Syllabus: Galactic, Extra-Galactic Astronomy & Cosmology
ASTR 400B Spring 2018

Instructor: Prof. Gurtina Besla
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Office Hours: (ATOMM) Monday 1-2:30 Parker Library

Course Website: All handouts, homework/in class worksheets and solutions will be posted on GitHub: https://github.com/gurtina/ASTR400B_2018

Classes: Tuesday & Thursday 2:00-3:15 PM **SO 208** Computer Lab

Recommended Textbook:

Galaxies in the Universe 2nd Edition
L.S. Sparke & J.S. Gallagher, III
Errata for the book: http://www.astro.wisc.edu/~sparke/book/errata.html

Overview:
This course will teach you about the structure of our Milky Way Galaxy and how it compares to the zoo of galaxies that exist in our Universe. We will also discuss the very early stages of the universe and how galaxies evolve over time. This course involves a computational research project, where you will develop code to analyze an aspect of a simulation of the future fate of our Local Group, wherein the Milky Way and Andromeda galaxies collide and merge.

Course Goals:

Class lectures will provide an overview of the equations and processes that describe galaxy evolution over cosmic time. Computational homework is designed to illustrate how those equations are used to study galaxy structure and evolution in practice.

The goals of this course are to:

1) Develop an understanding of how theoretical astrophysical research is conducted with real data sets.
2) Become proficient in python or a coding language of your choice
3) Be comfortable with the command line
4) Learn basic coding practices and version control (e.g. GitHub)

Evaluation:

7 Computational Homeworks	40%	~ Weekly for first half of semester
		You will be required to submit your code
Project Proposal	10%	March 1st 2018
Presentation	20%	March 12, 15, 20, 22nd, 2018
Final Report	30%	May 4th 2018

Lecture Topics Covered:

1) The Milky Way
2) Our Local Group of Galaxies
3) Galaxy Types and Profiles of Light and Dark Matter
4) Processes that Govern Galaxy Evolution: Mergers, AGN, Black Holes
5) Cosmology and the Early Universe

Prerequisites

Students must have completed Astronomy 300A, 300B, and 400A. Students must have taken or are currently taking Phys 305 OR already have proficiency in coding in some language.

Classroom Behavior

- **Academic Integrity**: All students in this course are expected to abide by the University of Arizona's Code of Academic Integrity http://dos.web.arizona.edu/uapolicies/

- **Cheating is not tolerated in any form.** If a student is caught cheating on any assignment or presentation the penalty will be failure in the course. In all cases a letter will be sent to the Dean of Students describing the incident. If you are aware that someone else is cheating, it is your obligation to inform the instructor.

- We allow, even encourage, collaboration on assignments. However, **you must always write the final version of an assignment yourself**, and use your own words to describe what you have concluded. If we receive verbatim answers from more than one person we will divide the credit received among all those with identical answers. Note, however, that the final research project is expected to be done **independently**.

- It is fine to make use of reference books or websites. But if you do so, make sure to add appropriate citations and put text taken verbatim in quotes, otherwise make sure to rewrite things in your own words. In all cases you must list the source of your information. **Plagiarism is strictly prohibited**. If you are uncertain as to what constitutes plagiarism see: http://deanofstudents.arizona.edu/codeofacademicintegrity

- **Cell Phones:** The use of cell phones is not allowed in the class.

Students with Disabilities:

If you anticipate barriers related to the format or requirements of this course, please meet with me so that we can discuss ways to ensure your full participation in the course. If you determine that disability-related accommodations are necessary, please register with Disability Resources (621-3268; drc.arizona.edu) and notify me of your eligibility for reasonable accommodations. We can then plan how best to coordinate your accommodations.