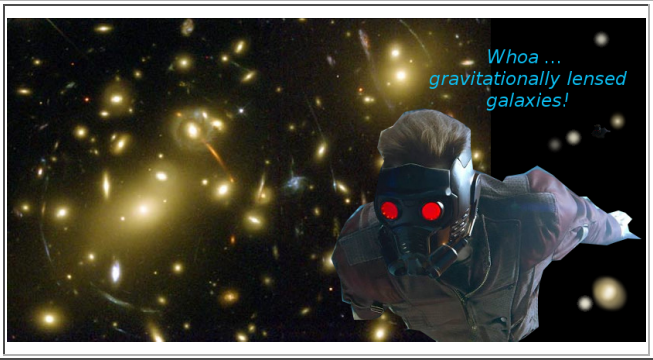
PHYSICS 1061 ``Stars and Galaxies'' Spring 2021

Class Home page: https://jpastro.net/AST1061/syll-ast1061.html (this page!)

Department: Physics and Astronomy
Class time and place: MWF,9:00-9:50 am, MT 112
Section: 1 (CRN=30769)
Instructor: **Dr. Jason Pinkney**
Office hours: in 111 Science Annex at 9 am Tue, 2-4 pm Wed, and 10-12 Thu.
Email j-pinkney@onu.edu or call 419-772-2740.
Instructor's Home page: https://jpastro.net
Credit hours: 3
Observatory Phone: 772-4028



NEW STUFF (*Watch this spot for new links, outlines, solutions, etc.*)

This is a nice link about solving word problems.
Astronomy Picture of the Day (APOD)
SkyMaps.pdf Color version of all 4 constellation sheets.
Interactive scale of the universe.
Week 1 outline (PDF) Powers of 10 and Ch 1 material.

Text: Astronomy Today, 9/E (9th Edition) by Chaisson and McMillan. This 2017 edition has a "rent-only" ISBN-13 of 978-0134450278. This is what we have in the bookstore. Do NOT buy the Volume 1 or 2 versions ("The Solar System" and "Stars and Galaxies"). Cost of rental should be about $76. I don't require you to bring the text to class.

Course Description:
Stars and Galaxies is an introductory astronomy course. You will learn about the nature of stars, galaxies and the universe. The details of our solar system are left to PHYS 1051. We will begin with a survey of the naked-eye universe (mostly nearby objects) and end with cosmology (the distant universe). In-between we will discuss such topics as the electromagnetic spectrum, the sunspot cycle, how stars are born and die, black holes, and galaxies. A tentative calendar of topics is outlined below.

Physics 1061 fulfills a general education learning outcome called 'knowledge of the physical/natural world'. Thus, you will be encouraged to improve your science knowledge and skills. Science "skills" include critical thinking, problem solving, use of mathematics, observing, and experimentation. I hope that it will become second nature for you to ask "how do they know that?" when presented with facts like "the age of the universe is 13.8 billion years". Another course objective is learning how certain physics principles, like conservation of momentum, can be applied to astronomical objects like stars and galaxies. Still another is to see how our astronomy class relates to current events in the world around us -- you will get extra credit for reporting astronomy news items in class. Since this is an introductory course, I will try to make the tests nearly math-free. But you will still be exposed to math in homework, lectures and activities.

Lab:
The lab for this class, PHYS 1091 (1 hr), is intended for astronomy minors and physics majors with an astronomy core You need my approval to enroll in the lab. If you are enrolled, expect to hear from me within a week about choosing a meeting time.

Astronomy Minor:
You might consider being an astronomy minor if a good familiarity with astronomy would complement your current major. Consider entering an exciting field like astrobiology, astrochemistry, archeoastronomy, cosmochemistry, science education, science illustration, or science journalism.

