Milestone 1: Literature review

Staying up-to-date on the literature is one of the most important parts of an astronomer's job. Reading (or at least skimming) papers is a great way to become familiar with new research areas, catch up on the latest results in your field, and get inspiration for new projects. As a researcher-in-training, you don't have to pay close attention to the literature *yet*, but developing strategies for reading papers quickly and effectively now will be incredibly beneficial later on.

Due date: before class on 2/28

Learning objectives

This assignment is designed to help you:

1. **Develop critical reading skills** so that you can confidently navigate and extract key information from astronomical literature.
2. **Understand different paper types** so that you can distinguish between a review article and an original research article.
3. **Visualize scientific narratives** by creating visual and textual summaries (storyboards) that outline the logical flow of your chosen papers.
4. **Build familiarity with your chosen field** to prepare you for conducting independent analysis with relevant datasets.

Task description

You have already chosen a research question or area of interest to focus on for this semester. To better understand the context of your chosen field, you'll select and read:

1. **1 review article:** A longer work that provides an overview of a broader topic or field, summarizing and synthesizing important results.
2. **1 research article:** A paper that presents original research, including methods, analysis, and conclusions.

Step 1: Finding and reading the papers

Search for and select your papers using the techniques we discussed in class. For best results, use NASA ADS or arXiv, and include keywords relevant to your topic in your query. Before you start reading, I'll check in with you quickly to approve your choices.

Once your papers have been approved, go ahead and start reading! You may use whatever reading techniques work best for you.

Step 2: Creating the storyboards

For each paper, create a storyboard showing the paper's logical flow. The storyboards should include the following elements:

Review article

1. Topic: What is the key topic being discussed?
2. Background/context: How did the field get to this point?
3. Current knowledge: What is the current state of the field? Include major themes/trends and open debates.
4. Future directions: What are the most promising directions for future research?

Research article

1. Research question/objectives: What is being investigated?
2. Background/context: Why is this research important?
3. Methods: Summarize the techniques or approaches used.
4. Key results: What are the main outcomes of this study?
5. Conclusions and implications: How do the authors interpret their results? What are the implications for the field?

Both articles

1. Title and citation: Include the title of the paper along with a parenthetical citation in the style (Name+Year)
2. Visual elements: Represent the flow of ideas as clearly as you can

Each storyboard should be at least one page. You can either hand-draw/write them and take pictures, or design them digitally in something like PowerPoint or Keynote.

You're encouraged to be creative! Use visuals, arrows, or whatever you'd like to illustrate relationships between ideas. Try to organize the storyboards so that a viewer can follow the narrative without having read the paper. If you incorporate visual elements, please also include brief annotations (bullet points or short sentences) explaining each visual.

Rubric

Criteria	Excellent	Satisfactory	Needs improvement
Understanding of content	Demonstrates a clear and thorough understanding of the paper's main ideas. All key elements are accurately identified.	Shows understanding of most key points, with some omissions or inaccuracies.	Lacks clear understanding. Many key points are missing or misinterpreted.
Visual organization & clarity	Storyboard is clear, logical, and well-organized. Visuals effectively enhance the narrative.	Organization is generally clear, though some areas may be confusing or cluttered. Visuals are present but could be improved.	Storyboard is disorganized or hard to follow. Visuals do not effectively convey the information.