

# Astro 2\*\*7 & 2\*\*8

*Astronomy Data Science Laboratory*

Information Session for Spring 2019

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# Course Aims

- Introduce and motivate a range of analysis techniques and data pipelining
- Gain practical, in-depth experience doing inference on real, open-ended modern astronomical challenges
- Build reproducible, well-tested, well-documented software & infrastructure
- Learn to work with open data and code, and in an open science environment
- Hone presentation (speaking & visualization) skills
- Develop skills for future in academia, industry, ...

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## Data Types

Timeseries

CCD Imaging

Spectra

Catalog  
metadata

## Techniques

Parallel  
computing

Bayesian  
inference

Deep  
Learning

ADQL/SQL

## Skills

Python

LaTeX/  
Overleaf

Git

Visualization

Science  
Communication

## Data Sources

Gaia DR2

SDSS

HST

APOGEE

## Astronomical Topics

Distance  
Ladder

Fundamental  
Stellar  
parameters

MW Structure  
& Dust

# Format

- 4 credits (grad and undergrad)
- 1 weekly 3 hour meeting
- “Show & tell” progress reports + instructor lecture
- 3 or 4 labs + final project & presentation
- Will require a fair amount of dedicated coding time
- Does NOT (yet?) count as an astronomy lab, but is styled after it.
- It WILL count as an astro major elective in Spring 2019
- Ugrad/Grad together
  - Grads will do a more in-depth labs

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# Prereqs

- Astrophysical background: Astro 7A & 7B
- Math background: Calculus (including Math 53), Linear Algebra (Math 54 or Physics 89)
- ***Proficiency or fluency*** in the Python programming language.
- This is NOT the place to learn how to program for the first time

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# Enrollment

- Requires a course control number
- We will review your transcript to check for prereqs, etc.
- You will do a short exercise in Python so we can gauge your coding level

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# Questions?

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