



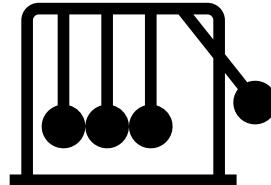
Session 1: Scratching the Surface

GRAD SCHOOL 101, LaTeX, AND THE
COMMAND LINE

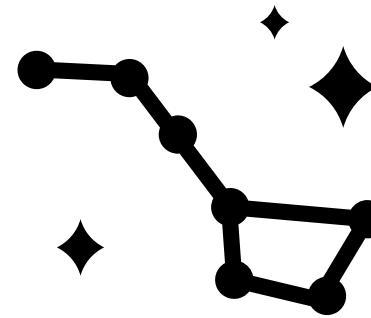
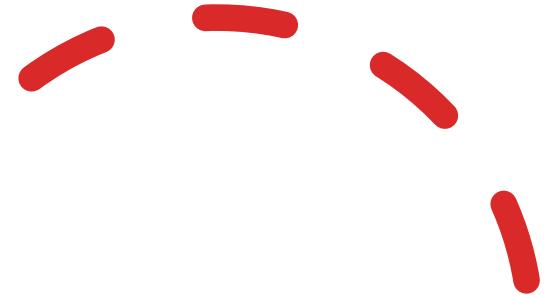
STARFISH SCHOOL 2022

**Who are we and why are we doing
this?**

Astronomy is more than just the Physics

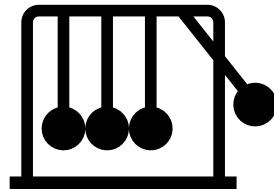


Physics

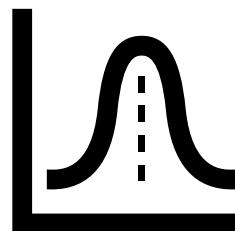


Astronomy

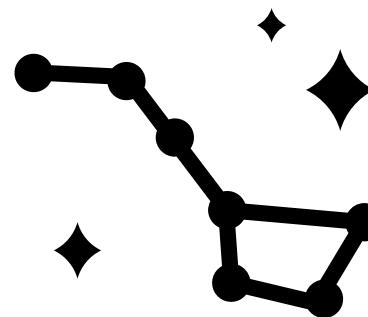
Astronomy is more than just the Physics



Physics



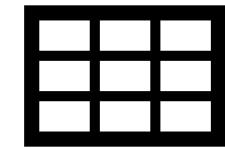
Statistics



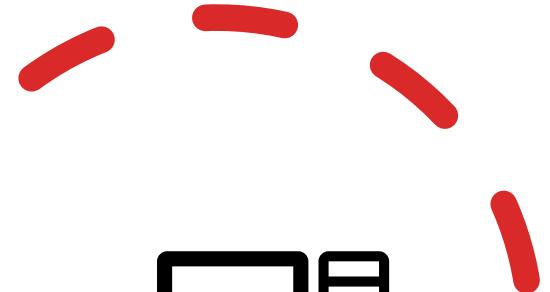
Astronomy



Computing



Data Analysis



Expectations

This bootcamp is about helping you become the best Astro grad student/researcher you can be!

This is not about grading or becoming expert in any of these concepts. It's about knowing that these tools and techniques exist, letting you get your hands dirty with them, and knowing where to search for help.

Our expectations for you are:

- Try things
- Ask questions to us and your peers throughout the bootcamp
- Do your best to complete the exercises as a group
- Help each other



Expectations

This bootcamp is about helping the student/researcher you currently are.

This is not about grading your concepts. It's about knowing how to let you get your hands dirty and search for help.

Our expectations for you are:

- Try things
- Ask questions to us and your peers throughout the bootcamp
- Do your best to complete the exercises as a group
- Help each other

HOT TIP

Sometimes, we'll have tips that will help make your life/research easier. We'll throw them into these Hot Tip boxes. Look out for the pepper!



Expectations

This bootcamp is about helping you become the best Astro grad student/researcher you can be!

This is not about grading or becoming expert in any of these concepts. It's about knowing that these tools and techniques exist, letting you get your hands dirty with them, and knowing where to search for help.

Our expectations for you are:

- Try things
- Ask questions
- Participate in the bootcamp
- Do your best
- Help each other

COOL CATCH

Sometimes, there'll be something we want to point out that we want to warn you about, or make you aware of before it causes a problem. That'll be in these cool catch boxes. Look for the snowflake.



Rough Schedule

Times	Session	What are you doing?
12:30-2pm	Lunch	Eating boxed lunches, chatting to your group, discussing the topics of last session
2 – 3PM	First session	Hands on learning/teaching sessions
3PM	Coffee	Grab coffee and a snack
3 – 5PM	Second session	Continue to hack on problems

Time and Project Management

Allow your future self to thank your past self

- Our idea of academia...
- The reality of academia...



Tips to a less stressed work life

- Deadlines really matter, and don't matter at all



Tips to a less stressed work life

- Deadlines really matter, and don't matter at all
- Eat the frog



Tips to a less stressed work life

- Deadlines really matter, and don't matter at all
- Eat the frog
- Don't confuse being 'busy' for being effective (NYT article, postdoc article)



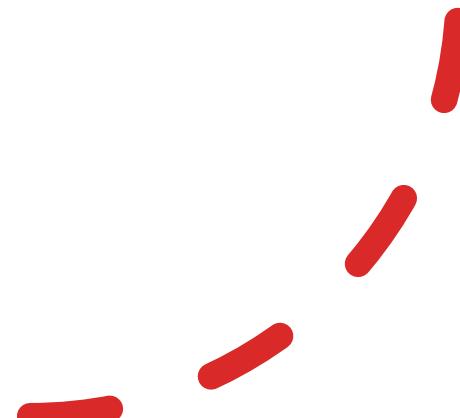
Tips to a less stressed work life

- Deadlines really matter, and don't matter at all
- Eat the frog
- Don't confuse being 'busy' for being effective
- 80/20 rule



Tips to a less stressed work life

- Deadlines really matter, and don't matter at all
- Eat the frog
- Don't confuse being 'busy' for being effective
- 80/20 rule
- Parkinson's rule



Tips to a less stressed work life

- Make a (work) budget – transition to work

Tips to a less stressed work life

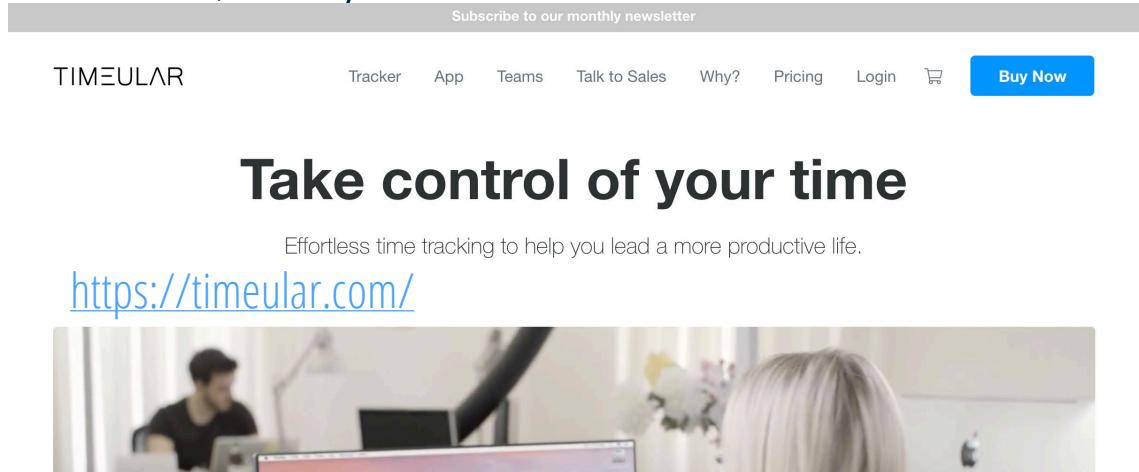
- Make a (work) budget
- No, really.
- Forgive yourself.

Tips to a less stressed work life

- Make a (work) budget
- No, really.
- Forgive yourself.
- Don't hide.

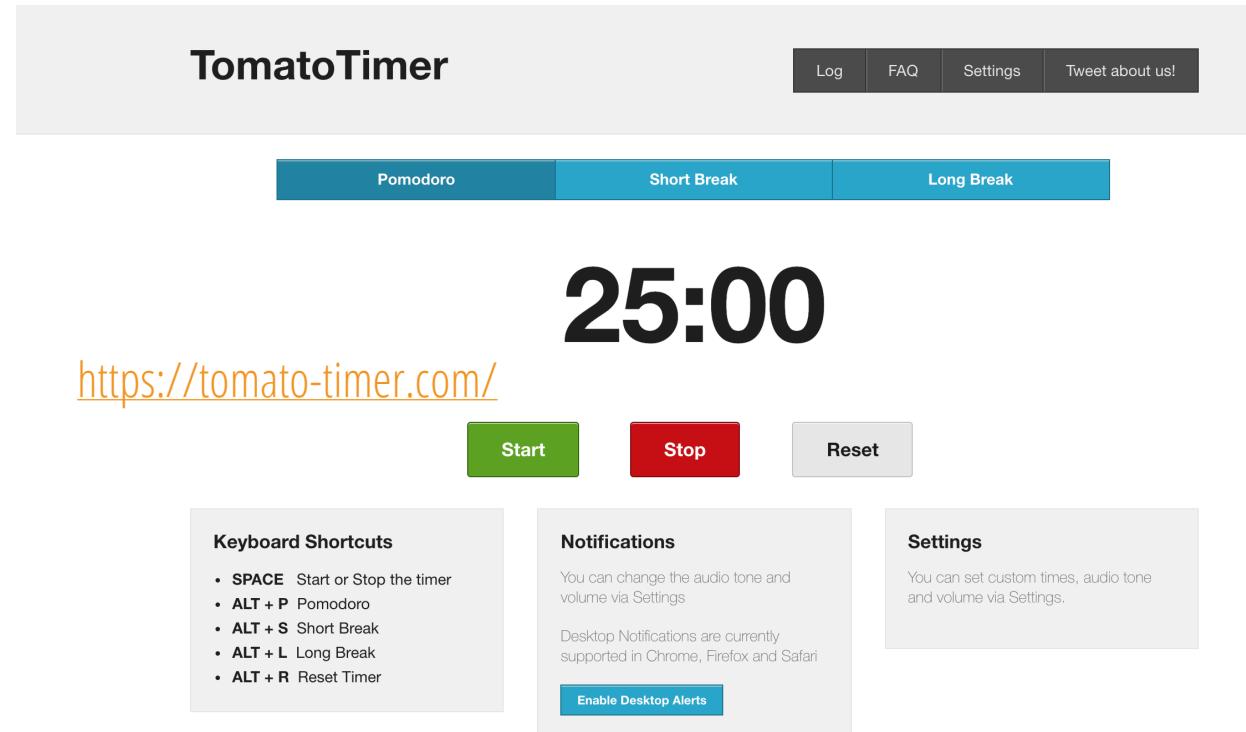
Tips to a less stressed work life

- Make a (work) budget
- No, really.



