Finding academic papers and citing them

Academic papers

- In scientific research, papers are published to thoroughly communicate
  - New results
    - New measurements, new discoveries, analyses that lead to null results, etc.
  - New methods
  - Sometimes an overview of the current state of a subfield of research
    - Review articles

What papers do we want to find?

- Gold standard - peer reviewed by a “reputable” journal
  - Scientific accuracy relies on the process of peer review
  - The process is managed by journals
    - Executed by peers (other scientists)

Common journals for astronomy

- The big guns - only for the highest impact results (across all of science)
  - Nature
    - Nature astronomy - slightly lower standards on impact but still high
  - Science
- American Astronomical Society (AAS) Journals
  - Astrophysical Journal (ApJ)
    - General astrophysical results and methods
  - Astrophysical Journal Letters (ApJL)
    - For timely, higher impact results
  - Astrophysical Journal Supplement Series (ApJS)
    - Papers publishing large catalogs or extensive data
  - Planetary Science Journal (PSJ)

Common journals for astronomy

- Astronomy and Astrophysics (A&A)
  - European based
- Monthly Notices of the Royal Astronomical Society (MNRAS)
  - UK based
- Other more specific journals
  - Journal of Cosmology and Astroparticle Physics
  - Experimental Astronomy
  - Astroparticle Physics
  - Physical Review D - Particles, Fields, Gravitation and Cosmology
  - Etc.
- Many others

Gold standard - pros and cons

- Pros
  - The obvious pro - Peer reviewed
  - Went through a professional editor
- Cons
  - money / access
    - Many of these journals are not free to access
    - Some (like AAS journals) are now open access
  - Timeliness
    - Peer review and editing takes time

Other option - the arXiv

- The arXiv
  - Free service to post and view academic papers
  - astro-ph
- Pros
  - Free / open access
  - Results can be posted before they appear in a journal
  - Articles that don’t fit into journals can be posted
    - Ex: Observing timeline of gravitational wave observatories
  - Citable
- Cons
  - The arXiv does not peer-review these articles!
    - They may be peer reviewed by some other journal though

How to actually find these papers?

- Google can work sometimes
- Google scholar works even better
  - Google search specifically for academic papers
- arXiv is searchable and contains most papers from journals (though not all)
- Probably the best resource - astrophysics data system (ADS)
  - An online database of astronomy related papers
    - Across most journals and the arxiv
    - Even have scans of old papers
  - Searchable

VIEW
Abstract
Citations (681)
References (48)
Co-Reads
Similar Papers
Volume Content
Graphics
Metrics
Export Citation

A bright millisecond-duration radio burst from a Galactic magnetar

Show affiliations | Show all authors

CHIME/FRB Collaboration ; Andersen, B. C. ; Bandura, K. M. ; Bhardwaj, M. ; Bij, A. ; Boyce, M. M. ; Boyle, P. J. ; Brar, C. ; Cassanelli, T. ; Chawla, P. ; Chen, T. ; Cliche, J. -F. ; Cook, A. ; Cubranic, D. ; Curtin, A. P. ; Denman, N. T. ; Dobbs, M. ; Dong, F. Q. ; Fandino, M. ; Fonseca, E. ; ...

Magnetars are highly magnetized young neutron stars that occasionally produce enormous bursts and flares of X-rays and γ-rays[1]. Of the approximately thirty magnetars currently known in our Galaxy and the Magellanic Clouds, five have exhibited transient radio pulsations[2,3]. Fast radio bursts (FRBs) are millisecond-duration bursts of radio waves arriving from cosmological distances[4], some of which have been seen to repeat[5-8]. A leading model for repeating FRBs is that they are extragalactic magnetars, powered by their intense magnetic fields[9-11]. However, a challenge to this model is that FRBs must have radio luminosities many orders of magnitude larger than those seen from known Galactic magnetars. Here we report the detection of an extremely intense radio burst from the Galactic magnetar SGR 1935+2154 using the Canadian Hydrogen Intensity Mapping Experiment (CHIME) FRB project. The fluence of this two-component bright radio burst and the estimated distance to SGR 1935+2154 together imply a burst energy at 400 to 800 megahertz of approximately 3×10^{34} erg, which is three orders of magnitude higher than the burst energy of any radio-emitting magnetar detected thus far. Such a burst coming from a nearby galaxy (at a distance of less than approximately 12 megaparsecs) would be indistinguishable from a typical FRB. However, given the large gaps in observed energies and activity between the brightest and most active FRB sources and what is observed for SGR 1935+2154-like magnetars, more energetic and active sources—perhaps younger magnetars—are needed to explain all observations.

