Before we start...

• Get comfortable... we will be using the full lecture time today
• This WILL be a funny semester. Will do the best we can for people who are attending remotely
• We will not be allowing laptops and cell phones without permission
Overview

1. What this course is really about and why I’m teaching it
2. How the course is organized
3. Stuff you’ll need for the course and the next lecture
Big Picture

This course is really designed to teach the wonder and excitement of the universe around us

• I want it to be understandable

• By the end of the course, I want you to be able to COMMUNICATE the understanding, the excitement and the evidence to others
The Story

• I think in terms of crime stories and the evidence for them

The Scientific Case of How the Universe Came to be the Way is Now

• We have a good degree of confidence in this story
Some of the Questions

• How did the Universe come to exist?
• A Big Bang occurred... then what?
• How did we get from a Big Bang ~14 billion years ago to the Universe we have today?
• What are black holes REALLY?
• What are dark matter and dark energy?
• Is the Universe REALLY expanding? Will it contract again and we'll all die?
• Should I be worried?
Questions and Evidence

- These are important questions for all for humankind.
- Everyone should know about (some of) these questions and (some of) what we know about the answers.
- You should also know something about the evidence.
Communicating the Excitement

• A great deal of the understanding can be had WITHOUT the math
  – You can enjoy music without being a musician or a composer

• As future leaders I want you to be able to go out into the world and effectively teach your senators, friends, co-workers, etc. why this stuff is exciting and important
Back to the Course

This course is designed to teach you about the Big Bang, Black Holes, Dark Matter, Dark Energy, and other stuff, and to do it without the Math.

Next talk about HOW we'll do it...
Being a Detective

• Want you to use **evidence** to make decisions like a detective (Sherlock, Elementary, Criminal Minds, CSI, NCIS, Bones, Law & Order, others like Scooby-Doo...). For example:
  
  - **Don’t** need you know **HOW** to do DNA tests
  - **Do** need you to understand that DNA tests (using blood from the scene of the crime) can tell us whose blood it is and provides evidence they were there

• **Can we put together evidence that would convince a jury to convict?**
What’s the Evidence?

- What is the evidence that the Big Bang actually occurred?
- What is the evidence that supports our understanding of the “history” of the Universe from the beginning until today?
- What is the evidence for little things we can’t see directly with our own eyes?
  - Atoms, protons and electrons
  - Dark Matter
  - Black Holes
Course Content

These are REALLY big questions

• We want to know what we observe in the universe
  - Big and Small
• To do this we need to understand some of the most important ideas in science
  - Quantum Mechanics
  - General Relativity
  - Others
Don’t worry

• Don’t worry... we aren’t going to do ALL of physics in a semester
• We aren’t going to ask you to calculate anything

• What we want is for you to understand, and re-tell, the story and explain some of the evidence
Ok... worry a little

• This course will make you question what you know about nature and history. If you are uncomfortable with that, you may not like this course.

• This course is harder than it looks. If you are looking for an "Easy A", you should drop before it counts against you.

• If you are looking for a course where you will can get an A if you put in the work, then this could be a good fit.
How the course is organized

Next few slides are on course organization, grades etc...

(page 2-35) And

• Overview: Grades, Course website, FAQ
• Other Stuff
• eCampus Quizzes
• PLRQ Reading
• Warmups

Big Bang, Black Holes, No Math

Introduction
Topic 1: Introduction
Intro Lecture Notes (for before Unit 1)
Overview

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

This document can be found at
Class Time

• We meet Monday and Wednesday from 5:35PM-6:50PM

• 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 Home Page/Web Page
http://people.physics.tamu.edu/toback/109
Most things can be found there
Need help? email at
109QuizHelp@physics.tamu.edu and
109GeneralHelp@physics.tamu.edu

Syllabus on Howdy and eCampus

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.

• Laptops/cellphones are NOT allowed during class since they are too distracting.
  - Will allow them for notes in the first 5 rows with explicit permission.
Grades

The course grade will be:

- Papers Assignments in Peerceptiv: 90%
- Small Assignments in eCampus: 10% (each with equal weight)
  - PLRQ Assignments
  - End-of-Chapter quizzes
  - Feynman Diagrams

No in-class exams or final

The lab (ASTR/PHYS 119) is a separate course, not required, 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)

- Read Chapters for the whole Unit
- Take PLRQ quiz in eCampus before next lecture
- Go to Lecture, take in-class Clicker quizzes and actively participate
- After we finish a chapter in Lecture, do the End-of-Chapter Quiz in eCampus
- Start Paper if we have finished Chapter 6, 8, 12 or 17
Tentative Schedule for 2020C

This document can be found at
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: (Part of your grade)
  - Peerceptiv
  - TurnItIn

- Warmup Quizzes: (Not part of your grade, but required)
  - 4 Separate sets of quizzes
  - All are Pass/Revise and require 100%
    - The exception Astronomy Misconception Survey (AMS) which is just one attempt (do the best you can do)

- Pre-Lecture Readin Questions (PLRQ): (Part of your grade)
  - Quizzes
  - TurnItIn (Submit your own questions for Unit 2 only as Pass/Revise)

- End-of-Chapter (EOC) quizzes: (Part of your grade)
  - All the quizzes are designed that you need 50% to move to later quizzes

