AST 250 Spring 2010
HOMEWORK #6

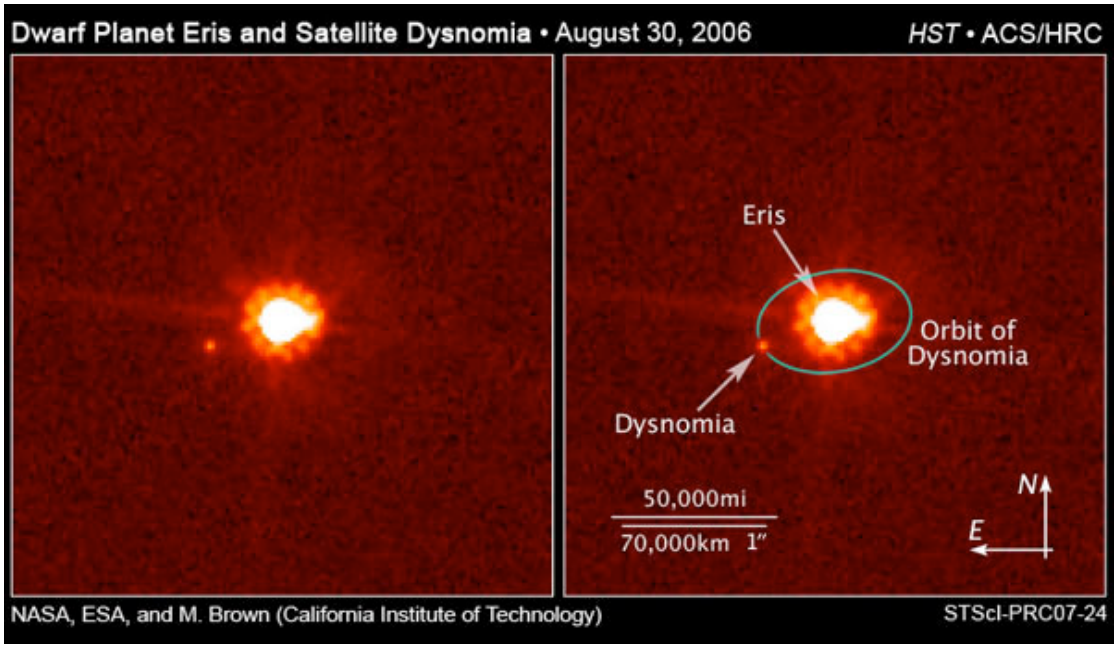
Due Wednesday April 7

(1) What is the variation in the solar flux density observed on Mars due to the eccentricity (a=1.524 AU, e=0.093) of its orbit?

(2) What is the difference in the speed of the Earth around the Sun at perihelion compared to aphelion?

(3) Calculate the orbital period (in years) for the largest known Kupier Belt object, Eris (a = 67.7AU, e = 0.442). What is the range in the Sun's visual apparent magnitude as viewed from Eris? Compare to the brightness of a full moon observed on the Earth.

(4) Eris has a small moon, Dysnomia, which orbits Eris with a=37,370 km in 15.774 days. Calculate the mass of Eris (assuming the mass of Dysnomia is negligible). How does that mass compare to Pluto ?



(5) Jupiter's moon Europa has an ocean of liquid water underneath a thick layer (~10 – 30 km) of ice. Depending on the composition, the ocean is between 25 and 100 km deep. How does the volume of Europa's liquid ocean compare to the volume of liquid water in the Earth's oceans (~ 1 billion km^3)?