Seventeenth Meeting of CASCA

The historical colour and magnitude of Sirius, J.D. Fernie, D.D.O., University of Toronto.

A recent paper offers fresh evidence from eighth-century Western Europe that Sirius was red in ancient times, and notes that if this was because Sirius B was then a red giant, the system’s apparent magnitude would have been $\sim 4$.

The magnitude system of the star catalogue in Ptolemy’s Almagest is re-examined. It is found to imply that Sirius then was fainter by more than $1^m$ than it is now. Remarks on star colours in the catalogue imply that Sirius had $B - V > 1$.

A similar faintness is shown in the estimate by Al-Sufi in the tenth century A.D., but both these brightness discrepancies are significant at only the two sigma level.

On the other hand, comparison of Sirius with other 1st-magnitude stars of the Almagest show it too faint at the four sigma level, and it is noted that two other stars are listed in the Almagest’s catalogue as being brighter than Sirius. In any case, there is no evidence that the latter was brighter then than now.

Theoretical models by Schönberner show it possible for red giants to change $B - V$ from 1.0 to 0.1 in less than a thousand years, but only at luminosities that would assign Sirius an apparent magnitude of $\sim 8$ – seemingly out of the question.

The mystery remains unresolved.

A revised spectroscopic orbit for RR Ursae Minoris, A.H. Batten and J.M. Fletcher, D.A.O., Victoria, B.C.

RR Ursae Minoris is a semi-regular variable that is also a spectroscopic binary with a known orbit. High-dispersion observations have been made in an attempt to increase the precision with which the orbital elements can be determined, but the increase attained is not as great as expected. A limit to precision is probably set by atmospheric motions in the giant variable star. The new elements are: $P = 748.9$ days, $T = J.D. 2,444,419$, $\omega = 212^\circ$, $e = 0.13$, $K = 8.3 \text{ km s}^{-1}$, $V_0 = 6.2 \text{ km s}^{-1}$, $a \sin i = 8.4 \times 10^7 \text{ km}$, $f(m) = 0.043$. There is no trace of a secondary spectrum.


The new infrared telescope is being constructed by the University’s Department of Technical Services machine shop under T.A.C.’s supervision. The alt-alt yoke mounting, Serrurier-truss assembly, mirror-support plate and cross-axis drive have now been completed. The horizontal and cross axes are driven by means of a friction disk/pressure shaft and V-belt combination. The cross-axis drive shows no slippage or back lash on any surface, even while nodding a load of 9300 N at frequencies up to 5 Hz. The axes controller CPU board and a 16 port I/O board have been designed and built and are currently being tested. The controller CPU is a Motorola M68000 micro-processor with floating point coprocessor which will upgrade position coordinates every ten milliseconds. BEI 21-bit absolute encoders are to provide positioning accuracy of up to 0.62 arc sec., permitting daytime setting of the telescope. Other completed units ready for integration are: an ITRES guidance system, an IR photometer, and XT and AT-compatible computers for control and data acquisition. The secondary mirror assembly and bonnette designs are progressing and are expected to be completed by mid-fall following which first light can be expected.

The RADS III is the latest version of an automated, chopping, pulse-counting two-star system developed to permit differential photometry of stars even under less than perfect photometric sky conditions.
conditions. It now supports three photometry programs, programmable filter changes, and a multichannel amplitude controller (MAC), which provides chopping amplitude, duty cycle and optimum delay interval selection.

*The Membership of the Scorpio-Centaurus Association*, Robert J. Hill*, University of Western Ontario, and J.D. Landstreet, University of Western Ontario, London, Ont.

The membership of the Scorpio-Centaurus association has been investigated over the range of spectral types B5–A9. *UBV* photometry has been obtained for the potential member stars and, when combined with spectral types, provides a distance criterion for determining association membership. Proper motions and radial velocities, when available, are used to develop motion criteria for the membership of the candidate stars. The inaccuracies of the presently available motion data allow only statements of probable membership, although some stars can be identified as certain non-members. The spectral type distribution of B0–B9 stars in the association is found to be similar to that of the Orion OB I association.

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P Cygni (34 Cyg, HR 7763, HD 193237, B2pe, $V = 4.81$) is one of the most luminous stars in our galaxy. Its spectral lines have characteristic profiles indicative of heavy mass loss, and numerous spectroscopic studies of this star have been carried out. Photometric studies, however, have been less frequent. It is known that P Cyg varied in $m$, from 3 to 6 between 1600 and 1700, and that since 1900 it has varied by about $0''^m2$ on a time scale of weeks. It is not known whether these variations are periodic.

In June 1985, we began systematic, co-ordinated observations of P Cyg from our various observatories, as part of an international *UBV* photometric campaign on bright Be stars. We find that the star varies regularly by $0''^m15$ on time scales of from 20 days to 80 days. We have also analyzed 10-day means of the numerous visual observations of P Cyg collected by the A.A.V.S.O. These support the results of our photometric observations, and also suggest that the star varies by about $0''^m2$ on a time scale of a decade or more.

These results will be discussed in the context of what we already know about the photometric variability of other supergiants.

*X-ray Production Mechanisms in CH Cyg*, D.A. Leahy, (Univ. of Calgary), A.R. Taylor (Univ. of Groningen).

The symbiotic system CH Cyg was observed by the Exosat X-ray astronomy satellite on May 24, 1985. The observed flux is $\approx 1.3 \times 10^{-11}$ erg cm$^{-2}$ s$^{-1}$ with temperature $\approx 0.1$ keV and column density $\approx 4 \times 10^{20}$ cm$^{-2}$. The emission could be either blackbody or thermal bremsstrahlung in form. An Einstein Imaging Proportional Counter observation in 1979 shows that the present flux level is more than 80 times greater. Flickering with a timescale of several minutes is found in the current data with 94 per cent confidence. The X-ray emission could be from: a boundary layer between an accretion disk and an accreting white-dwarf companion to the M6 III star; shocked gas formed in the collision of a fast wind from a white dwarf and the red giant wind; or a sheath of shocked gas surrounding the radio jets. If further observations confirm the X-ray flickering, only the accretion disk – white dwarf boundary layer emission mechanism is viable.