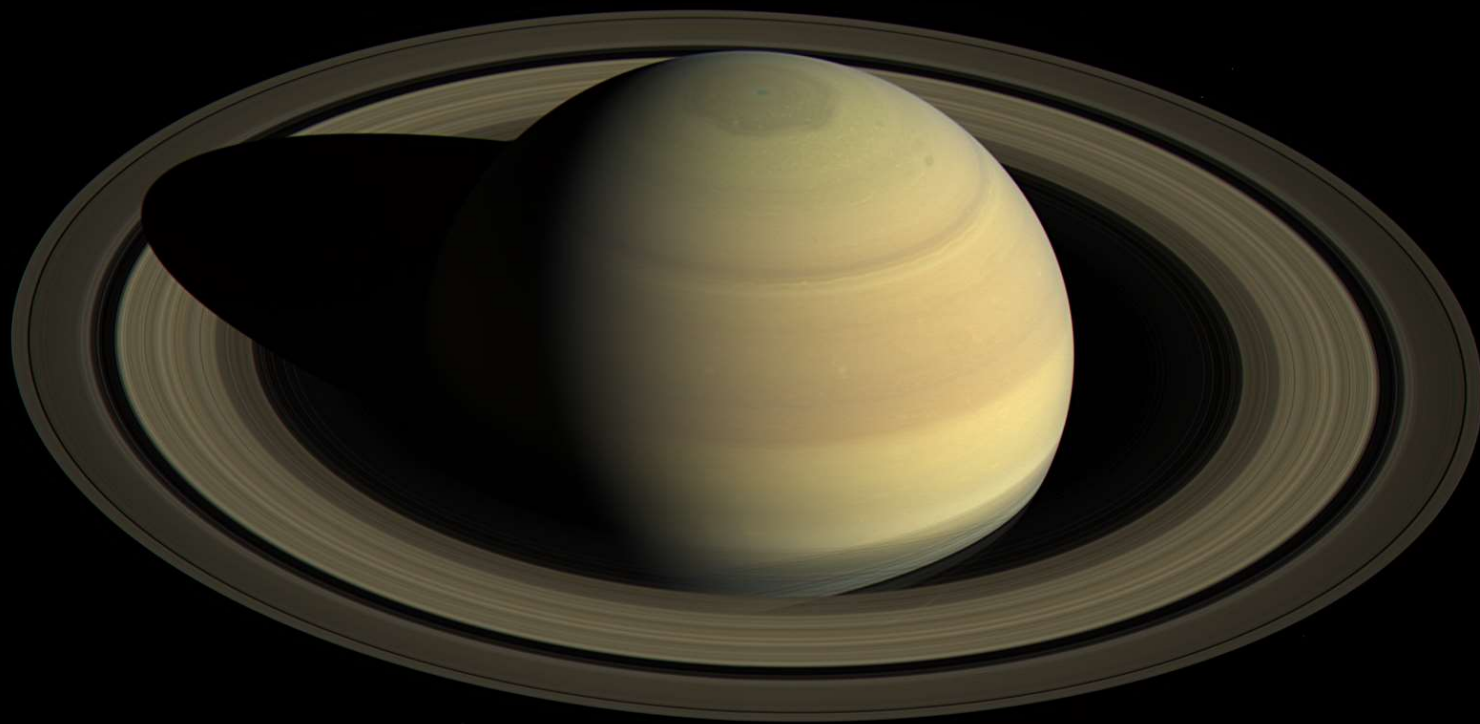


# **AST 2002**

## **Introduction to Astronomy**



# The Exam... what to expect

Exam will be in Class on Friday 9<sup>th</sup> Feb

*- When you come in, please make sure you have plenty of space when you chose a seat*

## Do Bring:

- Scantron

<https://ucfsga.com/services/free-scantrons-and-blue-books/>

- Pencil (2B or #2 recommended)
- Make sure you know your PID
- Scientific Calculator
- An ID – you will need your ID to hand in the exam.

## Don't Bring:

- Books, notes, or phones



# The Exam... what to expect

The Exam will consist of ~35 multiple choice questions.

There will be a few matching questions

There will be ~10 true/false questions

There will be ~5 questions that are meant to tease your brain...

