HW 7

15.34 The biggest dimension of Ceres is 974.6 km

a) Using Small Angle formula.

$$\alpha = \frac{D \times 206265}{d} = 823 \text{ arcsec}$$

b) There are approximately 40 pixels along equator. And the diameter of Ceres is 974.6 km

∴ Distance per pixel $= \frac{974.6}{40} = 24.365$ km/px.

c) Angular diameter corresponding to 40 pixels is 823 arc secs.

∴ angular width $= \frac{823}{40} = 20.57$ arcsec.

15.44. a) Volume of neucleus $= (10 \times 10^3)^3 \ m^3$

$V = 10^{12} \ m^3$

Mass = density $\times V = 10^3 \times 10^{12} = 10^{15}$ kg.

b) 1% of Mass of Neucleus $= 10^{13}$ kg

Suppose the tail is a 100 million X10 million X10 million km in size.

Volume $= 10^2 \times 10^6 \times 10^3 \times 10 \times 10^9 \times 10 \times 10^9$

Volume $= 10^{31} \ m^3$

density $= \frac{10^{13}}{10^{31}} = 10^{-18}$ kg/m^3 which is very sparse.

c) There would be no effects due to such low density.