The screenshot shows the TIMEULAR homepage. At the top, there's a grey bar with the text "Subscribe to our monthly newsletter". Below it is the TIMEULAR logo and a navigation bar with links: Tracker, App, Teams, Talk to Sales, Why?, Pricing, Login, and a shopping cart icon. To the right of the cart is a blue "Buy Now" button. The main heading "Take control of your time" is displayed in a large, bold, dark font. Below it is a subtitle: "Effortless time tracking to help you lead a more productive life." A blue link "https://timeular.com/" is shown below the subtitle. There's also a small video thumbnail at the bottom left showing two people working at a desk.

- Keep track of how long things *actually* take.
- Get better at estimating, keep iterating. Build in contingency.



The screenshot shows the TomatoTimer homepage. The title "TomatoTimer" is at the top center. To its right are links for Log, FAQ, Settings, and Tweet about us!. Below the title is a large digital timer displaying "25:00". Underneath the timer are three buttons: "Pomodoro" (green), "Short Break" (light blue), and "Long Break" (light blue). The main area has three sections: "Keyboard Shortcuts" (listing SPACE, ALT + P, ALT + S, ALT + L, and ALT + R), "Notifications" (describing how audio tone and volume can be changed via Settings), and "Settings" (describing how custom times, audio tone, and volume can be set via Settings). At the bottom is a blue "Enable Desktop Alerts" button.

Tips to a less stressed work life

- Make a (work) budget
- No, really.



Subscribe to our monthly newsletter

TIMEULAR

Tracker App Teams Talk to Sales Why? Pricing Login  [Buy Now](#)

Take control of your time

Effortless time tracking to help you lead a more productive life.

<https://timeular.com/>

- Keep track of how long things *actually* take.
- Get better at estimating, keep iterating. Build in contingency.

HOT TIP

Try out different tools/software until you find something that 'sticks'. There is no wrong answer if it works for you!



TomatoTimer

Log FAQ Settings Tweet about us!

Pomodoro Short Break Long Break

25:00

<https://tomato-timer.com/>

Start Stop Reset

Keyboard Shortcuts

- **SPACE** Start or Stop the timer
- **ALT + P** Pomodoro
- **ALT + S** Short Break
- **ALT + L** Long Break
- **ALT + R** Reset Timer

Notifications

You can change the audio tone and volume via Settings

Desktop Notifications are currently supported in Chrome, Firefox and Safari

[Enable Desktop Alerts](#)

Settings

You can set custom times, audio tone and volume via Settings.

Stress Happens: How to build Resilience

Case Study

Your laptop fell off your desk and has to be taken in for repairs for a week. You are due to send a draft of your thesis proposal to your committee on Thursday. What now?

Stress Happens: How to build Resilience

Case Study

Your laptop fell off your desk and has to be taken in for repairs for a week. You are due to send a draft of your thesis proposal to your committee on Thursday. What now?

How to avoid decision paralysis:

- How should I prepare for the conversation?
- What are valid/core responsibilities?
 - Who are you responsible to?
 - Who is responsible to you?
- What should your expectations be?
- What can you expect from others/faculty/advisor/etc?
- Can I come up with solutions?

Project Management

- Treat your research like a job, not a 'calling'

Trello lets you work more collaboratively and get more done.

Trello's boards, lists, and cards enable you to organize and prioritize your projects in a fun, flexible, and rewarding way.



Sign Up – It's free!

Create a free account

Confirm your email address. Confirm email · Remind me later

The image shows a screenshot of a Trello interface. At the top, there is a navigation bar with a search bar and some icons. Below it, a large blue circle contains text and a small image. The main area shows two boards:

- Collecting Data** board:
 - Invited article
 - Gaslighting book
 - Archive article
- Analyze Data** board:
 - Chapter 5: Conclusion

Each board has a 'Add another card' button at the bottom. The background of the slide features a large blue circle and a red circle on the right side.

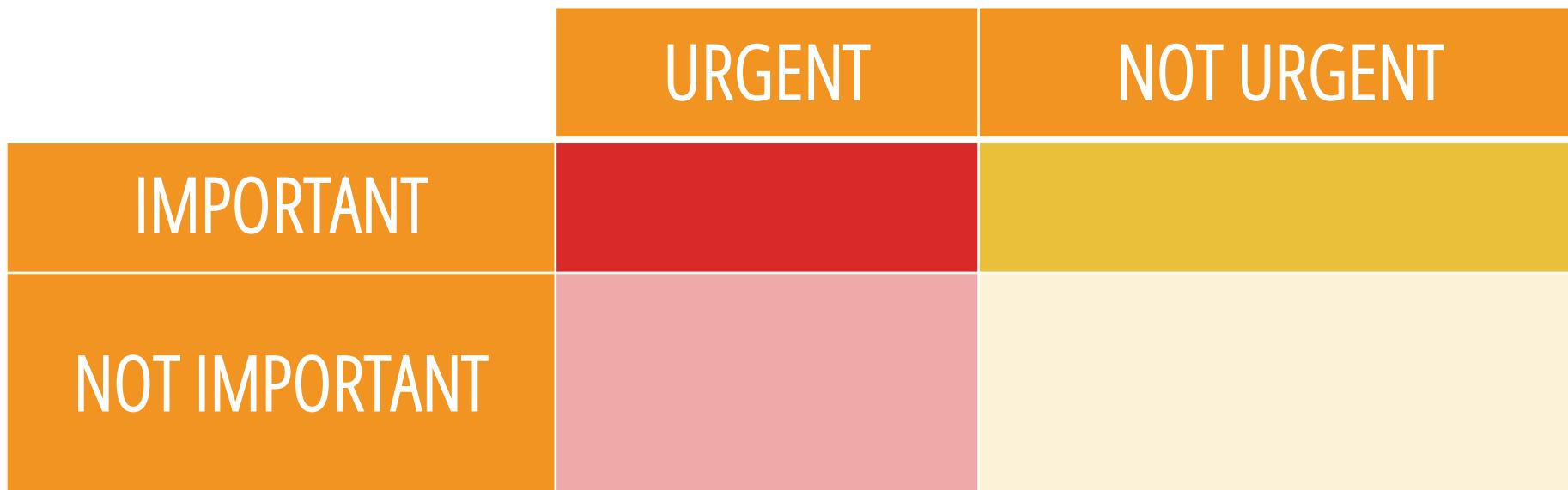
Time management is not optional

- Learning how you work/what works for you takes a while, but be intentional about it. Watch this talk.



- <https://www.youtube.com/watch?v=oTugjssqOT0>

Covey Quadrants

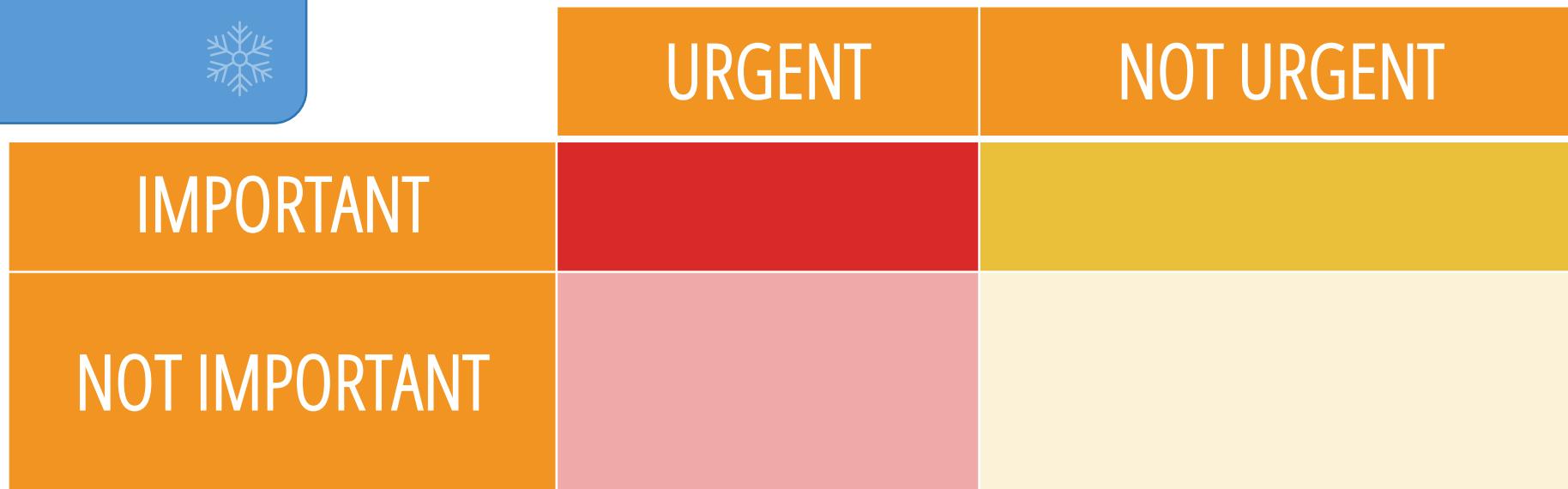


COOL CATCH

Your advisor will almost always put things in the URGENT quadrant – that's the hardest to separate



Covey Quadrants

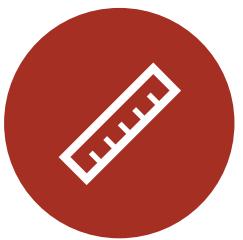




SMART goals



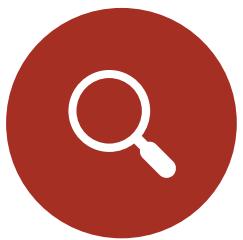
SPECIFIC



MEASUREABLE



ATTAINABLE



RELEVANT



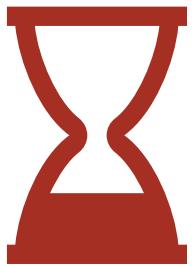
TIME-BASED

Exercises

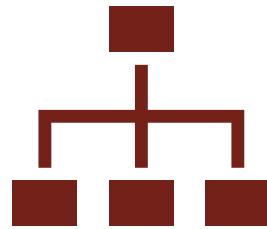
- Write down one SMART goal for the coming semester (e.g. submit my AST 1501 proposal by September 25)
- Identify a few specific projects that you can tackle linked to the SMART goals (Write the literature review/introduction, write the methods section, write the proposed results section)
- Identify all the tasks related to those projects (bullet points the literature review, read papers X,Y,Z, write section on analysis of X,Y,Z, make some schematic plots etc.)
- Make a Trello board for your life



Productive Procrastination



When waiting for code to compile... check the ArXiv



Make sure to get the big things (that you need to wait on other people for) out of the way first, then do plots/fun/email

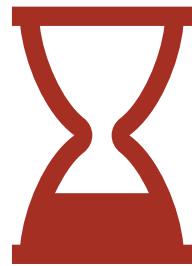


Take account of your time

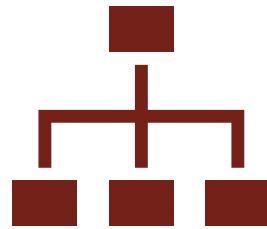
Productive Procrastination

COOL CATCH

This does **not** mean working while watching TV! Down time is really important.



