



# Course Organization Notes

## *Big Bang, Black Holes,*

## *No Math*

### ASTR/PHYS 109

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Last updated 2/13/2017



# 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>

# Grades

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**The course grade will be:**

1. Short Papers: 90%
2. Pre-Lecture Reading Questions (PLRQ) Assignments and In-Class Quizzes: 5%
3. eCampus quizzes (End-of-Chapter, PLRQ Boot Camp and others): 5%

**No in-class exams or final**

# Course WebSite

## Course Home Page

[http:// people.physics.tamu.edu/toback/109](http://people.physics.tamu.edu/toback/109)

Most things can be found there

Need help? email at

[109help@physics.tamu.edu](mailto:109help@physics.tamu.edu)

Syllabus is also on Howdy

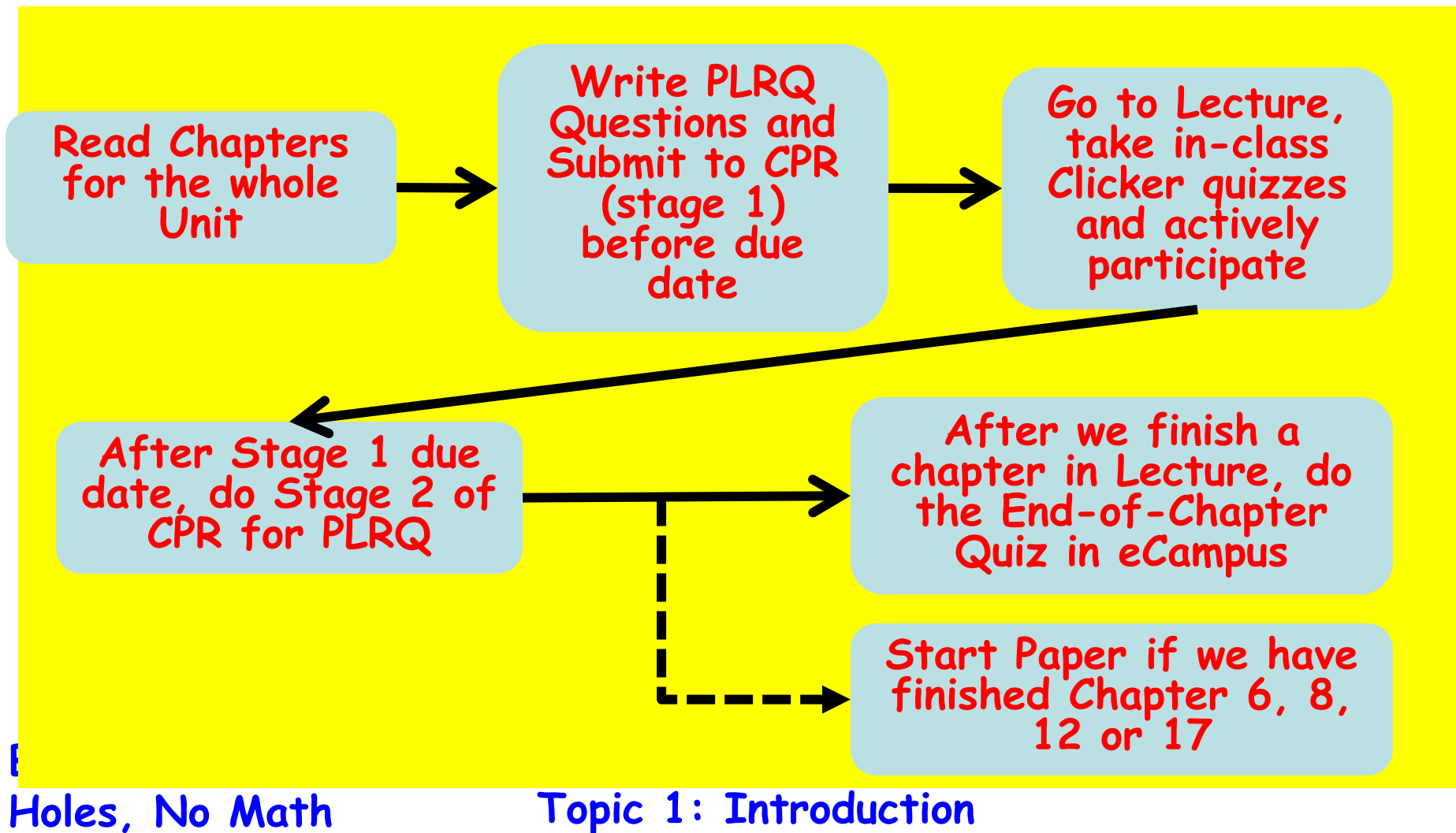
Don't need to write this all down!

