

This course is an overview of modern astrophysics beyond our Solar System and planets. We will learn about the , their origin, structure, evolution and fate. The questions to be addressed include: What are stars? How do stars evolve? What will happen to the Sun? What are galaxies? How do they organize themselves? What is the Big Bang model of the Universe?  
The course is suitable for both science and non-science students.

Tuesday and Thursday 10-11am online. Go to quercus under the zoom tab.

Prof. Diana Valencia (she/her/hers)

Virtual, same link as the class

By the end of this course, students should be able to:

1. Understand the properties of stars, galaxies and the Universe and the observations behind these.
2. Logically follow the steps of knowledge based on theory and observations that allow astronomers to understand how stars and galaxies are formed and evolved.
3. Appreciate the scales involved in astronomy, the limit of our knowledge, the most outstanding questions and the way astronomy knowledge moves forward.

#### OpenStax Astronomy

This is a free online book that is kept up-to-date.

<https://openstax.org/details/books/astronomy>

- \* Light, matter and gravity: Ch 17
- \* Observed properties of Stars: motion, brightness, masses, radii, spectra, H-R diagram: Ch 18, Ch 19
- \* Star's structure and evolution: Ch 21, Ch 22
- \* Star's death: Supernova, Neutron Stars and Black Holes: Ch 23
- \* The Milky Way: Ch 25
- \* Galaxies and Large scale structure of the universe: Ch 26
- \* Expanding universe, the Hubble Constant, The Big Bang Theory: Ch 29

#### Other Resources:

Basic: ASTRO 2st Canadian Edition by Shohini Ghose, Vesna Milosevic-Zdjelar, L. Arthur Read

More Advanced: Universe, by Roger A. Freedman & William J. Kaufmann III

1.

This term we will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, the TA, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. If you have any problems or feedback for the developers, email [team@piazza.com](mailto:team@piazza.com)

Find our class signup link at: <https://piazza.com/utoronto.ca/winter2023/asta02h3s20231>, as well as through quercus.

If Piazza doesn't work for your needs, you can always email me

- Please email me ("Prof. Diana" or "Prof. Valencia", or if you know or want to know Spanish "Profe Diana") directly at [diana.valencia@utoronto.ca](mailto:diana.valencia@utoronto.ca)

If you are with the AccessAbility office, please let me know as soon as possible, I will make every effort to accommodate your learning needs.

As this course's professor, I reserve the right to modify the course requirements, mode of delivery, and other related policies as circumstances may dictate with sufficient notification to all students. Given the COVID-19 crisis, I recognize that unanticipated emergencies may arise that require modifications to our class schedule and/or requirements. *I do not expect to invoke this clause*, but if I need to, you will be notified as soon as possible. Any change will be posted on our course quercus website and sent to your university email address.

Your educational growth and success are important to me. I want to see each student perform well in this class. Therefore, please know that I am here to support your learning and success! You are welcome to stop by my office hours or email me if you have any questions.

There will be problem sets assigned throughout the course. Problem sets are here for your benefit. The goal is to gain practice (especially in the quantitative aspects of this course) and understanding so that you can be successful in your term tests, final exam, and achieve the learning outcomes.

The only ground rule is that you may not consult solutions on the Internet and that the work you turn in must be your own. You are encouraged to discuss ideas with other students. If you have worked with another student, make sure you write her/his name as collaborator on the first page of the work you hand in.

After submitting your best answer for the problems, you will be given the solutions to the problem set. You will be tasked with grading your own solution, and submitting your analysis and grade of your problem set. The TAs will look at your grading and will give you a mark based on how you graded your work.

If you chose to not hand in a problem set, the percentage of the problem set will be added to the final exam.

We will have two in-person midterms. This is the opportunity for you to show all that you have learned at the time and also get detailed feedback so you can prepare for the final exam. If you don't show up to either or both midterms, the percentage will be added to the final exam.

To support your learning, I will be asking questions during class for you to answer. These will be graded on a basis mostly of effort.