When waiting for code to compile... check the ArXiv



Make sure to get the big things (that you need to wait on other people for) out of the way first, then do plots/fun/email



Take account of your time

(Try not to) let your email/inbox overwhelm you

The screenshot shows the Toodledo web interface. On the left, a sidebar lists categories: My Tasks, All Tasks (selected), Starred, Hotlist, RECENT (Recently Added, Recently Completed, Recently Modified), and a search icon. The main area displays a table of tasks. The columns are: Task, Folder, Due Date ↑, Repeat, Priority, and a delete icon. The tasks are grouped by due date: "Due Tomorrow" and "Due in the next 7 days".

Task	Folder	Due Date ↑	Repeat	Priority	
SRD PR	Work Admin	Tomorrow	None	3 Top	
SO CC stuff	Work Admin	Tomorrow	Weekly	2 High	
Check DC2 pull requests	Work Admin				
H(z) coding - check w(z) derivatives	Science				
P(k) clearing house	Science				
book review	Science				
Check rise/decay time for Jenny sims	Science				
LSST simulation check for peculiar velocity	Science				
Read/edit the writing for manifest galaxy	Creative				

See Github too

The screenshot shows the Get It Done task manager. At the top, it says "Accomplish More with *Get It Done!*". Below that, there's a call-to-action button "Get started for free!". The main area shows a desktop computer, a tablet, and a smartphone all displaying the same task list, demonstrating synchronization.

From Home, Work, or Anywhere In Between

Get It Done is a task manager for your web browser and your smart phone. No matter where you are, your tasks will always be in sync.

Use the app for free or get all the features for only \$39 a year.

Intentionality

01

Be online when it
matters

(not all the time)

02

Communicate your
style and talk about it
with your advisor

03

Have a buddy system

04

Challenge each other

05

Take *real* breaks

(including between
Zooms)

BREAK!

LaTeX and Overleaf

LaTeX intro

- LaTeX is a markup language (think: html), which means you type certain commands around your text/input which control the look and feel of that input.
- If you want to change certain style elements of the document, using pre-existing commands means that all those elements change together.
- It can be clunky at first, but believe me *it will change your life*



LaTeX syntax

- All documents start with some preamble to define document types/formatting

```
\usepackage{lineno}
\linenumbers
\setjournal{\apj}
\documentclass[iop,revtex4-1]{\color{red}hackemulateapj}

\usepackage{epsfig}
\usepackage{epstopdf}
\usepackage{graphicx}
```

LaTeX syntax

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```
\usepackage{lineno}  
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\setjournal{\apj}  
\documentclass[iop,revtex4-1]{\color{red}hackemulateapj}
```

```
\usepackage{epsfig}  
\usepackage{epstopdf}  
\usepackage{graphicx}
```

Pre-defined packages that do specific things, like
help me include figures (graphics) or add line
numbers to my document (lineno)

LaTeX syntax

- All documents start with some preamble to define document types/formatting

define my document class (which is set to something for the Institute of Physics or IOP) and define its style (something I've called hackemulateapj, because I hacked a previous style file called emulateapj which emulates the ApJ style file)

```
\usepackage{lineno}
\linenumbers
\setjournal{\apj}
\documentclass[iop,revtex4-1]{hackemulateapj}

\usepackage{epsfig}
\usepackage{epstopdf}
\usepackage{graphicx}
```

LaTeX syntax

- I then start writing my text, putting various things in special environments (e.g. figure captions, sections, the abstract)

```
\begin{document}  
  \title{A copy of an actual paper I'm working on}  
  \input{Starfish_folder/authors}  
  \input{./PLASTICC_sims_newcommand.tex}
```

```
\begin{abstract}
```

Next-generation surveys like the Legacy Survey of Space and Time (LSST) on the Vera C. Rubin Observatory will generate orders of magnitude more discoveries of transients and variable stars than previous surveys. To prepare for this data deluge, we developed \texttt{PLASTICC} (\texttt{acro}), a competition and associated simulated data set to challenge the community. \texttt{acro} took place between \texttt{DATESTART} and \texttt{DATESTOP}, with 1094 teams participating in the challenge which was hosted by the data-science platform [Kaggle](#). The aim of \texttt{acro} was to develop novel solutions to the problem of transient classification in a large, non-representative photometric data set.

LaTeX syntax

- I then start writing my text, putting various things in special environments (e.g. figure captions, sections, the abstract)

Kicks things off

```
\begin{document}  
  \title{A copy of an actual paper I'm working on}  
  \input{Starfish_folder/authors}  
  \input{./PLASTICC_sims_newcommand.tex}
```

This means I have another file with lots of pre-defined symbols/commands in it

This generates the title and abstract

```
\begin{abstract}
```

Next-generation surveys like the Legacy Survey of Space and Time (LSST) on the Vera C. Rubin Observatory will generate orders of magnitude more discoveries of transients and variable stars than previous surveys. To prepare for this data deluge, we developed \texttt{PLASTICC} (\texttt{acro}), a competition and associated simulated data set to challenge the community. \texttt{acro} took place between \texttt{DATESTART} and \texttt{DATESTOP}, with 1094 teams participating in the challenge which was hosted by the data-science platform Kaggle. The aim of \texttt{acro} was to develop novel solutions to the problem of transient classification in a large non-representative photometric data set.

What it generates...

DRAFT VERSION SEPTEMBER 10, 2020
Preprint typeset using L^AT_EX style emulateapj v. 01/23/15

A COPY OF AN ACTUAL PAPER I'M WORKING ON

R. HLOŽEK^{1, 2}

(A COLLABORATION)

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² Dunlap Institute for Astronomy and Astrophysics, University of Toronto, 50 St. George St., Toronto, ON M5S 3H4, Canada

Draft version September 10, 2020

ABSTRACT

Next-generation surveys like the Legacy Survey of Space and Time (LSST) on the Vera C. Rubin Observatory will generate orders of magnitude more discoveries of transients and variable stars than previous surveys. To prepare for this data deluge, we developed Photometric LSST Astronomical Time Series Classification Challenge (PLAsTiCC), a competition and associated simulated data set to challenge the community. PLAsTiCC took place between 2018 Sep 28 and 2018 Dec 17, with 1094 teams participating in the challenge which was hosted by the data-science platform Kaggle. The aim of PLAsTiCC was to develop novel solutions to the problem of transient classification in a large, non-representative photometric data set. Three winners were announced in February 2019, and a range of classification solutions were produced by the participants. [This is a comment I want to insert \(Renee\)](#) The machine learning techniques utilized by the community included hybrid combinations and ensemble averages of a range of approaches, including boosted decision trees, neural networks and multi-layer perceptrons (MLPs). We summarize the challenge entries and classes of solutions, highlight the performance of the winning solutions, and discuss how combining different approaches leads to further improvement in the performance of the classifiers.

1. INTRODUCTION

The Legacy Survey of Space and Time (LSST, [LSST Science Collaboration et al. 2009](#)) of the Vera C. Rubin

SuperNova ANalysis (SNANA) simulation code. We list the validations performed on the simulations below. **Confusing artifacts** – When processing light curves and metadata (additional information on the objects

LaTeX is great for mathematics

- Using pre-defined symbols takes you from this

```
The \acro-metric was a weighted log-loss
\begin{eqnarray}
\label{eq:logloss}
L &\equiv& -\sum_{m=1}^N w_m \sum_{n=1}^M \tau_{n,m} \ln[p(m \mid d_n)],
\end{eqnarray}
where
\begin{eqnarray}
\label{eq:indicator}
\tau_{n,m} &\equiv&
\begin{cases}
0 & m_n \neq m \\
1 & m_n = m
\end{cases}
\end{eqnarray}
```

LaTeX is great for mathematics

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\label{eq:indicator}
\tau_{n,m} &\equiv&
\begin{cases}
0 & m_n \neq m \\
1 & m_n = m
\end{cases}
\end{eqnarray}
```

HOT TIP

These mathematical symbols/notation will come about in handy later when we use matplotlib



LaTeX is great for mathematics

- To this

The PLAsTiCC metric was a weighted log-loss

$$L \equiv - \sum_{m=1}^N w_m \sum_{n=1}^M \tau_{n,m} \ln[p(m \mid d_n)], \quad (1)$$

where

$$\tau_{n,m} \equiv \begin{cases} 0 & m_n \neq m \\ 1 & m_n = m \end{cases} \quad (2)$$

If you move this equation around in the text, LaTeX will keep track of its location/numbering

LaTeX is great for mathematics

- To this

The PLAsTiCC metric was a weighted log-loss

$$L \equiv - \sum_{m=1}^N w_m \sum_{n=1}^M \tau_{n,m} \ln[p(m \mid d_n)], \quad (1)$$

where

$$\tau_{n,m} \equiv \begin{cases} 0 & m_n \neq m \\ 1 & m_n = m \end{cases} \quad (2)$$

HOT TIP

Want a math symbol in LaTeX but don't know what it's called? Detexify it!

<http://detexify.kirelabs.org>



If you move this equation around in the text, LaTeX will keep track of its location/numbering

Figures and tables exist in environments

- you \begin and \end the environments to start/end a table.

```
\begin{table*}
```

the * will mean it takes up the full
page (as opposed to a column)

```
\begin{center}
```

```
\begin{tabular}{cccccccccc}
```

```
\hline
```

```
\hline
```

```
Name & \multicolumn{3}{c}{Boosted Decision Trees} & &
```

```
\multicolumn{4}{c}{Neural Nets} \\
```

```
\cline{2-4}
```

```
\cline{6-9}
```

```
& LightGBM & CatBoost & XGBoost & & NN & CNN & RNN &
```

```
MLP \\
```

```
\hline
```

```
\topplace & \cmark & \xmark & \xmark & & \xmark &
```

```
\xmark & \xmark & \xmark \\
```

```
\secondplace & \cmark & \xmark & \xmark & & \xmark &
```

Figures and tables exist in environments

- you \begin{ and \end{ the environments to start/end a table.