Copy of all the lecture notes at

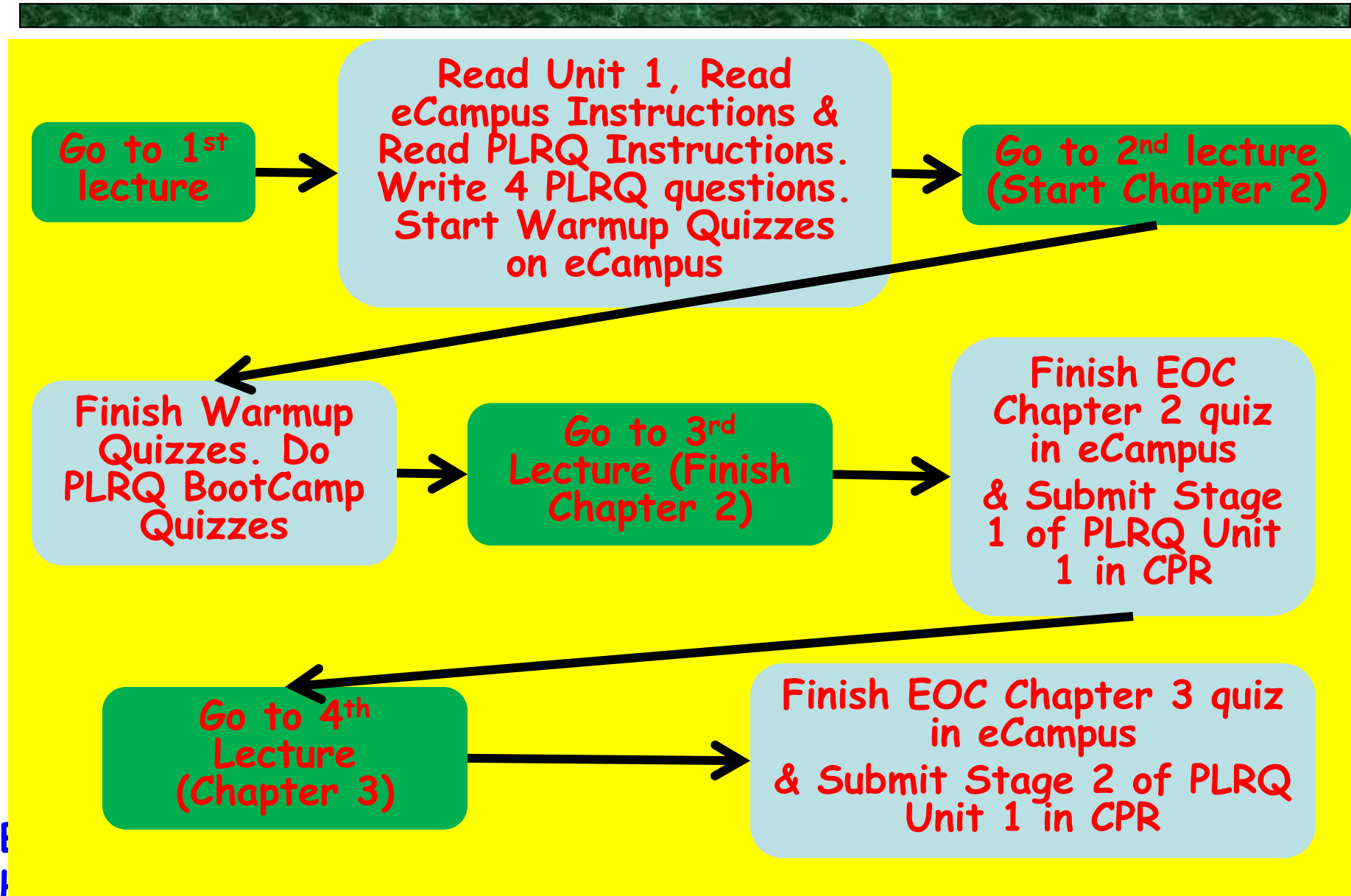
<http://people.physics.tamu.edu/toback/109/Lectures/>

