

Chi Cygni: My Favourite Star (from the BAA VSS Circular April 2007)

On the evening of July 4th 2005 I did something I hadn't done for twenty years- I observed a variable star. Through the Scandinavian twilight and traces of noctilucent clouds, the cross of Cygnus was emerging and I pointed my newly acquired binoculars in the direction of the eta Cygni. Fittingly, the first target after my 20 year astronomical hibernation was the extraordinary Mira star Chi Cygni, my favourite variable and the subject of this short article. It is amazing how certain variable star fields remain imprinted on the mind of the observer even after two decades in the doldrums. Despite my being totally out of practice, Chi eventually revealed itself, forming the left wing of an unmistakable, kite-like asterism.

I had been introduced to variable stars by Melvyn Taylor during a coffee break at the 1980 TA meeting. Melvyn convinced me that variable stars had something to offer the binocular observer and throughout the Autumn of that year I set about the mainly semi-regular and irregular red variables of the VSS binocular programme. Like many newcomers I struggled to recognize the variables and comparison stars in their respective fields. The most difficult problems I found however were the slow and subtle light variations of many of these stars, not to mention the difficulties in gauging the Purkinje effect for red objects.

Chi Cygni is one star with variations which are anything but subtle. Alerted by the VS pages in TA, I set out to observe Chi as it began its rise to maximum in the Autumn of 1980. After checking and re-checking with the comparisons, I eventually picked up the star which I made magnitude 8.0. Before heading out to the sixth form disco three weeks later I was astonished to see Chi positively glowing like a tiny ruby against the Cygnus star clouds at magnitude 6.0. Here at last was a variable beyond any shadow of a doubt!

Chi Cygni belongs to a select group of variable stars whose light variations have been charted for more than 300 years following its discovery by Gottfried Kirch in 1686. The official data for the star lists mean variations in brightness between magnitudes 5.2 and 13.4 over its 408 day pulsation cycle (AAVSO) and a S6 2e-S10 spectrum. However as many observers noted recently, Chi does on occasion break these extremes. In the Summer of 2006 for example, the star briefly became brighter than the 4th magnitude comparison eta Cygni; this would appear to have been the brightest maximum for nearly 150 years. Other maxima brighter than magnitude 4.0 were noted for the years 1702, 1845, 1847, 1858 and 1864. The twist of unpredictability superimposed on the otherwise relatively regular cycles is what has always fascinated me about Mira stars.

Coming back to the VS scene after so many years, I have been struck by the extent to which the pendulum of observational priorities (both amateur and professional) seems to have moved since the 1980s, away from the Mira variables and alike in favour of the 'sexier' CVs. The chance of catching one of the recurrent object programme CVs in rare outburst or a polar in a high state is certainly what sustains many observers' interest in the subject. Nevertheless it is still important to keep an eye on what Mike Simonsen has referred to as 'legacy variables' like Chi Cygni as well as the importance of including them in a 'mixed diet' along with CVs, AGNs and other objects. As John Percy stresses, long visual datasets of of Miras and other red variables help to shed light on secular variations in light curves. Such data in turn demonstrate the far from satisfactory state of astrophysical theory with regards to the underlying mechanisms of convection and pulsation at work in these stars.

There will always be a place for Chi Cygni on my observing programme!

References

Percy, J. (2007) *Understanding Variable Stars* Cambridge

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