




Course Organization Notes

Big Bang & Black Holes

ASTR/PHYS 109

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Last updated 1/15/2019



Lecture 1 Notes



Overview

First describe how everything fits together, then describe the assignments in detail

This document can be found at

<http://people.physics.tamu.edu/toback/109/CourseOrganization.pdf>

Class Time

- We meet Monday, Wednesday and Friday from 11:30AM to 12:20PM
- Will use the full time period
- I expect you to be on time, and prepared for class by being caught up with all the assignments

Course Website

Course Home Page

<http://people.physics.tamu.edu/toback/109>

Most things can be found there

Need help? email at

109help@physics.tamu.edu

Syllabus is also on Howdy

Don't need to write this all down!

Copy of all the lecture notes at

<http://people.physics.tamu.edu/toback/109/Lectures/>

Regular and Honors Sections

- **Regular sections**
 - ASTR 109, Section 501
 - PHYS 109, Section 501
- **Honors sections**
 - ASTR 109, Section 201
 - PHYS 109, Section 201

There is no difference between the Physics and Astronomy sections (All meet together)

This course counts as 3 credit hours for your "Life and Physical Sciences Core Courses" requirement

Honors vs. Regular Sections

- There is no difference between the Physics and Astronomy Honors sections lectures - All meet together
 - You should have gotten an email from me
- Assignments are the same, except students in the Honors section have an extra paper on a topic we agree upon - See Course Webpage
- *Want to be in the honors section but couldn't get in? In the honors section but want to get out? Let me know and we'll fix it*

Coming to Class

- Need you to be proactive DURING class!! Get into it and have fun
- If you need sugar or caffeine go for it... just do it quietly
 - Candy/Soda machine just outside the door at the top of the steps
- Laptops/cellphones are NOT allowed during class since they are too distracting.
 - Will allow in the first 5 rows with *explicit permission*

Grades

The course grade will be:

1. Short Papers in Peerceptiv: 90%
2. Pre-Lecture Reading Questions (PLRQ) Assignments and In-Class Quizzes: 5%
3. End-Of-Chapter (EOC) quizzes in eCampus: 5%

No in-class exams or final

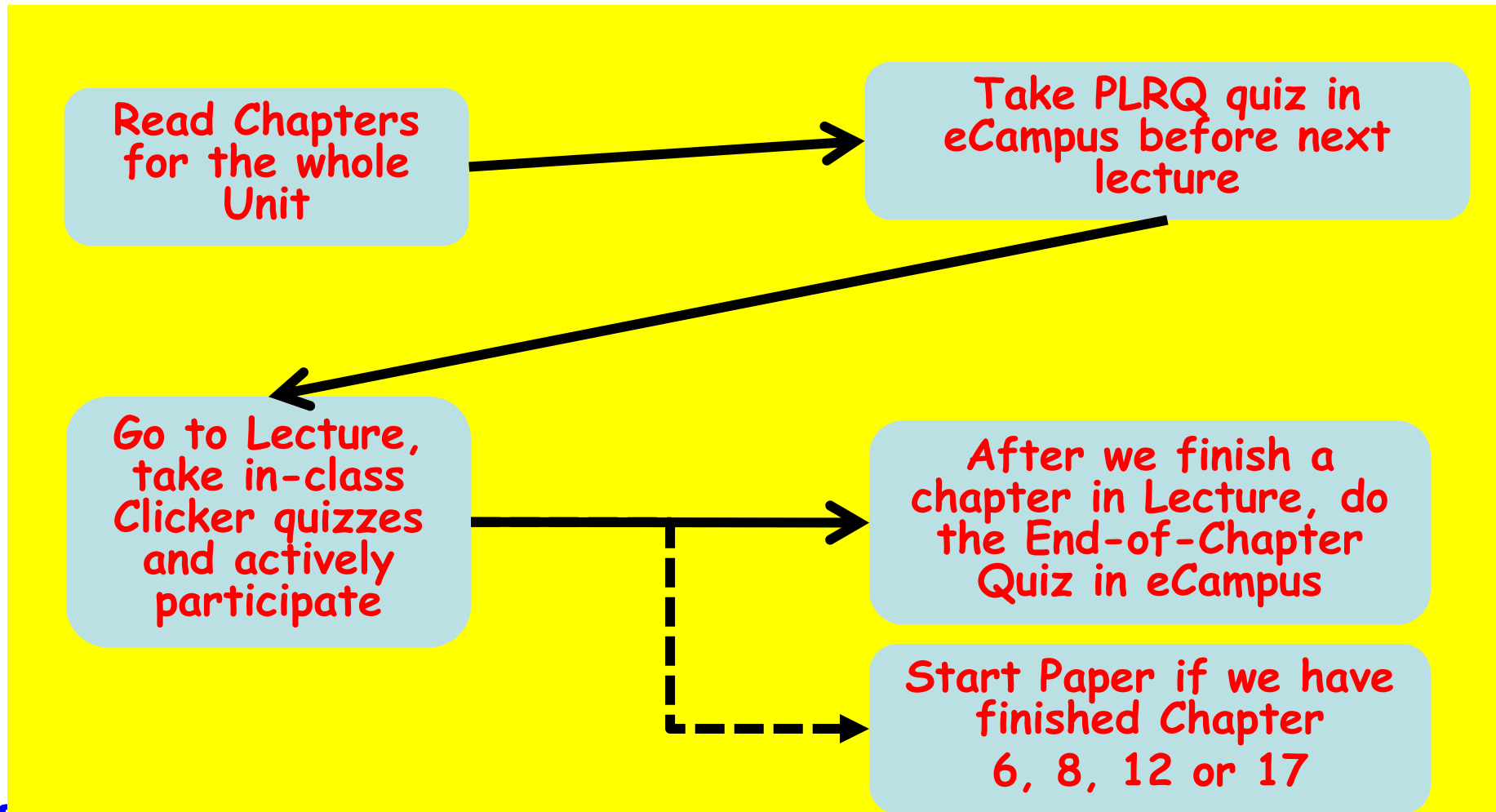
The lab (ASTR/PHYS 119) is a separate course and NOT being run this semester