# Typical Order of Things

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



# First Week(s) Order



# Example Schedule for 2017A

## Tenatative Schedule for ASTR/PHYS 109, Spring 2017

Week #	Date	Lecture #	Chapter in Class	Online Quizzes	Reading and PLRQ Assignments	Paper Assignments	TAMU Notes
***** (Tentative dates) *****							
1	Monday, January 16, 2017	NA	NA				MLK Day, No class
1	Wednesday, January 18, 2017	1	1	Read eCampus instructions Assigned in class	Unit 1 Reading Assigned in class. PLRQ Instructions assigned in class		
2	Monday, January 23, 2017	2	2		PLRQ Unit 1 Questions due before class (not to be turned in)		Last day add/drop
2	Wednesday, January 25, 2017	3	2	Warmup Quizzes due before class	PLRQ Unit 1 Assigned in class		
3	Monday, January 30, 2017	4	3	PLRQ BootCamp Quizzes due before class. EOC 2 due before class	PLRQ Unit 1, Stage 1 due before class		
3	Wednesday, February 1, 2017	5	4	EOC 3 due before class	PLRQ Unit 1, Stage 2 due before class. Unit 2 Reading and PLRQ Assigned in class		
4	Monday, February 6, 2017	6	5	EOC 4 due before class	PLRQ Unit 2, Stage 1 due before class		
4	Wednesday, February 8, 2017	7	5		PLRQ Unit 2, Stage 2 due before class		
5	Monday, February 13, 2017	8	6	EOC 5 due before class		Paper 1 Mentioned in class	
5	Wednesday, February 15, 2017	9	6			Paper 1 Assigned in class	
6	Monday, February 20, 2017	10	7	EOC 6 due before class			
6	Wednesday, February 22, 2017	11	7			Paper 1, Stage 1 due before class	
7	Monday, February 27, 2017	12	7,8			Paper 2 Mentioned in class	
7	Wednesday, March 1, 2017	13	8	EOC 7 due before class		Paper 1, Stage 2 due before class. Paper 2 Assigned in class	
8	Monday, March 6, 2017	14	9	EOC 8 due before class	Unit 3 Reading and PLRQ Assigned in class		Mid-term grades
8	Wednesday, March 8, 2017	15	10	EOC 9 due before class	PLRQ Unit 3, Stage 1 due before class	Paper 2, Stage 1 due before class	
9	Monday, March 13, 2017						No class, Spring Break
9	Wednesday, March 15, 2017						No class, Spring Break
10	Monday, March 20, 2017	16	11	EOC 10 due before class			
10	Wednesday, March 22, 2017	17	12	EOC 11 due before class	PLRQ Unit 3, Stage 2 due before class. Unit 4 Reading and PLRQ Assigned in class	Paper 2, Stage 2 due before class. Paper 3 Mentioned in class	
11	Monday, March 27, 2017	18	12		PLRQ Unit 4, Stage 1 due before class	Paper 3 Assigned in class	
11	Wednesday, March 29, 2017	19	13	EOC 12 due before class	PLRQ Unit 4, Stage 2 due before class		
12	Monday, April 3, 2017	20	14	EOC 13 due before class	Unit 5 Reading and PLRQ Assigned in class		
12	Wednesday, April 5, 2017	21	14,15		PLRQ Unit 5, Stage 1 due before class	Paper 3, Stage 1 due before class	
13	Monday, April 10, 2017	22	15	EOC 14 due before class	PLRQ Unit 5, Stage 2 due before class		
13	Wednesday, April 12, 2017	23	16	EOC 15 due before class		Paper 3, Stage 2 due before class	
14	Monday, April 17, 2017	24	16,17			Paper 4 Mentioned in class	April 18th is q-drop date
14	Wednesday, April 19, 2017	25	17	EOC 16 due before class	Unit 6 Reading and PLRQ Assigned in class	Paper 4 Assigned after class	
15	Monday, April 24, 2017	26	18	EOC 17 due before class	PLRQ Unit 6, Stage 1 due before class		
15	Wednesday, April 26, 2017	27	19	EOC 18 due before class	PLRQ Unit 6, Stage 2 due before class	Paper 4, Stage 1 due before class	
16	Monday, May 1, 2017	28	20	EOC 19 due before class			Last date of class
17	Wednesday, May 3, 2017	NA	NA	EOC 20 due		Paper 4, Stage 2 due	Reading Day, no classes, No Final
17	Monday, May 8, 2017	NA	NA				
18	Wednesday, May 10, 2017	NA	NA				
18	Monday, May 15, 2017	NA	NA				Grades due

