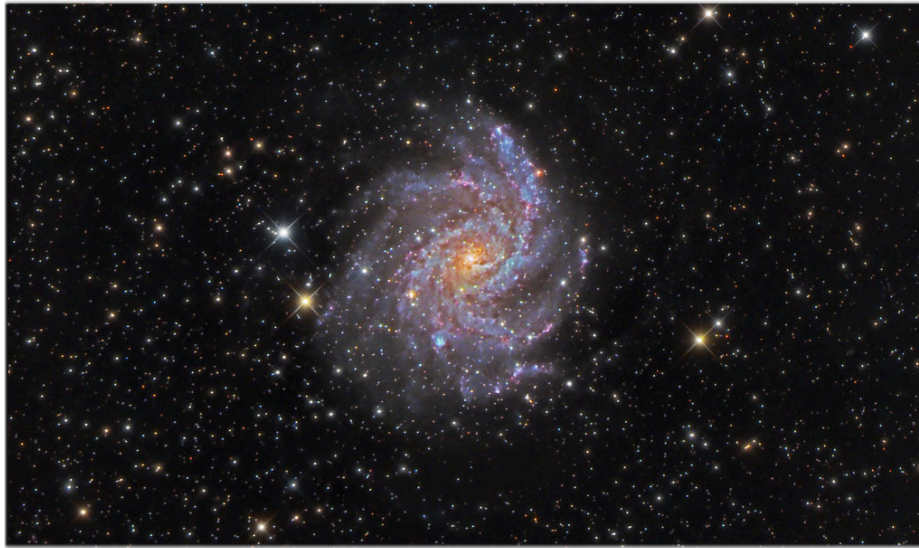


Galaxies



The Milky Way
Galactic astronomy refers to the study of the Milky Way.



Active Galaxies
Galaxies collide, merge, and go through some amazing phases!



Large Scale Structure
Galaxies make up the clumps in large scale structure.

Galactic and Extragalactic Astronomy

I am so excited to learn about galaxies with all of you! Galaxies are some of the most amazing structures in our Universe (and my personal favorites!). Studying these giant star-factories has revealed the presence of dark matter, helped build a picture of the history of the Universe, and so much more! This semester, we will journey through some of the amazing things galaxies have taught us and how astronomer have learned these things. The main learning goals I have for this course are listed below:

1

MEASURING GALAXIES

Be able to discuss how we measure properties of galaxies and what those measurements tell us

2

STAR-FORMING FACTORIES

Understand the different scales of star formation and where/when star formation occurs in galaxies

3

COSMIC HISTORY

Establish how galaxies are used to build a picture of cosmic history and the make-up of our Universe

