## Physics 1311 Spring 2020 Homework/Study 6 (two-sided)

Chapter 9

- 1. What mode of heat transfer carries solar energy from the surface of the photosphere to here?
- 2. What part of the Sun emits X-rays?
- 3. In as few words as possible, what is the physical nature of sunspots?
- 4. How long is the solar magnetic cycle? (Check your book carefully) What does the magnetic field do halfway through the cycle?
- 5. Briefly describe the solar corona (location, temperature, etc).
- 6. What is the condition of hydrostatic equilibrium?
- 7. What produces the granulated appearance of the photosphere?
- 8. What percentage (mass) of the Sun's mass is NOT hydrogen or helium?
- 9. How many Earth masses are needed to equal the Sun's mass? (Look in the Appendix for Earth's mass, calculate and show the work.)

10. In the proton-proton chain, what percent of the mass going in is actually converted to energy?

11. The radius of Earth's orbit is 1.496x10<sup>8</sup> km (1.496x10<sup>11</sup> m). Earth receives 1400 watts/m<sup>2</sup> from the Sun. Calculate the total energy output (watts) of the Sun. SHOW YOUR WORK. It is easier than it looks.

12. Why does the center (umbra) of a sunspot look dark?

13. What element is the Sun consuming for fuel and what element is the result?