

VARIABLE STAR OF THE YEAR

U Orionis

U Orionis is a classical Long Period Variable star that has been well observed from the UK for over 120 years. It was discovered on 1885 December 13 by J.E. Gore who went on to become the first Director of the BAA VSS some five years later. Initially it was thought to be a nova in the early stages of decline, but a spectrum taken at Harvard showed features similar to that of Mira. Thus U Orionis became the first Long Period Variable to be identified by a photograph of its spectrum. From the maxima he observed in the period 1885–1890, Gore calculated an early period for the variable as being 373.6 days. Gore's successor as Director of the BAA, VSS Col. E.E. Markwick, calculated the period to be 375.3 days from 13 maxima that he observed in the period 1886-1898. Using Gore's and Markwick's data combined with BAA VSS data up to 2006 covering 117 maxima the average period is 371.8 days. As with all Long Period Variables, intervals between successive maxima can vary considerably, in 1939 & 1993 the period shortened to 340 days whereas the normal spread is 365-385 days. The average period is slightly longer than a calendar year so the star can be seen at maximum during the same month for several successive years. For example throughout the period 1983 to 2000 all the maxima of U Orionis took place in the month of November. Currently the maxima are occurring in the month of January which is very convenient for early evening observers equipped with binoculars.

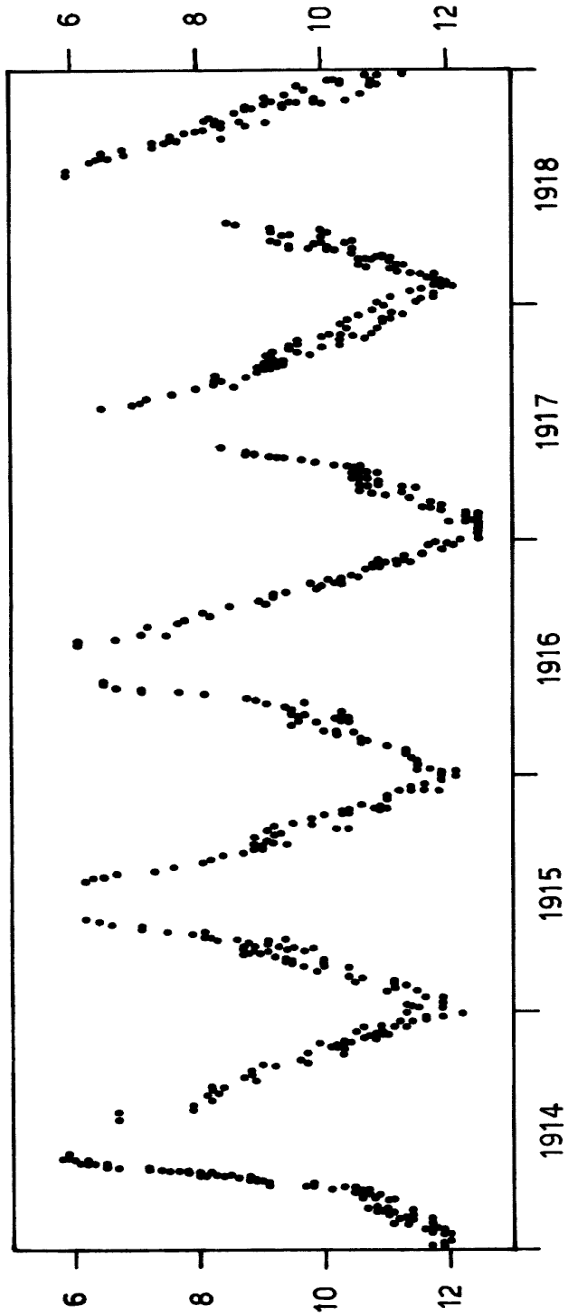
U Orionis is located in the northernmost part of Orion just 0.3 degrees south following Chi 1 Orionis. This is just 3.5 degrees from the northernmost point of the ecliptic which means that the sun, moon, planets and asteroids can pass close by. The normal apparition period is from early August to early May but observers with clear NW and NE horizons can extend this period by a few weeks. From examination of BAA VSS data C.F. Butterworth followed it until May 25 in 1914 and picked it up in the morning sky as early as July 10 in both 1920 and 1922. However, one should always take care in making visual observations in the bright summer twilight because of the red colour of the variable and its low altitude.

