

## **Astronomy 80B: Light Problem Set 4: due 1 May 2003**

• **Read Ch 3** in *Seeing the Light* and do the following problems:  
You will want a straight edge and graph paper for some of these problems

- page 101: P6, P9, P11, P12,

harder problems:

- page 101-102: PH9, PH10, PH12

atmospheric effects

- page 69: P24

• **Read Appendix C, D, E, F** (p416-9)

mathematical problems

- page 103: PM2, PM3, PM5

• **A.** Consider parallel light impinging on a sphere made of an unknown refracting material. It is found by observation that the light is perfectly focussed on the back surface of the sphere. What is the index of refraction of the material that constitutes the sphere? Assume the beam of parallel light is paraxial, thus only illuminates a modest part of the sphere. Such a sphere would be very useful as a retrosphere if the back surface was coated with a reflecting material. Can you think of any reason why such spheres are not in common use?