

HOMEWORK SET 4

Due September 30, Tuesday

4.1 – 4.5 Chap 7: Questions 27, 28, 29, 32; Chap 9: Question 15

4.6 Treating the Sun and Earth as spherical blackbodies:

- (a) Calculate the solar constant, i.e., the solar radiation flux at Earth, given that the surface temperature of the Sun is 5800 K and the radius of the Sun is 70,000 km [Hint: using Stefan-Boltzmann law]
- (b) Given the albedo of Earth as 0.31 and taking into account the cross-sectional area of Earth receiving solar radiation, calculate the surface temperature of Earth if green-house effect is not considered. [Hint: assuming energy balance, input energy = output energy]
- (c) The Earth's average surface temperature is 287 K. Compare this temperature with your result from (b). Do you think the difference significant? Why?