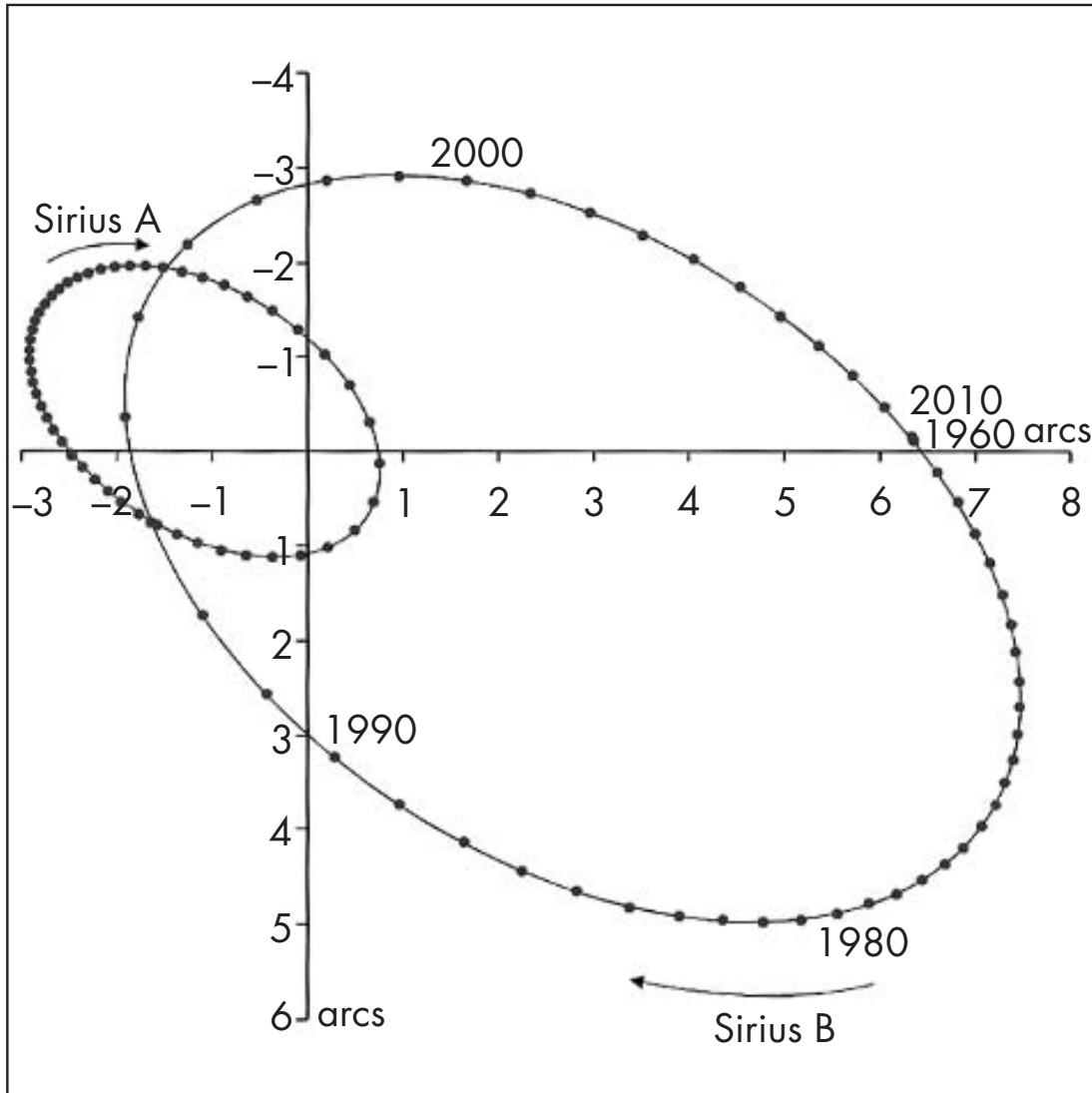
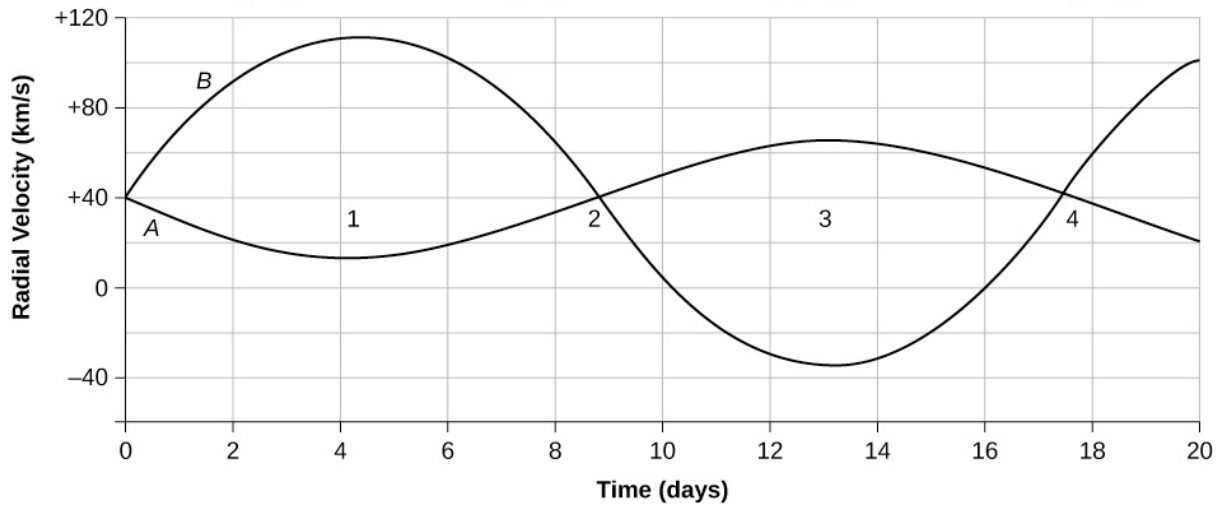