*It will be based mostly on the lecture content BUT the general knowledge questions may rely on content within the books (chapters 6-9 of the essential cosmic perspective, chapters 7-14 of the OpenStax book)*

***THIS GUIDE WILL NOT COVER ALL THE MATERIAL THAT MAY BE ON THE EXAM, FOR THAT YOU SHOULD COVER ALL LECTURE MATERIAL AS WELL AS THAT FROM EITHER TEXT BOOK!!***

# Study Guide – Chapter 6

- A Brief Tour of the Solar System, **ch6\_pt1 slides 6-22**
  - Know the main features of the solar system
    - Planetary distances, densities, temperatures, compositions
    - Asteroid belt, Kuiper belt & Oort cloud
    - The approximate size, composition and temperature of the Sun
  - Can you tell the Kuiper Belt from the Oort cloud?
  - Can you name the planets, in order of increasing distance from the Sun, and tell me why Pluto isn't one?
- Trends across the Solar System, **ch6\_pt1 slides 23-24**
  - How and why do the Terrestrial planets and Jovian planets differ?
    - Rings, moons, densities, formation conditions, compositions, etc.
- The formation of the Solar System, **ch6\_pt1 slides 27-30, Ch6\_pt2 slides 16-**
  - What are the general features of the Solar System that we must be able to explain?
  - What are the exceptions to the rules?
    - And how can these be explained?
  - What are some of the theories on Solar system formation? (e.g., can you explain Nebular Theory?)
    - Can you explain gravitational collapse, conservation of angular momentum, and why does it get hot and flatten out?
  - What is the snow line?
  - At what temperatures do metals, rocks, and hydrogen compounds condense and what proportion of the Solar Nebula are they?

# Study Guide – Chapter 6 cont.

- How did the Jovian planets form?, [ch6\\_pt2 slides 26-34](#)
  - What are planetesimals?
  - Why does the frost line matter so much?
  - What was the size of the cores of Jovian planets during accretion, and why did they grow to have different sizes and compositions? ... what stopped them?
- Exceptions to the Rules, [ch6\\_pt2 slides 35-37](#)
  - What are the exceptions to the rules, and how can we explain them?
  - What is the evidence for impacts?
  - What is radiometric dating and how does it work?
    - Do you understand the process and calculation well enough to answer questions?

# Study Guide – Chapter 7

- The Terrestrial Planets, [ch7\\_pt1 slides 14-19](#)
  - What are some of the main features common to the terrestrial planets?
  - What features are unique to each planet?
  - What is comparative planetology?
- Interiors, [ch7\\_pt1 slides 20-45](#)
  - What are S and P waves, and how do they inform us about the interior of planets?
  - Why does size matter when it comes to internal heat sources?
  - What are the main heat sources for terrestrial planets?
  - Can you describe differentiation?
  - How do bodies cool? – what is the role of surface area to volume ratio?
  - Why are large bodies round?
  - What are the different interior layers of the Earth and Terrestrial planets?
- Geological Processes, [ch7\\_pt1 slides 46](#)
  - Cratering Impacts and Surface ages
  - Volcanism and outgassing
  - Erosion and its connection to wind/rain/ice
  - Tectonics (and its relationship to climate stability on Earth)

# Study Guide – Chapter 7 cont.

- Magnetospheres, [ch7\\_pt3 slides 5-6](#)
  - What causes a magnetosphere on Earth (and on other planets?)
  - How does this interact with the Solar Wind?
- Atmospheres, [ch7\\_pt3 slides 7-11](#)
  - What are the different layers of the atmosphere?
  - How does the atmosphere protect us from radiation? – what radiation is let through? ... why?
  - Why is the sky blue, and sunsets red?
  - What is the greenhouse effect? What gases are most important for this effect? Why?
- Mercury and the Moon, [ch7\\_pt3 slides 12-13](#), [ch7\\_pt2 slides 30-39](#)
  - What is the evidence for geological activity on these bodies?
  - How long ago did it occur?
- Mars, [ch7\\_pt3 slides 15-17](#), [ch7\\_pt2 slides 40-62](#)
  - What is the evidence for past water on Mars?
  - Why did Mars change? What is the current theory about why Mars lost its water?
  - Is there water currently on Mars? If so, where is it?

# Study Guide – Chapter 7 cont.

- Venus, [ch7\\_pt3 slides 26-35](#)
  - Evidence of geological activity on Venus?
  - What is the surface age of Venus?
  - What is the runaway greenhouse effect?
  - How does the greenhouse effect compare for Earth, Venus, and Mars?
- Earth as a living planet, [ch7\\_pt3 slides 38-58](#)
  - Why is liquid water important on Earth, for life, and for geological cycles?
  - Where did atmospheric oxygen come from, how do we know, and would we expect to find it elsewhere?
  - What are plate tectonics? And how do they help with climate stability on Earth?
  - How do the plates evolve in time?
  - What is the carbon dioxide cycle on Earth, and how does it work as a feedback loop for global warming?
  - What is the evidence to support that humans are causing climate change on Earth?
  - What makes a planet habitable? – think of planetary size and distance as being two important factors.
  - What is the role between planetary size, heat retention and the surface ages of terrestrial worlds?



