ASTR 1001-10: Stars, Planets and Life in the Universe (Spring 2022)

Operational details:

Main (Lecture) Instructor: Prof. **Oleg Kargaltsev** (kargaltsev@gwu.edu)
- please address as Dr. Oleg or Professor Oleg

Lecture: When: **M/W, 2:20 pm - 3:35 pm** (US Eastern Time)
Where: Corcoran 203 (or via Zoom link in the GW Blackboard, with instructor's permission.

Office Hours: When: **M/W, 4-5 pm in Blackboard Collaborate Ultra,** or by appointment (via e-mail).

Where: **Blackboard Collaborate Ultra**

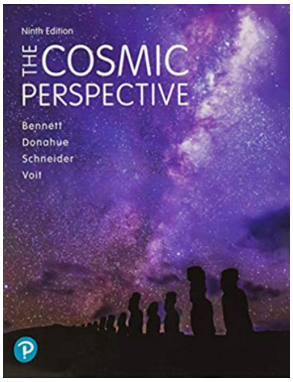
Lab Instructor: Prof. **Iraida Cabrera Carnero** (icabrera@gwu.edu)

Lab hours and location: M/W 4-5:50 pm, Corcoran 203

Required materials:

Computer: laptop or stationary PC with internet access, web browser, and Zoom app.

The textbook: The cheapest (and recommended!) way is to sign up through the Blackboard->ASTR 1001-10->HW Assignments-> MyLab and Mastering Course Home. You can pay for access right there in the Blackboard and it gets you access to the electronic version of the textbook (eText). You also order the loose-leaf version of the book from within the MyLab and Mastering Course Home. It is substantially cheaper than the traditionally bound book. If you would like to purchase the book with a traditional binding you can do so in the GW bookstore **but be sure to select** Bennett, Donahue, Schneider & Voit. "*The Cosmic Perspective"*, **9th Edition**, 2019, (ISBN-13: **9780135720875**) with Modified Mastering Astronomy access. Please also see the Intro lecture slides.



Lab manuals: Available from GA Bookstore

Course Website: http://blackboard.gwu.edu

OVERVIEW & COURSE OBJECTIVES

ASTR 1001 encompasses an exploration of our solar system with a focus on improved scientific and mathematical literacy. This course is intended for non-science majors. There is no university level course prerequisites: high school science & math (basic algebra and trigonometry) are sufficient. There are two major goals to this course (with specific examples listed below):

1. **Learning objectives for astronomical concepts, structures, and processes.**
    - **a.** Concepts:
        - **i.** Laws of nature, e.g. be able to apply Kepler' s laws, momentum, energy, conservation laws, gravity laws, explain the electromagnetic spectrum
        - **ii.** Be able to explain: planetary formation and motion around sun, geology and atmospheres of the inner planets, formation of the Jovian planets and the structure of the sun and how it is powered.
    - **b.** Structures:
        - **i.** Rocky Planets and Moons
        - **ii.** Gaseous Planets
        - **iii.** Our Sun
        - **iv.** Other objects: asteroids, comets, etc.
    - **c.** Scientific Process:
        - **i.** For example: be able to determine the mass, structure and chemical composition of various objects in our solar system, explain what powers the sun.
2. **Practicing basic problem solving (mathematical and conceptual) in an astrophysical context.**
    - **a.** Mathematical:
        - **i.** Basic algebra (e.g. $y = mx + b$, the equation of a line, or 'distance = rate × time', using given equations to solve for unknown values)
        - **ii.** Basic geometry (e.g., surface area and volume)
    - **b.** Conceptual:
        - **i.** Apply scales and conversion factors (e.g. sizes in scaled models, light-years to meters conversion)
        - **ii.** Reasoning/thought problems (applying a law or theory to explain some observed celestial or physical phenomenon)

Minimum amount of independent, out-of-class, learning expected per week: 8-10 hrs

GRADING

Your final numerical course grade will be calculated as a weighted average of:

