C207: Radiative Processes in Astrophysics

UC Berkeley, Fall 2016

An introduction to the basic physics of astronomy and astrophysics at the graduate level. Covers principles of energy transfer by radiation; elements of classical and quantum theory of photon emission; bremsstrahlung, synchrotron radiation; compton scattering, plasma effects, atomic and molecular electromagnetic transitions. Includes applications to current research into astrophysical phenomena.

Prof. Aaron Parsons

Classes: Tu/Th 11:00 - 12:30, Barrows Hall 122

Email: [aparsons@berkeley.edu](mailto:aparsons@berkeley.edu)

Office: Campbell 455 (or 425 lab)

Quizzes (10% of grade):

* intended to be easy (directly based on videos/reading)
* given at beginning of class

Homework (60%):

* assigned Tu, due **before** class, next Tu
* -10% for each week late (one freebie 1-week extension allowed)
* you may collaborate (share ideas verbally, draw pictures) …
* … but implement separately (your own equations, code, writing)
* … and acknowledge/cite external resources. No looking up answers!

Oral Final (30%):

* ~45-min discussion, one-on-one with me :)
* good practice for prelims/quals and giving scientific talks

Reading:

* Rybicki & Lightman,*Radiative Processes in Astrophysics* (primary reference)
* other material provided on the AstroBaki website (<http://casper.berkeley.edu/astrobaki>) C207 photontrain

Materials:

* a computer (let me know if this is a problem)
* a programming language (I’ll use Python, with numpy and pylab)
* a LaTeX installation

Schedule:

* See class website (AstroBaki, Radiative Processes in Astrophysics)