4.1 (10 points) Why should one expect lasing at ultraviolet wavelengths to be more difficult to attain than lasing at infrared wavelengths? Develop your answer based on the ratio A_{eg}/B_{eg} and the meaning of the A_{eg} and B_{eg} coefficients.

4.2 (30 points) The news media has shown astronauts placing laser retroreflectors on the moon.
a. Assuming a laser rod of 2 cm diameter and a Gaussian beam, predict the diameter of the laser beam when it hits the moon. Use $\lambda_0 = 6943\mathring{A}$.
b. Eye damage intensities are in the range of 10 μW/cm^2. If the laser on earth produced a pulse power of 10 MW, was there danger to the astronauts from the optical radiation?