Astronomy 101 – Descriptive Astronomy – The University of Mississippi

Perhaps you have wondered: Why is the sky blue? Why is the Earth or Moon or Sun round? Why does the Earth have seasons? Why is the Moon at times full, at times not? What is a star, and how does it shine and why does it 'twinkle'? What is a black hole? What is a galaxy? How old is the Universe? From where do the elements come? &c. Such a course as this, a course in the basics of astronomy and astrophysics, seeks answers to such questions. Understanding will be both qualitative and quantitative.

The Universe is full of many interesting and mysterious things, from planets harbouring life and exotic nebulae to galaxies with masses of thousand billion Suns. We will see many of these in images and try to understand the features seen. But astronomy is not really astronomy without some observations and practical outdoor skills, and so we shall have several observation sessions during the semester, using some of the telescopes at our disposal (a 15-inch refractor from the 1890s and a 25-inch reflector), so that you may see for yourself some of these objects. Objects to be seen include: the planets of Jupiter and Saturn, globular star clusters, open star clusters, nebulae and double stars. We will also identify constellations and give a general familiarity with the nighttime sky. It is hoped that by the end of the course, you would have gained a deeper understanding and appreciation for the Universe.

A class session is 75 minutes in length. A short interval may be taken if you wish. It is hoped, that the class will be a discussion. This means that *all of us* contribute, not just I talking and you mindlessly scribbling every spoken word. This also means, that questions are not only encouraged but expected. Historically, readings are a) beneficial and b) most beneficial if done before the class, with some review after. Evaluation is open for discussion, with test dates to be fixed the first day of classes. Short exercise sets will be made available to those wishing to challenge themselves. They will be worth extra points toward the final grade. Several quizzes will be given, so that both you and I may gauge your understanding. Every missed quiz will lower the final grade by half a grade. Every missed observation session lowers the final grade by one.

Suggested Text: *The Cosmos*, 2nd or 3rd edition, by Pasachoff and Filippenko
Class sessions: Tuesday and Thursday from 19.00 to 21.15 in Lewis Hall room 101
Course Examination: Thursday, 12th May, at 19.30 in Lewis Hall room 101
Office Hour: Tuesday 15.00 - 16.00 formally. Informally, at any mutually agreeable time.

Brian Mazur
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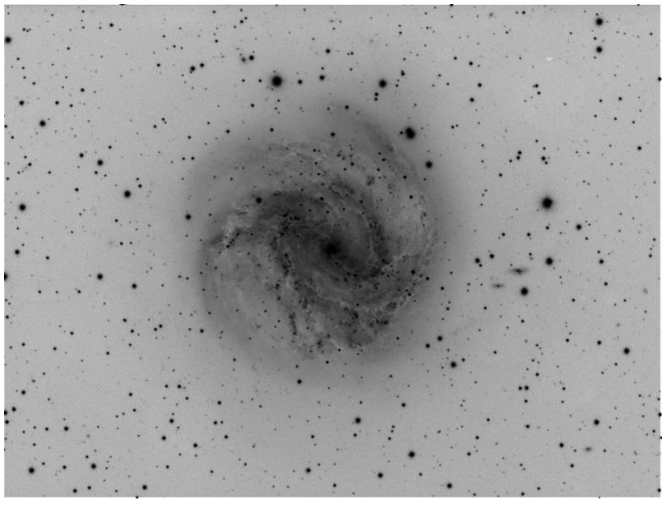
Kennon Observatory, room 1



Lecture Plan:

Part I – Basic Astronomy

Topics covered will include the celestial sphere, distance scales, a history of ancient astronomy, phases of the Moon, seasons, tides, basic physics of light and matter, telescopes &c. This corresponds to chapters 1 - 5 of Pasachoff.

Part II – Planetary Astronomy

He will shall discuss the formation of planetary systems, in particular our own, the interiors, surfaces and atmospheres of the planets, the formation of moons, asteroids, comets, the Sun &c. This corresponds to chapters 6 - 10 of Pasachoff.

