



ASTRO 278 - FALL 2024

AI for Astrophysics

Description: Graduate seminar on the use of machine learning (ML) and artificial intelligence (AI) in Astrophysical context. Project-based, with projects using recent developments in ML and AI methods applied to Astrophysics problems. Also an emphasis on discussion of scientific literature. Topics include deep learning, probabilistic machine learning and uncertainty quantification, simulation-based inference, normalizing flows, physics-informed neural networks, and large language models.

Learning Objectives

After this course, students will be able to:

- Read and interpret scientific papers using modern ML/AI methods
- Interpret the vocabulary and methods using ML/AI in scientific context
- Build effective datasets for ML/AI applications in Astrophysics
- Improve the replicability and reproducibility of ML science papers

Course Requirements: Astro 81, 115, & 117 (or equivalent courses), Mathematics 32A, 33A (Multi-variate Calculus and Linear Algebra), proficiency in Python programming, Recommended: Physics C170M/C270M or equivalent introductory machine learning experience.



Instructor: Prof. Tuan Do

Lectures: Mon. 10:00 AM to 11:50 AM

Lab/Code Tutorial (optional):
Wed. 10:00 AM to 11:50 AM

Questions? Contact Prof. Do at
tdo@astro.ucla.edu