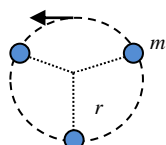


Introduction to Astronomy

HW20131031

due in one week

1. Find out where the “center of mass” is for the Earth-Moon system. Do the same for the Sun-Earth system.
2. Three stars of equal mass m rotate in a circular path of radius r about their center of mass, with equidistance from each other, as shown in the figure. Compute the angular velocity of the motion.



3. The *Large Zenith Telescope* (LZT) in British Columbia, Canada, uses a 6-m liquid mirror made of mercury. From the web, investigate this technology. How can a liquid metal be formed into the necessary shape for a telescope mirror? What are the advantages of a liquid mirror? What are the disadvantages?
4. The *Hubby-Eberly Telescope* (HET) at the *McDonald Observatory* in Texas has a spherical mirror, which is the least expensive shape to grind. Consequently, the telescope has spherical aberration. Check out what is the main functionality of the HET? Explain why spherical aberration does not affect the usefulness of the HET.
5. The *James Webb Space Telescope* (JWST) is the next-generation space telescope, optimized in the infrared wavelengths. Compare the light collecting power and optical diffraction limit of JWST to the *Hubble Space Telescope* (HST) currently in orbit.
6. What is active optics? What is adaptive optics? Why are they useful? Would either of these be a good feature to include on an astronomical telescope to be placed in orbit?