

Arvind Borde

AST 10: Homework 3b

1. The Hertzsprung-Russell diagram uses the temperature in degrees Kelvin, related to degrees Celsius by

$$^{\circ}K = ^{\circ}C + 273^{\circ}$$

- a) What is the freezing point of water in $^{\circ}K$?
b) What temperature is it in $^{\circ}C$ when it's $0^{\circ}K$?
2. Are stars likely to form from gas clouds that are 1% of M_{\odot} ? 50% of M_{\odot} ? 700% of M_{\odot} ? If not, why not? If stars do form in these cases, which (if any) are likely to create heavy elements such as iron?
3. Would you say our sun is (a) in its youth? (b) in middle age? (c) in old age? Why?
4. We said that the apparent brightness of a star is $\propto L/d^2$, where L is the absolute (or true) brightness. If a star is a hundred times fainter than you'd expect, were it 10 ly from us, is it really nearer us than that or farther? How far is it?