Presentations

When: Monday, December 6th at 6-9 pm.
Duration: ≈ 10-13 min, then 0-5 min for questions/discussion.
Format: any combination of slides and/or whiteboard. Email slides to me before class starts on December 6th.
Preparation: 3–6 hours of effort, see next page for details. Class replaced with open office hour on November 29, where you may come and discuss as you work. I'm also available by email or appointment if you would like to get feedback or do a dry-run of your talk.
References: Include references on your slides where appropriate and list them on the last slide in your presentation slides.
General guideline: it is often more compelling to discuss a few sub-topics that you know well, versus putting lots of content that is glossed over / simply read off your slides.

During presentations: everyone should answer the following questions for each talk; your responses will be given to the presenter. Printed forms will be provided on the day of the presentation.

- What's one thing you learned and/or enjoyed?
- What's one strength of the presentation that aided clarity, engagement?
- If you were to give the same talk, what would you change to convey the ideas more clearly?

Come ready to ask questions during and after each talk; these will count for participation. Any kind: "I didn't understand your sentence just now", asking for more information, informed disagreement, etc. will count.

Grading: 18 % of your final grade (two lab scores). 8% for the presentations, and rest 8% for your participation (This is excluding the 10% overall participation points)

Content: 75%

- Presenter [___] introduce(s) and describe(s) topic at level appropriate to this class
- Presenter [___] explain(s) extent of and limitations on our knowledge on the topic, including data/observations underlying knowledge
- Presenter [___] provide(s) context by drawing connections to, e.g., different areas of astronomy, concepts from lab or lecture, other areas of science, areas outside of science, etc.
- Presenter chooses and cites appropriate references (i.e., goes beyond Wikipedia and popular press releases). Presenter submits reference list.

[_] = easily and concisely (4), sufficiently (3), is somewhat able to (2), struggles to or cannot (1)

Delivery: 25%

- Presentation has a logical flow that audience can [___] follow
- Presentation aids (slides or boardwork) are [___] understood by audience
- Presenter speaks clearly, faces audience and makes (or approximates) eye contact
- Presenter can [___] address reasonable audience questions
- Presenter stays within allotted time

[_] = easily (4), sufficiently (3), somewhat (2), barely or not (1)

Adapted from Am. Astron. Soc. Chambliss and other rubrics

Possible topics

A not-comprehensive list of possible topics are listed below. You can choose something not listed, so long as it's within the realm of astronomy, our solar system, planets, exoplanets, and stars. It should be something you haven't covered in depth in class or this lab.

I recommend you go one step deeper for most of the below suggestions. Good topic: "The Great Red Spot and other storms, vortices, and zonal flows on Jupiter". Not-as-good topic: "Gas giant atmospheres". This will help both you and me determine whether your topic is well-suited for a 10–13min presentation.

- Solar system planets (including Earth)
  - surface geology and chemistry, prospects for life
  - atmospheres, climate
  - magnetospheres, magnetic field, aurora
  - rings and moons
  - Earth: formation of the Moon
- Smaller solar system bodies
  - Asteroids (incl. Ceres)
  - Comets (incl. Halley's Comet)
  - Kuiper Belt Objects (incl. Pluto)
- Sun
  - Interior structure, nuclear fusion, chemistry
  - Birth, life, and death
  - Deeper exploration of: sunspots, magnetic reconnection, flares and CMEs, tornados
  - Solar neutrinos
  - Helioseismology
- Planet/star formation
  - Solar system formation and history; meteorites
  - Age of the solar system
  - Proto-planetary disks
  - Planet and planetesimal formation
  - Brown dwarfs
  - Star formation (very broad, you'll have to narrow further)
- Exoplanets and exo-objects
  - Types of exoplanets: size, mass, composition. Rocky and gaseous planets.
  - Exoplanet atmospheres, chemistry
  - Exoplanet detection methods (choose one) and future missions
- Spacefaring; Search for Extraterrestrial Intelligence (SETI)
  - Astrobiology, chemistry; the habitable zone
  - Speciation and extinctions on Earth
  - Energy usage, Dyson spheres
  - Communication and signal detection; candidate SETI signals
  - Space travel;
- Telescopes and spacecraft
  - Ground- versus space-based telescopes
  - Specific missions/projects: Gemini Planet Imager, Hubble, Kepler, TESS (telescopes); Curiosity, OSIRIS-Rex, Dawn, Deep Impact, Rosetta/Philae (robots/probes); Juno, Cassini, New Horizons, Voyager (orbiters and fly-by spacecraft); many others.

  - NASA budget, mission, proposals. How funding decisions are made.

Other options (equally encouraged):

- Present a scientific paper. I recommend looking at the Daily Paper Summaries on Astrobites (https://astrobites.org/). This is a blog that summarizes scientific papers at an introductory level; summaries are written by astro graduate students and aimed for undergrad/grad students alike. Other sources of brief, accessible scientific papers include Nature (https://www.nature.com/), Nature Astronomy (https://www.nature.com/natastron/), and Science (https://www.sciencemag.org/). For popular press that can direct you to interesting papers, consider: https://www.quantamagazine.org/physics or https://www.scientificamerican.com.
- Biographical study of a famous astronomer or planetary scientist (you can choose your own or from the list below!). If you do this, choose at least one scientific contribution to emphasize.
  - Galileo Galilei
  - Johannes Kepler
  - Caroline Herschel
  - Annie Maunder
  - Annie Jump Cannon
  - Cecilia Payne-Gaposchkin
  - Carl Sagan
  - Jill Tarter
  - Sara Seager
  - Vera Rubin
  - Andrea Mia Ghez