25% Labs
10% In-class Quizzes (administered during the lectures)
15% Term paper
20% Homework (via MyLab and Mastering in Blackboard)
30% 3 Exams (10% each)

Numerical course grades translate into letter grades using the following scale:

≥ 94.00	**A**	70.00 – 73.99	**C**
90.00 – 93.99	**A-**	66.00 – 69.99	**C-**
86.00 – 89.99	**B+**	61.00 – 65.99	**D+**
82.00 – 85.99	**B**	55.00 – 60.99	**D**
78.00 – 81.99	**B-**	50.00 – 54.99	**D-**
74.00-77.99	**C+**	≤ 49.99	**F**

LECTURES

Lectures, offered twice a week, are the central part of this course. They are closely aligned with the textbook chapters but also designed to go beyond the textbook in terms of making sure you understand the material. During the lectures you will see additional examples and visualizations (e.g., videos, animations), participate in interactive activities. The instructor will explain in detail all difficult concepts or places that are not clearly written in the textbook and illustrate the textbook material through his own research experience. Taking short quizzes during the lectures will allow you to gauge your understanding throughout the course make you well prepared for the exam which will feature similarly designed questions. Attending the lectures regularly will save you from unpleasant surprises during the exams and will also help you greatly with the homework.

To to attend the lecture virtually you must use Zoom link provided on the Blackboard course page -> "Lectures in Zoom and Recordings" to be able to take quizzes and have your attendance properly recorded. *If you join in any other way your attendance and quiz responses will not be recorded.* When joining the meeting, your browser will open a new browser tab to launch the meeting session. If you have Zoom installed on your device, Zoom will automatically join you into the session. If you do not gain access to the Zoom session, you can click on the **Launch Meeting** button to start the session; if you don't have Zoom installed on your device, click on the **Download Now** link to download Zoom Client software. You **must install Zoom client (app) on your computer (tablet) and make sure it is working to participate in the Zoom polls**.

EXAMS

Three exams will be administered during the regular class time. *No make-up exams will be given without a documented legitimate reason (e.g., medical).* All three exams combined are worth 30% of overall grade (each exam is 10%). The final exam (15% of the grade) is a Term Paper with the due date during the final exam week.

TERM PAPER

You will need to pick a topic related to class material, formulate a research question, and answer it using real astronomical data. This will be a group project (group size can be between 1 and 4 students), which will culminate in a submission of the Term Paper (with the due date during the finals week). The submission should be done by uploading your paper in the Blackboard-> ASTR-1001->Term Paper Assignment. The rubric according to which this paper is graded will be provided. A set of possible projects will be discussed during the labs and examples of data resources will be provided. (15% of the overall course grade).

CLASS PARTICIPATION and EXTRA CREDIT

All students are expected to attend lectures, answer questions posed by the instructor, and ask questions about topics being discussed during the lectures. Specific activities to be considered in awarding the participation extra credit points include, asking questions during the lecture about the lecture content, active participation in discussions with other students, and thoughtful conversations during the office hours. The instructor may identify other pertinent activities for possible class participation credit. The participation extra credit is awarded solely at the instructor's discretion and is limited to 5% of overall numerical course grade.

HOMEWORK ASSIGNMENTS

Homework is assigned both as a way to help you learn the material being covered and as a way for you to explore new material independently. It is worth 20% of the overall course grade. Please expect to spend between 2 and 3 hours on homework most weeks, in addition to reading the book chapter(s). You will fall behind very quickly if you do not complete work as it is assigned. The homework assignments have clearly indicated due dates and any late homeworks are strongly penalized in the Pearson's Modified Mastering Astronomy system. Homework assignments will be made available to you way before their due date. *Therefore, getting sick or having an emergency the day the HW is due is not a valid excuse for not completing the HW*. **Simply don't postpone your homework until the last minute!**

Homework will be assigned and completed on through the Pearson's Modified Mastering Astronomy which **must be accessed through the course page** in GW Blackboard->ASTR-1001-10->Homework-> MyLab and Mastering Course Home.