Course Expectations

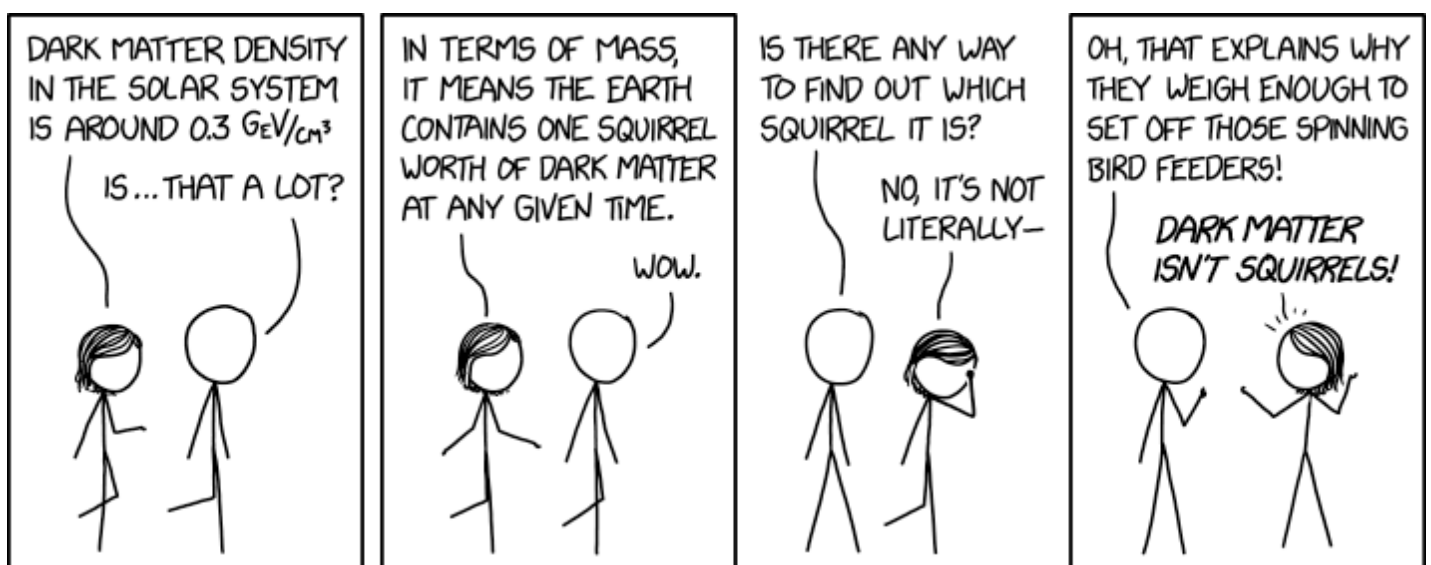
What I ask of you

1. Although we may not be able to meet in person, we will still need to work together to build knowledge of galaxies! This means your participation is a vital part of the learning process, please be sure to stay on track, whether you choose to participate synchronously or asynchronously!
2. Respect your fellow classmates. Science can be messy, and we are going to dive right into this mess. Be kind and supportive as we work through some difficult questions!
3. Respect yourself! Astrophysics isn't an easy subject, sometimes things will get tough. Remember that you are awesome and working hard to answer some of the big questions we have about the Universe!
4. Ask questions. Ask me, ask your classmates, ask Andrea, ask google. Progress couldn't be made in science if folks weren't asking questions! And no question is dumb, chances are if you're confused, someone else



is as well. You asking will help the whole class!

“We're made of star stuff. We are a way for the cosmos to know itself.” ~Carl Sagan



