

RESULTS FROM THE 1977 COORDINATED OBSERVING CAMPAIGN ON
HDE 226868 = CYGNUS X-1

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A coordinated campaign of radio, optical, and x-ray observations of the bright x-ray source Cygnus X-1 took place August 7 - 21, 1977 under sponsorship of Commission 42 of the International Astronomical Union. Radio flux measurements, optical spectra, photometry, and polarimetry were obtained during this period by ten groups from Canada, Great Britain, the Soviet Union, and the United States. The x-ray flux was monitored continuously by the SAS-3 satellite between August 11.0 and 17.0.

A review of the campaign data and previously obtained data by the campaign participants in March, 1978 led to the following conclusions. 1) Except a tendency for x-ray absorption events to occur near superior conjunction of the x-ray source, no unambiguous correlation between x-ray and optical behaviour has been seen. 2) There is a correlation between x-ray and radio variations if two kinds of x-ray transitions are recognized. 3) At least 2 percent of the total light of the system in the B band is modulated on time scales different than the 5^d6 period. It is not clear at this time whether this "extra" modulated light is a continuum or in one or more very broad emission lines. 4) The emission line velocity curves are not well-behaved, and estimates of the mass ratio based on these are not reliable. 5) The linear polarization behaviour of the system is complicated and its interpretation is presently unclear. 6) There is some evidence for a 78^d/39^d modulation of the x-ray flux, U-band flux, and U- and V-band polarization. The existence and possible interpretation of this phenomenon is controversial. 7) A good model for the complicated phenomena seen in this system has not yet emerged, but a consensus is developing that explanations of the behaviour will be easier if the inclination of the orbit is large with the x-ray source nearly grazing the limb of the visible star at superior conjunction. 8) The estimated mass of the x-ray source is still well in excess of upper limits on the mass of a conventional neutron star.

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*P. S. Conti and C. W. H. de Loore (eds.), Mass Loss and Evolution of O-Type Stars, 297-298.
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DISCUSSION FOLLOWING BOLTON

Morton: What is the current estimate for the upper limit on the luminosity of the secondary of Cyg X-1?

Bolton: The secondary contributes less than 2% of the light of the primary at $\lambda 4026$ He I (2σ limit). There are distortions in the He I lines $\lambda\lambda 4713, 5876, 6678$ which could be interpreted as due to the secondary, although I suspect they are due to some other effect (mass loss?). These distortions are $< 5\%$ of the total light of the system.