This page on Pearson's website offers help for the Modified Mastering Astronomy in MyLab and Mastering Course Home :
https://help.pearsoncmg.com/mastering/student/ccng/TopicsStudent/gettingstartedwithmastering_student.htm

The homework assignments and their due dates can be viewed inside the Blackboard->ASTR 1001-10->Homework-> MyLab and Mastering Course Home.

ATTENDANCE

Students are required to attend all classes and labs. Attendance will be taken via a sign-up sheet in-class, or it will be automatically recorded is the student joins via Zoom. Missing even a single class requires a legitimate (documented) reason. Students who miss more than 4 lectures without medical or other legitimate (documented) reason will be unable to earn higher than a B- in this course. ***Missing 7 or more lectures or more than 2 labs will automatically result in a failing grade (F) for the semester.*** Students must notify the corresponding instructor during the **first week** of the semester if they have any issues with attending lectures or labs during their scheduled times and/or of their intention to be absent from class on their day(s) of religious observance.

COMPUTER/CELL PHONE POLICY

In-person attendance: The use of laptop, tablet, or smartphone during the lecture is only allowed when explicitly permitted by the instructor. Repeating violators will be penalized by removing all attendance/participation points and may be asked to leave the classroom.

Virtual attendance: The use of laptop, tablet, or smartphone during the lecture is limited to only: (1) viewing and listening to the lecture, (2) to communicating the answers to the questions asked by the instructor during the lecture back to the instructor, (3) for the groups discussions when these are initiated by the instructor and (4) for asking the instructor questions about the lecture material or about the course in general (at the end of the lecture). During the exam you can only view the page with exam questions while answering them on your laptop. The use of any other browser pages or any other windows on your laptop or on other devices is strictly forbidden and will result in 0 points for the exam.

OFFICE HOURS

Virtual office hours will be held virtually (M/W, 4-5 pm) in Blackboard Collaborate Ultra. Blackboard Collaborate Ultra can be accessed from the Blackboard course page -> Office Hours. You may also request office hours by appointment at a different time is you have a valid reason that prevents you from joining during the regular office hours. *Note that ASTR-1001 labs are divided into 2 sections. Therefore, in you are in Wednesday labs section then you should be able attend office hour on Monday and vice versa.*

ONLINE RESOURCES

The course webpage is on **GW Blackboard** (http://blackboard.gwu.edu/). Course announcements will be posted on this site. Any PowerPoint slides shown in class will be made available online *after* each class as well as lecture video recordings. Exam and Lab grades will be posted in the Blackboard Gradebook on a regular basis.

After entering *Blackboard*, it is necessary for you to click on the course name (ASTR 1001-10). You are *automatically* subscribed within the *Blackboard* system to those courses for which you

have registered (you must have a valid GW e-mail address and use it everywhere!). The *Blackboard* course page is a valuable resource for all aspects of this course. It includes course announcements, access to live lectures, lecture recordings and slides, homework and exam access, discussion forum, office hours, and other useful features. You should visit it frequently!

Please visit these pages if you have any issues with Blackboard or tools within it:

https://instruction.gwu.edu/instructional-technology-faqs-students
https://instruction.gwu.edu/instructional-technology-student-guides#RPNow

There are plenty of online resources on how to use Zoom. A good starting point may be

http://web5.lib.pacificu.edu/zoom/students/

LABS

Your labs are taught by the lab instructor. Any questions about the labs or lab grades are between you and your lab instructor. The labs are important part of this course. They worth 25% of the total course grade. Lab attendance is mandatory. Students missing **two or more labs** without a justified excuse ***will receive a grade of F for the entire course***. The lab schedule it available on Blackboard and is subject to modifications. Please contact your lab instructor Prof. Iraida Cabrera (icabrera@gwu.edu) if you have any questions about the labs.

