Reminders

1. Quiz 4 Due TODAY at 11:59PM.
2. Read Chapter 3
3. Midterm 1: Friday Sept 25 (one week from Today)
4. Practice Midterm on course web page (also under Supplementary Material → Midterm 1)
Lecture 11 – More Spectra, Doppler Effect
Spectra from Hydrogen

- Balmer Lines Occur from transitions in the second level of Hydrogen
- The energy to excite Hydrogen atoms to the second level is high
Hydrogen Energy Levels
Digital Spectra

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Lines and Continua

- Lines come from electronic transitions in the atom
- Continua come from ionization or the opposite recombination
- Lines are broadened by both thermal effects and by density effects. We can sort out density from thermal effects.
Clicker Question

When we see strong Balmer Lines we know that

(a) The gas is very cold
(b) The gas is very hot
(c) The gas is not far from the temperature on the solar photosphere
(d) Both (a) and (b)
Blackbody Radiation
Blackbody Radiation: Height and Peak Depend on Temperature
Blackbody Radiation: Wien’s Displacement Law

Wien’s Law

Wavelength of Maximum Intensity (cm) $= \frac{0.29}{T (\degree K)}$
If we change the temperature of a blackbody by a factor of 2, we change its flux by a factor of

(a) 2
(b) 4
(c) 8
(d) 16
Clicker Question

If we increase the temperature of a blackbody by a factor of 2, we change its wavelength where it is has its maximum brightness by a factor of

(a) 2
(b) 1/2
(c) 1/4
(d) 4