Finding journal articles using ADS (https://ui.adsabs.harvard.edu/)

Strategy 1: General topic searches:

- Think of "keywords": words that are commonly used in describing the science theme. Example: "color gradients", "galaxy populations", "supernovae remnants", etc."
- Do an abstract search: `abs:"galaxy populations"` (words together) or `abs:("galaxy","populations")` (words individually)
- Refine the search by adding new abstract words: `abs:("galaxy populations","cluster environment")`
- Search for refereed publications: `property:refereed`
- Look for well-cited papers: `citation_count:[50 TO 10000]` (but be careful, you could miss interesting papers this way)
- Look for articles in the main astronomy journals:

  ApJ: Astrophysical Journal **A&A**: Astronomy & Astrophysics

  AJ: Astronomical Journal **MNRAS**: Monthly Notices of the Royal Astronomical Society
- **REALLY USEFUL**: Search for review articles in Annual Reviews of Astronomy and Astrophysics: `bibstem:"ARA&A"`
- Look at titles, if one looks interesting, click on it to read the abstract. If the abstract looks interesting, download the paper and look in more detail.

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Strategy 2: Starting from a known paper

- My course notes for other classes (e.g., ASTR 222, ASTR 323, ASTR328) often have citation links.
- Find the paper on ADS by searching on first author and year: `author:"^Mihos" year:2005` (^ means first author)
- Click on the paper title, then in left side menu click any of
  - Citations (other papers that cited this paper), or
  - References (other papers that this paper cited)
  - Co-reads (other papers read by people who read this paper)
  - Similar papers

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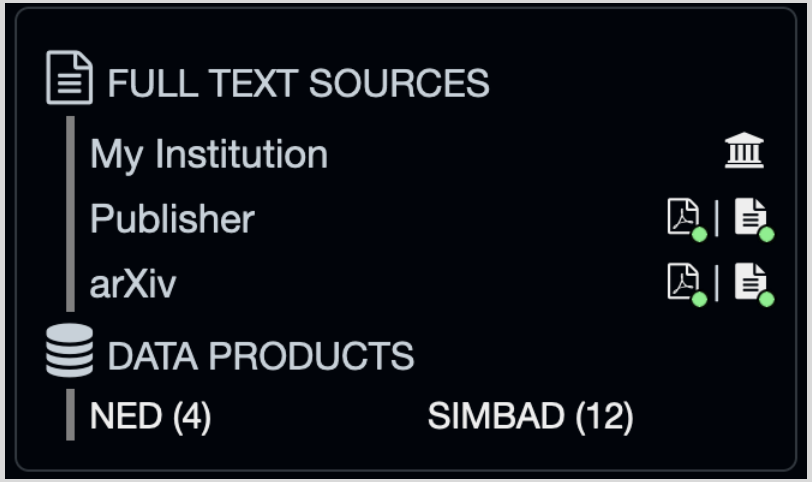

Strategy 3: When you have a paper that looks interesting

- Download the paper using the right hand panel. You can download from "Publisher" (may need to be on CWRU network) or "arXiv". Older papers will have an "ADS" option. Ignore "My Institution".

- Don't plan to read the whole thing and try to understand everything in detail.

- Instead:
  - Read the abstract for the overall summary
  - Look at the figures to see their data
  - Read their conclusions
  - Read the introduction to get more ideas on background and other work being done.
  - If it really looks useful, ***then*** read the whole thing.

- Follow the citation trail. If it's a useful paper,
  - Look up papers that it cites as being important
  - Look at papers that has cited it (ADS Citation search, see strategy #2)
  - Look at ADS Co-Reads or Similar Papers (see strategy #2)

Literature Searches: Big Picture Philosophy

- All this is a slow process and takes a lot of time.
- This is *fundamental* to the scientific process, it is what we do as scientists.
- It is critical for both understanding the problem, and explaining your project. It is not just “required busy work”, it makes us better scientists and it helps us do better science.
- It takes time, effort, and experience to get right, and even senior astronomers still screw it up (including me!)
- Your responsibilities, and my expectations:

    1. Do your best, try different strategies, get a feel for how to do searches and distill information from the published literature. Your goal here is to learn how this process works.
    2. You will feel overwhelmed by the volume of literature. This is normal. It’s okay. See point #1.
    3. You will miss some important references, and get side-tracked by things that may not help. That’s okay. See point #1.
    4. There is no right answer here. Different searches on the same topic will lead down different paths.
    5. I am not looking for a specific outcome, I am looking for a good faith effort. It’s usually straightforward to tell the difference between that and something thrown together in a rush at the last minute.