ASTR1001 Section 10: Lecture/Lab Schedule Spring 2022

STATUS	CRN	SUBJECT	SECT	COURSE	CREDIT	INSTR.	BLDG/RM	DAY/TIME	FROM / TO	
CLOSED	31072	ASTR 1001	10	Stars, Planets, and Life in the Universe	4.00	Kargaltsev, O	COR 203	MW 02:20PM - 03:35PM	01/10/22 - 04/25/22	Linked
Comments: Also register for one laboratory section: ASTR 1001.30-.31. Course Attributes										Find Books
									Phys Lab Fee	$50.00
LINKED COURSES :										
WAITLIST	31073	ASTR 1001	30	Laboratory	0.00	Cabrera Carnero, I	COR 203	M 04:00PM - 05:50PM	01/10/22 - 04/25/22	Find Books
Course Attributes										
WAITLIST	32057	ASTR 1001	31	Laboratory	0.00	Cabrera Carnero, I	COR 203	W 04:00PM - 05:50PM	01/10/22 - 04/25/22	Find Books
Course Attributes										

Detailed lecture and exam schedule

Week	Chapter(s)	Tuesday		In-Class Quizzes and Chapter #s	Thursday	
1	1	Introduction and basics.	**Jan 10**	*Testing quizzes (not graded)*	**Jan 12**	A modern view of the Universe
2	2	No class (MLK day)	**Jan 17**	CH 1 Quiz *	**Jan 19**	A modern view of the Universe
3	2	Discovering the Universe	**Jan 24**	CH 2 Quiz	**Jan 26**	Discovering the Universe
4	3	Science of Astronomy	**Jan 31**	CH 3 Quiz	**Feb 2**	Science of Astronomy
5	4	EXAM #1 (Ch 1, 2, 3)	**Feb 7**	CH 4 Quiz	**Feb 9**	Making Sense of the Universe
6	4, 5	Making Sense of the Universe	**Feb 14**	CH 4, 5 Quiz	**Feb 16**	Light & Matter
7	5	No class (President's day)	**Feb 21**	CH 5 Quiz	**Feb 23**	Light & Matter
8	6, 14	Light & Matter	**Feb 28**	CH 6, 14 Quiz	**Mar 2**	Telescopes
9	14	Our Star	**Mar 7**	CH 14	**Mar 9**	EXAM #2 (Ch 4, 5, 6, 14)
10	…	Spring break!	**Mar 14**	Spring break!	**Mar 16**	Spring break!
11	14,7	Our Star	**Mar 21**	CH 7, 8 Quiz	**Mar 23**	Our planetary system
12	8, 9	Formation of Solar system	**Mar 28**	CH 9, 10 Quiz	**Mar 30**	Planetary geology
13	10,11	Atmospheres	**Apr 4**	CH 11 Quiz	**Apr 6**	Jovian planet systems
14	12	EXAM #3 (Ch 14,7,8,9,10)	**Apr 11**	CH 12, Quiz	**Apr 13**	Asteroids, comets, small planets
15	13, 24	Extra solar Planets, Aliens	**Apr 18**	CH 12, Quiz	**Apr 20**	Life in the Universe
16	…	Term paper discussion	**Apr 25**	Make up Labs	**…**	Term Paper due on the final exam date

* The in-class Chapter quizzes are administered during the lecture via polling in Zoom.

Your lecture instructor:

Prof. Oleg Kargaltsev is a full-time research and teaching faculty at GW. He conducts research in high-energy astrophysics studying neutron stars, black holes, and extreme cosmic explosions. Prof. Kargaltsev uses Hubble Space Telescope (NASA), Chandra X-ray Observatory (NASA), the X-ray Multi-Mirror Mission (ESA), Nustar Hard X-ray Observatory (NASA), and soon James Webb Space Telescope (NASA) to study the physics, evolution, and properties of the compact, high-energy objects. He authored and co-authored more than 100 research publications and serves as a Principal Investigator of many observing programs on the above-mentioned international space missions. Prof. Kargaltsev's other interests include science philosophy and science policy, logical and mathematical puzzles, independent movies, chess, cooking, and science fiction.

