C207: Radiative Processes in Astrophysics

UC Berkeley, Fall 2013

An introduction to the basic physics of astronomy and astrophysics at the graduate level. 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. With applications to current research into astrophysical phenomena.

Prof. Aaron Parsons

Classes: Tu/Th 10:30 - 12:00, Hearst Field Annex B1

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Office: Hearst Field Annex B54

Quizzes (10% of grade):

* intended to be easy
* given at beginning of class on Th
* ensure you are keeping up on assigned reading/video lectures

Projects (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)

Oral Final (30%):

* 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>) Ay250 P9ls4R\*@

Materials:

* a computer (preferably laptop in class; 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)
* NO CLASS 11/21, 11/26, 11/28