Abstracts of Papers and Posters Presented at the 91st Annual Meeting of the AAVSO, Held in Somerville, Massachusetts, October 24–27, 2002

What's New With R Coronae Borealis Stars? (paper)

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I present new observational data concerning the R Coronae Borealis (RCB) stars and their evolutionary status. There are two major models for the origin of RCB stars: the Double Degenerate and the Final Helium Shell Flash. In the final flash model, there is a close relationship between RCB stars and Planetary Nebulae (PNe). The connection between RCB stars and PNe has recently become stronger, since the central stars of three old PNe (Sakurai's Object, V605 Aql, and FG Sge) have had observed outbursts that transformed them from hot evolved central stars into cool giants with the spectral properties of an RCB star.

I also discuss new RCB stars recently identified in the Galaxy and in the Large Magellanic Cloud (LMC) using the MACHO project photometry database. The absolute luminosities of the Galactic RCB stars are unknown since there is no direct measurement of the distance to any Galactic RCB star, hence, the importance of the LMC RCB stars.

Heavenly Harmony: Red Giants Pulsating in Many Modes (paper)

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We have analyzed the complex variability of five small-amplitude pulsating red giants—RZ Ari, V523 Mon, BC CMi, UX Lyn, FS Com—using a 5000-day database of *V* photometry from a robotic telescope. For each of these stars, two or three periods recur in each season, and are present in separate halves of the dataset. The periods and their ratios are consistent with low-order radial pulsation modes; the stars are pulsating in multiple overtones, or harmonics. The amplitudes of the modes rise and fall significantly on time scales of 2000 to 3500 days. In UX Lyn and FS Com, there are long secondary periods which add a bass drone to the wavering chord of the radial modes. Even with all these periods accounted for, there are small residuals, which suggest that the celestial harmony is even more complex than we might think.

NP Pavonis: A Misplaced Cycle (poster)

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Many far-southern eclipsing binaries have been neglected since publication of the original papers announcing their minima prediction elements. NP Pavonis is an exception. Good quality photoelectric photometry data were obtained in 1984 and again in 1995 and were used to refine the period. However, the number of elapsed cycles in that eleven-year interval was miscalculated. Persistent visual observation reveals this error and provides corrected elements.

Preliminary Photometric Results on Two Delta Scuti Stars (poster)

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During this year two amateur observatories collaborated on a CCD photometry campaign observing two delta Scuti stars, V2128 Oph and V645 Her. The preliminary results, including colors and period determination, of the campaign are shown in this paper.

Another Kind of Change in the Sky (poster)

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AAVSO-ers automatically think of variable stars when they think of change in the sky. In the school science curriculum, however, change in the sky refers to the motions of the sun, moon, and planets in the sky. Students are encouraged to observe these motions, since they are a good way of doing science. Planetary motions can be dull, however, and variable stars can be exciting, but the usual concern is that very few stars can be seen from urban locations. We have therefore developed this simple activity in which students estimate the brightness of the urban variable Betelgeuse, relative to Aldebaran and Procyon, and pool their own results with longer-term data from the AAVSO web site. They can then exercise a wide range of science and math skills, as well as investigate one of the brightest, largest, and most bizarre objects in the sky. We show how this activity, which is an extension of the AAVSO's *Hands-On Astrophysics* project, meets most of the expectations of a typical school science curriculum.

Variable Star Research in South America During 2000–2002 (poster)

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Since the creation of the Variable Star Section of the Latin American Astronomical League (LIADA) in late 1982, the development of cooperative variable star research, between amateur and professional astronomers has been significant. Several meetings, including workshops and symposia, have been devoted to variable star observing since that time. Particularly, the last two years have seen significant growth. This poster reviews several discoveries, fruitful observing campaigns, and publications of research results that demonstrate this growth.

Observatory Site Selection Using AAVSO Observation Reports, or, Is it Really Always Clear in Pahala? (paper)

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Many factors are involved in selecting an observing site, but the most important one is the amount of clear skies. Where complete weather observation data is absent, an active AAVSO observer in a location under consideration indirectly provides reliable data on sky conditions. Since an observation confirms suitable weather conditions, data submitted to AAVSO can be used to indicate the minimum amount of useable skies. Data from William Albrecht (AB), a very active AAVSO Observer living in Pahala, Hawaii, were analyzed to form an impression of the quantity of clear skies over nearly 20 years of observations. From the analysis, quantitative information on the site characteristics was obtained.