Publication: Nature, Volume 587, Issue 7832, p.54-58

Pub Date: November 2020

DOI: 10.1038/s41586-020-2863-y
10.48550/arXiv.2005.10324

arXiv: arXiv:2005.10324

Bibcode: 2020Natur.587...54C

Keywords: Astrophysics - High Energy Astrophysical Phenomena

E-Print Comments: Submitted to Nature. This version: Geocentric arrival time corrected

Get paper from journal or arxiv

- This of course can still be overwhelming!
  - Hard to even know what to search sometimes

- The best resource to find specific papers, other papers!
  - Papers cite other papers pointing where they found specific information
  - Review papers are especially great for this

- Staying up to date helps (though not something you all have to do yet)
  - ArXiv has lists of recently posted papers
    - Can also join the mailing list to get these
  - Journal clubs go over recent interesting papers
- Ask more senior researchers what are the important papers to read!

Reading Papers!

How to read a paper?

Reading Papers!

How to read a paper?

With great difficulty

- Reading an academic paper is not like normal reading
- Slow and tedious
- A skill that comes with practice

Why is it so hard?

- Lots of technical language
  - Google is your friend when deciphering this
- Very dense with information
  - It may take many readings of paragraphs or sentences to decipher everything that is being said
  - You may even need to dive into the cited papers
- It gets easier as you gain more experience and knowledge of the field!

Paper formats

- Different journals have different formats
  - Inside those journals things can also change from paper to paper

- Most have a similar flow though and have similar required sections

Critical Parts of a Paper

- Abstract
  - Box of text at the beginning of a paper, one paragraph long
  - Should summarize everything you need to know
- Conclusion
  - What did the authors conclude about their work/results?
- Figures
  - Look at the figures in order
  - **Read the captions**; a good figure caption will allow you to understand the figure's purpose without reading the paper's text

Other important parts

- Introduction
  - Gives you background and history on the topic
  - Tells you the relevance of the work within the greater subfield

- Results/Discussion
  - Gives you a more nuanced view of paper
  - May discuss limitations of work or suggest future avenues of research

Other common sections

- Data / Observations
  - Description of how data was taken
- Methods / Analysis
  - Description of how the data was analysed and any tests that were performed
- Bibliography
  - List of references
- Appendix
  - Any additional information that didn’t fit into the flow of the main body of the paper

Tips for Reading a Paper

- Don’t be afraid to Google things!
  - You can also look at references to have a deeper understanding before continuing (Beware: This can be very time consuming. Don’t go down a rabbit hole.)

- If you think that you will be using the paper often, print it out or download it in your favorite PDF note-taking app
  - Annotate and highlight to your heart’s content

- Don’t worry about trying to understand everything
  - Try to identify which details are important and which are not

Tips for Reading a Paper

- Before reading a paper, identify an idea or goal to focus on
  - e.g. Methodology if you're designing a similar study, motivation/next steps if you're new to the field
  - Take notes, especially if it's a paper you'll be using often!
  - Keep track of any questions or thoughts on the paper too!

- Find what works for you and stick with it!

Citing papers in your own work

- Back to LaTeX! Actually BibTeX

- In your Overleaf project you will have a separate file named something.bib
  - Usually references.bib
- This will contain all the information about your references

