AST 312 Assignment 5
Due Tuesday Feb 11th

1. Recall the Rayleigh criterion from class

$\theta\_min(radians) = 1.22\ \lambda\ /\ D$
Where λ is the wavelength and D is the aperture of the telescope.

      a. For an optical telescope working at λ = 500 nm, what aperture D is needed to give a theoretical resolution of θ_min = 1 second of arc?

      b. For a radio telescope working at = 1 m, what aperture is needed to give θ_min = 1 second of arc?

      c. Estimate θ_min (in seconds of arc) for your eye.

2. The largest optical telescopes today are reflecting telescopes. Why aren't the largest telescopes refracting telescopes? What advantages does a reflecting telescope have over a refracting telescope when it comes to making an instrument of large aperture?

3. What is the light gathering power of a 1 m telescope compared to that of the 10 m telescope at Keck?

4. What is the lowest declination a star can have and still be circumpolar as seen from East Lansing? Ignore the effects of atmospheric refraction. Stars of what declination range can never be seen from East Lansing? Explain how you calculated your answer. After doing the calculation, use Starry Night to verify your results.