Grades

- I like for my students to do well and I like giving lots of good grades
- While I do give lots of A's, this is not an "Easy A" class despite what you may have heard
- Do all the work and I'll make it worth your while, both in terms of fun and your grade
 - If you blow off the easy stuff or don't ask for help when you need it, then I'm unlikely to have much sympathy when you ask for a grade change at the end of the semester
 - I've given lots of F's
- It will be a lot of work, so if you don't want to keep up with the class every day, work hard and stretch your mind, you should drop now
- I'll expect you to keep at it until you get it right

Typical Order of Things

(Things will be a little different for the first week)
<http://people.physics.tamu.edu/toback/109/ClassSchedule.pdf>



Tentative Schedule for 2018C

This document can be found at
<http://people.physics.tamu.edu/toback/109/ClassSchedule.pdf>

Frequently Asked Questions Page

- There is an FAQ page for the course

<http://people.physics.tamu.edu/toback/109/109FAQ.shtml>

- In general, you should check there if you have a question about the course or assignments before emailing



eCampus


Where you will find all
the online assignments

Login instructions at

http://people.physics.tamu.edu/toback/109/ECampus_Quiz_Instructions_and_Help.pdf

Use eCampus for many things

- **Papers: (All are for a grade)**
 - Peerceptiv
 - TurnItIn
- **Pre-Lecture Reading Questions (PLRQ):**
 - Quizzes
 - TurnItIn
- **Quizzes: (All-but-AMS is Pass/Revise)**
 - Warmup quizzes (I and II)
 - Including Astronomy Misconception Survey (AMS)
 - End-of-Chapter (EOC) quizzes
- **Other:**
 - Announcements
 - Grades



General Information About Quizzes in eCampus

- Warmup quizzes and PLRQ Quizzes
 - Today's lecture
- End-of-Chapter (EOC)
 - Later lecture

Warmup Quizzes

- In the "Quizzes" folder, then go to "Required Warm-ups"
- Two sets of quizzes, labeled I and II (each with multiple easy quizzes)
 - Designed to teach you how to do things in the course (and practice for the science later)
- When you are done with Warmups I, Warmups II will become available
 - The last quiz in Warmup II is called "Astronomy Misconception Survey" (AMS) and is different than all the others. Designed to tell us what you know coming into the course. Please do your best. *For this AMS only:*
 - You only get one try
 - Won't count as part of your grade
- You are done with Warmups when you have finished quiz set I and II

Perfect Quizzes

Bad news:

- To pass the course you need to get a perfect score on all of them

Good news:

- You can take as many attempts as you want until you get a perfect score
- Feedback for most quiz questions
- I will only count your best score

I REALLY want you to learn and get good grades!