The range of the variable is typically magnitude 6.5 to 12.0 which is suitable for observers equipped with 20cm telescopes and binoculars. The extreme range observed is magnitude 5.0 which it peaked at in 1973 and 13.3 which it sank to in 2006. Like many Long Period Variables U Orionis has a skewed light curve where the rise is usually much steeper than the fade. There is often a hump in the light curve on the rising branch at around magnitude 11 which was first commented upon by H. Corder in 1895. Following the hump the rate of rise can accelerate to 0.1 magnitudes a day and this is the time that observers should try to increase the frequency of observations. Observers with small telescopes should take care when the star approaches minimum and the limit of the telescope due to the close proximity of UW Orionis which is a suspected eclipsing binary normally at magnitude 10.6.

Physically U Orionis is 306 parsecs distant and has a fairly typical spectral class range of M6-M9.5e. The linear radius is estimated at 370 times that of the sun and it has a calculated luminosity of 7000 times the sun. Since 1969 several types of maser radiation has been detected and the water vapour maser emission appears to be loosely correlated with the visual cycle of the variable. In 2000 U Orionis became the first Long Period Variable to be confirmed as spatially asymmetrical through a lunar occultation.

Finally if you want to witness the 120th maxima of U Orionis since its discovery take a look at the northern portion of Orion with a pair of binoculars in the first two months of 2008.

U ORIONIS Light Curve



FINDER CHART

059-02

5° FIELD DIRECT

U ORIONIS

05h 55m 49.2s +20° 10' 31" (2000)

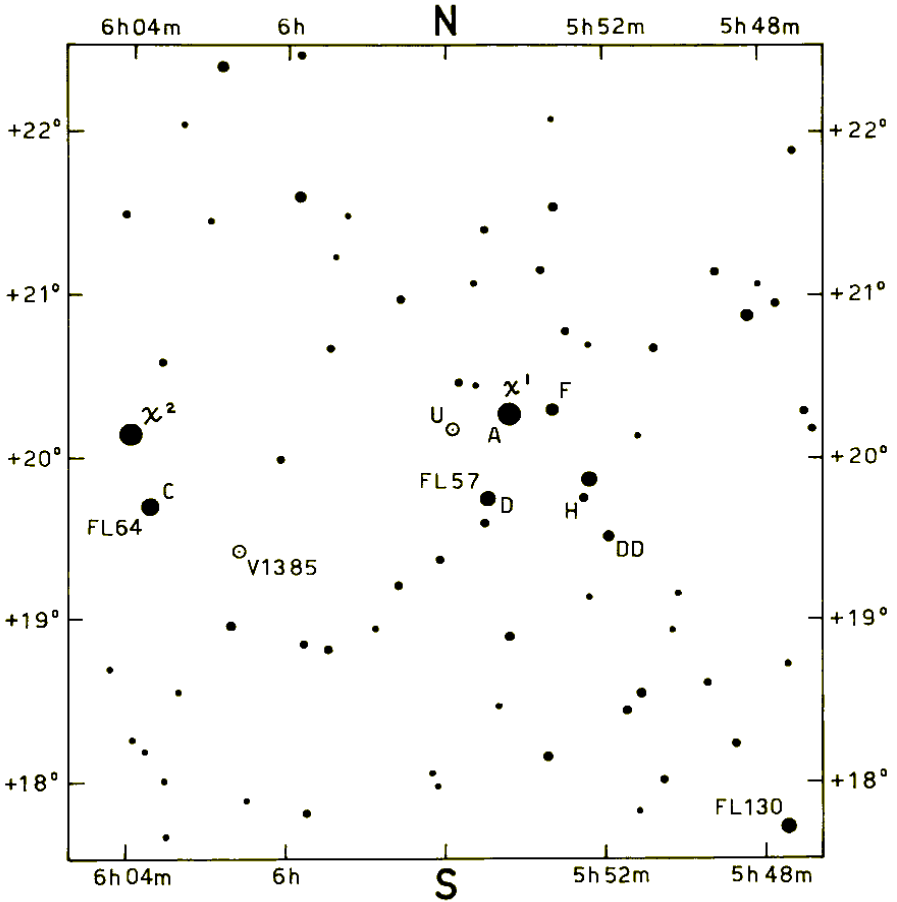


CHART:
MILLENNIUM SA
SEQUENCE:
TYCHO 2 VJ

A 4.40	F 6.70
C 5.13	DD 7.31
D 5.90	H 7.70

BAA VSS
EPOCH: 2000
DRAWN: JT 16-06-01
APPROVED: RDP