

Astronomy 305: Life in the Universe
Homework 11: Chapter 11

Total points: 40

1. (14 pts) [a] For the seven major spectral types OBAFGKM, discuss whether stars of each type are likely to have habitable planets, and give multiple reasons why or why not. [b] Could brown dwarfs be orbited by habitable worlds? Explain.
2. (10 pts) Describe the two techniques – the astrometric technique and the Doppler technique – by which we can measure gravitational effects of planets on stars, and contrast their advantages and limitations.
3. (8 pts) How might future images and spectroscopy allow us to determine whether distant planets are habitable or have life?
4. (2 pts) Compared to a star of spectral type K, a star of spectral type A is generally
 - (a) hotter, more luminous, and more massive;
 - (b) hotter, more luminous, and less massive;
 - (c) cooler, dimmer, and less massive.
5. (2 pts) Stars of types O and B are unlikely to have planets with life because
 - (a) they have short stellar lives;
 - (b) their intense ultraviolet light would sterilize any planets;
 - (c) they don't have enough heavy elements.
6. (2 pts) How does the habitable zone around a star of spectral type M compare to that around a star of spectral type G?
 - (a) It is larger and farther from its star.
 - (b) It is hotter and much brighter.
 - (c) It is smaller and closer to its star.
7. (2 pts) The main sequence on an H-R diagram represents stars that are
 - (a) in the final stages of their lives;
 - (b) fusing hydrogen into helium in their cores;
 - (c) all extremely low in mass.