

ASTR 170B1: The Physical Universe

Fall 2015 (Gen Ed Academy Online)

Professor Chris Impey

1. Teaching Team

Instructor: Chris Impey, University Distinguished Professor, Department of Astronomy
Email: cimpey@as.arizona.edu, Steward Observatory, Room 334.

Graduate Teaching Assistant: Tenzin Sonam
Email: tenzinsonam@email.arizona.edu

2. Overview

ASTR 170B1 “The Physical Universe” is a Tier 1 course of the General Education program. It does not assume any prior knowledge of astronomy. We will broadly cover all aspects of astronomy, from planets to cosmology. This is a fully online class and UA course management system Desire2Learn (go to <http://d2l.arizona.edu> and follow the instructions for students) will be the primary site for to access all class materials, including this syllabus, videos, writing assignments and quizzes.

Since this class is a fully online class and we won’t be meeting in person, in order engage you with the course material, we will use several online tools outside of D2L such as *Voice Thread for virtual discussion and Eli-Review for writing assignments*. Voice Thread is integrated with D2L and therefore you won’t need a separate account but Eli is not integrated with D2L therefore, you will need to create a new account at Eli-Review. The goal of these online tools is to increase peer interaction and allow you to support each other’s learning.

The core lectures of the course will be delivered to you on D2L site. Each week’s content will be released the Saturday before that week. You’ll need to watch an online video lecture 1-2 hours long, and take a Video Quiz and a long answer Writing Quiz covering that week’s material. You will also need to make post on the weekly discussion prompt in Voice Thread. All these three exercise are due by 11.30 pm, Mountain Time, Wednesday each week. You will then need to make at least two comments on your peers’ posts in Voice Thread by 11.30 pm on Friday each week.

This course is writing-intensive, since writing helps to tether knowledge, and another component of the class is Research Writing assignments. You will use those to gain experience in collecting information from reliable sources on different topics, synthesize it and communicate it to relevant audiences through writing. Finally, a significant component of the course grade will be awarded for an Observing Project. You will pick an astronomical object that you might want to observe,

write a proposal, do background research, request your own image from a robotic telescope network, and gather the results into a paper, then make a poster to be presented to the class online using Voice Thread at the end of the semester. We will give you more instructions on these writings during the semester. ***To do well in this class you need to put in consistent effort over the whole semester.***

3. Goals

This course has ambitious goals, but what's life without ambition? Few of you will become scientists, but you all live in a world that is being shaped and transformed by science. In this course, concepts will be more important than facts. The goals are to:

- Give a sense of the role of humans in the vast universe.
- Show the small set of physical theories that govern nature.
- Give a sense of the cutting edge of discovery in astronomy.
- Use teaching methods that engage you in your own learning.

Note that this last one involves you! Science doesn't happen through pure contemplation and learning doesn't happen by just listening. That's why apart from video lectures there will be weekly discussion boards, research writing, and a final presentation.

4. Class Materials

As mentioned earlier we will be using the UA course management system Desire2Learn (go to <http://d2l.arizona.edu> and follow the instructions for students). The price of textbooks is a real burden on students, so for background information on any of the course topics, we will use the extensive resources at the "Teach Astronomy" web site and there will be no required textbook (go to <http://www.teachastronomy.com>), which has over 500 articles written by your professor that cover the entire subject matter of the class. To request astronomical images for the final project, we will use the Harvard MicroObservatory robotic telescope network (the telescope controls are at <http://mo-www.harvard.edu/cgi-bin/OWN/Own.pl>).

5. Structure and Grades

All the material for the week (lecture videos, quizzes, discussion prompts) will be made available to you on the Saturday before that week. After watching each week's lecture videos, you have to complete ***two graded D2L quizzes—the Video Quiz and the Writing Quiz***. For all the weekly discussions, you will use Voice Thread to post a respond to a prompt and then comment on the posts of two of your peers. Over the semester there will be three Research Writing assignments and all writing will take place in Eli-Review. Finally, there is the Observing Project that includes a proposal to study an astronomical object, request an image, write a short research paper, make a poster and do an online poster presentation.

a. Video Quiz (20%)