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

# Frequently Asked Questions Page

- If you have questions not answered in this document, you can find more detail in the class FAQ
- Can be found on the main 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



# Two Ways of Looking at Things

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- **By Assignment (things that get grades)**
  - Quizzes
  - PLRQ
  - Papers
- **By Online System**
  - eCampus (for quizzes)
  - CPR (for Papers and full PLRQ assignments)

There is a lot of jargon and acronyms, read the whole thing then go back to see how it holds together

# Requirements to Pass the Course

- **Some things need to be turned in to pass the course**
  - All the stages for each Paper Assignment (in CPR)
  - All the End-Of-Chapter quizzes
  - All PLRQ BootCamp quizzes in eCampus
  - Pre-Lecture Reading Question Assignment for Unit 1 in CPR
- **Some things MUST get a passing grade to pass the course**
  - All eCampus quizzes (except AMS)
  - Pre-Lecture Reading Questions for Unit 1 in CPR
- **Some things in the course are pass/fail the first time, but are for a grade after that**
  - Unit 1 PLRQ in CPR
    - **Note: you are allowed (but not encouraged) to get a zero on the later PLRQ assignments**



**eCampus**

**For quizzes and other  
things**

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

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**Introduction  
Topic 1: Introduction**

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# Use eCampus for many things

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- **Quizzes:**

- Warmup quizzes
- PLRQ Boot Camp quizzes
- End of Chapter quizzes

- **Other things as well:**

- Turnitin
- Grades (but not Paper or PLRQ Grades, those will stay in CPR)
- Announcements

# eCampus Quizzes

- **Start with free Warmup quizzes**
  - Need a 100% on most of them (don't worry... most are easy if you read the FAQ)
  - In the "Quizzes" folder, then go to "Required Warm-ups and PLRQ Practice"
- **After these are done you will get a set of PLRQ Practice quizzes**
  - In a sub-folder called "PLRQ Boot camp"
  - Also need a perfect score
- **When these are done you will be able to get to the End-of-Chapter Quizzes**
  - First one is Chapter 2 (no Chapter 1 quiz)
  - EOC quizzed due AFTER we finish the chapter in lecture

# 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
- 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. AMS)

# Discouraging Guessing

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- You get unlimited attempts, but if you use more than 5 attempts you will have to request more

- To request more attempts follow the instructions at

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

# Getting Help/Additional Attempts for Quizzes

- Send an email at [109help@physics.tamu.edu](mailto:109help@physics.tamu.edu).
- Include the following:
  - The name of the quiz you are having trouble with
  - The full text of the question you are struggling with
  - The Yes/No answers you put for each of the options, and a sentence on WHY you picked each. A single line for each rubric question is helpful. Often the reason you picked No is the most helpful
  - The feedback from eCampus itself (if any) that the quiz gives you when it tells you you didn't get the question right. You can find that under 'My Grades'. Look for the quiz and click on it. Then click on the score (number). The attempt result will open and show all the information, including your answers and feedback.
- 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!