University policies and resources

Academic Integrity
Academic integrity is an essential part of the educational process, and all members of the GW community take these matters very seriously. As the instructors of record for this course, our role is to provide clear expectations and uphold them in all assessments. Violations of academic integrity occur when students fail to cite research sources properly, engage in unauthorized collaboration, falsify data, and otherwise violate the Code of Academic Integrity. If you have any questions about whether particular academic practices or resources are permitted, you should ask us for clarification. If you are reported for an academic integrity violation, you should contact the Office of Student Rights and Responsibilities (SRR) to learn more about your rights and options in the process. Consequences can range from failure of assignment to expulsion from the university and may include a transcript notation. For more information, please refer to the SRR website (https://studentconduct.gwu.edu/academic-integrity), email rights@gwu.edu, or call 202-994-6757.

Religious Holidays
Students must notify faculty during the first week of the semester in which they are enrolled in the course, or as early as possible, but no later than three weeks prior to the absence, of their intention to be absent from class on their day(s) of religious observance. If the holiday falls within the first three weeks of class, the student must inform faculty in the first week of the semester. For details and policy, see "Religious Holidays" at provost.gwu.edu/policies-procedures-and-guidelines.

Electronic Course Materials & Class Recordings
Students are encouraged to use electronic course materials, including recorded class sessions, for private personal use in connection with their academic program of study. Electronic course materials and recorded class sessions should not be shared or used for non-course related purposes unless express permission has been granted by the instructor. Students who impermissibly share any electronic course materials are subject to discipline under the Student Code of Conduct. Please contact the instructors if you have questions regarding what constitutes permissible or impermissible use of electronic course materials and/or recorded class sessions. Please contact Disability Support Services at disabilitysupport.gwu.edu if you have questions or need assistance in accessing electronic course materials.

Support for Students Outside the Classroom

Virtual academic support
A full range of academic support is offered virtually in the fall 2020 and spring 2021 semesters. See coronavirus.gwu.edu/top-faqs for updates.
Tutoring and course review sessions are offered through Academic Commons in an online format. See academiccommons.gwu.edu/tutoring
Writing and research consultations are available online. See academiccommons.gwu.edu/writing-research-help

Coaching, offered through the Office of Student Success, is available in a virtual format. See studentsuccess.gwu.edu/academic-program-support

Writing Center
GW's Writing Center cultivates confident writers in the University community by facilitating collaborative, critical, and inclusive conversations at all stages of the writing process. Working alongside peer mentors, writers develop strategies to write independently in academic and public settings. Appointments can be booked online. See gwu.mywconline.

Academic Commons
Academic Commons provides tutoring and other academic support resources to students in many courses. Students can schedule virtual one-on-one appointments or attend virtual drop-in sessions. Students may schedule an appointment, review the tutoring schedule, access other academic support resources, or obtain assistance at academiccommons.gwu.edu. Academic Commons offers several short videos addressing different virtual learning strategies for the unique circumstances of the fall 2020 and spring 2021 semesters. See academiccommons.gwu.edu/study-skills. They also offer a variety of live virtual workshops to equip students with the tools they need to succeed in a virtual environment. See tinyurl.com/gw-virtual-learning

Disability Support Services (DSS) 202-994-8250
Any student who may need an accommodation based on the potential impact of a disability should contact Disability Support Services at disabilitysupport.gwu.edu to establish eligibility and to coordinate reasonable accommodations.

Counseling and Psychological Services 202-994-5300
GW's Colonial Health Center offers counseling and psychological services, supporting mental health and personal development by collaborating directly with students to overcome challenges and difficulties that may interfere with academic, emotional, and personal success. healthcenter.gwu.edu/counseling-and-psychological-services.

Security
- In an emergency: call GWPD 202-994-6111 or 911
- For situation-specific actions: https://safety.gwu.edu/emergency-response-handbook
- In an active violence situation: Get Out, Hide Out, or Take Out; see https://go.gwu.edu/shooterpret
- Stay informed: https://safety.gwu.edu/stay-informed