

Astronomy 4 - *Solar System Astronomy*

Instructor: Dr. Ann Marie Cody

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- Feel free to email me about course questions or astronomy in general.

Online Textbook:

- *Astronomy— 4th Edition*, by Fraknoi, Morrison, and Wolff,
OpenStax FREE textbooks:
<https://openstax.org/details/books/astronomy>

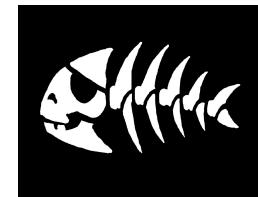
Class website:

- *<https://amcody.github.io/astro4>*
Your one-stop shop for anything course related.

First, a little about your instructor...

YOU CAN CALL ME:

- Dr. Cody (Mrs. Cody is my Mom.)
- Professor Cody,
or just Professor Ann Marie
- Can't remember that, I will still answer
to: Wazzup, Hey, Help, We're Stuck, I
don't get it, or even a good pirate
ARRRGGG Mate....



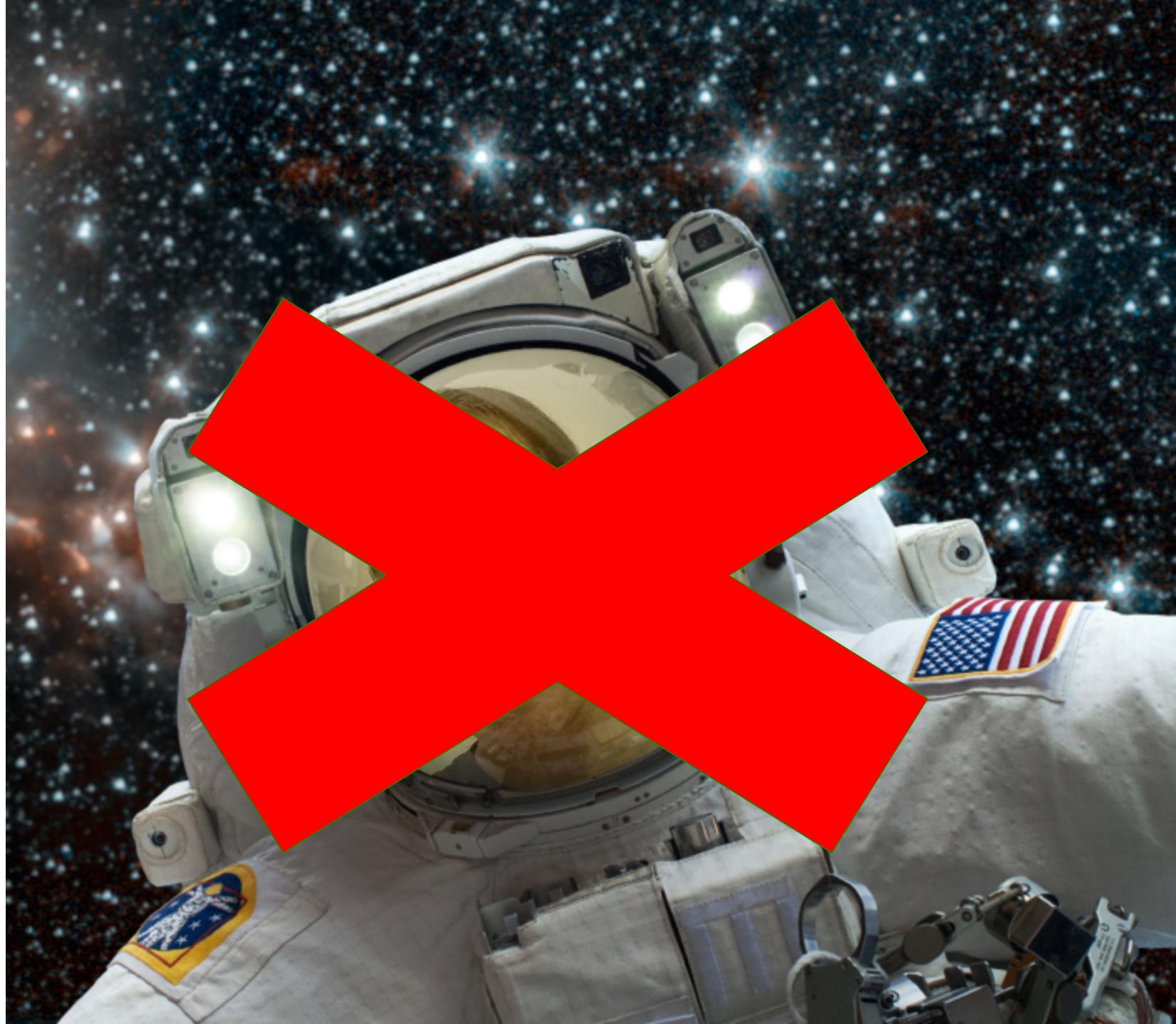
I work at NASA's Ames Research Center
(in Mountain View).





