ABSTRACTS OF PAPERS PRESENTED AT THE 89TH ANNUAL MEETING OF THE AAVSO, OCTOBER 27–28, 2000, WALTHAM, MASSACHUSETTS

THE SiO MASERS OF TX CAMELOPARDALIS

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Observations of evolved stars with the Very Long Baseline Array have shown that silicon monoxide masers are found just above the photospheres of these interesting objects. By observing many times over a few pulsation periods, researchers are now discovering complex motions in the extended photospheres of these bloated, old stars. We will present several dramatic "movies" of these sources and speculate on what such observations can tell us about the physical conditions near the star.

COMPLEX VARIABILITY OF THE PECULIAR EMISSION-LINE STAR MWC349

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We review the results of a multi-wavelength study of the unique variable star MWC349 done at the Maria Mitchell Observatory. This early-type, emission-line star is the only known natural hydrogen maser and the only known natural laser, both originating in the ionized, expanding atmosphere of an edge-on circumstellar disk. We have studied the variability of the star on the red photographic plates of the Harvard College Obsrvatory plate collection (for the years 1967–1982) and monitored it for three years (1997–2000) in UBVRI (with the 31-inch CCD telescope of the Lowell Observatory in Flagstaff) and in the millimeter radio domain (with the 12-m NRAO radio telescope on Kitt Peak). We reveal several types of variability in this star: long time-scale variations with a probable quasi-period of 9.2 years and a relatively large amplitude (± 0.4 magnitude) in the red photographic domain; small-amplitude (± 0.07 magnitude) variations with a quasi-period of 1.5 years in all the observed colors of the optical domain; complex variations, with several different time scales, in the masing hydrogen recombination radio lines; and, probably, slight variations of the radio continuum that correlate with those of the optical light. We discuss possible physical mechanisms responsible for all these variations.

MICROVARIABILITY OF CH CYGNI AT MINIMUM

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CH Cygni is a symbiotic star system that has been shown to have multiple variable periods ranging from minutes to over 1000 days. During the 1999 annual meeting, I presented data documenting the microvariability of CH Cygni. Those data spanned a time that had CH Cygni at a visual magnitude of 7.4. This past summer CH Cygni dimmed to visual magnitude 9.3, and this paper documents its behavior (microvariability) at its minimum state.

SUMMER WITH THE VARIABLE STARS

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This summer three undergraduate students worked with me on three projects using AAVSO light curves together with infrared light curves from the South Africa Astronomical Observatory. Sean Patterson, Bradley University junior, worked on O-C diagrams at different wavelengths, and in the process of doing this he rediscovered the Harrington effect. Carleton Miller, ISU junior, looked at the correlation of light curve shapes with mass loss rates from the infrared color index *K–L* to check whether the correlation discovered by Bowers and Kerr (P. F. Bowers, and F. J. Kerr, 1977, *Astron. and Astrophys.*, **57**, 115) (from OH maser data) holds for the IR color as well. Kevin Marasinghe, Cal Tech sophomore and Ames native, focused on methods for automating the predictions for the AAVSO, and devised a novel but physically well-grounded approach to this problem as well as some new and unexpected patterns in the light curves. In this presentation I will describe this "Mira Gang" and discuss their results.

SECRETS IN STARLIGHT: THE STRANGE CASE OF R CORONAE BOREALIS

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This high school science project attempts to provide an explanation for the varying light output of 1544+28A R Coronae Borealis. Using my own visual data in conjunction with published spectroscopic data, the star's reason for variability was explored.

Visual analysis of the behavior of R CrB was achieved from 85 observations collected over an interval of 331 nights using instruments ranging in size from 7 x 50 binoculars to a 12" Schmidt-Cassegrain telescope. Through research and data collection, I have determined that R CrB is an old star that has finished fusing hydrogen into helium, and now fuses helium into carbon. The fusing of helium into carbon forms dust (carbon) clouds. The variable density of the cloud yields changes in the brightness of R CrB.

The value of investigating the nature of R CrB lay in the attempt to develop a sound explanation of what is happening astrophysically by incorporating all of the measurable properties and changes in starlight. By applying our understanding of astrophysics, the understanding of stellar evolution is further developed. From this study alone, it has been determined that R CrB is an ancient star undergoing rapid adjustment to maintain stability in its fusion process.

NA HOKU O MILILANI—THE STARS OF MILILANI

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Mark Daranciang and Tiffany Llenos, high school juniors, describe how the TOPS (Towards Other Planetary Systems) Summer Program, sponsored by the Institute for Astronomy (University of Hawaii and Mauna Kea Observatories), introduced them to the delights of variable star observing taught by Janet and Mike Mattei. They contribute data to the AAVSO from the Pacific region and are embarking on an ambitious project to involve other Mililani residents in variable star astronomy.

MAKING CHARTS FOR CCD OBSERVING

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Recently, a large number of charts for observing variable stars with CCDs were made at AAVSO headquarters using a new automatic chart making program written in the Interactive Data Language (IDL). Some of these charts were for interesting new stars added to the AAVSO's CCD observing program, but many of the new charts were made to update poor photometric sequences on previously existing charts. I discuss the special requirements of charts for observing with CCDs and show how they differ from charts for visual observing. The features of the new automatic chart making program are discussed, as well as the guidelines for picking photometric comparison stars. There are many advantages to automating the chart making process, and the obstacles to doing this are discussed. I finish by highlighting recent CCD observations by AAVSO observers, and display how they compare to and complement visual observations.

THE PROMISE FOR STARRY EYES

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In this slidetalk, supplemented by a poster exhibit, a status report on New York City's ongoing eradication of luminous graffiti as of the end of the 20th century was laid out. The focus was on Manhattan, the core of the Big Apple.

Streetlamps are under global replacement in many parts of Manhattan, including Midtown, Greenwich Village, City Hall, and Lower Manhattan, with a variety of new lamps to give starfriendly illumination on the street.

By the turn of the new millennium, the City achieved essentially complete evisceration of light pollution from store and facade lighting. This is a direct spinoff of the theme that stores on Manhattan must redo their frontages every three to five years to conform to the modern codes for illumination.

Area and grounds lighting of immense corporate and commercial facilities stresses shielded, modest, occulted lamps. These include footlamps in parapets and sidewalls, lamppoles with large hoods, sconce lamps, ballards with concealed lamps. The World Trade Center, by a combination of these features, emits less light into the sky than a typical rural truck stop, despite it being quite the equal in urban activity as all of downtown Boston.

Astronomers in New York can monitor their progress toward a star-friendly cityscape from the tops of the towers. From here, they see New York from the eye of a star! Photographs from the Empire State Building showed that on the whole Manhattan — a conurbation equal to the region around San Diego, Miami, or Boston, already sends fewer excess skyward photons than its suburbs across the rivers.

With the accomplishments so far and with continuing work in progress, our profession set itself the goal that before this decade, the first in the new millennium, is over we will see the Milky Way from Manhattan—and see it with the bare eye.