The weekly video quizzes are based on the weekly lecture videos. There will be total of 14 video quizzes. This goal of these video quizzes is to ensure that you have watched and understood concepts in the video lectures. Make sure you complete watching the videos before doing the quiz. The quizzes are not timed and therefore you can do the quizzes along with watching the lecture videos. The video quizzes are due no later than 11.30 pm, Mountain Time, Wednesday of each week. There are ***no make-ups for these assignments***, but we are allowing you to drop two Video Quizzes, so the highest 12 out of 14 scores will be used in the grade.

b. Writing Quiz (10%)

The weekly Writing Quiz will be long answer questions. The prompts will mostly have three sub-questions and you need to answer each sub-question in no more than two or three sentences. As with Video quizzes, you can drop two lowest scores. These Writing Quizzes are due no later than 11.30 pm, Mountain Time, Wednesday of each week.

c. Voice Thread (15%)

There will be weekly discussion prompts on Voice Thread. You will need to make an original post on the weekly prompt by 11.30 pm, Mountain Time, Wednesday of each week. After making your post, each student will comment on the posts of at least two other students in the class. We will provide more specific instruction on the structure of these discussions on Voice Thread. Your grade will be based on your original post and not on the comments you make on other post but you will be penalized if you don't comment on other posts for multiple weeks. In other words, don't let your course participation waver or lapse.

d. Research Writing (20%)

There will be total of three Research Writing assignments over the semester and each will span three weeks. You will use Eli-review—online writing software—for all the writing in this course. We are excited announce that you will get free subscription to Eli-Review for six months due to the experimental nature of this course. Given that textbook materials are available free online at the "Teach Astronomy" web site, this course will not cost you as much as a typical course at the UA. You will do these Research Writing assignments on your own, but then you will work in groups to give and receive feedback on each other's writing. Peer review is an important mechanism in facilitating learning and mastery.

Eli-Review is specially built to support peer learning and better writing. In some research studies, providing feedback has had more impact than not receiving any feedback. At the same time, students who receive better feedback can learn to use that feedback to make high-quality revisions. So everyone will gain if you take the peer review process seriously. The process is you will first submit your draft in Eli, review a draft of your group members, create your own revision plan, and revise your paper. Ideally, this process is to be run as many times as possible. But for these writings we will go through the process twice. You

can follow this link (<http://elireview.com/features/>) to find out information on using Eli.

You need to **submit the final copy of your Research Writing** into Dropbox in D2L. You will see that the due dates for each of the writing assignments at the end of the syllabus and will also be in Eli. Instructions and description of the topic for the Research Writing assignments will be available in Eli.

e. Observing Project (30%)

The observing project is a semester-long final project that takes the place of a final exam. The goal of the observing project is to allow you to research and select your own target, gather your own data, and get a good sense of the how astronomers move from observing to writing up their results and interpreting them for an audience of other astronomers.

In this case, you will then write your Observing Project paper and finally, create a poster out of your paper to be presented on Voice Thread to your peers, just as scientists do. Again we will provide detailed instruction on the expectations for the final paper, the requirements for the poster, and the presentation on Voice Thread during the semester.

Stages of the project:

1. The first component is an observing proposal describing the object you will observe and a description of why the object is significant or interesting (by Oct 4).
2. Next is submission of the image you requested from MicroObservatory (by Oct 11).
3. The third is a short scientific paper about your object, including a description, history, and its significance with references or citations. You will have opportunity to review the drafts of papers on Eli (by 5pm on Dec 6).
4. Then you will work to create a poster of your paper and present it to the entire class online using Voice Thread (by 5pm on the last day of the class, Dec 9).

A copy of final proposal, paper and poster must be submitted into the dropbox folder in D2L. Due dates are listed at the end of this syllabus.

f. Science Literacy Survey (2%)

There will be an online Science Literacy survey in the beginning of the semester. You will get the credit as long as you complete the survey, and it is not graded for correct answers.

g. Library Tutorial (5%)

To help you develop your papers, you will complete two online "information literacy" tutorials hosted by the UA Library and complete a quiz in D2L. This quiz is due by 11.30 pm, August 30.