B If that's the case, we'll give you extra credit!





# Warmup Quizzes in eCampus

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Introduction  
Topic 1: Introduction

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# eCampus Warmups

- Designed to help you learn how to do things in the course (and practice for the science later)
- You are done if you have finished “How to format e-mail requests for additional attempts on eCampus quizzes”
- In the middle is the course pre-test called AMS (Astronomy Misconception Survey) *AFTER* you finish some of the warm-ups
  - Please do your best. Won't count as part of your grade. We just want to know what you know coming into the course


# Example Warm-up Help Email to 109help@physics.tamu.edu

Hello,

I've run out of attempts of Requirements Quiz 2, and would like to request more. Here is the question I'm struggling with Question 7

"Which assignments require you to get all the parts exactly correct in order to get a passing score? (select all that apply). Hint: Some assignments require you to get all the parts exactly correct to get a Passing grade. Some assignments require you to get a minimum score (<100%) in order to get a Passing grade. While it's true that when you get a Pass for an assignment we will give 100% of the \*points\*, but that isn't the same as getting all the parts of the assignment exactly correct."

- Warm-up and requirements quizzes - **Yes**. All of these require getting every question correct.
- An End Of Chapter Quiz for every chapter (except Chapter 1) - **Yes**. All of these require getting every question correct.
- PLRQ Boot Camp quizzes - **Yes**. All of these require getting every question correct.
- PLRQ Unit 1 assignment in CPR - **No**. While it's true we have to pass this assignment, we don't have to get all the parts exactly correct.
- Paper 1 assignment in CPR - **No**. This isn't pass/fail. We don't need to get it perfect.
- Astronomy Misconception Survey (AMS) - **No**. This isn't pass/fail. We don't need to get it perfect.



# Pre-Lecture Reading Questions (PLRQ)

## Overview, Boot Camp and CPR

### Instructions about PLRQ

[http://people.physics.tamu.edu/toback/109/Question\\_Guideline\\_109\\_CPR.pdf](http://people.physics.tamu.edu/toback/109/Question_Guideline_109_CPR.pdf)

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Introduction  
Topic 1: Introduction

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# Pre-Lecture Reading Questions

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- It is important to learn how to ask good science questions (or tell if a question is a good question), and to be well prepared for Lecture
- For these reasons we will have a number of PLRQ Assignments
- Work will be done online both in eCampus and CPR (more later)
- There is a set of guidelines on what we are looking for on the website and how you will evaluate questions

# Two Types of Assignments

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## 1. ECampus component

- Called BootCamp quizzes
- To help you prepare for CPR assignments by practicing Reviewing Questions

## 2. Full CPR Assignments for each Unit of the reading

- Will help you prepare for using CPR for Papers

# BootCamp Quizzes

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- In a sub-folder of "Warmups" in eCampus called "PLRQ Boot camp"
- Also need a perfect score

# Example Request for Additional PLRQ BootCamp Attempts Email to 109help@physics.tamu.edu

- **PLRQ Quiz - Hard**

"Are cosmological principles and religion totally incompatible, or is it possible to integrate the two?"

#1 - **Yes**, they have read the material

#2 - **No**, it is not exactly relevant to the topic at hand

#3 - **Yes**, the question is clear

#4 - **Yes**, reflects critical thinking

#5 - **Yes**, it asks for info beyond the reading

Response Feedback: This question has some parts which make it hard to assess. It clearly is about the reading (specifically the part about the cosmology), and it's clearly stated (we can understand what it is asking). It certainly is interesting (many people buy lots of books about the topic), but it's not clear it is an interesting *\*science\** question. Even though it is borderline, we decide to be generous and give a Yes for Rubric 4. Rubric 5, on the other hand, concerns whether the question is asking about "science beyond what is in the reading." This is not asking about the science beyond the reading. Rather it is about the compatibility between cosmology and religion. We give it a No for Rubric 5.



