

# Physics Department, California State Polytechnic University, Pomona



Physics 303

*The Universe in Ten Weeks*

Spring 2006

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**Course Description:** Physics 303, *The Universe in Ten Weeks*, is an upper division GE Area B synthesis course that explores modern theories about the constituents, structure, origin, and evolution of the Universe and the evidence on which those theories are based.

**Conditions of enrollment:** Students enrolled in Physics 303 must previously have completed their General Education requirements in Area A and Sub-areas B1, B2, and B3 including a physics or astronomy course from area B2.

**Text:** *The Cosmic Perspective*, 4<sup>th</sup> Ed., by Bennett et al. (w/ Mastering Astronomy)

**How to get help:** My office hours are Mondays 11:40 AM-12:10 PM, Wednesdays 1:30-3 PM, and Fridays 9:30-10:30 AM. I am also in the tutoring center in Bldg. 3, Room 213 on Mondays from 2:00-3:00 PM. The tutoring center will be open on Mondays from 11-12 and 1-3, Tuesdays from 10-11, 2:30-3:30, and 4-5, Wednesdays from 11-12 and 1-3, Thursdays from 10:30-11:30 and 3:30-4:30, and Fridays from 10:30-11:30. If you can't come during any of these hours, I will be happy to make an appointment with you for another time. For me, *the* most enjoyable aspect of teaching is working with students one-on-one. *Please, please* come see me often—*especially* if you run into difficulties with concepts you encounter in the readings.

**Email list:** I have set up an email list that I will use to communicate with you as needed between class meetings and that you can use to broadcast questions or comments of any kind related to the course. For instance, I particularly encourage you to use the list for discussions of textbook readings, homework questions, and other class assignments. I will monitor the discussion and contribute myself when I feel it might be useful.

You must subscribe to the list at <https://mailman.csupomona.edu/mailman/listinfo/phy303>, which is linked from the class home page. Once you have subscribed to the list, you can send messages to everyone else who has subscribed by addressing them to [303@mailman.csupomona.edu](mailto:303@mailman.csupomona.edu).

**Preparation, Attendance, and Participation:** Class meetings are MW 4–5:50. This is a 4-unit course. Accordingly, it will require 8 to 12 hours per week (using the standard guide of 2 to 3 hours for each unit) of reading, writing, and working on homework *outside* of class. Preparation for class, attendance, and participation are expected and will be rewarded both directly through a relatively minor “Bonus” component (see a later section) and indirectly through their far more significant and desirable effect on exam scores. I have included a schedule of topics with this syllabus along with the readings to be studied *before* each class meeting.

**Online Tutorials, Exercises, and Quizzes:** Much of your work outside of class will involve using the text website at [www.masteringastronomy.com](http://www.masteringastronomy.com). You will need to enroll in our specific course using its specific course id (which is PHY303SPRING2006) and the access code that came with your text if you bought it new. (If you bought the text used, you will need to purchase an access code at the web site for an additional \$36.)

Online assignments will be indicated on the *course* website at [www.csupomona.edu/~ajm/classes/phy303](http://www.csupomona.edu/~ajm/classes/phy303) which you will probably want to bookmark for regular access.

**Papers:** You will write 1) a brief report of 2-3 pages and 2) a research paper of 6-10 pages during the quarter. Topics should be specifically relevant to this course and suggestions will be available on the course website. In both cases, you should deal with not only the specific scientific content of your topic, but also its political, cultural, societal, and/or religious implications. You may use both hard copy and online resources, but you will be expected to carefully document your sources with appropriate references, to synthesize your findings, and to present them in your own words. We will spend some time discussing how to make appropriate use of online resources, how to assess their authority, how to properly document them as references, and how to avoid the dangerous pitfall of plagiarizing.

**Exams:** There will be a midterm and a final exam. Both will be comprehensive. See the schedule and make particularly sure that your personal schedule keeps the dates of exams free as they will not be given early or as makeups.

In order to allow for students who *do* miss the midterm *and* to serve as motivation for those who simply don't do as well as they might have liked, the score on your midterm will be the highest of a) what you actually got or b) 80% of your score on the final exam.

**Bonus:** A small bonus may be awarded. Although it is subjective, my policy is that, if it is used at all, it can *only* increase your grade; it allows me to recognize and reward students who make special contributions to the class, who make particularly effective use of office hours, or who, in some other visible way *demonstrate* that they deserve a bit of additional credit.

**Grading:** Your final grade in the course will be determined from combining the various graded components of the course with the following weights and then assigning grades with the following break points:

<u>Component</u>	<u>Weight</u>	<u>Percentage of possible credit earned</u>	<u>Final Grade</u>
Online work	25%	! 85%	A
Brief report	10%	75-85%	B
Research paper	20%	65-75%	C
Midterm exam	20%	50-65%	D
Final exam	25%	<50%	F
Bonus	5%		

While I *do* reserve the right to adjust the grade breakpoints downward should that seem appropriate, I do *not* grade on the curve. So there is a tremendous advantage to be gained from working productively with your classmates.

**Academic Integrity:** Please make sure that you have read and fully understood the statement on academic integrity that appears in the University catalog. My sincere desire is to act as facilitator for your studies in physics. Accordingly, I operate on the assumption that all of our interactions are based on openness, honesty, and good faith. I expect all of us to be honest and to treat each other fairly and with respect. Because our trust in each other is absolutely *crucial* to the effectiveness of our relationship, I take an uncompromising stance, as should you, on the necessity for sanctions when it is violated.

**Emergency Procedures:** All students are responsible for being aware of the College of Science Emergency Procedures.

Please take a moment to read them at [http://www.csupomona.edu/~sci/student\\_info/emergency\\_procedure.shtml](http://www.csupomona.edu/~sci/student_info/emergency_procedure.shtml) which is also linked to from the course home page.

**Tentative Course Schedule:**

<i>Date</i>	<i>Read Before Class</i>	<i>Topics/Events/Notes</i>
3/27	—	Overview of syllabus, course outline and procedures, Cosmos video
3/29	Ch. 1 & Sect. 2.1	Our place in the universe and what we see from where we are
4/3	S2	New concepts of space and time in relativity
4/5		
4/10	S4 & 14.1-2	Quantum physics and its relevance to sunshine
4/12		
4/17	Ch. 15	Categorizing the stars
4/19	Ch. 16	The birth of stars
4/24	Ch. 17	The life of stars
4/26	—	<b>Midterm Exam</b>
5/1	S3 & 18	Relativistic gravity and the death of stars
5/3		<b>(Brief report due at beginning of class)</b>
5/8	Ch. 19	Our galaxy
5/10	Ch. 20	A universe of galaxies
5/15	Ch. 21	The evolution of galaxies
5/17	Ch. 22	Extrapolating forward: The fate of the universe
5/22	Ch. 23	Extrapolating backward: The birth of the universe
5/24	Ch. 24	The search for extraterrestrial life
5/29	—	<b>Academic Holiday</b>
5/31		Wrapping up <b>(Research paper due at beginning of class)</b>
6/5	—	<b>Final Exam (Monday, 3:50 - 5:50)</b>