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ASTR 135N.00: Stars, Galaxies, and the Universe Lab

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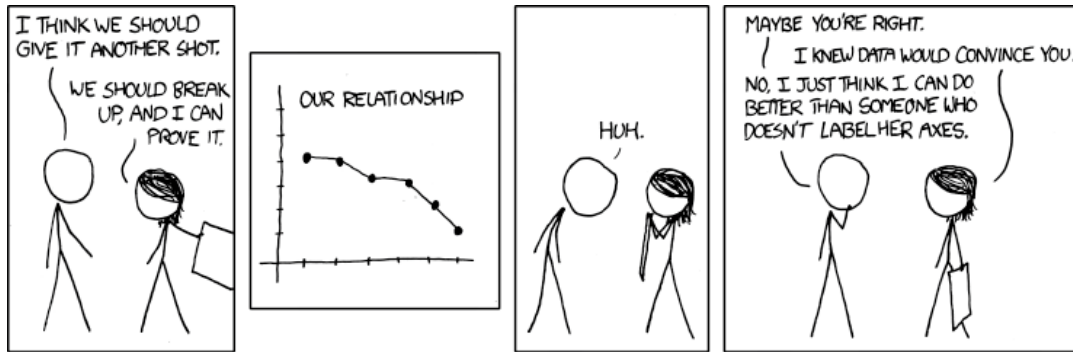
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Instructor: Mark Reiser, Kaitlin Wilkinson (TA) **Room:** CHCB 225
Class Times: Wed 1-3, 4-6; Thur 1-3; Fri 1-3 **Format:** in-person
My Office: CHCB 120 **E-mail:** mark.reiser@umontana.edu
Office Hours (3): Tue 11-12 Wed 10-11 Fri 11-12 (or appointment)



Credit: XKCD

Course Description

This course is an optional supplement to the material from ASTR 132N. While the material in here is not required or expected for students taking ASTR 132N, it is our hope that these labs will help deepen your understanding of the lecture material. Hopefully, the overlapping of concepts will seem natural, as I have attempted to synchronize the topics and pacing of the lecture content with the labs you’ll do here.

Objectives

- Explore the topics of this course in a more hands-on fashion
- Utilize data, critical thinking, and inquiry to reach a deeper understanding of the material
- Actively collaborate with peers to further the learning of your entire group

Required Materials

- **Lab manual: ASTR 135N: Spring 2022 (ISBN: 9780137294046)**
Note: This e-book is unique to *this class* -- **must purchase** through UC Bookstore
- Calculator (cell phone use is fine)

Grading

We have a total of 12 labs this semester. Your final grade will be taken out of 10 labs, so I’ll keep your best 10 scores. Ultimately, this means you can drop 2 labs. This does **not** mean it’s a good idea to skip a lab, but it allows a cushion if life circumstances arise. You can earn up to 10 points for the completion of each lab, and your final grade will be taken out of 100 points.

Total points possible for the term is 100. Final grades will follow a 60/70/80/90 scale:

| | | | |
|----------|---|-----------|---|
| 90-100% | A | 60-69.9% | D |
| 80-89.9% | B | 50-59.99% | F |
| 70-79.9% | C | | |

Attendance Policy, and Earning Full Credit

You need to be **in class** to complete each lab. An integral part of lab, and the learning goals of this class, is predicated on group work and interaction. These labs are not designed to be done in isolation, on your own. If you must miss a lab, please check with me **ahead of time** about the option to attend one of the lab other sections for that week. You can **not** do these labs on your own for credit.

For all labs, you're expected to adequately respond to **each question** in your lab manual. **Work together!** In general, I'll only ask for one completed lab to be submitted per each group of 3-4 students. If you skip questions, or **answer incompletely**, you will lose points. The bulk of your 10 points each week will depend on an illustration of full effort & participation. Complete, well-thought out answers are expected. I will not automatically subtract points for incorrect answers if accompanied by sufficient reasoning/thought. However, if an answer is incomplete (e.g., correct, but doesn't address "Explain your reasoning" part of question), you will lose points. At the conclusion of each lab, you need to **check out with your instructor before class is over**. You will likely be able to finish the full lab within most lab times. On occasion, you may need to finish outside lab. Check with me before you leave on the best course of action.

Schedule

| Week | Week of | Lab # | Topic |
|------|-----------|-------|--|
| 1 | Jan 19-20 | -- | No Lab |
| 2 | Jan 26-27 | 1 | Quantitative Reasoning: Exploring Nearby Stars |
| 3 | Feb 02-03 | 2 | Gravity and Orbital Motion (Mark) |
| 4 | Feb 09-10 | 3 | Atoms and Electrons: Absorption & Emission Spectra |
| 5 | Feb 16-17 | 4 | Observatories Around the World |
| 6 | Feb 23-24 | 5 | Colors of Stars |
| 7 | Mar 02-03 | 6 | Stars and the H-R Diagram |
| 8 | Mar 09-10 | 7 | Nuclear Fusion and Energy in Stars |
| 9 | Mar 16-17 | 8 | Planetarium Visit |
| -- | -- | -- | SPRING BREAK |
| 10 | Mar 30-31 | -- | No Lab (optional observing?) |
| 11 | Apr 06-07 | 9 | Star Clusters and the Ages of Stars; Project Intro |
| 12 | Apr 13-14 | 10 | Spiral Arms and Star Formation |
| 13 | Apr 20-21 | 11 | The Hubble Law and Expansion of Universe |
| 14 | Apr 27-28 | 12 | Student Projects, Evals, Wrap-Up |
| 15 | May 04-05 | -- | No Lab (optional observing?) |

Special Accommodations

If you have a physical, learning, or psychological disability and require accommodations, please let me know as soon as possible. I am happy to discuss this with you, and want to do what I can to help. You will need to register with, and provide documentation of your disability to Disability Services for Students (DSS). Visit them in Lommasson 154, or reach them at (406) 243-2243.

Instructor's Note

In addition to the supplementary learning in this course, I look forward to the additional opportunity to get to know you in this lab setting. Given the smaller number of you in here, I greatly enjoy the chance to work with you more extensively and often in a one-on-one capacity.

I hope you gain some new insights into our course material in here, and also have a lot of fun with myself and your peers. We'll do some fun things in lab, and if we're lucky, maybe even do a little socially-distanced observing (hopefully!).