There will be many assignments with this rule, but not all of them (e.g. PLRQ and AMS)


Discouraging Guessing

- You get unlimited attempts, but to discourage guessing if you use more than 5 attempts you will have to request more
- Specific instructions on how to request more attempts (following the proper format for simple email or using the worksheet helps us help you)

http://people.physics.tamu.edu/toback/109/ECampus_Quiz_Instructions_and_Help.pdf

Getting Help/Additional Attempts for Quizzes

- Send an email at 109help@physics.tamu.edu
- Two ways: Send email where you type in the information, or send a copy of the worksheet
 - Instructions on Page 3 of http://people.physics.tamu.edu/toback/109/ECampus_Quiz_Instructions_and_Help.pdf
 - Follow the instructions on how to get to all the information about your previous attempts that you will need to send us in your request
 - For good examples see Page 4
 - Direct link to an excel worksheet at <http://people.physics.tamu.edu/toback/109/RequestingAttemptsWorksheet.xlsx>
- With that information we can usually figure out what is causing you to struggle (and will usually just give you two more attempts)
- Then again, maybe you are correct and we need to fix it in eCampus! If that's the case, we'll give you extra credit!



Pre-Lecture Reading Questions (PLRQ)

Pre-Lecture Reading Questions

- It is important to learn how to ask good science questions (or tell if a question is good scientifically), and to be well prepared for Lecture
- For these reasons we will have a number of PLRQ Assignments
 - Quizzes (One per Unit1)
 - In the "Quizzes" folder, then go to "PLRQ Quizzes"
 - 1 written assignment to be submitted (more on this later)
- Guidelines for what we are looking for at

http://people.physics.tamu.edu/toback/109/PLRQ_Guidelines.pdf

How can I tell if a question is well asked?

- 1. Is it obvious the question-asker read the Unit (or rather, is it not obvious that they didn't read)?*
- 2. Is the question relevant to this unit's reading?*
- 3. Is the question clear and well-phrased?*
- 4. Does it reflect critical thinking?*
- 5. Is it relevant to the science of the reading?*

Two Types of PLRQ Assignments

1. Quizzes, Units 1-6

- Each Unit has a quiz with ten questions for you to evaluate the quality of some question
- Designed to help you decide if it's a good question
- Feedback will help you learn about whether it is good, and contain some physics answers
- Won't get the same questions for each quiz
- Unit 1 is Pass/Revise

2. Units 2

- Pass/Revise
- You write your own questions and submit to TurnItIn

There are late penalties

Lab Course
ASTR/PHYS 119
(Not being run for
Spring 2019)

Lab - ASTR/PHYS 119

- You are not required to take the Lab for this course
 - Useful if you want another credit hour for your "Life and Physical Sciences Core Courses" requirement
 - Or maybe you just want to learn more? Get more in-depth? Use a little math...
 - **Meets on Wednesday: 12:40PM-2:40PM**
 - No meeting Wednesday of 1st week
 - You need to read the lab Manual and web instructions (and do the prep work)
- B** BEFORE lab



Other Stuff

Class Time

- Lecture will be a time where you and I interact by asking and answering each others questions
- You will need to prepare BEFORE lecture
 - Do the reading assignments
 - Do the "Pre-Lecture Reading Questions" Quiz
 - Be ready to be answer questions in class using a clicker
- If you don't understand something, ask a question in class!

Clickers and In Class Quizzes

- We will be doing a lot of clicker quizzes during class
- You will need a clicker
 - Can get a used one/use the same one for multiple classes
- More information at <http://people.physics.tamu.edu/toback/109/iClickers.shtml>

Accounts, email and eCampus

- You will need a NetID/UIN account for your clicker and eCampus
- You are responsible for checking your official email periodically for announcements

In-Class Quizzes

There will frequently be in-class quizzes which are part of your grade

- Most will be done with an iClicker
 - Can buy a used one
 - Register with your **UIN** at <http://people.physics.tamu.edu/toback/109/iClickers.shtml>
we will be using eCampus
 - Bring your clicker every day
- Sometimes we will do in-class writing
 - Bring a sheet of lined paper and a pen every day