Name	Boosted Decision Trees			Neural Nets			
	LightGBM	CatBoost	XGBoost	NN	CNN	RNN	MLP
Kyle Boone (avocado)	✓	✗	✗	✗	✗	✗	✗
Mike & Silogram	✓	✗	✗	✗	✗	✓	✗
Major Tom, mamas & nyapn	✓	✓	✗	✗	✓	✗	✗
Ahmet Erdem	✓	✗	✗	✓	✗	✗	✗
SKZ Lost in Translation	✓	✗	✗	✗	✗	✓	✓
Stefan Stefanov	✗	✗	✗	✓	✗	✗	✗
rapids.ai	✓	✗	✗	✗	✗	✓	✓
Three Muskateers	✓	✓	✓	✗	✓	✗	✗
Simon Chen	✓	✗	✗	✗	✗	✗	✗

References are defined in a bibliography file

```
@ARTICLE{biswas/opsim,
    author = {{Biswas}, Rahul and {Daniel}, Scott F. and {Hlo\v{z}ek},
R. and
{Kim}, A.-G. and {Yoachim}, Peter and
{LSST Dark Energy Science Collaboration}},
title = "{Enabling Catalog Simulations of Transient and Variable
Sources Based on LSST Cadence Strategies}",
journal = {\apjs},
keywords = {Astrophysics - Instrumentation and Methods for
Astrophysics, Astrophysics - Cosmology and Nongalactic Astrophysics},
year = 2020,
month = apr,
volume = {247},
number = {2},
eid = {60},
pages = {60},
doi = {10.3847/1538-4365/ab72f2},
archivePrefix = {arXiv},
eprint = {1905.02887},
primaryClass = {astro-ph.IM},
adsurl = {https://ui.adsabs.harvard.edu/abs/2020ApJS..247...60B},
adsnote = {Provided by the SAO/NASA Astrophysics Data System}
}
```

This is how the citation defined in a .bib file

This is how the citation is referenced in the main text

Once the 'pure' source model is obtained, it is combined with a noise model specific to the observational conditions of LSST `\cite{biswas/opsim}`, including the cadence information, zero points, sky noise, and point spread function (PSF) `\cite{snana}`. The objects have to

References are defined in a bibliography file

```
% Include both collaboration papers and external  
citations:  
\bibliographystyle{apsrev}  
\bibliography{results,metric}
```

Once the ‘pure’ source model is obtained, it is combined with a noise model specific to the observational conditions of LSST [Biswas et al. \(2020\)](#), including the cadence information, zero points, sky noise, and point

You define your bibliography style and then also tell LaTeX where to look (here in files results.bib and metric.bib)

This is how the reference appears in the text (for this particular referencing style)

R. Biswas, S. F. Daniel, R. Hložek, A. G. Kim, P. Yoachim, and LSST Dark Energy Science Collaboration, *ApJS* **247**, 60 (2020), 1905.02887.

This is what the reference looks like at the end of the file

References are defined in a bibliography file

```
% Include both collaboration papers and external  
citations:  
\bibliographystyle{plain}  
\bibliography{results,metric}
```

If you change the bibliography style file

Once the ‘pure’ source model is obtained, it is combined with a noise model specific to the observational conditions of LSST (4), including the cadence information, zero points, sky noise, and point spread function (PSF) (16). The objects have to be ‘detected’ in order

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[4]Rahul Biswas, Scott F. Daniel, R. Hložek, A. G. Kim, Peter Yoachim, and LSST Dark Energy Science Collaboration. Enabling Catalog Simulations of Transient and Variable Sources Based on LSST Cadence Strategies. *ApJS*, 247(2):60, April 2020.

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COOL CATCH



LaTeX is great about re-ordering references, but it really doesn't like if you define something twice – so keep that .bib file clean.

This is what the reference looks like at the end of the file

References are defined in a bibliography file

```
% Include both collaboration papers and external  
citations:  
\bibliographystyle{plain}  
\bibliography{results,metric}
```

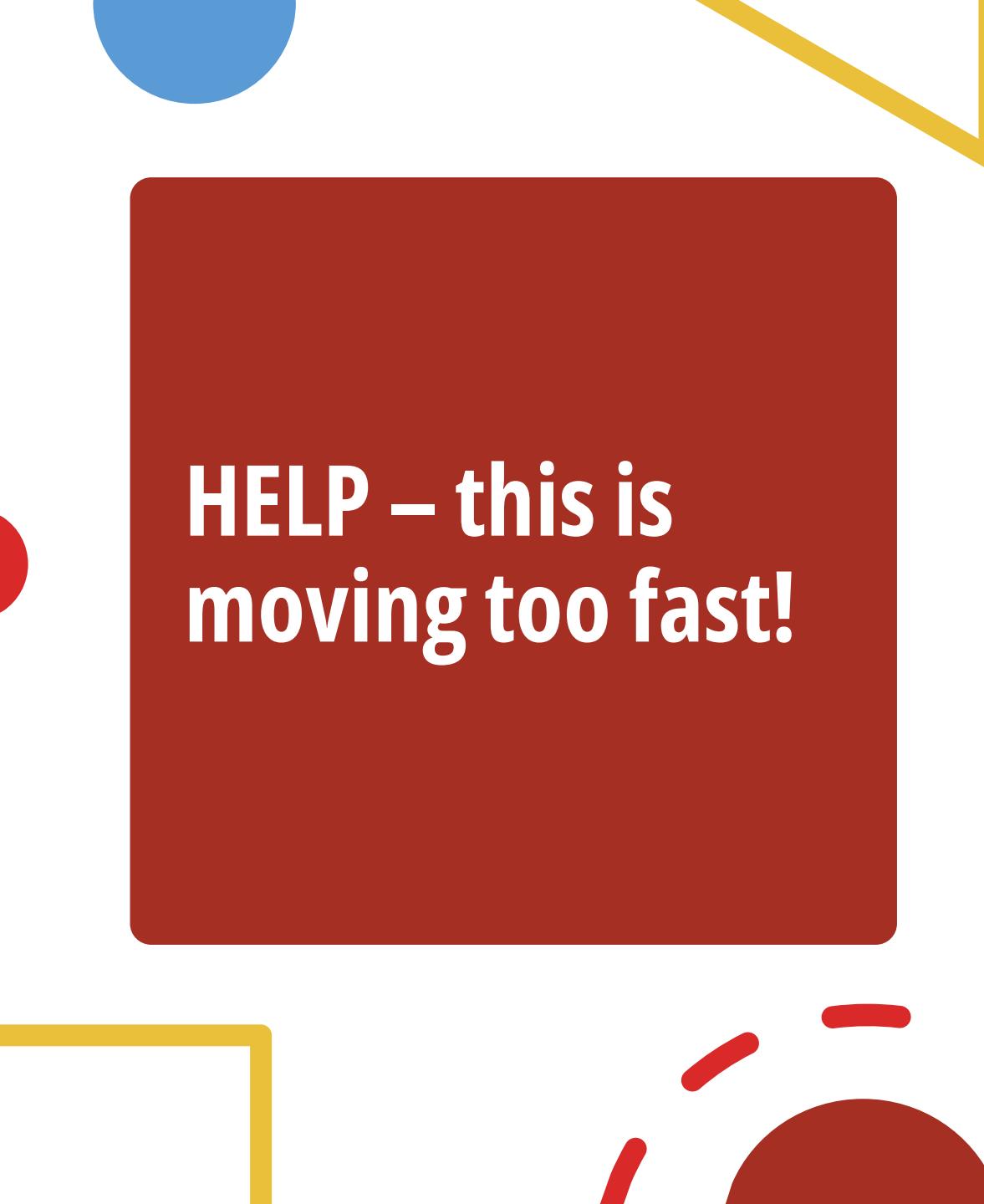
If you change the bibliography style file

Once the ‘pure’ source model is obtained, it is combined with a noise model specific to the observational conditions of LSST (4), including the cadence information, zero points, sky noise, and point spread function (PSF) (16). The objects have to be ‘detected’ in order

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This is what the reference looks like at the end of the file



HELP – this is moving too fast!

- Don't worry – the internet is your friend.
- Google the thing you want to do and there is almost certainly an answer. Also, ask your colleagues/students/mentors for advice.
- Everyone loves teaching people their LaTeX tricks

Overleaf/styles/templates

- Overleaf is online LaTeX editing software that you can use to compile LaTeX and collaborate with others.
- LOTS of templates for articles/reports etc. -- check out the AAS template

The screenshot shows the Overleaf dashboard. On the left, there's a sidebar with links for "New Project", "All Projects", "Your Projects" (which is currently selected), "Shared with you", "Archived Projects", "Trashed Projects", "TAGS/FOLDERS", and "+ New Folder". The main area has a search bar labeled "Search projects...". Below it is a table listing five projects:

	Title	Owner	Last Modified
<input type="checkbox"/>	PLAsTiCC_results	You	35 minutes ago
<input type="checkbox"/>	SO_Governance	You	14 days ago by '
<input type="checkbox"/>	The Atacama Cosmology Telescope: Constraining the primordial power spectrum with ACTPol 98 and 150 GHz data	You	15 days ago by '
<input type="checkbox"/>	Canadian LSST contributions	You	10 months ago
<input type="checkbox"/>	litebird-sms-documents2	You	10 months ago

Overleaf/styles/templates



Demo Time!
Overleaf

- Overleaf is online LaTeX editing software that you can use to compile LaTeX and collaborate with others.
- LOTS of templates for articles/reports etc.

The screenshot shows the Overleaf web interface. On the left, there's a sidebar with a 'New Project' button and links for 'Blank Project', 'Example Project', 'Upload Project', 'Import from GitHub', 'Templates', 'Academic Journal', 'Book', 'Formal Letter', and 'Homework Assignment'. The main area has a search bar labeled 'Search projects...'. Below it is a table listing recent projects:

Title	Owner	Last Modified
PLAsTiCC_results	You	35 minutes ago
SO_Governance	You	14 days ago by '
The Atacama Cosmology Telescope: Constraining the primordial power spectrum with ACTPol 98 and 150 GHz data	You	15 days ago by '
Canadian LSST contributions	You	10 months ago
litebird-sms-documents2	You	10 months ago
LSST CFI Preproposal		

Overleaf/styles/templates



Demo Time!
Overleaf

<https://www.overleaf.com/read/tntwghqvcxzh>

Overleaf

New Project

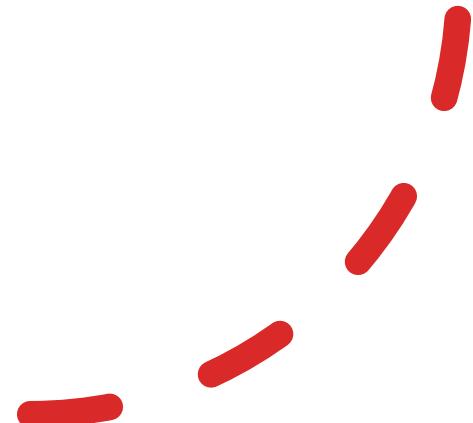
- Blank Project
- Example Project
- Upload Project
- Import from GitHub
- Templates
- Academic Journal
- Book
- Formal Letter
- Homework Assignment

Search projects...

Title	Owner	Last Modified
PLAsTiCC_results	You	35 minutes ago
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Canadian LSST contributions	You	10 months ago
litebird-sms-documents2	You	10 months ago
LSST CFI Preproposal		

Exercises

- Set up an overleaf document with AAS, MNRAS, etc. template



Keeping tidy/sync often

- Backup early and often! UofT gives us all 1TB of OneDrive space
- Overleaf can sync to Dropbox & Github - so you can work offline
- Try keeping the main .tex file bare, keep definitions in their own .input files



Looking at the Literature through ADS

Literature & Research

- Don't expect yourself to understand everything immediately
 - Reading scientific papers is a skill you will develop
- You will read papers, and re-read them, and re-read them...
 - And you'll retain something new each time!
- You will search the literature, then search it again, and again...
 - After all, we are doing **re**search! :)

(Re)searching the literature



Limit query to: Astronomy Physics General

Search

Author AND OR

Object AND OR

Publication date between

 / and /

Title

AND OR BOOLEAN

Abstract/Keywords

AND OR BOOLEAN

Refereed only Articles only

Publication(s)

Press Return Key To Add Publication

Sort

 Date ▾

Clear

Search

ADS: astrophysics data system (bookmark!)

