Final Presentations

When: Tuesday April 6th at 6:00 PM.
Duration: 10–15 minutes (10 min minimum), followed by 0–5 min for questions/discussion.
Format: Any combination of slides and/or whiteboard. Email slides to me by April 5rd 5 PM.
Preparation: 3–6 hours of effort, see next page for details. Class replaced with open office hour coming March 30th, 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: You should send me the list of research papers, popular articles, websites, books, chapters referred by 5 PM on April 5rd, along with your slides. You should include references in your presentation that you used at appropriate locations. No special formatting or citation style is needed.
A 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 feedback 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: E.g., "I didn't understand your sentence just now, as it is contradictory with previous statement", asking for more information, hypothetical questions based on relevant scenarios, etc. will count. More thought-out the questions are better. But, we believe that no question is a bad question.

Grading: 16% of your final grade – 8% for the presentations, and rest 8% for your participation (This is excluding the 20% overall participation points). Here is a rubric[1] for your 'presentation'.

Content: 70%

- (35%) Presenter [___] introduces and describe(s) topic at level appropriate to this class
- (40%) Presenter [___] explains extent of and limitations on our knowledge on the topic, including data/observations underlying knowledge
- (20%) Presenter [___] provides 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.
- (5%) Presenter chooses and cites appropriate references (i.e., goes beyond Wikipedia and popular press releases). Presenter submits reference list.

Delivery: 30%

- (35%) Presentation has a logical flow that audience can [___] follow
- (25%) Presenter can [___] address reasonable audience questions
- (20%) Presentation aids (slides or boardwork) are [___] understood by audience
- (10%) Presenter stays within allotted time
- (10%) Presenter speaks clearly, and keeps the audience engaged (questions, activities, etc.)

[_] = easily and concisely (4), sufficiently (3), is somewhat able to (2), barely to did not (1)

[1] Chiefly adapted from the American Astronomical Society—Chambliss award rubric.

Suggested topics

A not-comprehensive list of suggested topics follows. You can choose something not listed, so long as it's within the realm of starts, galaxies, cosmology, and related topics relevant to our lab's focus area. 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 10–13 min presentation.

- Galaxies (including our own)
  - Supermassive black hole and galactic dynamics (birth, growth, rotation, etc.)
  - Different theories of dark matter
  - Intergalactic medium
  - Galactic halo, and dark matter content of different galaxies
  - Stellar life cycle—from birth to supernova!
  - Dark energy
- Stars (including Sun)
  - Interior structure, chemistry and phase composition
  - Asteroseismology (aka starquakes!)
  - Surface properties, and stellar atmospheres, and magnetospheres
  - The process of star formation, and star forming regions in galaxies
  - Stellar life cycle—from birth to supernova!
  - Binary star systems
- Planets
  - Solar system formation and history
  - Proto-planetary disks
  - Planet and planetesimal formation
  - Brown dwarves
  - Exoplanets: Types, detection methods, atmosphere, future missions, etc.
  - Are we alone?
- Telescopes and spacecraft
  - Ground- versus space-based telescopes
  - Specific missions/projects: Hubble, James Webb Space Telescope, Kepler, Very-long-baseline interferometry, Rossi X-ray Timing Explorer (RXTE), Large Synoptic Survey Telescope, Chandra (or your other favorite choice).
  - NASA budget, mission, proposals. How funding decisions are made.
- Miscellaneous
  - Gravitational waves and LIGO
  - Compact objects (Black hole, neutron stars, white dwarf)
  - Mysterious signals (Fast Radio Bursts, Gamma Ray Bursts)
  - Big bang, and the acceleration of Universe (inflation, nucleosynthesis, final fate, etc.)
  - Clusters (of stars and galaxies)
  - Present any scientific paper. I recommend looking at https://arxiv.org/archive/astro-ph to choose your favorite field within astronomy. Then go through some of the papers' titles to narrow down to a paper of your liking.