Physical Characteristics of the System

	H.D. 37043-A	H.D. 37043-B
Sp	O8.5	O8.5
T_e	31,000° K	31,000° K
L	7,800 $\odot$	1,230 $\odot$
m_v	3.05	5.04
M_v	-5.0	-3.0
R	10.3 $\odot$	4.1 $\odot$
Mass	39.4 $\odot$	23.2 $\odot$
ρ	0.04 $\odot$	0.34 $\odot$

Separation of stars: at periastron = 26.6×10^6 km
 at apastron = 193.2×10^6 km

locity of escape. The parallax of the system is 0".0026, corresponding to a distance of 1250 light years.

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Petrie, Robert M. Recent spectroscopic results on HD 199140.

Radial velocities and spectral line intensities have been measured on single-prism spectra of this β Cephei star. The following results are established.

- 1) The period of the velocity variation is increasing linearly at the rate of 0".037 per year.
- 2) One period only is present and the spectral lines vary also in this period. The velocity curves exhibit irregular differences from cycle to cycle.
- 3) The total range of the velocity curve varies irregularly but increases on the average at a rate of 1.5 km/sec per year.
- 4) The spectral lines vary in shape being deepest and sharpest at "maximum" star and broad and shallow at "minimum" star. The total absorptions however remain sensibly constant over the cycle.

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Popper, Daniel M. Two eclipsing binaries with giant components.

TW Cancr. An earlier report¹ on this 70-day eclipsing binary indicated that the brighter and hotter component receded after primary minimum, which is a total eclipse. It is now clear that the lines measured are instead those of the cooler and photographically slightly fainter component. The only line of the hotter component which I have been able to measure is a broad strong K line, which yields rather uncertain velocities. On the basis of the velocity curves and of unpublished fragmentary light curves by Huffer and by Whitney, the following provisional properties of

the system are obtained:

Spectrum	G9 III+	F5::
Mass	1.3	1.3
Radius	8	1.5
M_{bol}	+1.2	
M_{pv}	+1.5	

The classification of the cooler star is from spectrograms at total eclipse. The computed value of M for this star from its radius and surface temperature is in good agreement with that expected from the spectral type, whereas M_{bol} is over two magnitudes above that predicted from the mass-luminosity relation for main sequence stars; i.e., it is over-luminous for its mass.

This system is comparable to Capella in respect to types of stars and period, and may perhaps be of equal or greater importance for the determination of the mass of a typical giant star. An advantage of TW Cnc lies in the fact that the spectral type and color of the giant can be determined unambiguously from observations at primary minimum.

The highly provisional nature of the data given above should be emphasized. The principal purpose of this note is to point out the importance of the system, and the need for improved data.

V356 Sagittarii. Since the previous report on this system,² light curves in yellow and blue light have been obtained at Mount Hamilton. Primary eclipse is total, and both eclipses are of considerable depth. The photometric ellipticity, Nz in Russell's notation, has the high value 0.34, which is due entirely to the cooler star. Because of the great difference in shapes of the stars, obtained from dynamical considerations, rectification of the light curve by ordinary procedures is invalid. On the hypothesis that the orbital inclination, i , is 90°, the following properties of the stars are obtained from the spectrographic and photometric data:

Spectrum	A2 II	B3: V
Mass	4.7	12.1
Radius	12.7	4.7
M_{bol}	-3.2	-4.1
M_{pv}	-2.7	-2.0

The values given here supercede those listed earlier.² The spectral class of the larger star was provided by W. W. Morgan from spectrograms at primary minimum.

For the hotter star the derived mass fits the mass-luminosity relation and the computed M is normal for the spectral class. For the cooler star, M_{pv} is in agreement with the estimate for this type of star,³ but M_{bol} is about 1.5 magnitudes