# PLRQ and CPR

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- We will have a full CPR Assignment for each Unit in the textbook
  - 6 in total
  - Typically assigned to be due before we start the lecture on the unit
  - Stage 2 will typically be due before the next class
- Unit 1 will be different from Units 2-6

# PLRQ Unit 1 in CPR


PLRQ Unit 1 in CPR is different than the others (mostly for practice) since we want to make sure you get good at CPR

- It is Pass/Revise
- You need a 65% or better on it to pass
- I'll post the grades in eCampus
- If you don't pass the first time, you will need to contact your instructor ([toback@tamu.edu](mailto:toback@tamu.edu))

# Units 2-6 in CPR

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- Later units are just your combined CPR score for all parts
  - You can do a revision if you want to get a better grade
  - We will average the two scores
- Send an email to [109help@physics.tamu.edu](mailto:109help@physics.tamu.edu) if you think you were misgraded or we gave you the wrong grade



# End of Chapter Quizzes (EOC)

# End-of-Chapter Quizzes in eCampus

- 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 instructions on the FAQ



# Calibrated Peer Review (CPR)

## For PLRQ and Papers

# Calibrated Peer Review

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- Full assignments will be done using CPR
  - Full PLRQ Assignments
  - Paper Assignments
- Each assignment has 2 Stages
  - The quizzes in eCampus are about practicing *before* you start on the CPR system

# Learning to Write and Critique

- Each CPR Assignment has two parts (Call them Stage 1 and Stage 2)
  1. You do your own writing and submit
  2. You review and evaluate other papers (and your own)
- Why?
  - Learn how to determine the difference between excellence and mediocrity (according to the class standard), and give feedback (evaluate) papers to make them better
  - Learn to better evaluate your own work to make it excellent BEFORE you turn it in
- Want you to get good at writing and being able to tell if you have written excellently before we get to the main paper assignments for this class



# Stage I and Stage II in CPR

## Stage I: (50% of the grade)

- For PLRQ: Write 4 questions and turn them into CPR (online)
- For Papers: Write the text of the paper

## Stage II: (50% of the grade)

### • Three-Parts

#### 1. Calibrations (learning to use the Rubrics - 20%)

- Read an example submission and use the grading rubric to answer Yes/No questions and count the fraction of Yeses to assign a score. Evaluate the three example submissions (get only one free try to pass the grading rubric)
- You have practiced these in eCampus

#### 2. Reviews (Evaluate three other submitted submissions - 20%)

- Ignore that it says you have only 5 minutes for this. I have set it so you can start the reviews right after you finish your calibrations

#### 3. Self-Assessment (Evaluate your own submission - 10%)

Note: You get a separate score for each of the 4 parts (Text, Calibrations, Reviews and Self-Assessment)

# Help Available for Stage I

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- For Papers you can submit a draft for feedback from the TA if desired
  - Submit on eCampus in "Rough Drafts (Optional)"
  - Drafts due Friday at 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

# Help Available for Stage II

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- **Stage II help:**

- Each calibration is graded 0 or 100%.
- You only get 2 tries for each of the 3 calibrations
- Many students have trouble with the calibrations because they do them **RIGHT** before they are due, and do them too quickly (and then fail them)

- **Our advice:**

- Do them early and ask for help if you fail one the first time
- Practice in eCampus quizzes to help you get good at them

# The "I hate CPR Club"

- Most students HATE CPR until they get good at it
- Many reasons:
  - Takes practice to get good at the system
  - Learning how to both be a good writer and be a good evaluator is really difficult (and incredibly important) skill - Takes practice
  - We require you follow the instructions
  - You need to learn the standards we will be using in the class, not your own, personal standards
- My advice: Don't fight the system, blame it for being "unfair", or wish it were "better." Just do what it takes to get good at it
- Don't hesitate to ask for help (instructions in the FAQ)
- If you are grumbling and neither I nor the TA have heard from you to talk to you about it, then you get what you deserve
  - Don't pretend this is a way to get free grading by the instructor... You'll be wrong and it will just piss you off