Workshop 8

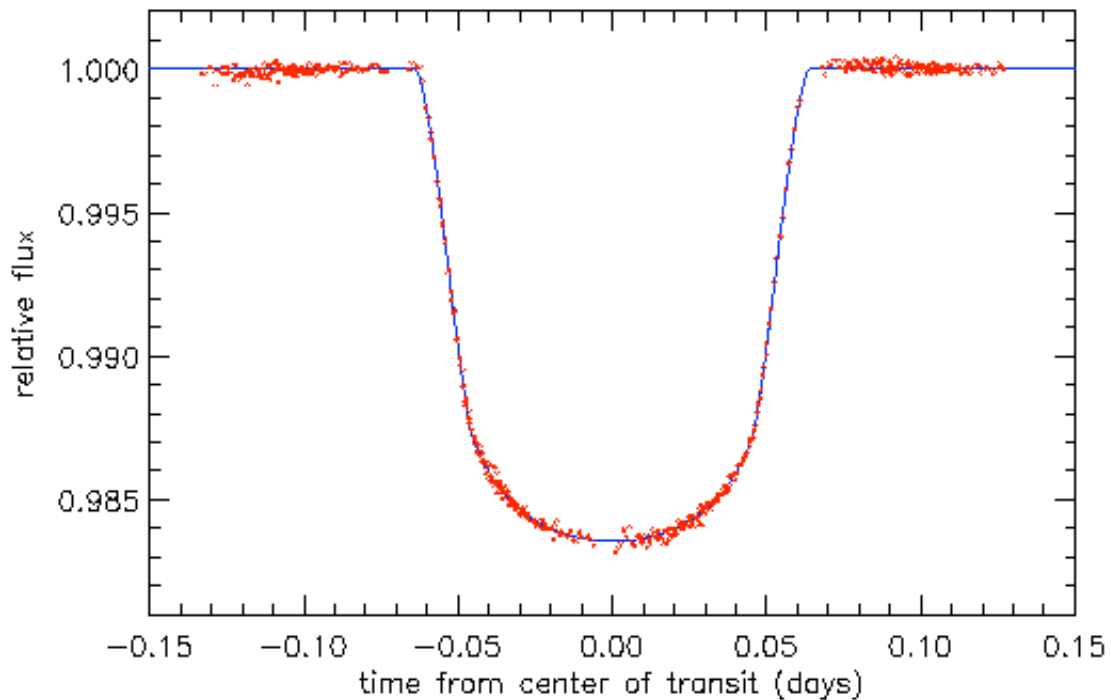
1. The diagram below shows the position of the two stars Sirius A and B as they orbit each other. The scale is in arcseconds and each data point is separated by a time span of one year. Assuming the distance to the system to be 2.6 pc and that the orbital plane is face-on, calculate the individual masses of the stars in solar masses.