Required Textbook

Required Textbook

- *Big Bang, Black Holes, No Math (Toback)*
 - Extra credit for students who email me corrections which make it better (list of previous corrections online)
 - eBook or paper is fine. Can order now at bigbang.physics.tamu.edu
 - Copy on Reserve if needed

Recommended Textbooks

Recommended books

- *Briefer History of Time* (Hawking)
- *The Science of Interstellar* (Thorne)
- *Theory of Everything* (Hawking)
- *Stephen Hawking's Universe* (Filkin)
- *The First Three Minutes* (Weinberg)
- Other readings on the Web

Make sure you get the most up-to-date versions of each (see webpage)

- Not "*Brief History*", *Briefer History*
- Paperbacks available for each
- Looks like about \$15 for ALL of them (with shipping) if you get them online

Recitation


- **No recitation for this course**
- **However, there are Teaching Assistants (TA's) who are here for you to ask questions, get help with your work and give you feedback on your paper drafts**
- **Their emails are on the main page**

Just for Fun...

- We have created a “just for fun” Facebook account for students (past, present and future) who want to stay in touch with the course
- *Learning about the Big Bang and Black Holes Without the Math*
- It's not part of the course, but I try to post fun, related things there periodically
 - If you send me something fun (and appropriate for public consumption) I'll post it for everyone
 - If you send me something fun, but inappropriate, I'll say thank you and just enjoy privately
- Also, lots of fun stuff on <http://people.physics.tamu.edu/toback/109/Video/>



Lecture 2 Notes



More Information About Quizzes in eCampus

- Warmup & PLRQ Quizzes
 - Earlier lecture
- End-of-Chapter (EOC)
 - Today's lecture

End-of-Chapter Quizzes

- There are End-of-Chapter quizzes for each chapter
 - Helps ensure you have a good knowledge of some of the important FACTS for each chapter
 - Will be done online, using eCampus
 - Need a 100% on all quizzes to pass course
 - Are assigned AFTER we finish the chapter in lecture, and due before the next lecture
 - If you need more attempts, follow the standard instructions

eCampus Quizzes

- **Start with free Warmup quizzes**
 - Need a 100% on most of them (don't worry... most are easy if you read this document)
- **When these are done, the End-Of-Chapter Quizzes folder becomes available**
 - In the "Quizzes" folder, then go to "End-of-Chapter Quizzes" folder
 - First one is Chapter 2 (no Chapter 1 quiz)
 - EOC quiz due **AFTER** we finish the chapter in lecture

Example of a Good Email if you run out of attempts or need help

Howdy,

I'm struggling with End of Chapter quiz Chapter 3:

Question 12: "Which of the following are thought of as a composite particle? Select all that apply."

1. Atom (Yes. Atoms are composed of protons, neutrons, and electrons)
2. Quark. (No. Quarks are listed as fundamental particles in Table 3.1)
3. Electron. (No. Electrons are listed as fundamental particles in Table 3.1)
4. Neutrino. (No. Neutrinos are listed as fundamental particles in Table 3.1)

Feedback: Hint: Any particle that is not a fundamental particle must be a composite particle

IT HAS:

- THE NAME OF THE QUIZ
- THE QUESTION NUMBER
- THE TEXT OF THE QUESTION
- THE ANSWER NUMBERS AND TEXTS...
- YOUR ANSWER AND REASON WHY CLOSE TO ONE ANOTHER
- THE FEEDBACK (or a note that there is none)
- AND NO RANDOM FORMATTING CLUTTERING UP EVERYTHING

THIS IS A GOOD E-MAIL! MAKE YOUR EMAILS FOR HELP LOOK LIKE THIS!

For more details see page 3 of

B http://people.physics.tamu.edu/toback/109/ECampus_Quiz_Instructions_and_Help.pdf



More Stuff About Grades

More Detail on Grades, Revisions and Pass/Revise/Fail

- **For the online eCampus quizzes:**
 - The Warmup quiz scores (including AMS) are not counted as part of your grade. However, all but AMS must be Passed (unlimited attempts for each except AMS)
 - For the EOC quizzes you will get unlimited attempts to get 100% for each quiz for all chapters (regardless of lateness), but when they are completed we will give you a 100% for each (before late penalty)
 - For the PLRQ quizzes you get unlimited attempts, but you are not required to get a 100% except on Unit 1
- **PLRQ Unit 2**
 - For Units 2, you will keep submitting until you pass.
- **For Papers:**
 - The Reviewer Training Assignment (Paper 0) is not counted as part of your grade, but must be completed
 - Papers 1-4 will be curved. You can do a single revision for the text portion for each (will average text scores, not overall scores)
- **Late penalties**
 - There are late penalties for all assignments