Kepler Space Telescope





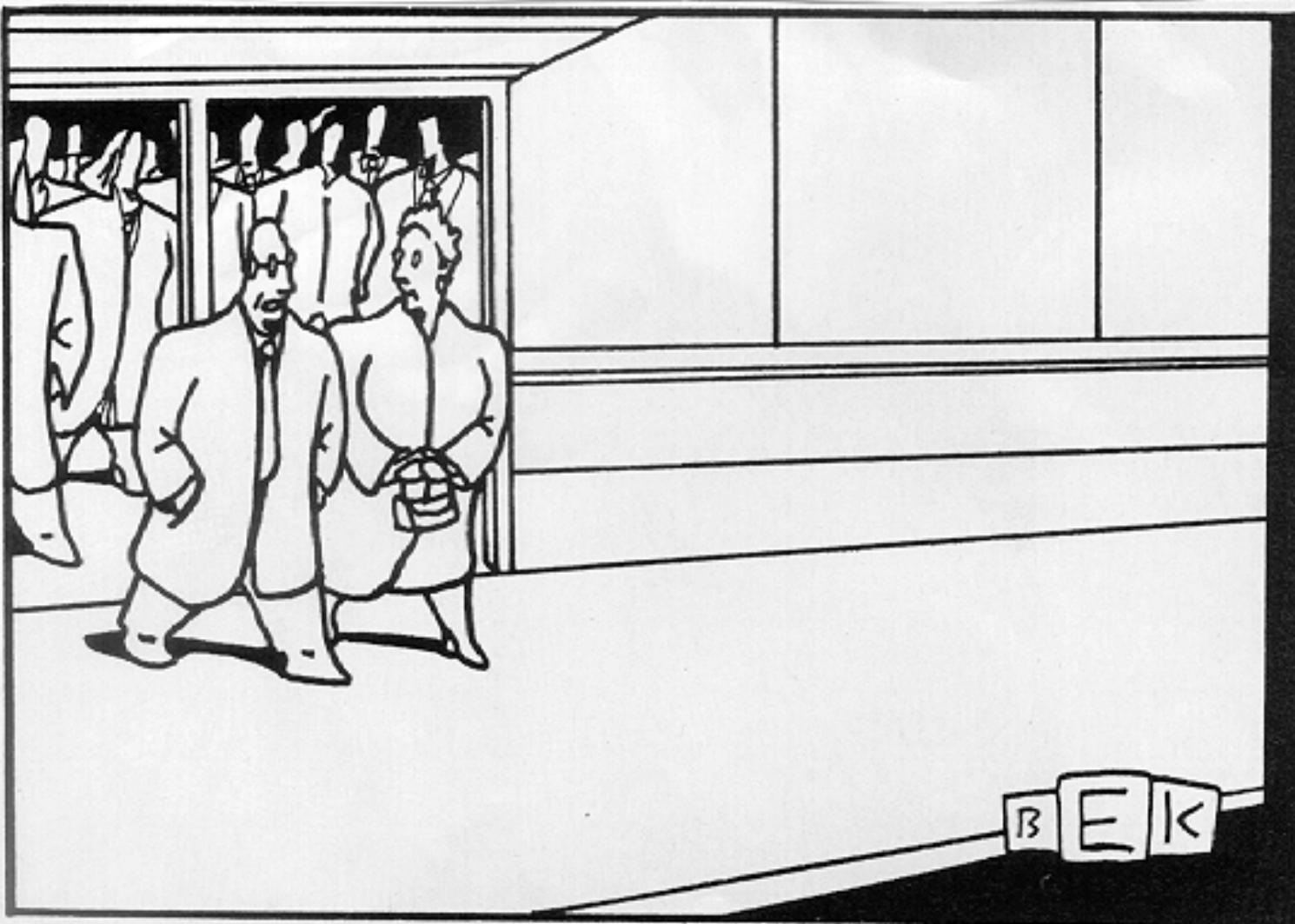


**AS-TRO-NO-MER, I'm an Astronomer,
NOT an Astrologer!**

This Course Satisfies De Anza’s General Education Physical Science Requirement

Solar System Astronomy involves “analysis of the physical principles, logic, and development of solar system astronomy from ancient times through the present. We examine earth and sky relationships, exploration of the solar system by spacecraft and earth-based methods, similarities and differences between Earth and other planets, theories of the origin of our planetary system, and properties of other stars' planetary systems.”