Grades are on a standard scale, with 90-100% an A, 80-90% a B, 70-80% a C, 60-70% a D, and below 60% a failing grade. A curve may be applied. Different categories of work will have similar mean scores. No late work will be accepted without prior written justification submitted to the

professor. You're welcome to appeal or query a score on any item but it must be done within a week of the score being posted on D2L. Check your D2L grade book as often as you can.

There are *no make-ups for individual assignments in this class*, but for both types of online quizzes (the Video Quiz and the Writing Quiz) only the highest 12 out of 14 scores will be used in the grade (where not doing a quiz counts as a zero), so that will alleviate a problem where you can't keep up with the work for several weeks.

Grade Distribution

<i>Type of Work</i>	<i>Total #</i>	<i>Due</i>	<i>Total %</i>
Video Quizzes	14	Sunday by 11pm MST	20%
Writing Quizzes	14	Sunday by 11pm MST	10%
Research Writing	3	Sunday by 11pm MST	20%
Observing Project	Multiple	See above	30%
Voice Thread post	14	See page 6	15%
Library Tutorial	1	11.30 pm, August 30	5%
Literacy Survey	1	11.30 pm, August 30	2%

Things to remember about how to do well in this online class:

- Put in a consistent effort, this is not a class where you can catch up at the end.
- Stay on top of the video lectures, writings, and meet the deadlines for the assignments.
- Participate with peer review in Eli, and posts and comments in Voice Thread.
- Pay attention to the observing project, the largest component of the grade.
- The professor and TA are always available online, so get help if you need it!

The culmination of the class is when you present your project to the class, in poster form on Voice Thread, just as at a scientific conference. The deadline for poster presentations in Voice Thread is 5pm on Wednesday, Dec 9. The final grades will be posted by 5pm on Friday, Dec 11.

Conduct

UA policies (<http://deanofstudents.arizona.edu/academicintegrity>) prohibit all forms of academic dishonesty including cheating, plagiarism and fabrication; all students need to be familiar with these rules and follow them scrupulously in this class. Student behavior is also governed by UA policy (see <http://deanofstudents.arizona.edu/disruptiveandthreateningstudents>). We will use Turnitin.com within D2L to check for plagiarism in any work you submit online in Dropbox. In general, and unless otherwise specified, you should always do your own work in this class. If you need disability-related accommodations, please register your situation with the DRC and let me know (<http://drc.arizona.edu>).

ENJOY YOUR CLASS!!

Class Schedule

Note: Unless specified all assignments are due 11.30 pm (MST) of that day

Week	Topics	Content Released	Assignments <u>Due Dates</u>
1	Introductory	August 22nd	Voice Thread 1: Your Intro (Wed, Aug 26)
			Science literacy survey (Sun, Aug 29)
			Library Tutorial Quiz (Sun, Aug 29)
2	Scientific Method	August 29th	Week 2 Quiz (Wed, Sept 2)
			Writing Prompt 2 (Wed, Sept 2)
			Voice Thread 2 (Wed, Sept 2)
3	History of Astronomy	Sept 5th	Week 3 Quiz (Wed Sept 9)
			Writing Prompt 3 (Wed, Sept 9)
			Voice Thread 3 (Wed, Sept 9)
4	Modern Telescopes	Sept 12th	Week 4 Quiz (Wed, Sept 16)
			Writing Prompt 4 (Wed, Sept 16)
			Voice Thread 4 (Wed, Sept 16)
5	Atoms and Radiation	Sept 19th	Week 5 Quiz (Wed, Sept 23)
			Writing Prompt 5 (Wed, Sept 23)
			Voice Thread 5 (Wed, Sept 23)
			Research Writing 1 (RW1) Draft (Sun, Sept 20)
6	Matter and Gravity	Sept 26th	Week 6 Quiz (Wed, Sept 30)
			Writing Prompt 6 (Wed, Sept 30)
			Voice Thread 6 (Wed, Sept 30)
			Research Writing 1 Draft 2 (Sun, Sept 27)
7	Solar System	Oct 3rd	Week 7 Quiz (Due Wed, Oct 7)
			Writing Prompt 7 (Due Wed, Oct 7)
			Voice Thread 7 (Wed, Oct 7)
			Research Writing 1 Final (Sun, Oct 4)