<https://ui.adsabs.harvard.edu/classic-form>

(Re)searching the literature

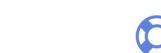
The screenshot shows the ADS Classic Form search interface. At the top, there's a logo with a magnifying glass over an 'a' and the text "astrophysics data system". Below the logo are three navigation links: "Classic Form" (highlighted with a red oval), "Modern Form", and "Paper Form". Underneath these are search filters: "Limit query to" with checkboxes for "Astronomy" (checked), "Physics", and "General"; "Author" search fields for "(Last, First M) one per line" and "Object" search fields for "SIMBAD object search (one per line)". There are also fields for "Publication date between" (MM / YYYY and MM / YYYY), "Title" (with search modes AND, OR, BOOLEAN), and "Abstract/Keywords" (with search modes AND, OR, BOOLEAN). Below these are checkboxes for "Refereed only" and "Articles only", and a "Publication(s)" section with a note to "Press Return Key To Add Publication" and a field for "Comma-separated bibstems of journal titles". At the bottom, there's a "Sort" dropdown menu set to "Date", and a row of buttons: "Clear", "Search", and "Help".

ADS: astrophysics data system (bookmark!)
<https://ui.adsabs.harvard.edu/classic-form>

The screenshot shows the ADS Modern Form search interface. It has a similar header with the "astrophysics data system" logo and navigation links for "Classic Form", "Modern Form" (highlighted with a red oval), and "Paper Form". Below the header is a search bar with a placeholder "I" and a "Search" button. To the left of the search bar is a "QUICK FIELD" dropdown menu containing "Author", "First Author", "Abstract", "Year", "Fulltext", and "All Search Terms". The main area displays search terms and their corresponding queries:

author	author:"huchra, john"	citations	citations(author:"huchra, j")
first author	author:"^huchra, john"	references	references(author:"huchra, j")
abstract + title	abs:"dark energy"	reviews	reviews("gamma-ray bursts")
year	year:2000	refereed	property:refereed
year range	year:2000-2005	astronomy	collection:astronomy
full text	full:"gravity waves"	OR	abs:(planet OR star)
publication	bibstem:ApJ		

Arrows point from the search terms to their corresponding query examples. An orange arrow points from "year" to "year:2000", another from "full text" to "full:\"gravity waves\"", and a third from "publication" to "bibstem:ApJ". A fourth orange arrow points from "OR" back to "abs:(planet OR star)".



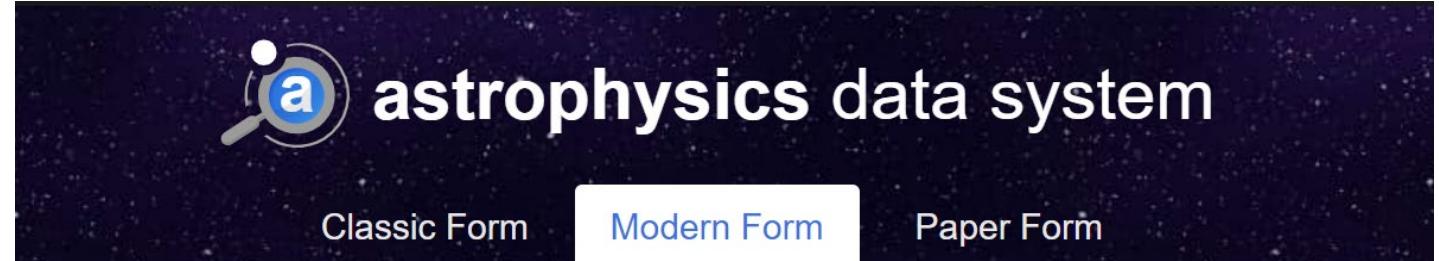
Use a classic ADS-style form



Learn more about searching
the ADS



Access ADS data with our
API



Let's try a simple search:

Searching for papers by our department chair, Roberto Abraham

Here we can choose the *author* option to find the outputs of the person in question

Let's try to be specific with author names, and add their first name or their initial, especially when looking for a person with a common name.
Here I see in my first search, I'm pulling in many people named Abraham, instead of Roberto Abraham.

 ads

Feedback ▾ ORCID ▾ About ▾ Sign Up Log In

QUICK FIELD: Author First Author Abstract Year Fulltext All Search Terms

author:"Abraham"

Your search returned 5,997 results

AUTHORS

- > Abraham, N 886
- > Chen, Y 611
- > Chen, H 588
- > Zhang, J 586
- > Liu, J 567
- > Chen, X 560
- > Kim, Y 559
- > Wang, J 559
- > Zhang, L 559
- > Diaz, M 556
- > Li, X 556
- > Jones, R 554
- > Lange, J 554

Show highlights Show abstracts Hide Sidebars Go To Bottom

1 2022CSBS....6....3A 2022/12 cited: 7
Emulating the impact of additional proton-proton interactions in the ATLAS simulation by presampling sets of inelastic Monte Carlo events
Aad, G.; Abbott, B.; Abbott, D. C. [and 2848 more](#)

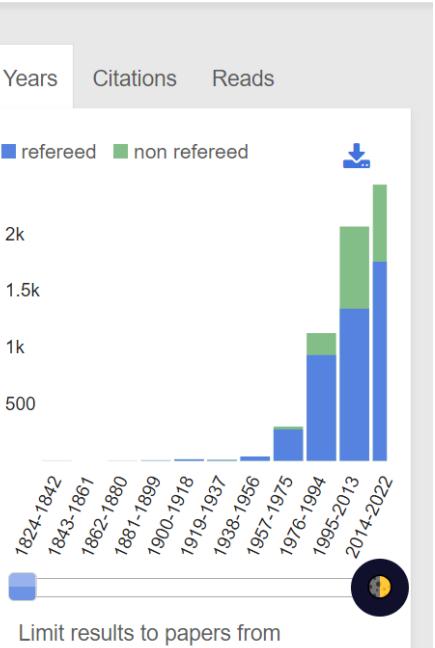
2 2022ScTEn.844o7146P 2022/10
Degradation and adsorption of synthetic DNA water tracers in environmental matrices
Pang, Liping; Heiligenthal, Laura; Premaratne, Aruni [and 5 more](#)

3 2022MNRAS.515.5335L 2022/10 cited: 3
Reaching for the Edge I: probing the outskirts of massive galaxies with HSC, DECaLS, SDSS, and Dragonfly
Li, Jiaxuan; Huang, Song; Leauthaud, Alexie [and 9 more](#)

4 2022AdAtS..39.1650L 2022/10
How Well Do CMIP6 and CMIP5 Models Simulate the Climatological Seasonal Variations in Ocean Salinity?

Years Citations Reads

refereed non refereed



Limit results to papers from

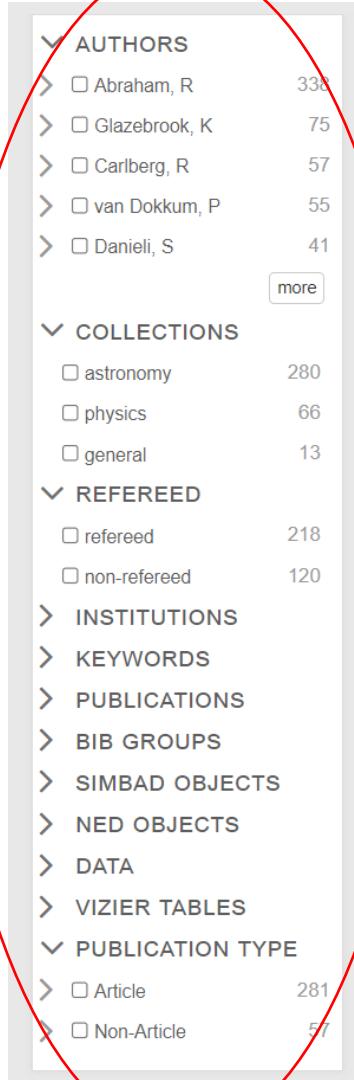
Limit results to papers from

By adding in the first name, I've gotten a tighter search result, which I can specify more by selecting for the specific author's name listed on the left-hand side.

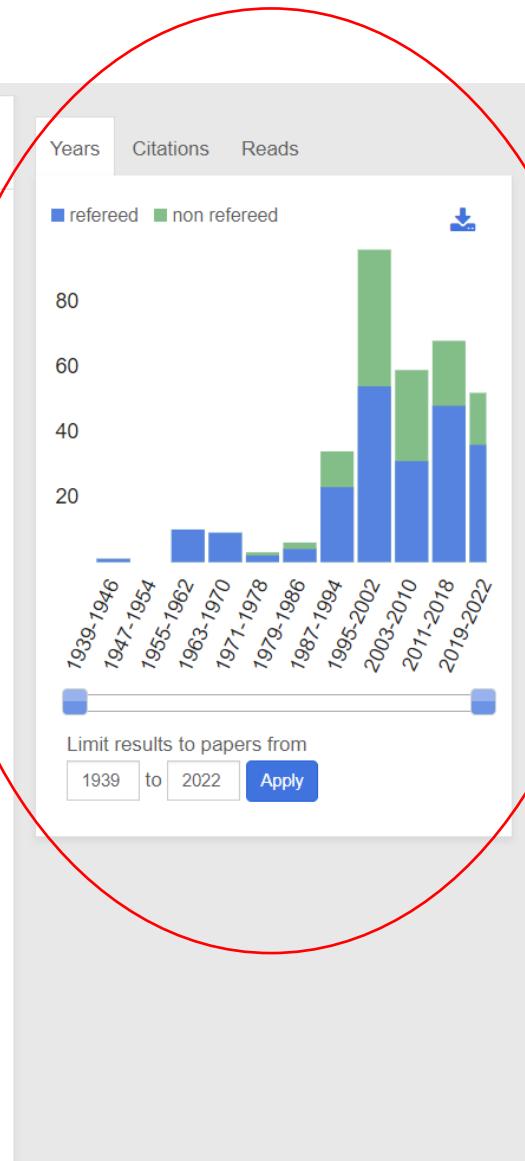
Now I'm getting all publications related to the specific person in question.

The screenshot shows the Astrophysics Data System (ADS) search interface. At the top, there is a navigation bar with links for Feedback, ORCID, About, Sign Up, and Log In. Below the navigation bar is a search bar with the query "author:'Abraham, Roberto'" and a search button. The search results page indicates "Your search returned 350 results". On the left side, there is a sidebar titled "AUTHORS" with a list of authors. An orange arrow points to the entry for "Abraham, R" which has a checked checkbox. A dropdown menu for "Authors" is open, showing "1 selected" and options to "limit to" or "exclude" other authors. The main content area displays a list of 350 publications, each with a title, year, citation count, and download links. To the right, there is a chart showing the distribution of publications by year, citation count, and read count. A "Limit results to papers from" dropdown is also visible at the bottom right.