Citing from BibTeX in LaTeX

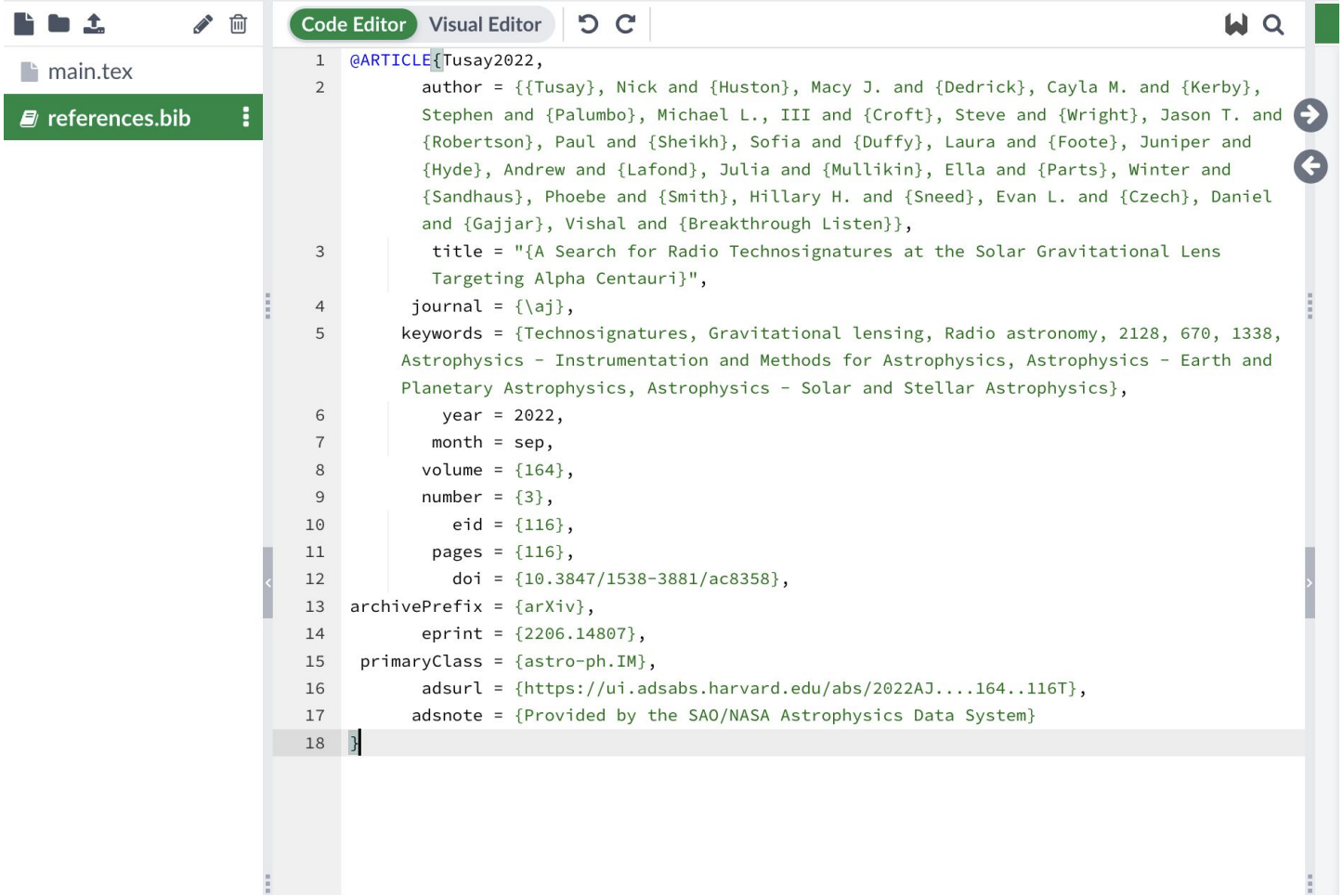
- You'll need a references.bib file in Overleaf
- Each citation you use has an entry in the .bib file
- Requirements:

Before text (in the preamble):

```
\usepackage{natbib}
\usepackage{hyperref}
```

At the end of the text:

```
\bibliographystyle{aasjournal}
\bibliography{references}
```


main.tex
references.bib
Code Editor
Visual Editor
@ARTICLE{Tusay2022,
author = {{Tusay}, Nick and {Huston}, Macy J. and {Dedrick}, Cayla M. and {Kerby}, Stephen and {Palumbo}, Michael L., III and {Croft}, Steve and {Wright}, Jason T. and {Robertson}, Paul and {Sheikh}, Sofia and {Duffy}, Laura and {Foote}, Juniper and {Hyde}, Andrew and {Lafond}, Julia and {Mullikin}, Ella and {Parts}, Winter and {Sandhaus}, Phoebe and {Smith}, Hillary H. and {Sneed}, Evan L. and {Czech}, Daniel and {Gajjar}, Vishal and {Breakthrough Listen}},
title = "{A Search for Radio Technosignatures at the Solar Gravitational Lens Targeting Alpha Centauri}",
journal = {\aj},
keywords = {Technosignatures, Gravitational lensing, Radio astronomy, 2128, 670, 1338, Astrophysics - Instrumentation and Methods for Astrophysics, Astrophysics - Earth and Planetary Astrophysics, Astrophysics - Solar and Stellar Astrophysics},
year = 2022,
month = sep,
volume = {164},
number = {3},
eid = {116},
pages = {116},
doi = {10.3847/1538-3881/ac8358},
archivePrefix = {arXiv},
eprint = {2206.14807},
primaryClass = {astro-ph.IM},
adsurl = {https://ui.adsabs.harvard.edu/abs/2022AJ....164..116T},
adsnote = {Provided by the SAO/NASA Astrophysics Data System}
}