			Observing Project Proposal (Sun, Oct 4)
8	Exoplanet	Oct 10th	Week 8 Quiz (Due Wed, Oct 14)
			Writing Prompt 8 (Due Wed, Oct 14)
			Voice Thread 8 (Wed, Oct 14)
			Observing Project Image (Due Sun, Oct 11)
9	Stars I: Stellar Evolution	Oct 17th	Week 9 Quiz (Due Wed, Oct 21)
			Writing Prompt 9 (Due Wed, Oct 21)
			Voice Thread 9 (Wed, Oct 21)
			Research Writing 2 (RW2) Draft 1 (Sun, Oct 18)
10	Stars II: Endpoints of Stellar Evolution	Oct 24th	Week 10 Quiz (Wed, Oct 28)
			Writing Prompt 10 (Wed, Oct 28)
			Voice Thread 10 (Wed, Oct 28)
			Research Writing 2 Draft 2 (Sun, Oct 25)
11	Galaxies I	Oct 31st	Week 11 Quiz (Due Wed, Nov 4)
			Writing Prompt 11 (Due Wed, Nov 4)
			Voice Thread 11 (Wed, Nov 4)
			Research Writing 2 Final (Sun, Nov 1)
12	Galaxies II	Nov 7th	Week 12 Quiz (Due Wed, Nov 11)
			Writing Prompt 12 (Due Wed, Nov 11)
			Voice Thread 12 (Wed, Nov 11)
			Research Writing 3 Draft 1 (Sun, Nov 8)
13	Expansion and Big Bang	Nov 14th	Week 13 Quiz (Due Wed, Nov 18)
			Writing Prompt 13 (Due Wed, Nov 18)
			Voice Thread 13 (Wed, Nov 18)
			Research Writing 3 Draft 2 (Due Sun, Nov 15)
14	Life I	Nov 21st	Week 14 Quiz (Due Wed, Nov 25)
			Writing Prompt 14 (Due Wed, Nov 25)
			Voice Thread 14 (Wed, Nov 25)

			Final Paper draft 1 (Sun, Nov 22)
			Research Writing 3 Final (Due Sun, Nov 22)
15	Life II	Nov 28th	Week 15 Quiz (Due Wed, Dec 2)
			Writing Prompt 15 (Due Wed, Dec 2)
			Voice Thread 15 (Wed, Dec 2)
			Final Paper draft 2 (Due Sun, Nov 29)
Final paper due (Sun, Dec 6)			
Final poster and presentation due (Wed, Dec 9)			

Research Writing Schedule On Eli-Review

	Research Writing		Due date	Points (10)
1	Telescopes	First draft	Sun, Sep 20	1
		Review Task	Tue, Sep 22	1
		Revision Task	Thu, Sept 24	1
		Second draft	Sun Sep 27	1
		Review Task	Tue, Sep 29	1
		Revision Task	Thu, Oct 1	1
		Final paper	Sun, Oct 4	4
2	Exoplanet	First draft	Sun Oct 18	1
		Review Task	Tue, Oct 20	1
		Revision Task	Thu, Oct 22	1
		Second draft	Sun, Nov 25	1
		Review Task	Tue, Nov 27	1
		Revision Task	Thu, Nov 29	1
		Final paper	Sun Nov 1	4
3	Star evolution	First draft	Sun Nov 8	1
		Review Task	Tue, Nov 10	1
		Revision Task	Thu, Nov 12	1

		Second draft	Sun Nov 15	1
		Review Task	Tue, Nov 17	1
		Revision Task	Thu, Nov 19	1
		Final paper	Sun Nov 22	4

Observing Project

	Observing Project (30%)		Due Dates	Points
1	Project proposal (5 pts)	D2L dropbox	Sun, Oct 4	5
2	Project Image (1 pts)	D2L dropbox	Sun, Oct 11	1
3	Final paper (20 pts)	First draft (Eli)	Sun, Nov 15	1
		Review Task (Eli)	Tue, Nov 17	1
		Revision Task (Eli)	Thu, Nov 19	1
		Second draft (Eli)	Sun, Nov 22	1
		Review Task (Eli)	Tue, Dec 1	1
		Revision Task (Eli)	Thu, Dec 3	1
		Final paper copy D2L and Eli	Sun, Dec 6	14
4	Poster presentation (10 pts)	Voice Thread	Wed, Dec 9	10

