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ABSTRACTS OF PAPERS PRESENTED AT THE 77TH ANNUAL MEETING  
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COMPUTERIZED DATA HANDLING: AN ON-LINE DEMONSTRATION

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**Abstract**

A demonstration is given to show how variable star observational data is computer-recorded at the telescope for automatic sort and printout for the monthly report. Details were previously presented in *JAAVSO*, Vol. 16 (1987). The program is written in PASCAL, and is IBM-compatible. Copies may be obtained from the author.

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A PERIOD DETERMINATION FOR ECLIPSING BINARY NSV 3005

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**Abstract**

A search of the Harvard Photographic plate collection reveals five minima in addition to the one recently observed in March 1988. From these minima a period of 1258.56 days has been derived. Details of the discovery and period determination have been published in *IBVS* 3196 and *IBVS* 3233.

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R SCUTI: THE (O-C) DIAGRAM

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**Abstract**

R Scuti (HR 7066, HD 173819, K0 Ibpv,  $V = 4.45 - 8.20$ ) is a bright member of the RV Tauri class of variable stars. These are yellow supergiant pulsating variables with alternating deep and shallow minima (though not all RV Tauri stars adhere to this rule at all times). The cause of the alternating minima is not known.

R Scuti was discovered in 1795 by Pigott. It was observed only sporadically until 1843. Thereafter, observations are reasonably

complete. The star has been on the AAVSO visual program since the founding of the association in 1911. The AAVSO light curve of R Scuti from 1963 to 1985, based on over 30,800 observations by 835 observers, has recently been published as **AAVSO Monograph 3**.

We have redetermined the magnitudes and times of maximum and minimum brightness of R Scuti from AAVSO light curves from 1911 to 1985, in a uniform and consistent fashion. Initially, we have used these data, plus earlier data from the literature, to plot an (O-C) diagram for the star. There are occasional large fluctuations in the cycle length of R Scuti, and there are other fluctuations in (O-C) on a time scale of 50 to 100 cycles. These may be the cumulative result of small, random cycle-to-cycle fluctuations, as is the case in many Mira stars. On a time scale of several hundred cycles, however, the period of R Scuti is relatively constant. The AAVSO data are best fit by a period of 70.95 days. In the future, we will use our data for other purposes, such as to look for "chaotic" or non-linear behavior in this star.

Amy Alfred is a participant in the University of Toronto Mentorship Program, which enables talented high school students to work on research projects with university faculty members. As well as working on the R Scuti project, Amy gave a one-hour presentation on variable stars in a high school science class, and gave short presentations on her research project at her school "Open House" and at a meeting of faculty and student participants in the Mentorship Program at the university.

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**V SER, RS SER, AND CQ SER: THREE NEGLECTED ECLIPSING BINARIES**

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**Abstract**

The eclipsing binaries V Serpentis, RS Serpentis, and CQ Serpentis, neglected for decades, have been observed visually with good results, providing new times of minima to update these stars' ephemerides.

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**THE CONTINUITY OF AAVSO U.S. MEMBER  
OBSERVATIONS: 1978 - 1986**

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**Abstract**

An analysis is presented of the yearly observing totals of more than 900 AAVSO members during a nine-year period by means of a BASIC computer program.

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METHODS OF PERIOD ANALYSIS IN THE STUDY OF VARIABLE STARS  
WITH APPLICATIONS TO AF CYGNI

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**Abstract**

The nature of astronomical observations requires that techniques of period analysis in the study of variable stars be valid for unevenly sampled data. We present a brief review of such methods and use some of them to analyze AAVSO observations of AF Cyg (M5e + M7).

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**BETA LYRAE: AN UNPREDICTABLY PREDICTABLE VARIABLE**

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**Abstract**

The fiber-coupled echelle spectrograph on the 1m telescope at Ritter Observatory and the photometer on the 38cm Schmidt-Cassegrain of Villanova University Observatory are used to observe the eclipsing binary beta Lyrae. The well-known but little understood variations in the shape of primary and secondary minima are discussed in terms of the recently found (approximately 275 days; Guinan 1988) periodic changes in eclipse depth.

**REFERENCE**

Guinan, E. F. 1988, **Space Sci. Rev.** 50, Parts 1 and 2.

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