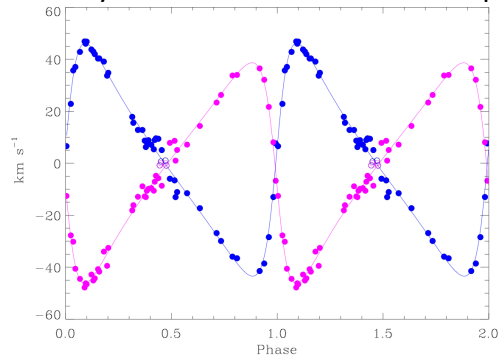


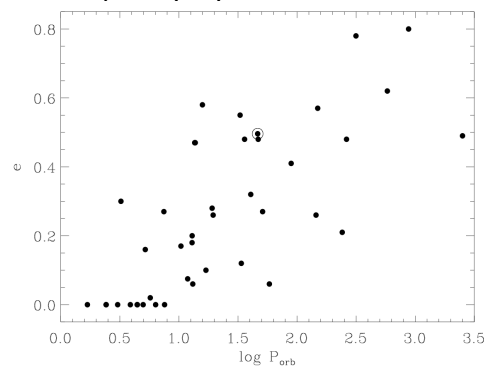
Pre-main Sequence stars In an eccentric orbit. Clues to formation?

FM Walter (Stony Brook University) & L Hebb (Hobart and William Smith Colleges)

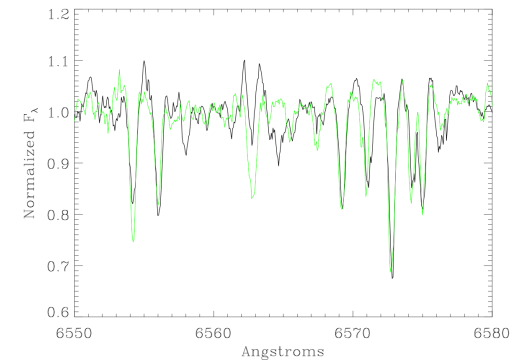
RX J1901.1-3648 (2MASS J19010971-3647528) was discovered in a ROSAT HRI observation of the Corona Australis star forming region. Initial optical spectroscopic followups showed it to be an SB2 system of two similar mid-K PMS stars. Over 4 nights the two spectra closed in velocity by 7 km/s. Twenty five years later we got around to investigating the orbit. It is a high-eccentricity system with asynchronous rotators. The *Gaia* parallax (6.55 mas) and proper motion confirm its membership in the CrA SFR (e.g., Galli *et al.* 2020).



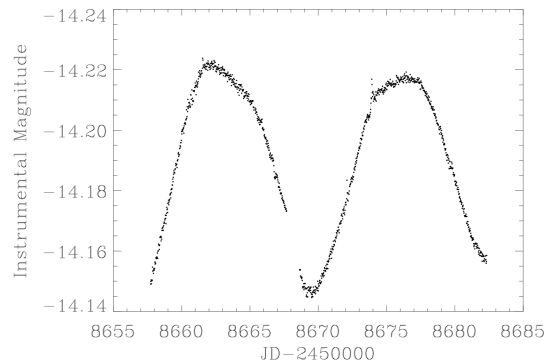
The orbit from 48 spectra obtained with *Chiron* between 10 May 2018 and 1 June 2020. The period is 46.53 ± 0.05 days, with an eccentricity of 0.48 ± 0.05 . The minimum stellar masses are 1.05 and $1.10 M_{\odot}$.



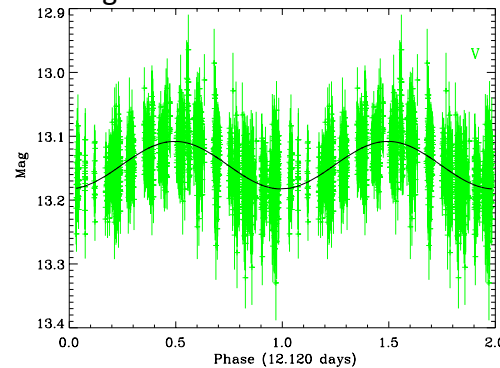
RX J1901.1-3648 in the eccentricity-period plane. The star is indicated by circled dot; other data are from Melo *et al.* (2001). There is nothing unusual about this high eccentricity at this period among PMS stars.



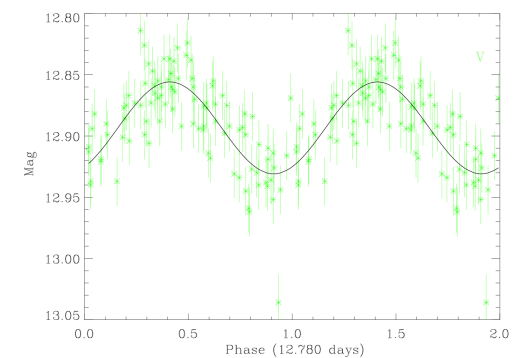
The $H\alpha$ region of the stars, separated by shifting each star to its rest velocity and diluting the lines from the other star. The less massive star is green. There are no emission lines, aside from the wings of $H\alpha$ from the more massive star which appear in emission. Line widths are unresolved.



The TESS light curve. The modulation appears to repeat after about 13 days, but does not do so exactly. There is no eclipse. There are at least 3 short flares of 1-2 hour duration, indicative of magnetic activity.



The SWASP light curve in 2012. The period is 12.2 days. Between 2005 and 2012 the period varied between 12.2 and 12.9 years. Annual modulation amplitudes range from 0.015 to 0.046 mag. At least one star is an asynchronous rotator.



The ASAS-SN light curve from 2017 and 2018. The period is 12.8 days. Between 2014 and 2018 the period varied between 12.3 and 12.8 days. The inconstant period may be due to spot migration, or a beating between periods of the two stars.