- Feynman Diagram Assignments
  - Learning how to draw Feynman Diagram (later in the semester)

- Other:
  - Announcements
  - Grades

More on Page 42
General Information About Quizzes in eCampus

• Warmup quizzes and PLRQ Quizzes
  - Today’s lecture
• End-of-Chapter (EOC)
  - Later lecture
• Feynman Diagrams
  - Later lecture
Warmup Quizzes

- In the “Quizzes” folder, then go to “Required Warm-ups”
- Four sets of quizzes, each with multiple easy quizzes and designed to teach you how to do things in the course (and practice for the science later)
  - Part 1 - Warmups: First quizzes and “Astronomy Misconception Survey” (AMS). First set is just to get going in the course. Since AMS is just designed to tell us what you know coming into the course you only get one try and it won’t count as part of your grade.
  - Part 2 – How to ask for help/additional attempts: When you are done with AMS, a new set of quizzes will open. They are “How To Ask For Help/Additional Attempts for eCampus Quizzes.” There are 6 of them. Since most people don’t get all the quizzes quickly, and need to learn to get good at them, this is how we help-you-help-us teach you to ask for help in a useful way
  - Part 3 - Requirements: This quiz is designed to teach you about the Requirements in the course. Most of what you will need to answer those quiz question is in this document
  - Part 4 - Peerceptiv: This is about learning how to use the Peerceptiv system. We’ll come back to this later when we are starting to get to papers in the course.
Discouraging Guessing

• You get unlimited attempts, but to discourage guessing if you use 5 attempts and need more, you will have to request them.

• Specific instructions on how to request more attempts (following the proper format for simple email or using the worksheet helps us help you).

• There are a set of warmup quizzes to help you get good at asking for more attempts.

http://people.physics.tamu.edu/toback/109/ECampus_Quiz_Instructions_and_Help.pdf
Getting Help/Additional Attempts for Quizzes

• Send an email at 109QuizHelp@physics.tamu.edu

• Two ways: Send email where you type in the information, or send a copy of the worksheet we have provided
  
  
  - 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!
Class Time

• Lecture will be a time where you and I interact by asking and answering each other’s questions

• You will need to prepare \textit{BEFORE} lecture
  - Do the reading assignments
  - Do the “Pre-Lecture Reading Questions” Quiz
  - Be ready to answer questions in class

• If you don’t understand something, ask a question in class!
Accounts, email and eCampus

You are responsible for checking your official email periodically for announcements.
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 at bigbang.physics.tamu.edu
  - First 4 chapters online if your book is late
    - [http://people.physics.tamu.edu/toback/109/ThisSemester/Textbook_temp.pdf](http://people.physics.tamu.edu/toback/109/ThisSemester/Textbook_temp.pdf)
  - Copy on Reserve at Evans if needed
Recommended Textbooks

Recommended (not required) 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 and TA Help

• While there is no recitation for this course, there is a Teaching Assistant (TA).

• They can help you:
  - Understand the science and get good at learning how to understand how to use Peerceptiv, and do the things necessary to pass the quizzes
  - Give you feedback on your paper drafts before they are submitted
  - Help review your case if you think you were mis-graded

• 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/
Next Time...

- Talk more about
  - End-of-Chapter Quizzes in eCampus
  - Grades
- Lecture is on Chapter 2
- The Very Big
Prep for Next Time - L1

- **All this is posted in the lecture notes!!**
- **Reading:**
  - Required: BBBHN/M/Chapters 1-4
  - Recommended Reading:
    - BHOT: Chap. 1-3
    - SHU: Chap. 1-2
    - TOE: Chap. 1
- **eCampus Stuff**
  - Read eCampus Instructions on the main course page
  - Complete Warm-up Quizzes 1-3
    - Part 1 due next time, will make 2 due Wednesday and 3 due the following Monday
    - Extensions granted if needed. Email me
  - If you need additional attempts, follow the instructions or fill out the worksheet
    - How to get to your old submission information
      - [http://people.physics.tamu.edu/toback/109/ECampus_Quiz_Instructions_and_Help.pdf#page=3](http://people.physics.tamu.edu/toback/109/ECampus_Quiz_Instructions_and_Help.pdf#page=3)
- **Pre-Lecture Reading Questions:**
  - Read Instructions on what kinds of questions we are looking for at
  - PLRQ Unit 1 quiz
    - Will open after you finish Warmups. Two parts A & B. Not yet assigned
- **Honors Section:**
  - If you are in the Honors Section you need to reply to the email I sent you. If you didn’t get it email me
- **Other Prep**
  - Make sure you are receiving email using the Official A&M email, will use it for class announcements
Useful Links

• Course Website
http://people.physics.tamu.edu/toback/109

• Course Organization

• Class Schedule

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

• PLRQ Instructions

• Lecture Notes
http://people.physics.tamu.edu/toback/109/Lectures/

• Papers and Peerceptiv
http://people.physics.tamu.edu/toback/109/WritingAssignments/Papers_and_Peerceptiv.pdf

• FAQ Page
Full Set of Readings So Far

- **Required:** BBBHN: Chap 1-4
- **Recommended:**
  - BHOT: Chap. 1-3
  - SHU: Chap. 1-2
  - TOE: Chap. 1