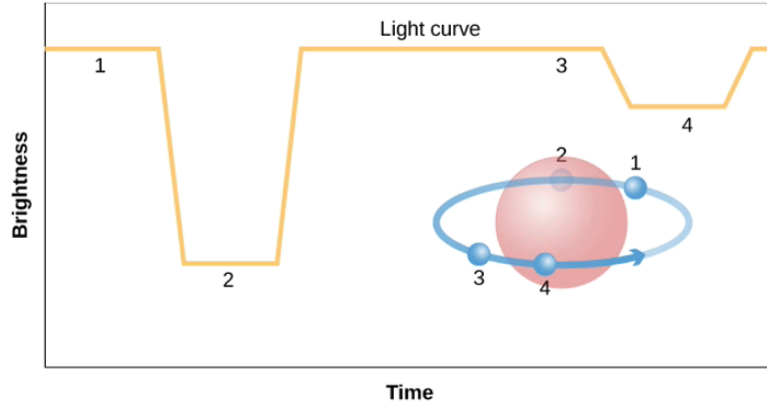


# The Diameters of Stars

- 1 We can use eclipsing binary systems to measure the sizes (diameter or radius) of stars

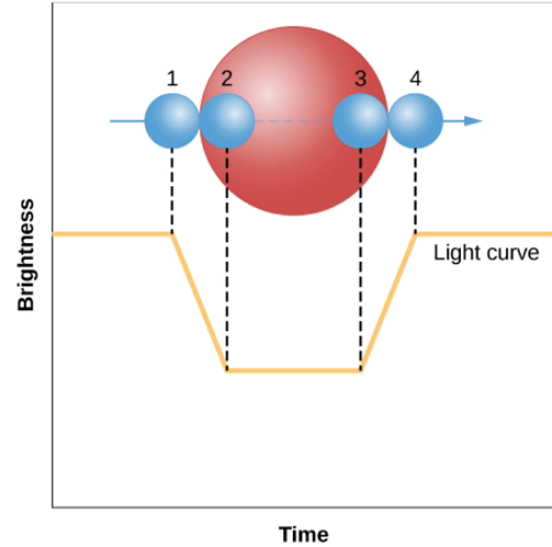


- 3 Another approach: if we know the star's surface temperature  $T$  and luminosity  $L$ , we can apply the Stefan-Boltzmann radiation law to find its surface area  $A$

$$A = \frac{L}{\sigma \times T^4}$$

Knowing the surface area, we can figure out the diameter!

- 2 The diameter of the smaller star is determined by multiplying its velocity (measured using the Doppler effect) by the time elapsed between first contact (1) and second contact (2)



- 4 Using these techniques, we find the diameters of stars are between a *tenth* and a *few thousand times* the diameter of the Sun