This is Going to be Fun!!



"I've seen it performed many times, but I can't remember ever sleeping through it so peacefully."

How often have you thought or said:

- I just can't do science!
- I just can't do math!
- I understand your lectures and the readings, but I can't do the homework.
- I did all of the homework three times, but I can't do well on your tests.
- ~~I just can't do history!~~
 - From a teaching and learning perspective, just what is it that makes astronomy different?

But first, some questions for you

Do your best!

This is not graded!!

Tell the truth!!!

The length of an Earth day...

...is determined by the time required for approximately one...

- A.) Earth rotation
- B.) Earth revolution
- C.) Sun rotation
- D.) Sun revolution

Something bright in the sky

You look south just after sunset and see a bright object in the sky that is definitely not the moon. It is most likely....

- A.) Venus
- B.) an airplane
- C.) Jupiter
- D.) A UFO

Why are there seasons?

- A.) The Earth spins on its axis
- B.) The Earth is closer to the Sun in summer
- C.) The Earth orbits the Sun
- D.) The axis of the Earth is tipped

What is an astronomical unit?

- A.) distance from the Earth to the Moon
- B.) distance from the Earth to the Sun
- C.) distance from the Earth to the nearest star
- D.) distance light travels in one year

Solar system planets:

Which statement is FALSE?

- A.) None are visible to observers on earth
- B.) They move relative to the stars
- C.) They are found along the zodiac
- D.) They do not twinkle as the stars do

Asteroids and comets

Which statement is TRUE?

- A.) Only asteroids collide with Earth
- B.) Comets are balls of ice and dust
- C.) Most of the trillions of comets in our solar system have tails
- D.) All asteroids lie in the asteroid belt between Mars and Jupiter

More on planets

What is the maximum number of planets visible to the naked eye on a given night

- A.) 2
- B.) 3
- C.) 4
- D.) 5

What is a meteorite?

- A.) A streak of light caused by a star moving across the sky
- B.) A streak of light caused by a small particle from space burning up in Earth's atmosphere
- C.) a fragment of an asteroid from the solar system that has fallen to Earth's surface
- D.) a small moon that orbits one of the giant planets

The Sun

How does our Sun produce energy?

- A.) solar wind
- B.) convection
- C.) nuclear fission
- D.) nuclear fusion

How do we think planets form?

- A.) When two stars collided
- B.) They were captured by our Sun's orbit as they passed by it through space from another galaxy
- C.) They formed from the same cloud of gas and dust as the Sun did
- D.) After an asteroid crashed into the Sun

So what is going to happen in this course?

