Ay121: Undergraduate Radio Lab

UC Berkeley, Spring 2020

This course uses four laboratory experiments to introduce instrumentation, laboratory techniques, and data analysis. We will build receiving, observing, and analysis systems for two telescopes: a single-dish 21-cm line system, and a 12-GHz interferometer. We will use these telescopes for astronomical observing projects that include: measuring the structure of the Milky Way galaxy, determining the precise position of several radio sources, and measuring the radio brightness distributions of the sun and moon with high angular resolution. There is a heavy emphasis on digital data acquisition, software development in the Python language, and high-quality written reports.

Prof. Aaron Parsons

Classes: Tu/Th 1:00 - 2:30p, Campbell 541

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

Office: Campbell 455

Class Participation (30% of grade):

* Presenting work during weekly “show and tell”
* Active engagement in class discussion and lecture

Lab Reports (70%):

* due **before** class on Tuesday.
* -10% for each day late
* collaborate (talk, draw pictures, collect data) with your labmates …
* … but implement separately (your own equations, code, plots, writing)

Reading:

* lab instructions and topical handouts linked on the AstroBaki website
* https://casper.berkeley.edu/astrobaki/index.php/Undergraduate\_Radio\_Lab

Materials:

* you may use department computers; an account has been made for you.
* lab book for notes, recording data, etc.

Schedule:

* See class website (AstroBaki, Undergraduate Radio Lab)

Lab Rules:

* Do not prop open the lab door and make sure it shuts behind you.
* No food or beverage in equipment areas---only at the conference table.
* Keep the lab clean. Please dispose of your trash.
* Do not disconnect or modify the wiring of any of the computers, monitors, keyboards, or mice.
* Be respectful. Talk quietly and use headphones to e.g. listen to music.
* Put equipment back where you got it when you are done.
* Be careful with equipment, but if you break something, tell us.
* No email/games/social media during class hours.

Class Conduct:

This is a work-intensive class. You are going to spend significant time on your own in the lab with minimal supervision. At all times, you are expected to abide by the posted lab rules and the UC Berkeley Code of Conduct (<http://sa.berkeley.edu/code-of-conduct> ), acting with respect to your peers, GSIs, technicians, and instructor. Should you experience any form of harassment or discrimination, we maintain a list of resources that can help you decide how to respond. (<https://astro.berkeley.edu/department-resources/reporting-harassment> ). GSIs, technicians, and instructors are non-confidential reporters; we have a legal obligation to act on any reports of harassment. Please know that we take our responsibility seriously.