2. The graph below shows the radial velocity curves of two stars in a spectroscopic binary system. What is the radial velocity of the centre of mass of the binary system? Assuming we view the system close to edge-on, calculate the individual masses in solar masses.

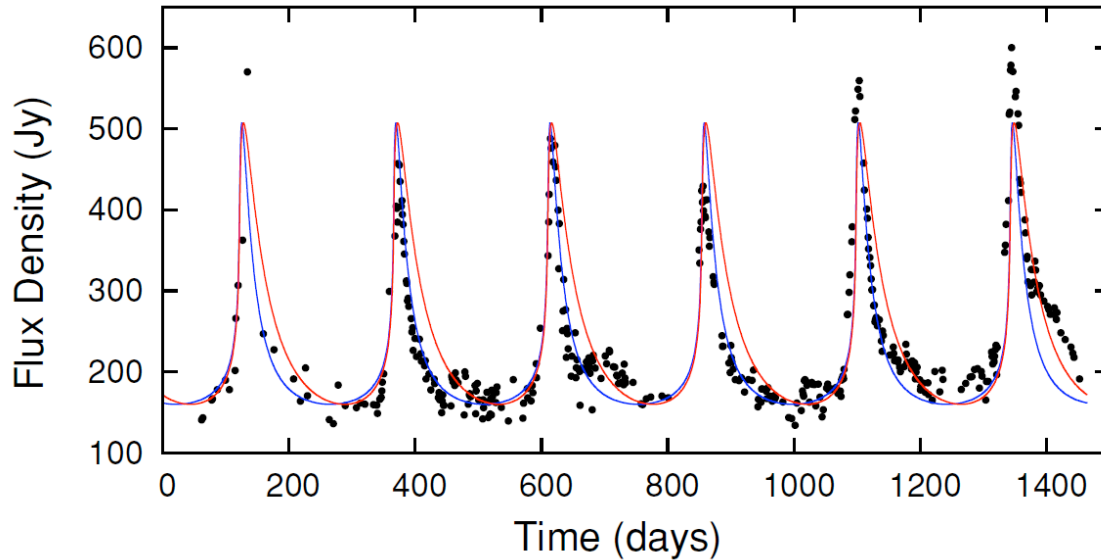


3. The companion to HD209458 has been observed to transit across the face of the star causing a slight dimming of star. The light curve for this event is shown below. Use the size of the drop in the light level during the transit to estimate the radius of the object. Comment of the size that you find.



Case Study G9.62+0.20E

The curve below shows the flux of the methanol maser line in the source G9.62+0.20E as a function of time. Note the periodic flaring behaviour.



One model for these systems involves the interaction between the stellar winds of two massive young stars in the process of forming a close binary system. The only other parameter known for this system is the total luminosity of $3 \times 10^5 L_{\odot}$. Make some assumptions and estimate an average separation of the two stars in a plausible binary system consistent with these data. What would be the typical angular separation of the two binary stars?