



An easy naked-eye eclipsing variable star

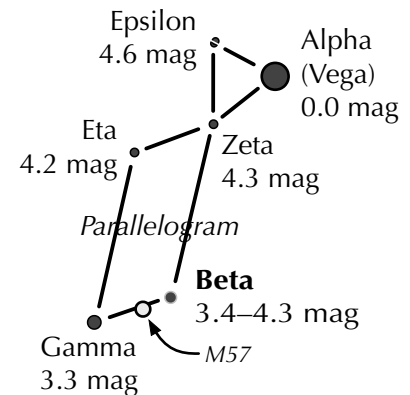


Beta Lyrae

Observing Activity

Where is Beta Lyrae in the sky?

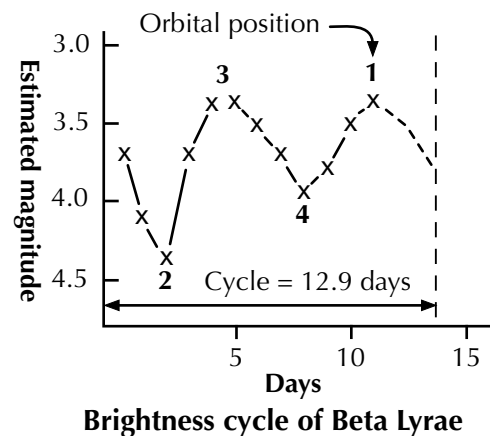
- On summer evenings, the bright star Vega shines nearly overhead. (In the fall, Vega lies high in the northwest.) It is the primary star of the small constellation Lyra. (It is also 0.75° wnw of M57, the Ring Nebula.)
- Stretching from Vega's southeast are four dim stars in the shape of a parallelogram.
- Beta Lyrae is the star at the parallelogram's southwest vertex.



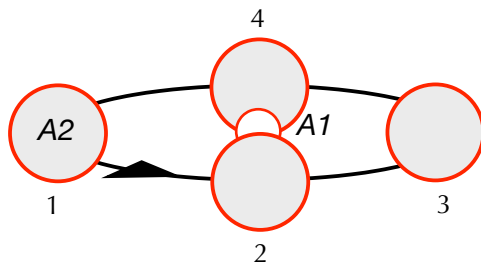
Your Observing Project



- Viewing through binoculars helps greatly.
- Closely examine the brightness of Beta Lyrae each night for up to two weeks. Try not to miss a night. (Yes, weather is always a problem!)
- Determine its estimated magnitude by interpolating the stated magnitudes for Eta, Gamma, and Zeta.
- Construct a graph showing the brightness of Beta over the two week period.



Orbit of Beta Lyrae A2 around A1



Day Orbital position

0.0	1: System at maximum brightness
3.2	2: Dimmer A2 partially transits brighter A1 Deep minimum system brightness
6.4	3: System at maximum brightness again
9.7	4: Brighter A1 eclipses dimmer A2 Secondary minimum
12.9	1: Cycle repeats

Examine the Beta Lyrae reports at the American Association of Variable Star Observers:
app.aavso.org/webobs/results/?star=000-BCD-386&num_results=200

What you are seeing

- Beta Lyrae A consists of two stars, A1 & A2, of unequal brightness and size. They are so tightly separated that a telescope can not split them.
- When the dimmer but larger star, A2, is off to either side of the brighter, A1, the system appears at its maximum brightness of 3.4 magnitude. (Positions 1, 3)
- As the dimmer star orbits in front of the brighter, their total magnitude drops to the deep minimum, because the dimmer star is partially blocking the brighter one. (2)
- Again, when the dimmer star is off to the other side, the system is at maximum brightness. (3)
- When the dimmer star passes behind the brighter one, it is partially blocked causing the system's brightness to reach its secondary (shallow) minimum at 4.3 magnitude. (Position 4)