A Simple, Easy-to-Build VLF Receiver (poster)

Casper H. Hossfield (deceased November 26, 2002)
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The poster provides instructions on how to build a simple Very Low Frequency (VLF) loop antenna receiver. This receiver has a pass band of less than 500 Hz, and compares favorably with other SES (Sudden Enhancement if Signal) receivers in use today. It can be used to detect solar flares and gamma-ray bursts. [Instructions may be found in AAVSO *Solar Bulletin*, **58**, No. 10, October 2002, SID Supplement.]

American Urban Star Fest (poster)

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Over the last couple of decades New York City implemented, and continues to carry out, several schemes of eradicating luminous graffiti. One result has been the gradual recovery of the natural night sky. By 1994 the normal clear sky transparency over Manhattan deepened to fourth magnitude and has been slowly creeping deeper, until in 2002 it is at magnitude 4 to 4.5. In the spring of 1995, during some lazing on a Manhattan rooftop under a sky full of stars, several New York astronomers hatched the idea of letting the whole people celebrate the renewed starry sky. In due course they, through the Amateur Astronomers Association, engaged the New York City Parks Department and the Urban Park Rangers in an evening of quiet picnicking to enjoy the stars in their natural sky. Thus the Urban Star Fest was born. The event thrilled about 3,000 visitors in Central Park's Sheep Meadow on Saturday 30 September 1995. This year's Fest, the eighth in the series, demonstrated the City's upper skyline of stars on Saturday 5 October 2002 to about 2,200 enthused visitors. Although the Fest is always noted as cancelable for inclement weather, so far, it has convened every year, with attendance ranging from 4,000 down to a mere 1,000, this latter being under the smoke plume of the World Trade Center in 2001. Despite this swing in attendance, the American Urban Star Fest is America's largest regularly scheduled public astronomy event. Of course, special occasions, like comets or eclipses, can and do attract far larger interest both in the City and elsewhere. The presentation shows the setup and program of the American Urban Star Fest, to illustrate how the general public can actively become aware of the night sky and see for themselves the results of their very own efforts at removing light pollution—and note where improvement is yet to come.

The 1963 Total Solar Eclipse, Athens, Maine (paper)

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A restoration of a recently recovered Super 8 movie of the total eclipse from the AAVSO site at Athens, Maine. How many AAVSO'ers can you recognize?

An Experimental Wolf Numbers Index (poster)

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The purpose of this experiment is to see how Wolf number sunspot counts compare over time with modern Zurich number sunspot counts. Six AAVSO sunspot observers made Wolf number sunspot counts using Wolf's system of counting as defined in Waldmeier's introduction to his book (Waldmeier, 1962). Nine AAVSO sunspot observers made sunspot counts according to the Zurich system of counting also described by Waldmeier in his book. The two sets of data are compared graphically for the period September 2001 through September 2002.

The Sloan Digital Sky Survey (poster)

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The Sloan Digital Sky Survey (SDSS) will map 25% of the night sky from 9th to 23rd magnitude, cataloging more than 100 million objects and taking spectra of more than 1 million objects. All data from the SDSS will be publicly available on the Internet. SDSS data will give the public a unique opportunity to conduct astronomical research using the same data that professional astronomers use.

Interactive JAVA Applet Access to AAVSO Data (paper)

John Good
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Presented at the 91st Spring Meeting of the AAVSO, July 2, 2002

The NASA Infrared Science Archive (IRSA) at Caltech is working with the AAVSO to bring the AAVSO variable star measurements on-line in a dynamically searchable DBMS front-ended by globally-accessible web services. The results of such a search can either be downloaded as text or displayed interactively in a JAVA plot Graphical User Interface (GUI). In addition, the system allows for area searches (finding all the AAVSO Sources in a region), the results of which can be sent to the Oasis JAVA-based GIS multi-archive data access and fusion system (usable through most Web browsers).