Observatory:
Your visits to the ONU Observatory will weigh into the "Observing" portion of your grade (see below). You should try to visit at least 3 times for "A" work. There is a legal pad in the control room that you must sign for credit. I plan to be at the observatory for 1 hour on Friday nights (if < 50 % cloudcover) so that I can help you fulfill your observing duties. Another time to visit is during meetings of the ONU Astronomy Club every other Wednesday night at 9 pm. I will not be holding "Public Events" this semester due to covid-19. When you visit, bring along your **Constellation Sheets** and **observing forms** (see below), and try to get some views through our telescopes and binoculars. I should be able to get you started on your constellations, even though my attention may be diverted. You should bring a friend or two (not necessarily signed up in the class) for the long, dark walk to and from the Observatory.

Grading:

You will be graded on the following:

Observing	Observing Forms, 3+ visits to Observatory	5%
In-class	Homework, in-class activities, participation	20%
Quizzes	Quizzes (drop lowest grade)	25%
Exams	There will be two exams and a final.	50%
Total		**100%**

Score to letter grade conversion:

<55	**55-70**	**70-80**	**80-90**	**90-100**
F	D	C	B	A

I will not grade any "harder" than the above. However, if the class mean drops below 75, I will grade more leniently.

Schedule (approximate):

Week of	**Topic**	**Chapter(s)**	**Tests**
1/20,22	Syllabus. Powers of 10 Cosmology.	1	Survey
1/23,27,29	Naked Eye Universe, Celestial Sphere	1	
2/1,3,5	Celestial Sphere: coordinates, seasons	1	quiz 1
2/8,10,12	Time, precession, parallax. History	1,2	quiz 2
2/15,17,19	History: Geocentric vs Heliocentric solar system	2	quiz 3
2/22,24,26	History: Kepler, Newton, the A.U.	2	Exam I
3/1,3,5	Light & Spectroscopy	3, 4	
3/8,*,12	The Sun - Observatory visit	16	quiz 4
3/15,17,19	Stellar Properties	17	
3/22,24,26	ISM,Star formation	18,19	quiz 5
3/29,31	Stellar Evol. - low-mass stars like Sun	20	
4/2	**Good Friday**	**-**	**-**
4/5,7,9	Stellar Evol. - High mass, supernovae	20,21	Exam II
4/12,16,18	The Milky Way Galaxy	23	quiz 6
4/19,21,23	Galaxies / The Distance Ladder	24	quiz 7
4/26,28,30	Cosmology.	26	Turn in constel. shts.
5/3 Monday	Comprehensive Final Exam on Monday 5/3, 9:15-11:15 am.	_	Final exam.
*** 3/10 (Wed) is Honor's Day**			

Other Course Policies

COVID-19 accomodation: Faculty were asked to include this response to the request from Student Advisory Board to relieve academic pressure during this time of pandemic. I choose to **drop your lowest homework grade**. Rather than pick one week that everyone will skip the homework, I will allow you to pick an especially trying week. This will appear as a 0 score, but will be dropped from the final grade.

Attendance is important for doing well in this course. Absenteeism can directly lower your grade if you miss an in-class activity. Note that in-class activities cannot be "made up". I will record attendance on some days and factor that information into your "In-class" grade (see above). Let me know in advance (e-mail is good) if you have to miss on a test/deadline day for a ***valid reason*** (e.g., your team or musical group is on the road) and want to schedule a make-up. If you miss because of an emergency, let me know as soon as possible, and provide proof of the emergency. "Proof" can consist of a name and phone number of a parent or authority figure who knows your situation. Make up any missed quizzes or exams before I go over them during the next class.

Graded Homework consists primarily of answering questions and problems from the textbook. Homework will be accepted late, but will only receive 50% credit if it has already been graded. Try to turn it in *before* an impending absence. Homework will be scored on completeness and correctness, but not every problem will be checked. Look for keys posted after your homework is due. I encourage you to discuss homework with your classmates, but don't copy their work verbatim. After a warning, you'll be docked points.

