

Homework #9

due Thursday April 12

1. Tipler and Mosca Chapter 30 #15
2. Tipler and Mosca Chapter 30 #17
3. Hirose & Lonngren Chapter 9 #6
4. Hirose & Lonngren Chapter 9 #7
5. Hirose & Lonngren Chapter 9 #8
6. Hirose & Lonngren Chapter 9 #11
7. Hirose & Lonngren Chapter 9 #12 What would your answer be if the target were white (perfectly reflecting)?
8. The figure below shows a device called a radiometer or light mill (implying that it is propelled by light in the same way that a windmill is propelled by wind). It is made from a glass bulb from which much of the air has been removed to form a partial vacuum. Inside the bulb, on a low friction spindle, is a rotor with several (usually four) vertical lightweight metal vanes spaced equally around the axis. The vanes are polished or white on one side, black on the other. When exposed to sunlight, artificial light, or infrared radiation (even the heat of a hand nearby can be enough), the vanes turn with no apparent motive power. Do you think that radiation pressure is enough to cause the vanes to turn? Based on your answer to #7, in which direction do you expect it to turn.



Figure 1: A radiometer or light mill.