C207: Radiative Processes in Astrophysics

UC Berkeley, Fall 2020

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, https://berkeley.zoom.us/j/3587609756

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Class Participation (20% of grade):

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

Homework (50%):

* 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)
  + acknowledge/cite external resources
  + no looking up answers

Oral Final (30%):

* 45-min discussion, one-on-one with me (I’m not that scary :)
* good practice for prelims/quals, giving scientific talks

Reading:

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

Materials:

* a computer with Zoom
* a programming language (I’ll use Python)
* optional: a jupyter installation (otherwise, use datahub.berkeley.edu)
* optional: a tablet/stylus for collaborative “board work” (otherwise, shared screens data, paper held up to camera)

Schedule:

* See class website (AstroBaki->Radiative Processes in Astrophysics)