There are other interesting filters that you can use to cut down your search results



- Top navigation buttons: Show highlights, Show abstracts, Hide Sidebars, Go To Bottom.
- Search results list:
- 1 2022MNRAS.515.5335L 2022/10 cited: 3 Reaching for the Edge I: probing the outskirts of massive galaxies with HSC, DECaLS, SDSS, and Dragonfly. Li, Jiaxuan; Huang, Song; Leauthaud, Alexie [and 9 more](#)
 - 2 2022arXiv220806516J 2022/08 cited: 1 Early results from GLASS-JWST XIV: A first morphological atlas of the $1 < z < 5$ Universe in the rest-frame optical. Jacobs, Colin; Glazebrook, Karl; Calabro, Antonello [and 19 more](#)
 - 3 2022arXiv220802233M 2022/08 cited: 4 The Sparkler: Evolved High-Redshift Globular Clusters Captured by JWST. Mowla, Lamiya A.; Iyer, Kartheik G.; Despres, Guillaume [and 17 more](#)
 - 4 2022ApJ...935..160K 2022/08 cited: 8 Tidal Distortions in NGC1052-DF2 and NGC1052-DF4: Independent Evidence for a Lack of Dark Matter. Keim, Michael A.; Dokkum, Pieter van; Danieli, Shany [and 11 more](#)
 - 5 2022ApJ...935....3L 2022/08 Light from the Darkness: Detecting Ultra-diffuse Galaxies in the Perseus Cluster through Over-densities of Globular Clusters with a Log-Gaussian Cox Process. Li, Dayi David; Eadie, Gwendolyn M.; Abraham, Roberto [and 6 more](#)
 - 6 2022arXiv220713052G 2022/07 A low-cost ultraviolet-to-infrared absolute quantum efficiency characterization system of detectors. Gill, Ajay S.; Shaaban, Mohamed M.; Tohuvavohu, Aaron [and 8 more](#)
 - 7 2022arXiv220707129V 2022/07 cited: 1 Monochromatic globular clusters as a critical test of formation models for the dark matter deficient galaxies NGC1052-DF2 and NGC1052-DF4. van Dokkum, Pieter; Shen, Zili; Romanowsky, Aaron J. [and 8 more](#)
 - 8 2022ApJ...932...44G 2022/06 cited: 1 Stellar Halos from the The Dragonfly Edge-on Galaxies Survey



You can select for *show abstracts* at the top of the search results if you find that the titles are too vague for you to figure out if the article is something you're interested in. You can also use the drop-down list to sort by parameter that interest you, such as citation count or date.

Your search returned 338 results

Author +Abraham, R

Hide highlights Hide abstracts Hide Sidebars

Author Count
Bibcode
Citation Count
Normalized Citation Count
Classic Factor
First Author
Date
Entry Date
Read Count
Score

Years Citations Reads

refereed non refereed

1 2022MNRAS.515:5335L 2022/10 cited: 3
Reaching for the Edge I: probing the outskirts of massive galaxies with SDSS, and Dragonfly
Li, Jiaxuan; Huang, Song; Leauthaud, Alexie [and 9 more](#)

No highlights
Abstract
The outer light (stellar haloes) of massive galaxies has recently emerged scatter tracer of dark matter halo mass. To test the robustness of outer lig across different data sets, we compare the 1D azimuthally averaged surface profiles of massive galaxies ... [more](#)

2 2022arXiv220806516J 2022/08 cited: 1
Early results from GLASS-JWST XIV: A first morphological atlas of the rest-frame optical
Jacobs, Colin; Glazebrook, Karl; Calabrò, Antonello [and 19 more](#)

No highlights
Abstract
We present a rest-frame optical morphological analysis of galaxies observed with the NIRCam imager on the James Webb Space Telescope (JWST) as part of the GLASS Early Release Science program. We select 217 sources at redshifts $0.8 < z < 5.4$ and use the seven 0.9–5 μm NIRCam filters to generate ... [more](#)

3 2022arXiv220802233M 2022/08 cited: 4
The Sparkler: Evolved High-Redshift Globular Clusters Captured by JWST
Mowla, Lamiya A.; Iyer, Kartheik G.; Despres, Guillaume [and 17 more](#)

No highlights
Abstract
Using data from JWST, we analyze the compact sources ("sparkles") located around a remarkable $z_{\text{spec}} = 1.378$ galaxy (the "Sparkler") that is strongly gravitationally lensed by the $z = 0.39$ galaxy cluster SMACS J0723.3-7327. Several of these compact sources can

Export Explore

1939-1946 1947-1954 1955-1962 1963-1970 1971-1978 1979-1986 1987-1994 1995-2002 2003-2010 2011-2018 2019-2022

Limit results to papers from 1939 to 2022 **Apply**

Other facets you may be interested in is creating a library to save all the citations of interest, and creating an email notification for your search to keep updated on the newest publications related to your search terms.

The screenshot shows the Advanced Digital Skyline (ADS) search interface. On the left, a sidebar lists various facets: AUTHORS (Abraham, R; Glazebrook, K; Carlberg, R; van Dokkum, P; Danieli, S), COLLECTIONS (astronomy, physics, general), REFEREED (refereed, non-refereed), INSTITUTIONS, KEYWORDS, PUBLICATIONS, BIB GROUPS, SIMBAD OBJECTS, NED OBJECTS, DATA, VIZIER TABLES, and PUBLICATION TYPE. The main panel displays a list of 8 search results, each with a checkbox, publication details, and citation counts. The first result is 2022MNRAS.515.5335L, cited 3 times. The second is 2022arXiv220806516J, cited 1 time. The third is 2022arXiv220802233M, checked, cited 4 times. The fourth is 2022ApJ...935..160K, checked, cited 8 times. The fifth is 2022ApJ...935....3L, cited 0 times. The sixth is 2022arXiv220713052G, checked, cited 0 times. The seventh is 2022arXiv220707129V, cited 1 time. The eighth is 2022ApJ...932...44G, cited 1 time. A red circle highlights the right-hand sidebar, which contains options for 'Add papers to library' (with dropdown for 'selected papers on' and 'to an existing library' or 'create a new library') and 'Create email notification' (with fields for 'Notification Name' (My Notification), 'Frequency' (Daily selected), and 'Create' button).

1 2022MNRAS.515.5335L 2022/10 cited: 3
Reaching for the Edge I: probing the outskirts of massive galaxies with HSC, DECaLS, SDSS, and Dragonfly
Li, Jiaxuan; Huang, Song; Leauthaud, Alexie [and 9 more](#)

2 2022arXiv220806516J 2022/08 cited: 1
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Jacobs, Colin; Glazebrook, Karl; Calabro, Antonello [and 19 more](#)

3 2022arXiv220802233M 2022/08 cited: 4
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4 2022ApJ...935..160K 2022/08 cited: 8
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5 2022ApJ...935....3L 2022/08
Light from the Darkness: Detecting Ultra-diffuse Galaxies in the Perseus Cluster through Over-densities of Globular Clusters with a Log-Gaussian Cox Process
Li, Dayi David; Eadie, Gwendolyn M.; Abraham, Roberto [and 6 more](#)

6 2022arXiv220713052G 2022/07
A low-cost ultraviolet-to-infrared absolute quantum efficiency characterization system of detectors
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7 2022arXiv220707129V 2022/07 cited: 1
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8 2022ApJ...932...44G 2022/06 cited: 1
Stellar Halos from the The Dragonfly Edge-on Galaxies Survey
Gilhuly, Colleen; Merritt, Allison; Abraham, Roberto [and 6 more](#)

When you click into an article, there a few things that may be of interest to you. If there is data available, it will be linked in DATA PRODUCTS on the right had side, as well as the FULL TEXT SOURCES which are PDFs or links to the article, if available. You will see that some articles will have two versions, which is the pre-print and the final publisher copy.

Screenshot of the ADS (Astrophysics Data System) search interface showing a detailed view of an article record.

The main search bar shows the query: `author:"Abraham, Roberto"`.

The left sidebar shows the following navigation options under "VIEW":

- Abstract (selected)
- Citations (1)
- References (60)
- Co-Reads
- Similar Papers
- Volume Content
- Graphics
- Metrics
- Export Citation

The "FEEDBACK" section is also present.

The central content area displays the following details for the article:

Title: Early results from GLASS-JWST XIV: A first morphological atlas of the $1 < z < 5$ Universe in the rest-frame optical

Authors: Jacobs, Colin ; Glazebrook, Karl ; Calabro, Antonello ; Treu, Tommaso ; Nanayakkara, Themiya ; Jones, Tucker ; Merlin, Emiliano ; Abraham, Roberto G. ; Stevens, Adam R H ; Vulcani, Benedetta ; Yang, Lilan ; Bonchi, Andrea ; Bradac, Marusa ; Castellano, Marco ; Fontana, Adriano ; Mason, Charlotte A ; Morishita, Takahiro ; Paris, Diego ; Trenti, Michele ; Marchesini, Danilo ; ...

Abstract: We present a rest-frame optical morphological analysis of galaxies observed with the NIRCam imager on the James Webb Space Telescope (JWST) as part of the GLASS Early Release Science program. We select 217 sources at redshifts $0.8 < z < 5.4$ and use the seven 0.9-5um NIRCam filters to generate rest-frame gri composite color images, and conduct visual morphological classification. Compared to HST-based work we find a higher incidence of disks and bulges than expected at $z > 1.5$, revealed by rest frame optical imaging. We detect 73 clear disks (43 at $z > 1.5$) of which 45 have bulges. No evolution of bulge fraction with redshift is evident: 60% at $z < 2$ ($N = 26$) versus 64% at $z \geq 2$ ($N = 19$). A stellar mass dependence is evident, with bulges visible in 47% of all disk galaxies with mass $10^{9.5} M_{\odot}$ ($N = 30$) but only 9% at $M < 10^{9.5} M_{\odot}$ ($N = 15$). We supplement visual morphologies with non-parametric measurements of Gini and Asymmetry coefficients in the rest-frame i-band. Our sources are more asymmetric than local galaxies, with slightly higher Gini values. When compared to high-z rest-frame ultraviolet measurements with Hubble Space Telescope, JWST shows more regular morphological types such as disks, bulges and spiral arms at $z > 1.5$, with smoother (i.e. lower Gini) and more symmetrical light distributions. The unexpected prevalence of detectable bulges and regular morphology at $z > 1.5$ will allow new tests of theoretical models of galaxy evolution.

Publication: eprint arXiv:2208.06516

Pub Date: August 2022

arXiv: [arXiv:2208.06516](#)

Bibcode: [2022arXiv220806516J](#)

Keywords: Astrophysics - Astrophysics of Galaxies

E-Print Comments: Submitted to ApJ Letters

Feedback/Corrections?

