Recitation V

1) The work function for Cesium is 1.9eV.
   a) What is the photoelectric effect threshold frequency and wavelength
   b) What is the stopping potential when the wavelength of the light is 300nm?

2) The full Moon appears with an angular diameter of $\sim 0.5^\circ$. What is the solid angle covered by the Moon? What fraction of the entire visible sky does that represent?

3) Water has a mass density $\rho = 1.0 \, \text{g}\cdot\text{cm}^{-3}$. The molecular mass of water is $18 \, \text{g}\cdot\text{mol}^{-1}$. Each water molecule consists in one Oxygen and two Hydrogen atoms. A beam of proton is sent through a water target of thickness 1mm. The cross section for the studied proton-proton interaction is $20 \, \text{mb}$ where $\text{mb}$ stands for milli-barn and a barn is $10^{-24} \, \text{cm}^2$.
   a) What is the number density of water molecules? What is the number density of hydrogen atoms?
   b) What is the fraction of beam protons that will interact with target water protons?