

# PHY 371: Introduction to Astrophysics

## What exactly is *astrophysics*?

*Astronomy* is the science (sometimes the art) of observing things in space from the Earth. Humans have been doing this for as long as we have been humans. By contrast, *astrophysics* is the relatively modern practice of taking what we've learned about the Universe from physics experiments and using it to explain what we see in space. While you didn't ask, I should also mention that *space physics* is when you try to figure out what is going on in space by actually going there (or sending a robot) rather than simply using telescopes to look at it from Earth. Since our robots can't yet travel at warp speeds, space physicists almost always study things within our solar system. Astrophysicists tend to study the stuff outside of our solar system, such as stars, galaxies, and the Universe as a whole. Just to make it confusing, when talking to the public, scientists tend to use the word *astronomy* to mean observational astronomy, astrophysics, and space physics. (Ask me to draw you a Venn diagram, if you're confused.) Finally, for completeness, I should point out that *astrology* is when people try to take what they see in the sky and use it to explain why they're having a bad day.

## Ok, let me rephrase. What are you we going to cover in *Introduction to Astrophysics*?

While the title of the course and the big orange book we're using both include the word *astrophysics*, what we will really be doing is an introduction to astronomy for physicists. When we're done, you should be able to explain how we know the most basic things there are to know about astronomy, such as:

- The Sun is an average star. The stars are suns to other planets.
- The Universe began with an explosion 13.7 billion years ago.
- The biggest mystery in physics is the dark energy ripping the Universe apart and will shred it to bits within 50 billion years.
- There is almost certainly other life in the Universe, but we might be the only civilization within our Galaxy.

Since this course is meant to serve as a bridge between Modern Physics and upper-level physics classes, we'll be doing quite a bit of the physics, math, and computer programming that professional astronomers do when facing these topics.

## What is the class going to be like?

The first portion of the class is a review of the first three semesters of physics with a little astronomy added in. I'm going to introduce each topic with a lab activity, followed by a lecture, and then some related problems from the end of the chapter. Once that is complete, we will begin our survey of astronomy topics.

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## How are you going to calculate the grade?

The in-class lab activities combined will be worth 15% of your grade. If you have a valid reason to miss class **and** let me know you're going to miss a class **before** you miss it, you can make it up during the following week. These will culminate in a single small research project, also worth 15% of your grade. There will be three exams, each worth 15% of your grade. The end-of-chapters homework problem I assign collectively will be worth 25% of your grade.

## Let's get to the point. Am I going to get an A?

Probably not. Usually, only one or two students in my classes get an A. Doing the assignments correctly will really only get you to a B, maybe a B+. To earn an A or A-, your work really needs to be *amazing*. Inevitably, in every class there are students that pull this off. Likewise, if your work is merely complete but not quite correct, you'll likely end up with a C. If you want to hear me wax poetic about grading policies, ask me to lunch sometime.

## When are your office hours?

My office hours are on Mondays and Wednesdays from 1:30 to 2:30 PM in MCMI 204. You can phone me there and leave me voice mail (278-6268), e-mail me ([acrider@elon.edu](mailto:acrider@elon.edu)) or instant message me (AIM: [acrider@elon.edu](mailto:acrider@elon.edu)). Of course, whenever you see my office door open, feel free to pop in.

## Where is all the boilerplate material that is normally in a course syllabus, like the stuff about the Elon Honor Code?

I decided to try something different for this syllabus. Most of the mundane information about the course is found on-line at the course website (<http://facstaff.elon.edu/acrider/classes/phy371>). As for the Honor Code, you can and should read it at least once per year, since it has changed a lot at Elon in the past few years. If I suspect that you have broken the code, I'll ask you to come talk to me about it. Hauling a student to the Provost's office for a hearing is one of my least favorite things to do as a professor, but I seem to get stuck doing that at least once every other year. Please don't let that student be you.

## Back on page one, in bullet four, did you admit that you believe in aliens?

Yes. Do I believe that they visit the Earth and to experiment on humans? No.