# Papers

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Introduction  
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# 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

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- **Must follow expected Format**
- Each paper is usually 5 paragraphs:
  - Introduction paragraph that outlines the evidence
  - 1 paragraph per piece of evidence (3 total?)
  - Conclusion paragraph that ties it together

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

# When papers will be assigned

- Papers will announced before we start the chapter
- Assigned after we finish the chapter
- Will have 1 week for Stage 1, and 1 week for Stage 2
- 4 Papers
  - Paper 1:
    - Assigned after Chapter 6, Typically week 5
  - Paper 2:
    - Assigned after Chapter 8, Typically week 7
  - Paper 3:
    - Assigned after Chapter 12, Typically week 10
  - Paper 4:
    - Assigned after Chapter 17, Typically week 14



# Example Notes: Paper 1

- **Abbreviated description: *What is the evidence for Dark Matter?***
  - More detail on CPR, you REALLY need to read ALL the instructions
- Explain it to someone who isn't taking the class (no jargon)
- Follow the required Format:
  - Introduction paragraph
  - ~1 paragraph per piece of evidence
  - Conclusion paragraph that ties it together
- Help:
  - Example of good paper  
<http://people.physics.tamu.edu/toback/109/WritingAssignments/samplepaper.shtml>
  - The first 9 Rubric questions  
[http://people.physics.tamu.edu/toback/109/WritingAssignments/PaperRubrics\\_9Questions.pdf](http://people.physics.tamu.edu/toback/109/WritingAssignments/PaperRubrics_9Questions.pdf)

# Biggest reason people don't do well

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1. Read ALL the instructions on CPR
  - See the FAQ on papers
2. Don't forget to submit to [turnitin.com](https://turnitin.com)
3. We are NOT giving you the Rubrics for the papers, but lots of hints about what the Rubric questions will contain are in the *Writing Prompt* and *Goals* sections



# Lab Course

# ASTR/PHYS 119

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Introduction  
Topic 1: Introduction

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# Lab - ASTR/PHYS 119

- You are not required to take the Lab for this course
- Useful if you want a 4<sup>th</sup> credit hour of "Life and Physical Sciences" requirement credit
- Or maybe you just want to learn more? Get more in-depth
- Meets on Tuesday: 12:45PM-2:45PM
  - First meeting 2<sup>nd</sup> week of class
  - You need to read the lab Manual and web instructions (and do the prep work) BEFORE lab



# Other Stuff

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Introduction  
Topic 1: Introduction

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# Regular and Honors Sections

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- **Regular sections**
  - **ASTR 109-501**
  - **PHYS 109-501**
- **Honors sections**
  - **ASTR 109-200**
  - **PHYS 109-200**

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

# Honors vs. Regular Sections

- There is no difference between the Physics and Astronomy Honors sections lectures - All meet together
- Assignments are the same, except students in the Honors section have an extra research paper - 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*

# Class Time

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- We meet Monday and Wednesday from 5:45PM to 7:00PM
- 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



# Coming to Class

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- 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 will only be allowed in the first 5 rows, and with explicit permission
  - They are too distracting

# Class Time

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

# Accounts, eMail and eCampus

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- You will need a netID/UIN account for your clicker
- Will use it for eCampus stuff and creating your accounts to turn in your papers (CPR system)
- You are responsible for checking your official email periodically for announcements

# In-Class Quizzes

There will frequently be in-class quizzes

- Most will be done with an iClicker
  - Can buy a used one
  - Register with your **UIN** at <http://www.iclicker.com/support/registeryourclicker/>
    - 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

# Textbooks

## Required Textbook

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

## 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*
- I find purchasing them online is much cheaper
- Paperbacks available for most

# Grades

- I like for my students to do well and I like giving lots of good grades
- 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
- 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

# Recitation

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- **No recitation for this course**
- However, there are assistants who are here for you to ask questions, get help with your work and give you feedback on your paper drafts

# 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/>

B