A look at the syllabus

- *Active engagement with nearly group activities interspersed.*

A Commonly Held Incorrect Model of a Student's Conceptual Framework

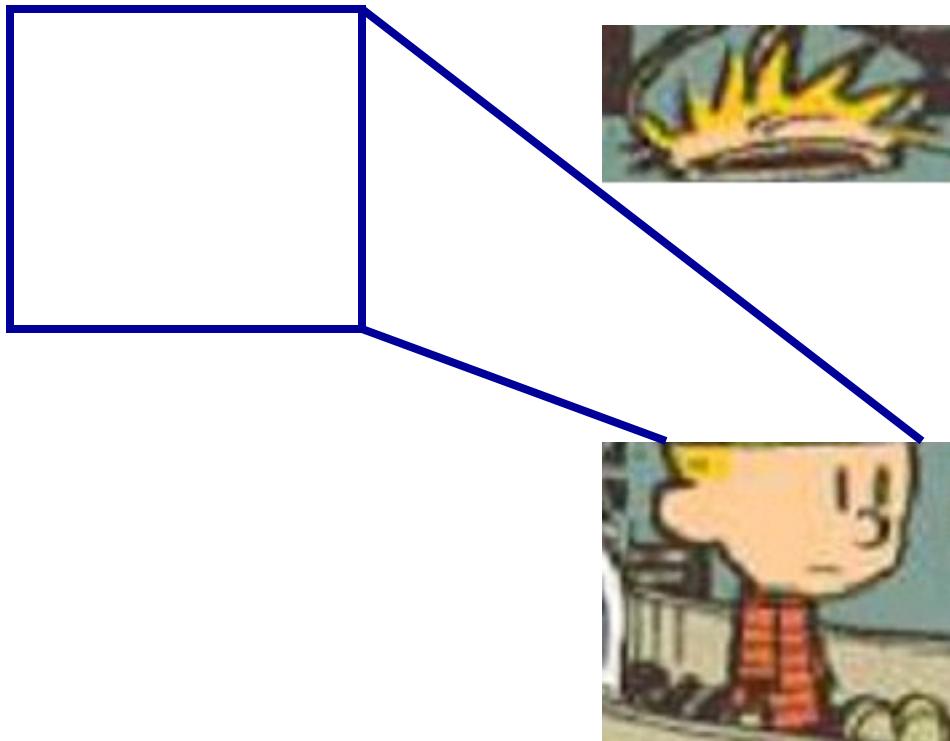


tabla rasa

A Commonly Held Incorrect Model of Teaching and Learning



from *How People Learn*

“Students enter your lecture hall with preconceptions about how the world works. If their initial understanding is not engaged, they may fail to grasp the new concepts and information that are taught, or they may learn them for the purposes of a test but revert to their preconceptions outside the classroom.”

HOW PEOPLE LEARN, National Research Council,
National Academy Press, 2000.

Key results from cognitive science and education research

1. Learning is productive / constructive - learning requires mental effort
2. Knowledge is associative / linked to prior mental models and formal structures
3. The cognitive response is context dependent – what and how you learn depends on the educational setting
4. Most people require some social interactions in order to learn effectively

A look at the syllabus

- *Active engagement with nearly daily group activities.*
- Daily preparation for class
 - ✓ OpenStax readings will be posted on the online calendar
 - ✓ There is no official homework, but you will spend a lot less time studying and be much better prepared for in-class questions if you do the readings in advance

A look at the syllabus

- *Active engagement with nearly daily group activities.*
- Daily preparation for class
- Testing Circumstances
 - ✓ You can drop your lowest, or missed, midterm exam.
 - ✓ Everyone is required to take the CUMULATIVE Final Exam!!
 - ✓ Multiple choice – bring a pencil (not your cell phone)
 - ✓ **No make-up exams for the midterms or Final (exceptions require a written/dean's excuse)!!!**

Exams and Grading

- Absolute grading
 - (no curves, no competition, and **no extra credit**)
- Three Exams (drop lowest) **400 pts**
Jan. 22, Feb. 12, March 4 8:30am
- Final Exam (cannot drop) **300 pts**
March 25 7-9am
- For help with studying, be sure to see the *What2Know* section of our course website

89 – 100	A
79 – 88	B
68 – 78	C
57 – 67	D
< 57	F
<i>No plus or minus grades</i>	

All grades in the class are final **72 hours** after they have been posted and/or returned. Please make sure if you have any grading dispute that you contact us BEFORE this **72 hour** period is over.

How to be *SPECIAL* (*in AMC's class*)!!

- Cell Phone calls or Texting in class
- Don't Participate
- Eat/drink/chew gum
- Be disruptive or disrespectful
- Leave before class is over
- Come late to class - often
- Lie, Cheat, or Steal

Trust me you don't want to be *special*!!!

Some goals of the course

To help you:

- Develop a basic understanding of solar system astronomy: development of planetary systems, and the major planet types, including uniqueness of Earth
- Form an appreciation for the role astronomy has played in shaping the consciousness of the world in the past, at present and what the future holds.
- Evaluate astronomy-related news items using the scientific method, and gain a real world perspective for how astronomy is connected to your daily lives
- Gain the skills and motivation to pursue life long learning and become a valuable member of the workforce and our society

NOT Goals of the course

- Turn you into Math-oholics!
- Expect you to sit there and listen to me lecture non-stop everyday
- Force you to work through an endless array of unconnected assignments (don't worry you will still EARN your five credits!)
- Teach you essentially the same stuff as I would to astronomy majors

My wish is that this experience will
make you a better human...

Breath!!!

Life is a journey not a destination!

The only certain thing in life is change!!