO Validation Project is a 2-year project funded by NASA to validate (check for transcription and digitization errors and perform quality-control checks) over 9.5 million variable star observations made between 1911 and 2001 by over 6,000 observers worldwide and contributed to the AAVSO International Database. When the project is completed in the fall of 2004, the data, already available on the AAVSO website, will be placed on Caltech's NASA IPAC-IRSA site and in other NASA databases so that the data are publicly available for astronomical research, education, and public outreach.

The AAVSO International Database, with its 11+ million observations going back to 1911 or earlier, was described by the late AAVSO Director Janet Mattei as

a treasure chest waiting to be opened and explored. Validation makes this exploration possible. This paper addresses the questions: what is validation? why is it necessary? how is it done? and shows several examples of the "treasure" becoming available to everyone.

William Tyler, Meet Janet: How Two Extraordinary People Made Variable Stars Accessible to the Rest of Us (paper)

David H. Levy
2500 E. Wetstones, Vail, AZ 85641

The idea of watching a point of light brighten and fade over a specific period of time is not always an "easy sell"—there are some very good amateur astronomers who have embraced the planets, comets, and deep sky observing while leaving variables alone. Like fine wines, variable star observing can be an acquired taste.

Fortunately, over the decades, some people have dedicated their careers and lives to making the field accessible to the larger community of lovers of the stars.

This presentation celebrates the work of two of these champions—William Tyler Olcott and Janet Mattei, two mentors who transformed variable star observing into a field that touches the hearts of their generations. They both combined knowledge and enthusiasm for variables with an uncanny way of reaching out to people. Variable stars would not be the field it is today were it not for the efforts of these very special astronomers.

Gamma-ray Burst Optical Afterglow Observations at Nyrölä Observatory (poster)

A. Oksanen
P. Tikkanen
M. Aho
H. Hyvönen
M. Moilanen
Jyväskylän Sirius ry, Kyllikinkatu 1, FIN-40100 Jyväskylä, Finland

The GRB team of Nyrölä Observatory has been involved with gamma-ray bursts since 1999, when the observatory joined the GRB Coordinates Network. Since then twenty GRB fields have been imaged, four of them showing optical afterglows and sixteen upper-limit observations. The observers also joined the AAVSO International High Energy Network in 2000.

The optical afterglows of GRB 000926, GRB 010222, GRB 021004, and GRB

030329 have been successfully observed. A table of all observations with delay from the burst and the magnitude or optical upper limit is presented. Fourteen GCN Circulars have been issued by the authors.

The Rice University CCD Imager for the AEOS Telescope (poster)

R. I. Dufour
I. A. Smith
E. P. Liang
Rice University, Department of Physics and Astronomy, MS 61, 6100 South Main, Houston, TX 77005

L. C. Hardin *et al.*
Hardin Optical Company, P.O. Box 219, Bandon, OR 97411

We describe the details of our new versatile CCD imager (RUCCD) that has recently been constructed for use on the AEOS telescope. It is a flexible instrument capable of performing imaging photometry, spectroscopy, and polarimetry of both bright and faint sources. It will be in a permanent state of readiness for making observations. Its primary objective will be performing comprehensive studies of the early emission from gamma-ray burst counterparts. However, it will be made available to the United States Air Force and other visiting scientists. The RUCCD was successfully installed and aligned in Coudé room 6 of the AEOS 3.63m telescope at Haleakala, Maui, Hawaii on 2004 February 3-4 and several test images of astronomical objects made. Examples of two of the objects observed (Saturn and the planetary nebula NGC 2392) are presented here.

Deep Impact Mission (poster)

Mary Ann Kadooka
Institute for Astronomy, 2680 Woodlawn Drive, Honolulu, HI 96822

The NASA Discovery mission, Deep Impact (DI), has the task of launching a 370-kg copper impactor in December, 2004, which will arrive at comet 9P/Tempel 1 in July 2005. The mission goals are to have the probe intercept the comet to create an impact crater and to dig below the evolved surface materials of this comet. Scientists will study the physics of the crater formation and the composition of the pristine interior of the comet. The comet orbit, the probe trajectory, and other details are featured to demonstrate the scientific challenges of this mission. Comet nuclei plus gas and dust tail images from past missions provide some background information.

Professionals, amateurs, and students are being encouraged to participate in the observing campaign before, during, and after the impact to support the DI scientific team. Telescope sizes, sample images for data analysis needed, and the process for participation are described. A table of visibility dates of comet 9P/Tempel 1 is shown. One example given focuses on Hawaii's students' use of Faulkes Telescope North at Haleakala Observatory on the island of Maui during the months that the comet is visible. The dynamic nature of the Deep Impact Mission will instill the excitement of 21st Century astronomy in observers worldwide.