The right sidebar contains links to "FULL TEXT SOURCES" (arXiv), "DATA PRODUCTS" (MAST 1), and "Add paper to library".

The "GRAPHICS" section shows a grid of astronomical images corresponding to different redshift ranges: (0.8, 1.1), (1.4, 1.7), (2.4, 2.5), (3.4, 3.7), and (4.3, 5.4). A red oval highlights the "DATA PRODUCTS" link in the sidebar.

You may also be interested in the exporting the citation if you're using LaTeX or a reference management software like Zotero, Endnote or Mendeley. If you're interested in downloading citation information for multiple articles you can do so by putting the articles in a library first. We will see that in the next slide.

ads

Feedback · ORCID · About · Account

QUICK FIELD: Author First Author Abstract Year Fulltext All Search Terms

author:"Abraham, Roberto"

Back to results

VIEW

Abstract

Citations (1)

References (60)

Co-Reads

Similar Papers

Volume Content

Graphics

Metrics

Export Citation

FEEDBACK

Early results from GLASS-JWST XIV: A first morphological atlas of the $1 < z < 5$ Universe in the rest-frame optical

Show affiliations Show all authors

Jacobs, Colin ; Glazebrook, Karl ; Calabò, Antonello ; Treu, Tommaso ; Nanayakkara, Themiya ; Jones, Tucker ; Merlin, Emiliano ; Abraham, Roberto G. ; Stevens, Adam R H ; Vulcani, Benedetta ; Yang, Lilan ; Bonchi, Andrea ; Bradac, Marusa ; Castellano, Marco ; Fontana, Adriano ; Mason, Charlotte A ; Morishita, Takahiro ; Paris, Diego ; Trenti, Michele ; Marchesini, Danilo ; ...

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Publication: eprint arXiv:2208.06516

Pub Date: August 2022

arXiv: arXiv:2208.06516 ⓘ

Bibcode: 2022arXiv220806516J ⓘ

Keywords: Astrophysics - Astrophysics of Galaxies

E-Print Comments: Submitted to ApJ Letters

Feedback/Corrections?

FULL TEXT SOURCES

arXiv

DATA PRODUCTS

MAST (1)

Add paper to library

GRAPHICS

Click to view more

When you click *Account* in the top right corner, you will see an option to ADS Libraries. If you have built a library, you will be able to see it here. To export a batch of citations at once, you can select for them in the library and use the Export dropdown to choose the citation extension (BibTeX, Endnote, RIS etc.)

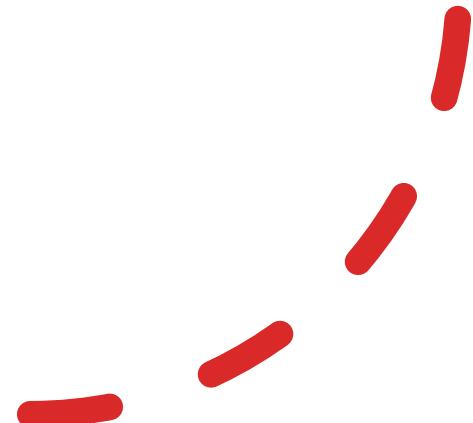
The screenshot shows the ADS Libraries interface. At the top, there's a navigation bar with links for Feedback, ORCID, About, and Account. The Account link is circled in red. Below the navigation bar, the user is signed in as nu.lee@utoronto.ca. On the left, there's a sidebar with options to ADD A LIBRARY, VIEW ALL LIBRARIES, and LIBRARY HELP. The main content area shows a library named "Example Library". It has a description "My ADS library". Below that, it shows "Number of Papers: 3", "Date Created: Sep 8 2022, 12:05pm", "Date Last Modified: Sep 8 2022, 12:08pm", and "Owner: nu.lee". There's a "View editing options (You have owner privileges)" button. At the bottom of the main content area, there are buttons for View Library, Manage access, and Export (which is circled in red). Below these buttons, a modal window is open, showing three selected records for deletion. The records are:

- 1 2022arXiv220802233M 2022/08 cited: 4 The Sparkler: Evolved High-Redshift Globular Clusters Captured by JWST Mowla, Lamiya A.; Iyer, Kartheik G.; Despres, Guillaume and 17 more
- 2 2022ApJ...935..160K 2022/08 cited: 8 Tidal Distortions in NGC1052-DF2 and NGC1052-DF4: Independent Evidence for a Lack of Dark Matter Keim, Michael A.; Dokkum, Pieter van; Danieli, Shany and 11 more
- 3 2022arXiv220713052G 2022/07 A low-cost ultraviolet-to-infrared absolute quantum efficiency characterization system of detectors Gill, Ajay S.; Shaaban, Mohamed M.; Tohuvavohu, Aaron and 8 more

At the bottom of the modal, there are buttons for Delete 3 Records and Show Selection in Results Page. The bottom of the page also has Per Page (set to 25), prev, 1 of 1, next, and Top links.

Why sign up for an ADS account?

- Keep track of papers you read (and write!)
- Organize papers into libraries and share
- Receive email reminders on topics you care about
- easy bibtex output for overleaf and latex
- It's free!



Why sign up for an ADS account?

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HOT TIP

Go to ui.adsabs.harvard.edu to set up an account. You can link your account to an ORCID account too!



Hot off the press at arXiv

<https://arxiv.org/list/astro-ph/new>

The screenshot shows the arXiv.org homepage for the Astrophysics category. At the top, there's a dark header with the Cornell University logo and a link to the Simons Foundation. Below the header is a red navigation bar with links for "arXiv.org > astro-ph", a search bar, and a "Search" button. The main content area is titled "Astrophysics" and "New submissions". It displays a list of 114 entries from September 8 to 10, 2020. The first entry is a paper by Zhe Li, Kenny C. Y. Ng, Songzhan Chen, Yuncheng Nan, and Huihai He, titled "Simulating gamma-ray production from cosmic rays interacting with the solar atmosphere in the presence of coronal magnetic fields". The second entry is a paper by Sho Fujibayashi, Masaru Shibata, Shinya Wanajo, Kenta Kiuchi, Koutarou Kyutoku, and Yuichiro Sekiguchi, titled "Viscous evolution of a massive disk surrounding stellar-mass black holes in full general relativity". Both entries include links to PDF files and other formats.

We gratefully acknowledge support from
the Simons Foundation and member institutions.

arXiv.org > astro-ph

Astro-physics

New submissions

Submissions received from Tue 8 Sep 20 to Wed 9 Sep 20, announced Thu, 10 Sep 20

- New submissions
- Cross-lists
- Replacements

[total of 114 entries: 1-114]
[showing up to 2000 entries per page: [fewer](#) | [more](#)]

New submissions for Thu, 10 Sep 20

[1] [arXiv:2009.03888](#) [pdf, other]
Simulating gamma-ray production from cosmic rays interacting with the solar atmosphere in the presence of coronal magnetic fields
Zhe Li, Kenny C. Y. Ng, Songzhan Chen, Yuncheng Nan, Huihai He
Subjects: High Energy Astrophysical Phenomena (astro-ph.HE); Solar and Stellar Astrophysics (astro-ph.SR)

Cosmic rays can interact with the solar atmosphere and produce a slew of secondary messengers, making the Sun a bright gamma-ray source in the sky. Detailed observations with Fermi-LAT have shown that these interactions must be strongly affected by solar magnetic fields in order to produce the wide range of observational features, such as high flux and hard spectrum. However, the detailed mechanisms behind these features are still a mystery. In this work, we tackle this problem by performing particle-interaction simulations in the solar atmosphere in the presence of coronal magnetic fields modeled using the potential field source surface (PFSS) model. We find that the low-energy (\sim GeV) gamma-ray production is significantly enhanced by the coronal magnetic fields, but the enhancement decreases rapidly with energy. The enhancement is directly correlated with the production of gamma rays with large deviation angles relative to the input cosmic-ray direction. We conclude that coronal magnetic fields are essential for correctly modeling solar disk gamma rays below 10GeV, but above that the effect of coronal magnetic fields diminishes. Other magnetic field structures are needed to explain the high-energy disk emission.

[2] [arXiv:2009.03895](#) [pdf, other]
Viscous evolution of a massive disk surrounding stellar-mass black holes in full general relativity
Sho Fujibayashi, Masaru Shibata, Shinya Wanajo, Kenta Kiuchi, Koutarou Kyutoku, Yuichiro Sekiguchi
Comments: 25 pages, 17 figures
Subjects: High Energy Astrophysical Phenomena (astro-ph.HE)

Hot off the press at arXiv

<https://arxiv.org/list/astro-ph/new>

Cornell University We gratefully acknowledge support from the Simons Foundation and member institutions.

arXiv.org > astro-ph Search... All fields Search

Help | Advanced Search

Astrophysics

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[total of 114 entries: 1-114]
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HOT TIP

There is an arXiv *mini-course* offered in the DADDAA!



COOL CATCH

Twitter account @astro-ph-leaks scrapes comments in .tex files uploaded to arXiv ... If you upload a manuscript, then don't leave any comments in it that you don't want broadcast to the world ;)



Phone Apps (e.g. libarxiv)

The image shows two side-by-side screenshots of the libarxiv mobile application on an iPhone. The left screenshot displays the main navigation menu with categories like Physics, Mathematics, and Computer Science. The right screenshot shows a detailed view of a specific research paper from the 'Cosmology and Nongalactic Astrophysics' category.

Left Screenshot (All Categories):

- Physics
 - Astrophysics (astro-ph)
 - Physics(Condensed Matter) (cond-mat)
 - General Relativity and Quantum Cosmology (gr-qc)
 - High Energy Physics (hep)
 - Mathematical Physics (math-ph)
 - Nonlinear Sciences (nlin)
 - Nuclear Experiment (nucl-ex)
 - Nuclear Theory (nucl-th)
 - Physics (physics)
 - Quantum Physics (quant-ph)
- Mathematics
- Computer Science
- Quantitative Biology

Bottom Navigation: All, Recent, Bookmarks, Others

Right Screenshot (Cosmology and Nongalactic Astrophysics):

2020/9/9

Stellar cooling, inelastic dark matter, and XENON
Wai-Yee Keung, Danny Marfatia, Po-Yan Tseng

Newtonian-like gravity with variable G
úlio C. Fabris, Tales Gomes, únior D. Toniato, Hermano Velten

Multi-messenger parameter estimation of GW170817: from jet structure to the Hubble constant
Hao Wang, Dimitrios Giannios

Palatini Higgs and Coleman-Weinberg inflation with non-minimal coupling
Nilay Boston

Minimum variance estimation of statistical anisotropy via galaxy survey
Maresuke Shiraishi, Teppei Okumura, Kazuyuki Akitsu

The patch like model of galaxies formation: the virial paradox, core-cusp and missing satellite problems
ínski, A. Doroshkevich

A model-independent constraint on the Hubble constant with gravitational waves from the Einstein Telescope
Sixuan Zhang, Shuo Cao, Jia Zhang, Tonghua Liu, Yuting Liu, Shuaibo Geng, Yujie Lian

