AST 105: Introductory Astronomy: The Solar System

Prof. Rosalba Perna
TA: Alec Wills
**Introductions** -

I am a Professor of Physics and Astronomy, with special interests in stars and their deaths.

I have been a professor at Stony Brook for ~7 years; prior to that I was a professor at U. of Colorado Boulder for 10 years.

Also a professional pianist, and marathon runner..
Who are you...

• Introduce yourself (we’ll do this at end of class)
  - Name, major, interests, etc.
  - Why are you taking this course?
  - What topics do you most want to learn about in this class?
Who are you...

• **Introduce yourself**
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  - What topics do you most want to learn about in this class?

• **I’ll try to get to know you throughout the semester but you can help by...**
  - Asking questions
  - Answering questions
  - Coming to see me in (virtual) office hours
Outline of Today’s Class

• Course goals
• Course overview
• Course information
• Real astronomy
Course Goals

• Learn critical thinking skills
  - How to think, reason, and argue scientifically, using logic, observation, and evidence
• Learn why our solar system looks like it does
• Understand how we know what we know about the solar system
• Appreciate what we know about the solar system
  - and what we don’t yet know!
Course Overview:
What we will study

- Vast range of **SIZES and SCALES**: Understanding our place in the universe
How does our position here on Earth affect us and what we see?

- Celestial Motions
- Eclipses
- Seasons
- Moon Phases
What shaped the Terrestrial planets?
Why is there abundant life on Earth but no apparent life on Mars or Venus?
Why is Earth so different than Jupiter?
Why is there a debate about whether Pluto is a planet?
In What Ways Are Other Solar Systems Like Us... How Are They Different? How Do We Find Them?
Planet detections: year 1995

[Image credit: E. Kempton]
Planet detections: year 2020

Over 4000 planets discovered!!!
Energy, Gravity, Motion
LIGHT

Electromagnetic Radiation

- **What is light?**

- **How do we use it to find out what and where things are?**

Full electromagnetic spectrum much wider than the familiar optical
What is this course NOT?

Memorizing Constellations
What is this course NOT?

Astronomy ≠ Astrology!!!
Who should take this course?

- No prerequisites, aimed at **non-science majors**
- **Moderate amounts of quantitative work** (algebra)
- **Complementary material to AST 101 (Stars and Galaxies)**
Will this course have MATH?!?!?

• **YES**
  - But not that kind!!
• Algebraic Manipulation
• Scientific Notation
• Significant Figures
• Areas
• Volumes
• Exponents
This class is not about memorization!!!

- Knowledge (remembering facts and numbers) is really only the base of learning.

- You need to understand the concepts of WHY and HOW.
Who should rather *not* take this course?

- **Astronomy/Astrophysics**
  - Physics majors
  - More advanced course: AST 205
    - (Introduction to Planetary Science)
Course Information

COURSE WEB PAGE:
http://amalfi.astrosunysb.edu/rosalba/ast105/ast105.html

You can find announcements, reading assignments, syllabus, lecture notes and other useful things there.
Required Textbook

*The Cosmic Perspective*

by Bennett et al.

Older Edition is fine, though reading assignments based on chapters from latest (9th) edition.
Clickers (via TurningPoint): 10%

Group Labs (last 20-30min every 2-3 classes): 5%

Group Projects (2 of them): 15%

Midterms (3 of them): 40%

Final exam: 30%

READ ALL THE INFO ON THE COURSE WEBPAGE
Group Labs

• Every 2-3 classes
• Consist of problems and questions on the material covered in the previous 2-3 classes
• Students work in groups of 4 (via zoom chatrooms) - *learn how to be a scientist, discuss opinions*
• 1 class lab will be randomly selected at the end of the course and graded to count towards 5% of the total grade
Group Projects

• Students work in group of 4 (similarly to the class lab).
• Groups will be randomly chosen, with the only requirement that they be different between the 2 projects.
Multiple choice questions

• Download the TurningPoint app on your phone or use web interface - a link to a video with instructions is posted on blackboard

• Used for reading quizzes, in-class discussion questions, feedback - favors peer learning

• This is current technology to replace the ‘clickers’, tailored to this new world of online learning.
More on multiple choice questions

- **Credit starts next week**

- **Graded** 2 pts for correct answer, 1pt for wrong answer, 0 pts for no answer

- **Discussion with other students via private chats is encouraged**

Please make sure to sign in on TurningPoint by the end of this week
Video Camera during class

• Please try to keep your camera on if possible. It helps reducing the impersonal feeling of online education. Students' expressions can provide immediate feedback on concepts which require further explanations.
This is an unusual time for the world…. which includes universities

YOUR FEEDBACK THROUGHOUT THE COURSE IS VERY IMPORTANT!

I will be happy to readjust based on what works best.

Given the size of this class, for questions we will use the chat option. I will pause frequently and answer questions.
‘Office’ hours

• **Prof. Rosalba Pernas** office hours:
  Tue: 1pm-3pm – Wed: 3:30-5:30pm
  rosalba.perna@stonybrook.edu

• **TA Alec Wills’s** office hours:
  Mon and Thu: 12pm-2pm
  alec.wills@stonybrook.edu

• We will be available via zoom during those times

• Or email (any of us) to make an appointment at a different time
Welcome to a discovery of the Universe!

“Not everything that can be counted counts, and not everything that counts can be counted”

- Albert Einstein