

Spring 2023

PHYS 321 - 002: Astronomy and Astrophysics II

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PHYS321002-Astronomy and Astrophysics II

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Phys 321: Astronomy & Astrophysics II (Spring 2023)

This course is a quantitative introduction to the astronomy of the stars, the galaxy, and cosmology, with an emphasis on the physical principles involved. Includes stellar interiors, stellar evolution, galactic dynamics, large-scale structure, and early history of the universe.

According to NJIT policies, **the classes will be held fully in person**. All students must attend in-person unless they have a special accommodation granted by the instructor or the Dean of Students. Although not mandated, students/instructors are free to wear face masks in the classroom if they so desire. Eating/drinking in the classroom is permitted, so long as it does not affect the class/other people.

Course Information

Time, Location: 02:30 pm - 03:50 pm Tuesdays and Thursdays, Faculty Memorial Hall, Room 307

Office Hour: Tuesdays 1–2 pm or by appointment. Location: Tiernan Hall 101

Instructor: Prof. Bin Chen. Email: bin.chen@njit.edu (<mailto:bin.chen@njit.edu>). Web: <https://web.njit.edu/~binchen> (<https://web.njit.edu/~binchen>). Office: Tiernan Hall 101

Textbook: Introduction to Modern Astrophysics (2nd Edition) by Carroll & Ostlie ([NJIT bookstore](https://www.bkstr.com/njitstore/course-materials-results?shopBy=course&divisionDisplayName=&departmentDisplayName=PHYS&courseDisplayName=321§ionDisplayName=002&programId=556&termId=100077428) [↗](https://www.bkstr.com/njitstore/course-materials-results?shopBy=course&divisionDisplayName=&departmentDisplayName=PHYS&courseDisplayName=321§ionDisplayName=002&programId=556&termId=100077428) (<https://www.bkstr.com/njitstore/course-materials-results?shopBy=course&divisionDisplayName=&departmentDisplayName=PHYS&courseDisplayName=321§ionDisplayName=002&programId=556&termId=100077428>); [Amazon](https://www.amazon.com/Introduction-Modern-Astrophysics-2nd/dp/0805304029) [↗](https://www.amazon.com/Introduction-Modern-Astrophysics-2nd/dp/0805304029) (<https://www.amazon.com/Introduction-Modern-Astrophysics-2nd/dp/0805304029>)). This is the same textbook used by Phys 320 (Astronomy & Astrophysics I). For this course, we will be covering **Chapters 3, 5, 8, 9, 10, 12, 13, 15–17, 24–27, 29**.

Homework Assignments

The homework assignments will be posted via Canvas. They are **typically** due each Thursday by the time of the lecture (2:30 pm) but please **pay close attention to the specific due dates posted with each assignment**. You should submit either a text response or upload a file (preferably in pdf, but doc, docx, or pages also accepted), so check the assignment early and be prepared. **All the homework submissions must be done on Canvas**.

Late submissions for homework assignments are strongly discouraged. They **will only receive 50% of the original points**. All the **late submissions need to be submitted prior to the end of the reading days (May 4) to receive any credits**.

Exams

There will be **two in-class exams** during the semester, and **one final exam** during the exam week. All the exams will be carried out **in person** unless you have received special accommodation from the [Dean of Students](https://www.njit.edu/dos/) [↗](https://www.njit.edu/dos/) (<https://www.njit.edu/dos/>). **Makeup exams** will only be allowed **under extenuating circumstances** such as severe illness. Students with such requests must contact the [Dean of Students](https://www.njit.edu/dos/) [↗](https://www.njit.edu/dos/) (<https://www.njit.edu/dos/>) for approval. They will be making the determination of whether extenuating circumstances exist or not and will be notifying the instructor (me) accordingly. Note I will never request or accept medical or other documents from students; such documents need to be submitted by the student to the [Dean of Students](http://njit.edu/dos/) [↗](http://njit.edu/dos/) (<http://njit.edu/dos/>).

Final Presentation

Students will form groups of two to work on a presentation on a topic related to this class toward the end of the semester. The grades of the presentation are determined by the breadth and depth of the materials, as well as the quality of the presentation. The students forming each group will receive the same grade. So be sure to collaborate with each other and have frequent interactions.

Grades

Your grade will be based on your homework assignment scores (30%), two in-class common exams (30%), attendance (5%), final presentation (10%), and final exam (25%).

Here are the approximate weights to be used for calculating the final grade and the final grade scale:

30% for the two in-class exams	85% and more	A
25% for the final exam	80% - 84.99%	B+
30% for the total homework/assignment grade	70% - 79.99%	B
5% for attendance/class participation	65% - 69.99%	C+
10% for final presentation	55% - 64.99%	C
	50% - 54.99%	D
	49.99% and less	F

Grades are not negotiable. A score of 84.99% is a B+, not an A


Statement on academic integrity

Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found

at: <http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf>  (<https://lt.e2ma.net/click/r5rj1ib/rxll0ovf/v8spqqx>).

*Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. **Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university.** If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu (<mailto:dos@njit.edu>)*

Other Information

Questions or problems regarding using Canvas can be submitted via web form by going to: <https://servicedesk.njit.edu>  (<https://servicedesk.njit.edu>) and clicking on the "Report your issue online" link. You may also call the IST Service Desk with any questions at 973-596-2900.

Course Schedule

The following is a *tentative* schedule, which could be adjusted during the semester. Please refer to "Modules" in Canvas for the most updated schedule and lecture materials.

Week 1 (Jan 17): Introduction and Blackbody Radiation

Week 2 (Jan 23): The Interaction of Light and Matter

Week 3 (Jan 30): Stellar Spectra

Week 4 (Feb 6): Stellar Atmospheres I

Week 5 (Feb 13): Stellar Atmospheres II

Week 6 (Feb 20): Review and Exam #1

Week 7 (Feb 27): Stellar Evolution

Week 8 (March 6): Stellar Remnants I

Week 9 (March 13): No class (spring break)

Week 10 (March 20): Stellar Remnants II

Week 11 (March 27): Review and Exam #2

Weeks 12 (April 3): The Milky Way Galaxy

Week 13 (April 10): Other Galaxies

Week 14 (April 17): Large-Scale Structures and Cosmology

Week 15 (April 24): Final Presentations

Week 16 (May 1): Reading Days and Final Exam (date TBD)