Part III – Stellar Astronomy

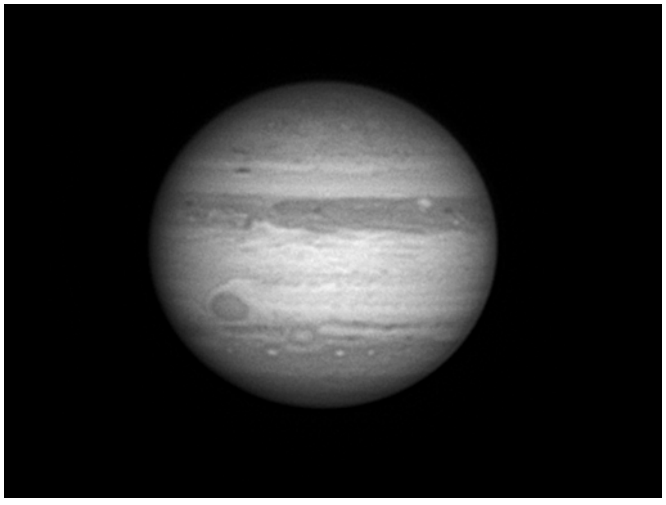
In this part of the course we shall discuss the essential building blocks of galaxies: the stars. We will investigate the conditions of their formation out of the interstellar medium, their evolution and eventual death and return to be reformed again. Also included are star clusters, both galactic and globular. This corresponds to chapters 11 -14 in Pasachoff.

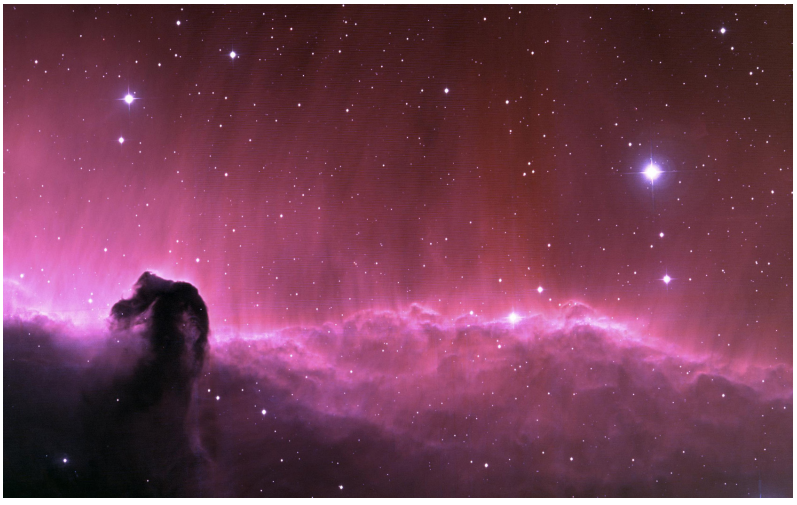
Part IV – Galactic Astronomy

This part is devoted to the basic building blocks of the Universe: the galaxies. These objects, which can be collections of a few to a hundred million suns, have their own structure, dynamics and evolution. It is these that we shall discuss here. This corresponds to chapters 15 -17 in Pasachoff.

Part V – Cosmology

Finally, cosmology is the study of the Universe as a whole. We shall ask and attempt to answer questions such as: How did it form? How does it evolve? How will it end? This corresponds to chapters 18 and 19 in Pasachoff.





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Evaluation Addendum:

There will be four (4) tests, including the course examination, with the tentative dates:

17th/22nd Februrary

10th March

14th April

The grading scheme will be: term tests averaged compared with course examination, the higher of the two is taken. Quizzes/observations will then affect the final grade accordingly. Indeed, a complete set of both quizzes and observations will raise the grade by one half a grade.

Envisioned[1] grades are:

Letter	Percentage
A	80 - 100
B	65 - 80
C	55 - 65
D	50 - 55
F	0 - 50

[1] Will depend on performance of group on first examination