Citations: Why? When? How?

- To give proper credit to others' work
- To support your arguments and factual claims
- To ground your work in the broader scientific context
- To give a trail for readers to learn more about the topic.
- To demonstrate your awareness and understanding of other work in the field and establish your credentials as a researcher.

failed massive objects and lower-mass dwarf-sized galaxies (e.g., Lim et al. 2018, 2020; Doppel et al. 2021).

The cluster environment offers additional evolutionary pathways to explain cluster UDGs. One possibility for cluster UDGs is that they started as otherwise normal dwarf galaxies but have been dynamically heated and "puffed up" by interactions within the cluster (Moore et al. 1996; Carleton et al. 2019; Liao et al. 2019; Tremmel et al. 2020) or after gas is ram-pressure-stripped by the intracluster medium (Safarzadeh & Scannapieco 2017). UDGs that are satellites in groups and clusters have also been shown to form by tidal stripping of otherwise normal galaxies either with (Carleton et al. 2019) or without (Sales et al. 2020) cored dark matter halos. However, not all cluster UDGs may have formed in response to the cluster environment; simulations show that a significant fraction of UDGs found in clusters may have been an object "born" as UDGs in the field environment and later accreted into the cluster (Sales et al. 2020).

Citations: Why? When? How?

- When making general statements about past work on a topic: “Previous studies have shown that galaxies in clusters are preferentially red [citations].”

- When giving factual data that someone else worked out: “The distance to the Virgo Cluster is 16.5 Mpc [citation].”

- When supporting an important claim that you are making: “Tidal stripping should affect low mass galaxies more than massive galaxies [citation(s)].”

- When planning to test a particular model, theory, or result: “Our observations will test tidal stripping models such as those of [citation].”

Citations: Why? When? How?

Astronomical Literature *(Please use this format in this class!)*

Parenthetical (Author Year) in text, full citation in list at end of document.

- Single author: “Tidal tails are visible for 1-2 Gyr (Mihos 1995)”
- Two authors: “Galaxy mergers trigger starbursts (Mihos & Hernquist 1996)”
- Three or more authors: “The distance to VCC615 is 17.7 Mpc (Mihos et al 2015)”

Citations at end listed in alphabetical order.

- Format: Author(s) Year, Journal, Volume, Page or Article Number
- Example: Mihos et al 2015, ApJ, 638, 17

List multiple citations in chronological order: “The Virgo Cluster contains many diffuse galaxies (Binggeli et al 1996, Mihos et al 2015, Ferrarese et al 2019).”

If your sentence references the work as a grammatical part of the sentence, only the date is parenthetical: “The models of Mihos et al (1995) have shown that….”

Citations: Why? When? How?

Physics Literature *(Please **do not** use this format in this class!)*

Bracket [Number in end list] in text, full citation in list at end.

- Single author: “Tidal tails are visible for 1-2 Gyr [3]”
- Two authors: “Galaxy mergers trigger starbursts [12]”
- Three or more authors: “The distance to VCC615 is 17.7 Mpc [25]”

Citations at end listed in order of appearance in text.

- Format: Number, Author(s) Year, Journal, Volume, Page or Article Number
- Example: [15] Mihos et al 2015, ApJ, 638, 17

List multiple citations in order of appearance in end list: “The Virgo Cluster contains many diffuse galaxies [12, 17, 32].”

If your sentence references the work specifically, just cite via citation number: “The models of [17] have shown that….”

Citations: Why? When? How?

Other notes:

- Direct quoting is extraordinarily rare in the sciences. Do not quote your sources, just summarize their findings using your own words, and give citation to their work.

- Citations should be to journal articles, technical documents, preprints, or works published in scientific monographs (books).

- Data aggregator websites (including NED or Simbad) are typically not appropriate as cited source. If you get data using NED, look at the citation NED gives for the data, and cite that source directly.

- For examples of how citations are used, look at the (good) proposal example and the journal articles you find.