Late Penalties

- **EOC and PLRQ Quizzes**
 - Up to 50% per assignment
- **Papers**
 - Penalties in Peerceptiv (described there)

Regrades and Revisions

- If you think you were misgraded on ANY assignment, send an email to 109help@physics.tamu.edu
- Revisions are allowed for many assignments, and we are here to help you do better



Notes for Before we Start Chapter 4



Papers

Paper Topics and Due Dates

- Papers will be announced before we start the chapter
- Assigned after we finish the chapter
- 4 Real Papers + 1 Practice
 - Paper 0: Reviewer Training (no writing, just review)
 - Assigned after Chapter 4, Typically week 3
 - Paper 1: Evidence for Dark Matter
 - Assigned after Chapter 6, Typically week 5
 - Paper 2: Evidence Stars are made of Atoms
 - Assigned after Chapter 8, Typically week 7
 - Paper 3: Evidence Universe started with a Big Bang
 - Assigned after Chapter 12, Typically week 10
 - Paper 4: Evidence for Black Holes
 - Assigned after Chapter 17, Typically week 14

Style of the Paper

- Explain it to someone who isn't taking the class (no jargon)
- ~600 words (This is the equivalent of both sides of a sheet of paper, double spaced)
- No citations! Use your own words
- Only use information from the book
- Text should be professional. You are "trusted guide" not a "buddy" or "comedian"

Paper Format

- **Must follow expected Format**
 - Like the case a trial lawyer will make
- **Each paper is usually 5 paragraphs:**
 - Introduction paragraph that outlines the evidence
 - **Opening Statement**
 - 1 paragraph per piece of evidence (often, but not always, three)
 - **Testimony from the expert witnesses**
 - Conclusion paragraph that ties it together
 - **Closing arguments**

people.physics.tamu.edu/toback/109/WritingAssignments/samplepaper.shtml

Different than usual...

- Each Paper Assignment has 3 Stages, all in Peerceptiv
 1. Text Submission: 50%
 - Also submit to TurnItIn
 - Typically due on a Tuesday
 2. Review (evaluate others text): 40%
 - You are required to do 3, (extra credit at 3% per extra review, up to three)
 - Typically due the next Thursday
 3. Back-evaluate your graders: 10%
 - Typically due the next Tuesday
- You are assigned points for each, and the entire assignment is graded on a curve
- Actual dates from the Lecture notes
- *Careful of late penalties*

Help Available for the Writing Stage

- Can submit a draft for feedback on eCampus in "Rough Drafts (Optional)" in TurnItIn
 - Due Friday before by 11:55PM
 - If you submit late, we can try to give feedback but we can't guarantee it
- We also recommend going to the Writing Center

Biggest reasons people don't do well

1. Don't read all the hand-out instructions on how to use Peerceptiv

http://people.physics.tamu.edu/toback/109/WritingAssignments/Papers_and_Peerceptiv.pdf

2. Don't read all the paper-specific instructions given in the assignment

- Lots of hints given

3. Don't do all the Peerceptiv stages and/or Forget to submit to TurnItIn

4. Don't get help when you need it

- Go to the Writing Center
- Submit a draft to the TA
- Read the hints on the handouts

Peerceptiv for Papers In eCampus

http://people.physics.tamu.edu/toback/109/WritingAssignments/Papers_and_Peerceptiv.pdf

Why are we using Peerceptiv?

- **Skills:**

- People in the real world need to keep working on documents, often with others, until they are excellent
- People in the real world need to know how to tell the difference between an excellent document and a mediocre one
- People in the real world need to know how to give feedback on documents that will help turn them from mediocre to excellent

- **How does this impact you?**

- You need to get good at this for after you graduate
- Learn to better evaluate/improve your own work to ensure it is excellent BEFORE you submit it for a grade

Paper 0 Reviewer Training in Peerceptiv

Nothing to write!!!

- Will do a “Reviewer Training” assignment (Called Paper 0) to help you practice the reviewer portions of Paper assignments in Peerceptiv
- There is nothing to write
- Just do the Review and Back-Evaluation parts for some sample papers we give you
- Will be done after we start Chapter 4