# Study Guide – Chapter 8

- Jovian Planets, [ch8\\_pt1 slides 22-49](#)
  - What missions have flown to the Jovian planets?
  - How, when, and where are the Jovian planets thought to form? Is migration a factor?
  - What happens to the size of Jupiter as you add more mass?
  - How do the compositions of the Jovian planets differ from one another? Similarity to the Sun?
  - Do the Jovian planets have strong or weak magnetic fields?
  - Can we see their aurora? What is the connection between the magnetic field and their moons?
  - What are the atmospheres composed of, and how can we tell?
  - What is the weather like on the Jovian planets?
  - What is Jupiter's Big red Spot?
  - What is the relation between heat received and heat flux out of Jovian planets? [Ch9\\_pt1\\_slide3](#)
- Jovian Rings, [Ch8\\_pt1 slides 37-40](#), [Ch8\\_pt2 slides 68-70](#)
  - All the Jovian planets have rings, but how do they differ in size, shape, composition?
  - For Saturn, what are the causes of the gaps and what is so special about Enceladus?
  - What is thought to be the origin of the Rings?

# Study Guide – Chapter 8 cont.

- Jovian Satellites, [ch8\\_pt2 slides 28-67](#)
  - Why are the medium and large moons spherical?
  - Where did the medium and large moons form? Are any of them captured objects?
  - What are Jupiter's Galilean Moons?
    - Io. What is the cause of its geological activity?
    - Europa, what distinct features make this interesting for future missions?
    - Europa – can you explain the surface features?
    - Ganymede – what can you tell me about this moon? How could it have a magnetosphere?
    - Callisto (see [Ch9\\_pt1 slide 10](#))
  - Which moons of Saturn are interesting?
    - Titan – what is going on with all those hydrocarbons?? What did the Huygens probe tell us?
    - Enceladus – what is the source of the plume, and what is it doing at Saturn?
  - What are the main moons of Uranus?
  - Why is Triton so unique at Neptune?
  - What is the reason that less heat is required for activity on the small moons and what is the origin of this heat in most cases??

# Study Guide – Chapter 9

- Classifications, [ch9\\_pt1 slides 34-37](#)
  - What are asteroids?
  - What are comets?
  - What are dwarf planets?
- Meteorites, [ch9\\_pt1\\_slides 38-51](#)
  - What are meteors, meteoroids, and meteorites?
  - How to identify a meteorite
  - Primitive vs. processes meteorites
  - How do we know that meteorites originate from: a) Mars ... or b) differentiating bodies
  - What sort of things do we find in carbonaceous chondrites? What do these tell us about the early conditions of the Solar System? What else can we learn from meteorites?
- Asteroids, [ch9\\_pt1\\_slides 38-51](#), [ch9\\_pt2 slides 11-](#)
  - Where are the asteroids located? How many are there?
  - Why didn't a planet form in the asteroid belt, and how big would it be if it did?
  - What missions have been to the asteroids? Which returned samples?
  - How do asteroid compositions vary?

# Study Guide – Chapter 9 cont.

- Comets, [ch9\\_pt2 slides 28-38](#)
  - What are comets? What are the main parts of a comet?
  - Why do they start to grow tails? Why are there two tails, and where do they face?
  - Where do short and long periods of comets come from? How can you tell?
  - Where did comets from the Kuiper Belt and Oort cloud originate from?
  - What is the association between comets and meteorite showers?
  - What missions to comets have there been? Were any sample return missions? If so, what did they find?
- Pluto and the Kuiper belt, [ch9\\_pt2 slides 39-46](#)
  - What can you tell me about the Pluto-Charon system? Size, moons, interiors, composition?
  - Why is Pluto classed as a dwarf planet? ... or as a Kuiper belt object? (or Trans-Neptunian object)
- Impacts, [ch9\\_pt2 slides 48-62](#)
  - What is the evidence for an impact wiping out the dinosaurs?
  - How frequent do large impacts occur on Earth? ... in the Solar System?
  - What is the role of Jupiter?

**Good Luck!**