

Extragalactic Astrophysics / PHYS-GA 2051 / Fall 2018 / Syllabus

This course teaches the astrophysics of galaxies and quasars at the graduate level.

You can find the course notes at the course web site. Please read the introduction posted on the web site.

Useful textbooks are *Galaxy Evolution* by Cimatti, Fraternali, & Nipoti, and *Extragalactic Astronomy and Cosmology*, by Peter Schneider. A good fraction of my notes are drawn from those books.

Class meets Tuesday and Thursday at 11:00am in Room 1045 of 726 Broadway, according to Albert.

The classes will proceed as shown on the next page (subject to revision!).

There will be two types of assignments in this course:

- *Homework* will be based on exercises described in the notes. There are answers that I will make available, but only to a small number of the exercises. You will help complete the answers (with proper attribution to you of course). Each week I will assign one of the questions to each of you in the notes we covered, and you will submit an answer in the form of a LaTeX file or Python notebook, emailed to me.
- You will each write a short *Review Paper* describing the significance of some recent finding in extragalactic astrophysics. The paper should be 5–6 pages of text plus references and (if appropriate) figures. During the first week or so of the course I will assign each of you a topic. Mid-semester a FULL DRAFT of this paper will be due. I expect to give substantial feedback on the draft in preparation for the final version due at the semester's end.

<i>Sep. 3</i>	Inventory	
<i>Sep. 8</i>	Light I & II	
<i>Sep. 10</i>	Telescopes & Atmosphere	
<i>Sep. 15</i>	Detectors, Images, Spectra	Exercise #1 due
<i>Sep. 17</i>	Distance Ladder	
<i>Sep. 22</i>	Cosmology	Exercise #2 due
<i>Sep. 24</i>	Structure Formation	
<i>Sep. 29</i>	Galaxy Demographics	Exercise #3 due
<i>Oct. 1</i>	Galaxy Morphology	
<i>Oct. 6</i>	Galaxy Scaling Relations	Exercise #4 due
<i>Oct. 8</i>	Stellar Evolution	—
<i>Oct. 13</i>	Stellar Populations	Exercise #5 due
<i>Oct. 15</i>	Stellar Populations	
<i>Oct. 20</i>	Stellar Dynamics	Exercise #6 due
<i>Oct. 22</i>	Stellar Dynamics	
<i>Oct. 27</i>	Stellar Dynamics	Full paper draft due
<i>Oct. 29</i>	ISM & Dust in Galaxies	
<i>Nov. 3</i>	ISM & Dust in Galaxies	Exercise #7 due
<i>Nov. 5</i>	Gravitational Lensing	
<i>Nov. 10</i>	Gravitational Lensing	Exercise #8 due
<i>Nov. 12</i>	Groups & Clusters	
<i>Nov. 17</i>	Star Formation in Galaxies	Exercise #9 due
<i>Nov. 19</i>	Active Galactic Nuclei	
<i>Nov. 24</i>	Quasars	Exercise #10 due
<i>Dec. 1</i>	High Redshifts	
<i>Dec. 3</i>	Theory of Galaxy Formation	Exercise #11 due
<i>Dec. 8</i>	Feedback in Galaxy Formation	
<i>Dec. 10</i>	Future of Extragalactic Astronomy	
<i>Dec. 17</i>	—	Final paper due