A BibTeX entry

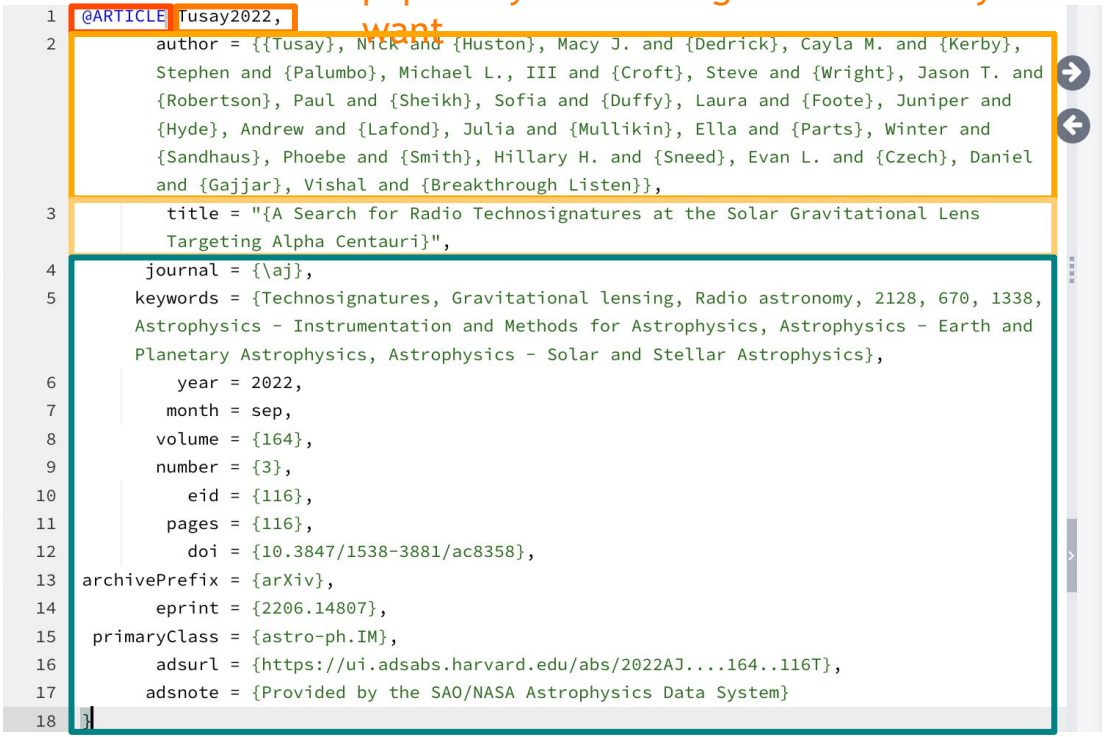
entry type

paper key - can change to whatever you want

authors

paper title

journal info



```
@ARTICLE{Tusay2022,
       author = {{Tusay}, Nick and {Huston}, Macy J. and {Dedrick}, Cayla M. and {Kerby},
       Stephen and {Palumbo}, Michael L., III and {Croft}, Steve and {Wright}, Jason T. and
       {Robertson}, Paul and {Sheikh}, Sofia and {Duffy}, Laura and {Foote}, Juniper and
       {Hyde}, Andrew and {Lafond}, Julia and {Mullikin}, Ella and {Parts}, Winter and
       {Sandhaus}, Phoebe and {Smith}, Hillary H. and {Sneed}, Evan L. and {Czech}, Daniel
       and {Gajjar}, Vishal and {Breakthrough Listen}},
        title = "{A Search for Radio Technosignatures at the Solar Gravitational Lens
        Targeting Alpha Centauri}",
      journal = {\aj},
     keywords = {Technosignatures, Gravitational lensing, Radio astronomy, 2128, 670, 1338,
     Astrophysics - Instrumentation and Methods for Astrophysics, Astrophysics - Earth and
     Planetary Astrophysics, Astrophysics - Solar and Stellar Astrophysics},
         year = 2022,
        month = sep,
       volume = {164},
       number = {3},
          eid = {116},
        pages = {116},
          doi = {10.3847/1538-3881/ac8358},
archivePrefix = {arXiv},
       eprint = {2206.14807},
 primaryClass = {astro-ph.IM},
       adsurl = {https://ui.adsabs.harvard.edu/abs/2022AJ....164..116T},
      adsnote = {Provided by the SAO/NASA Astrophysics Data System}
}
```

Citing papers in LaTeX

Two important commands:

- \citep{PaperKey} → Parenthetical citation
- \citet{PaperKey} → In-text citation

Optional parameters:

- \citep{PaperKey1, PaperKey2, PaperKey3} → cite multiple papers in parenthetical
- \citep[after]{PaperKey} →insert text **after** citation in parentheses
- \citep[before][after]{PaperKey} → text **before and after** citation in parentheses
    - If you ***just*** want text before, you have to have **empty square brackets** after the first pair
      i.e. \citep[before][]{PaperKey}