Turning in Assignments. I have shared a Google Drive folder with you to use for turning in assignments. You should create a subfolder with a name like: Lastname_Firstname. Most homework assignments should be typed up in Word (.docx) but then exported to PDF. Some might involve drawings which should be scanned and then turned into a PDF file. The assignment will be annotated to indicate how your grade was determined.

Quizzes will be given on most non-exam weeks. They will consist of 5-15 multiple choice/short answer questions. They cover the assigned reading and especially the material discussed in class. They will not always be given on the same day. You can only make up a quiz that was missed because of a valid conflict or emergency. Also, you can only make up the quiz before the answers are revealed (usually the next period). For this reason, I will drop your lowest quiz score.

Exams will be given roughly every 4-5 weeks. These will weigh most heavily towards your class grade. The **final exam** will be comprehensive, but will emphasize the last 5-6 weeks of material. The final will occur on Wednesday of finals week. *Do not schedule anything to conflict with your final exam! Do not ask to get out of this time!* Drop NOW if this will be a problem. ***Review Questions*** will be provided to help you prepare for quizzes and exams. They will appear under "NEW STUFF". Many of these questions will appear on the quizzes and exams and so it is strongly recommended that you use them to prepare. More than half of the questions on a given test will be found in the review.

Observing consists of filling out **constellation sheets** , **Observing Forms** , and visiting the ONU Observatory. I'll provide you with one hardcopy of the constellation sheets (aka sky maps). If you loose them, you can print out more from SkyMaps.pdf, which is a PDF file containing 2 sky maps (North and South) for 2 dates during the spring (4 sheets total). Your job is to 1) write the names of the constellations within the constellation boundaries, 2) label the 6 brightest stars on each sheet, and 3) fill out this Observing Form on two different occasions in which you actually viewed the sky. #1 and #2 can be done on your laptop using a planetarium program (e.g, Stellarium). #3 must be done under open skies, but not necessarily at the ONU Observatory. For full observing credit, you must visit the observatory at least 3 times. Additional visits give you extra credit in the "Observing" portion of your grade. You must sign the log near the entrance to the observatory in order to get credit for a visit. The Observing Forms and Constellation Sheets are due on the last day of class. ***Tutoring*** is available. You are welcome to drop by during my office hours, or you can make an appointment. Physics tutoring sessions should occur on Thursday evenings, starting at 7:00 PM.

Disruptions: You should ask questions during class, and talk during group activities, but in general you shouldn't talk while the professor is talking. Anything that distracts your teacher or your neighbors is hindering the teaching/learning process. This includes playing with your phones, laptops or tablets, talking with neighbors, coming to class late, and leaving class early. **Do NOT use your phones and laptops during class.** If you have a disability that requires you to take notes using a laptop, let me know.

Academic Misconduct: In *PHYS 1061* (this class), the biggest temptation will be to look at another person's work during tests. Do not wear caps during quizzes or exams or store information on electronic devices. The penalty for cheating is a zero score for the quiz or exam. See the link to the university's "Academic Honesty" in the table below.

ONU Health & Safety In accordance with the University's COVID-19 safety plan and the Polar Pledge , all students will wear face coverings at all times in academic buildings. Additionally, students are to maintain a social distance of 6 feet when possible, especially when in conversation with others, during academic course meetings, and while waiting for a classroom to open. No eating or drinking will be allowed during course meetings. Students who violate this policy will be asked to leave the building immediately and must comply with this request. Additionally, students will be reported to the Office of Student Conduct for

adjudication. Students who are unable to wear a face covering will need to make arrangements for accommodations with the Student Disability Coordinator prior to or during the first week of classes. (https://www.onu.edu/disability-services).

Other Mandatory Syllabus Information:

Disability services	Academic Honesty (Append. F, p. 97)	Title IX

Cool Astro Links	Pinkney's Homepage	The ONU Physics Homepage	Hyperphysics