The HR Diagram - Review

Name_____

Purpose:
- To provide you with necessary skills to understand the HR diagram and how to use it
- To give you practice performing simple mathematical calculations using spectroscopic parallax

Estimated Completion Time: 1 hour

Resources needed:
- Calculator (preferably scientific)
- Textbook
- Web access is highly desirable
- Stellarium

Questions

1. Complete the table below: (10 marks)

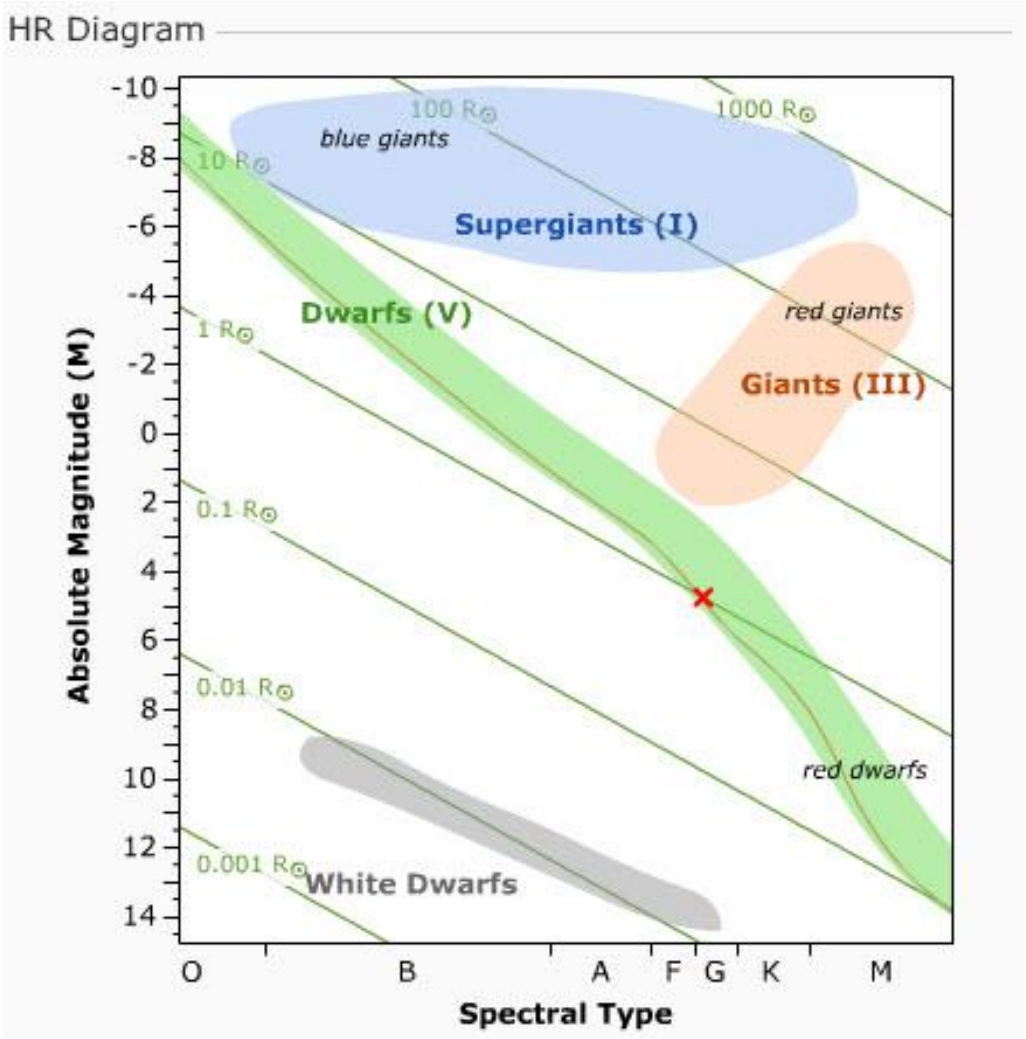
Star	Spectral Type	Absolute Magnitude	Apparent Magnitude	Parallax	Distance	Distance Modulus
Procyon	F5IV		0.34	0.28”		
Castor	A1V		1.93		15.6 pc	
Antares	M1 Iab	-5.28	0.96			
Altair	A7V	2.21	0.77			
Regulus	B7V	-0.52			24.3 pc	
Capella	G8III	0.35	0.91			
Mizar	A2V	0.33	2.23			
Sirius B	DA2		8.30	0.38”		

2. Place each of the stars in the table from question 1 on the HR diagram that is attached to this exercise. (5 marks)

3. A Cephied Variable star has a spectral type of F6 Ia and an apparent magnitude of 8.3. What is the distance modulus for this star? How far away is this star in light years? (Hint – use the HR diagram to find M for this star). (5 marks)

4. Explain why knowing both the absolute and apparent magnitudes of objects is an important part of determining the size of our galaxy. (3 marks)

5. If a supernova were to occur in our galaxy it could conceivably be bright enough to be seen during the day. Suppose a Type Ia supernovae (M = -19) where to occur 3000 pcs from earth. Do you think it would be visible during the day? Find the distance modulus for this distance and from this determine the apparent magnitude of the supernova. Discuss your answer. (5 marks)



Useful links to web pages:

Brightness-Luminosity: http://www.kcvs.ca/martin/astro/kingsu/unit1/21/chp2_1.html
Parallax: http://www.kcvs.ca/martin/astro/kingsu/unit4/81/ch8_1.htm
Distance Modulus and Applet:
http://www.kcvs.ca/martin/astro/kingsu/unit4/82/ch8_2.htm