Citation Format Examples

In LaTeX:

information packets. \citet{Eshleman1979} proposed that the Sun's gravitation could be used as a lens to magnify the radiation to or from a distant source. A spacecraft beyond 550 AU along

In-text:

information packets. Eshleman (1979) proposed that the Sun's gravitation could be used as a lens to magnify the radiation to or from a distant source. A spacecraft beyond 550 AU along

Citation Format Examples

In LaTeX:

photons. This process can create a lensing effect similar to a focusing element of a telescope \citep{Einstein1936}. Gravitational lensing warps

Parenthetical:

photons. This process can create a lensing effect similar to a focusing element of a telescope (Einstein 1936). Gravitational lensing warps

Citation Format Examples

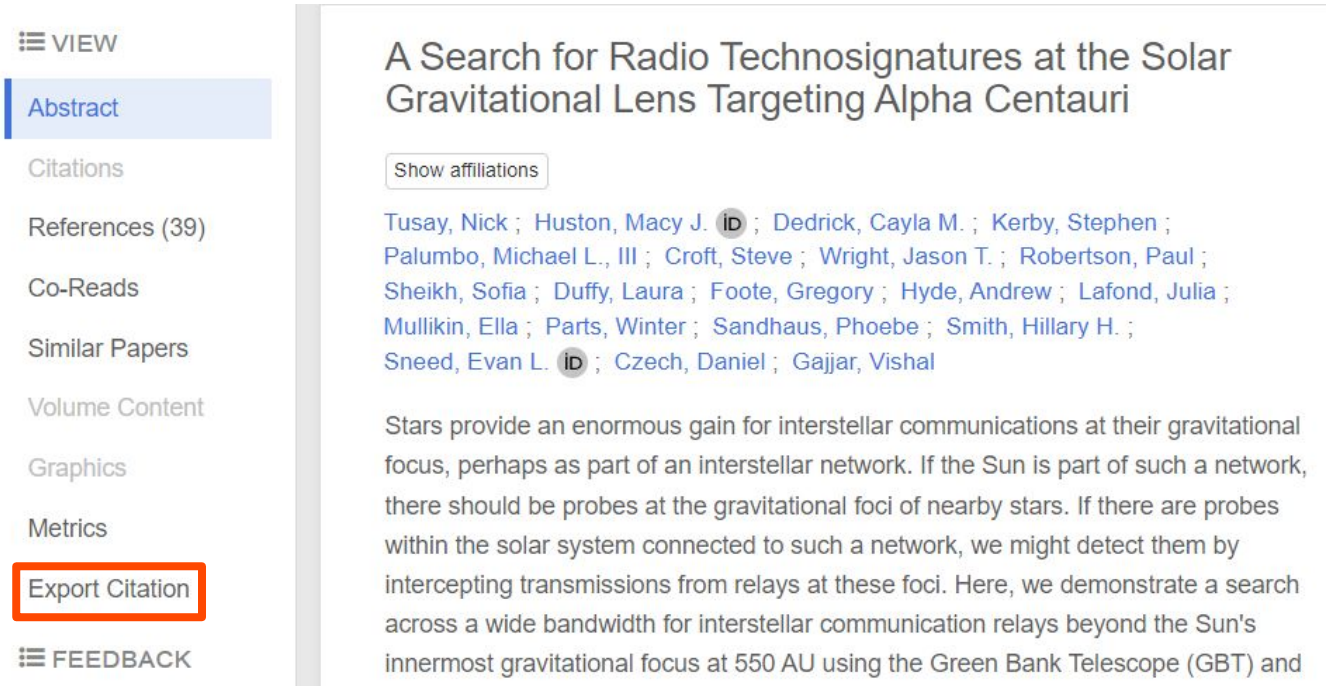
In LaTeX:

One proposed application of this mechanism is to utilize the Solar Gravitational Lens (SGL) to provide huge magnification to a telescope along the Sun's focal line at a distance between 550 and 1000 AU \citep[e.g. the FOCAL mission;][]{Maccone1994, Maccone2010, Maccone1997}.

Parenthetical, with additional text

One proposed application of this mechanism is to utilize the Solar Gravitational Lens (SGL) to provide huge magnification to a telescope along the Sun's focal line at a distance between 550 and 1000 AU (e.g. the FOCAL mission; Maccone 1994, 2010; Maccone & Piantà 1997).

Finding BibTeX info on ADS



Retrieving BibTeX info from ADS library