What you can expect of me

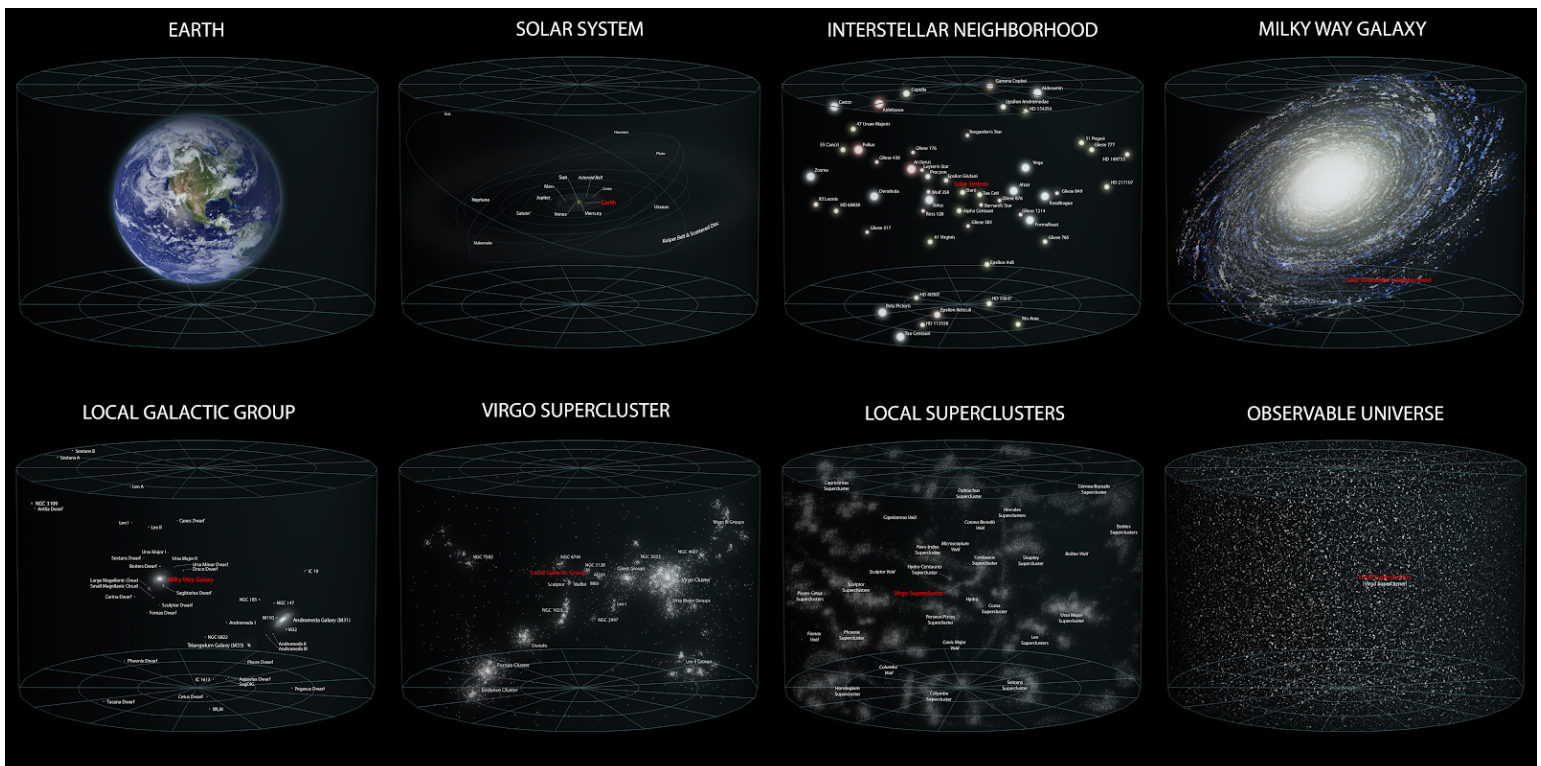
1. Pretty much everything I ask of you. I will come to class prepared and ready to teach! And of course, I will maintain the utmost respect for each student in this class.
2. To teach in a clear, organized manner to help you become competent and confident problem solvers. At the expense of skipping some of the later topics, I will reserve the option of slowing down the pace of the course according to the students' needs.
3. Throughout the course, I will administer feedback questionnaires and act on the advice you give me on how to make this course the best learning experience for you.
4. I will encourage group learning with frequent questions and activities to be discussed in groups. Research on how people learn **STRONGLY** indicates that lecture alone is **NOT** an effective way to learn. Effective

learning requires interaction with the material, instructor, and your classmates.

5. Think of me as your tour guide to the Universe! Classes should be fun, engaging, and interesting. It is my job to help you all discover all the cool things out there!

If you want to learn more about my thoughts on teaching, feel free to check out my video teaching philosophy (or my written one). Both are accessible on my webpage, here:

www.physics.uwyo.edu/~jessicas/teach/



Grading & Assessment

PARTICIPATION (15-35%)

With the switch to remote learning, participation will look a little different. Whether you choose to join synchronously or not, there will be in-class assignments for each meeting that will determine your participation grade. This might be jupyter notebooks that need to be completed, discussions threads where we discuss science topics, or other small assignments. There is no partial credit for participation, either you tried or you didn't; there is no penalty for getting an in-class assignment 'wrong'. Failure is an important part of the scientific process, and we should learn from it!

HOMEWORK (15-35%)

There will be two longer homework assignments throughout the course. I will try to assign them early and let you know when we cover the material needed for each question. The goal will then be for you to work on them throughout the semester (and not leave it all to the week they are due!).

