Introduction to Astronomy and Astrophysics II:

Beyond the Sun and Planets

ASTA02 - Winter 2023

Problem set # 2

Assigned: Feb 16th 2023
Due: 3 March 2023

Answer the following questions some with multiple parts. Write clearly and make sure you show ALL your work. Your solution should look like an explanation to someone about how you solve the problem. Discussion of questions and ideas on how to solve the problems and checking that you got the same answer with other students is allowed and encouraged. However, the problem set you hand in MUST BE YOUR OWN WORK.

1. Two stars, A and B have the same temperature of 8500K. Star B however is 100 times more luminous. What are their relative sizes? What colour are they?

   Solution: For this question we use the fact that the luminosity can be calculated from the flux it emits at the surface times the surface of the star:

   $$L = 4\pi R^2 \sigma_{SB} T^4,$$

   because the relationship applies to both stars, we can divide the right hand side and left hand side