EXAMS (15-35%)

There will be a mid term and final exam in this course. They will be based on the work we have done together in class. I will provide a study guide at least a week before each exam.

FINAL PROJECT (15-35%)

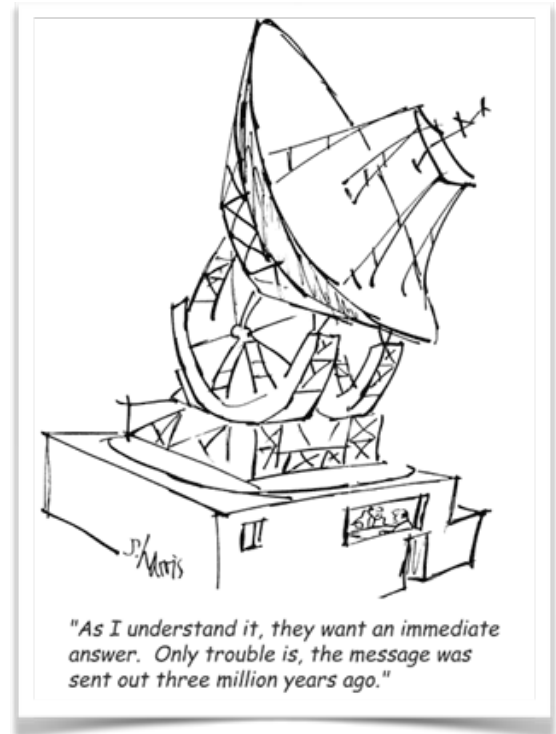
At the end of the semester, each student will complete a final project. This can be focused on any galaxy-related topic and will consist of a paper and presentation.

LATE WORK

Late work will have ____ points deducted for each day late, if you have not talked with me before the due date about receiving an extension. I will try to give you plenty of time to complete each assignment, including some in class time, but I understand life can get crazy and sometimes you'll just need an extra couple of days.

COSMIC RAY POINTS

Throughout the semester, you will have 5 'cosmic ray' points you can use to overwrite late work or missed classes. If you do not use your cosmic ray points by the end of the semester, each will count as one percent extra credit on the final exam.



Schedule

Week	Subject	Assignments
Introduction 1	Review of 170's, definition of galaxies	
Photometry (what galaxies look like) 2	Galaxy types, morphology	Start photometry project
3	Galaxy colors	
4	Galaxy structures	
5	Interstellar Medium	
6	Exam 1	
Spectroscopy (galaxy rainbows!) 7	Galaxy SEDs	Start spectroscopy project
8	Galaxy emission lines	
9	Galaxy motions	
10	Using spectra to measure properties	
11	AGN, Green Peas, Blueberries and other oddballs	
12	Galaxy evolution, mergers, and cannibalism	
Large Scale Structure (how galaxies are arranged) 13	Milky way and its neighbors to superclusters and voids	
Final Project Presentations 14		

Nuts & Bolts

Office Hours

I will have zoom open office hours Monday and Wednesday mornings, from 10:00AM-Noon. I will also be available for virtual one-on-one meetings whenever you might need!

Textbook

We will not be using a textbook for this course. Instead, I will be assigning short readings from different sources that I think are more useful and up to date. I will do my best to always remind you what the readings are for the next class period and will post a list of the readings on the canvas website.

My Remote Plan

I want to make this course as flexible as I can. With that in mind, my plan is to host live zoom sessions that I will also record. This way, you can choose to join and participate during the scheduled class time or watch later. If you join in the live zoom meeting, I will be able to answer your questions in real-time and you will be able to chat with your classmates during discussions. If you choose to watch the recordings later, it might take me a little longer to get to any questions you have about the material, but you will also be able to pause, rewind, etc. This is a learning process for me as well, and I ask for your patience and feedback as we determine the best way to learn during this unusual time. I will post all materials for the class on the canvas site along with the videos of the lectures as soon as I get them edited and ready to post. Please do let me know if there is any way I can make your learning experience better despite difficult circumstances!

Disclaimer

This syllabus is subject to change.