On cosmography in the cosmic dark ages: are we still in the dark?
Aritra Banerjee, Ó Colgáin, Misao Sasaki, Mohammad M. Sheikh-Jabbari, Tao Yang

The XXL survey: XLII. Detection and characterization of the galaxy population of distant galaxy clusters in the XXL-N/VIDEO field: A tale of variety
A. Trudeau, C. Garrel, J. Willis, M. Pierre, F. Gastaldello, L. Chiappetti, S. Ettori, K. Umetsu, C. Adami, N. Adams, R. A. A. Bowler, L. Faccioli,

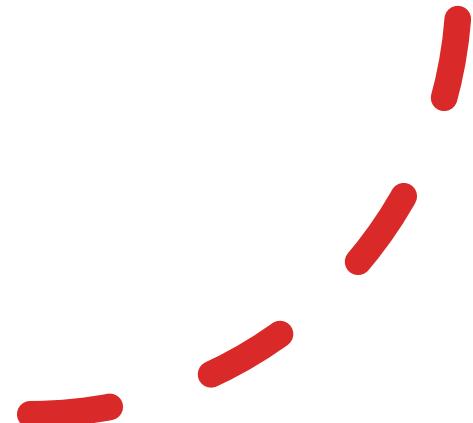
Bottom Navigation: All, Recent, Bookmarks, Others

Accessing Library Services

Searching the UofT Library Website

<https://onesearch.library.utoronto.ca/>

Or Google Search UofT Library



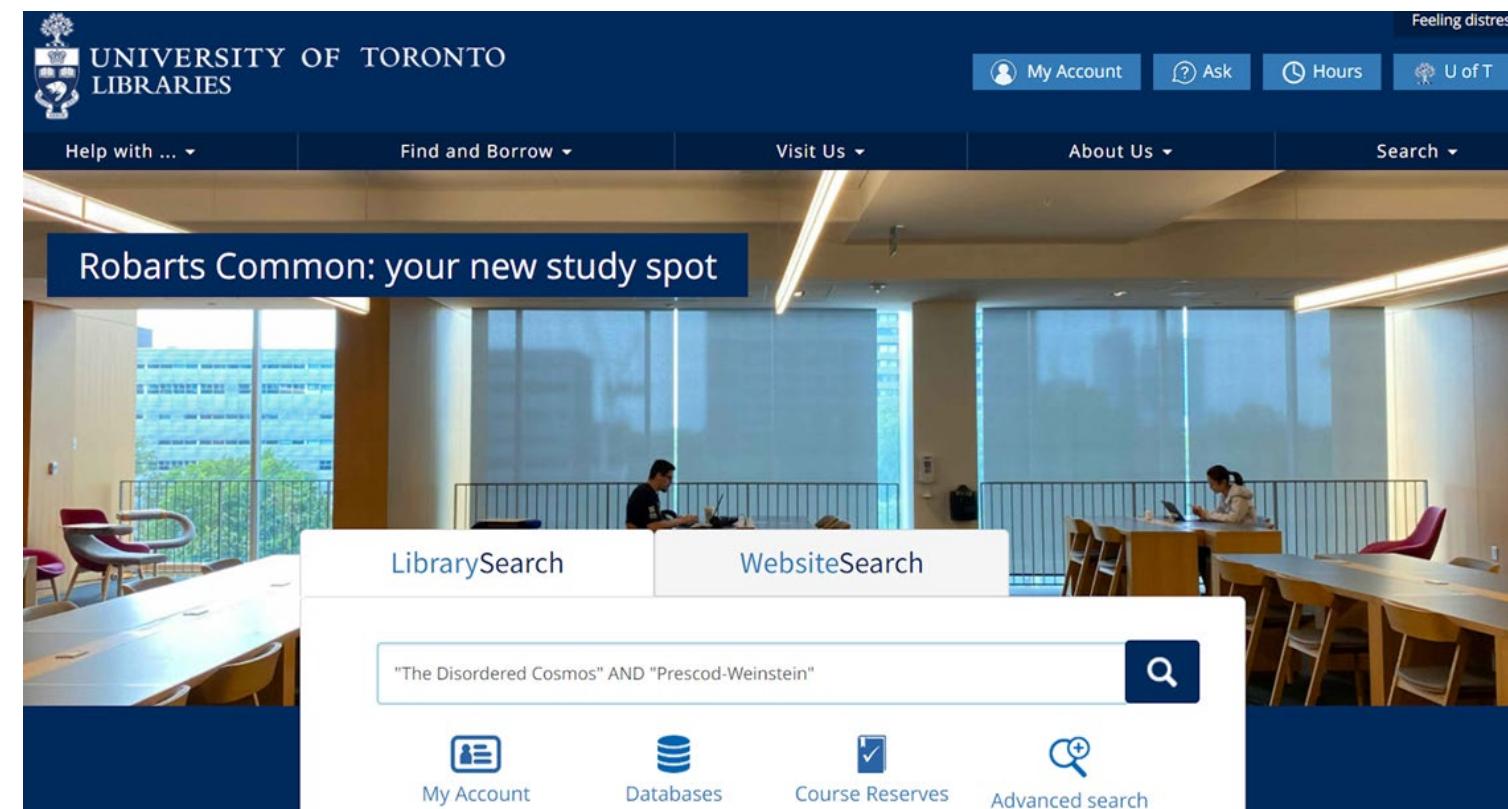
How to find a specific book/item at UofT

The best method to find a book is the **exact title and author surname**. If the patron only has the title or author, it might be a harder search. In that case try Googling the book first to find the title and author.

Example: Looking for *The Disordered Cosmos* by Chanda Prescod-Weinstein

You can search on the library website's main search bar.

Search the title in quotation marks (" ") and if you have an author, put AND in capital letters to combine both to try to get a specific search result.



Accessing Library Services

**Finding an item for
interlibrary loan**

**(Borrowing from other
universities)**



Interlibrary Loan

Example: We're trying to find a thesis titled "Magnetohydrodynamic Shocks in Molecular Clouds" by David F. Chernoff printed in 1985.

Pay attention to this one, as the author wrote an article of the same title AFTER he completed his thesis. Try not to mistake the type of publication when searching for the title in question.

Here it shows that we have access to the ARTICLE, not the thesis.

The screenshot shows the University of Toronto LibrarySearch interface. The search bar contains the query: "Magnetohydrodynamic Shocks in Molecular Clouds" AND Chernoff. The results page displays one article from The Astrophysical Journal, 1987, Vol.312 (1), p.143-169; CHICAGO: Univ Chicago Press. The article is titled "MAGNETOHYDRODYNAMIC SHOCKS IN MOLECULAR CLOUDS" by CHERNOFF, DF. It includes links to download PDF and view the article online. Below the results, there is a section for "Newspapers search".

UNIVERSITY OF TORONTO LIBRARIES | LibrarySearch | Sign In | Menu

New Search | Databases | Journals | Interlibrary Loan | Newspapers | Browse | ...

"Magnetohydrodynamic Shocks in Molecular Clouds" AND Chernoff | Everything | All Libraries | Advanced Search

All items ▾

The email a record feature is currently not available. Please sign in to save searches or see request options. [Sign In](#) Need help? [DISMISS](#)

Filter your results 0 selected 1 Results

Expand results beyond Library collection

Search in Full Text

ARTICLE

MAGNETOHYDRODYNAMIC SHOCKS IN MOLECULAR CLOUDS

CHERNOFF, DF

The Astrophysical journal, 1987, Vol.312 (1), p.143-169; CHICAGO: Univ Chicago Press

[Download PDF](#) [Available Online](#)

Newspapers search >

These search results do not include newspapers. View results from our entire collection of newspapers, or search specifically within Featured newspapers.

Results Per Page 25 50

[Report a problem](#)

Interlibrary Loan

Next, to find out if another university has the thesis available, we're going to toggle on “**Expand results beyond Library collection**” found on the left-hand side of the page.

Here we see that results #2 is the thesis we're looking for.

The screenshot shows a library search results page. At the top, there is a search bar with the query "Magnetohydrodynamic Shocks in Molecular Clouds" AND Chernoff. Below the search bar, a yellow banner displays a message about saving searches and a "Sign In" button. The search results are filtered by "All items". There are three results listed:

- ARTICLE**
MAGNETOHYDRODYNAMIC SHOCKS IN MOLECULAR CLOUDS
CHERNOFF, DF
Astrophys. J.; (United States), 1987, Vol.312 (1), p.143-169; CHICAGO: Univ Chicago Press
Download PDF Available Online >
- THESIS**
Magnetohydrodynamic shocks in molecular clouds
Chernoff, D.F.
United States: Univ. of California,Berkeley, CA
1985
No Online Access >
- ARTICLE**
Magnetohydrodynamic shocks in molecular clouds

Interlibrary Loan

When you click on the thesis, you will see a pop-up showing that we do not have this thesis for access at our university.

Instead, it gives you the option, **The library does not have this book? Request is via interlibrary loan”**

If you click this link, it will direct you to a form which you fill out and submit, which will send a request to the central library system

THESIS

Magnetohydrodynamic shocks in molecular clouds

Chernoff, D.F

United States: Univ. of California, Berkeley, CA

1985

[Check For Available Services >](#)

Top

Send To

How To Get It

Details

Send to _____

Permalink Citation Print Export Citation (RIS) RefWorks Export To Excel

Report A Problem!

How to get it _____

Please sign in to check if there are additional request options. [Sign In](#) Need help?

The library does not have this book? Request it via interlibrary loan.

E-books

If you scroll down the main library page, you will see our e-book collection linked in the bottom-left corner.

Click on the "More eBooks collections" link to see our full list.

The screenshot shows the University of Toronto Libraries' homepage. In the bottom-left corner, there is a section titled "Places to find eBooks" with icons for various platforms: Library Catalogue Online Books, U of T Books on Internet Archive, Scholars Portal Books, JStor Books, Elsevier Science Direct, and Springer. A red circle highlights this section. Below it, a link reads "More eBooks collections" with the URL "https://onesearch.library.utoronto.ca/robarts-common/home".

Course reserves

Wifi | computers

Print, copy, scan

Online Books

Places to find eBooks

Library Catalogue Online Books

U of T Books on Internet Archive

Scholars Portal Books

JStor Books

Elsevier Science Direct

Springer

More eBooks collections

<https://onesearch.library.utoronto.ca/robarts-common/home>

Copyright and syllabus services

Support for course readings, syllabi, publishing, and open access.

Workshops

Introduction to the Engineering & Computer Science Library Supports & Services (geared for grad students but all are welcome)

Friday, September 9, 2022
12:10pm - 12:45pm
Online

Introduction to the Engineering & Computer Science Library Supports & Services (geared for grad students but all are welcome)

Tuesday, September 13, 2022
12:10pm - 12:45pm
Engineering Library

Graduate student library orientation

Monday, September 12, 2022
1:00pm - 1:45pm
Online

Research and Writing Seminar: Critical Reading

Monday, September 19, 2022
2:00pm - 4:00pm
Online

UTL News

University of Toronto Libraries' statement on National Truth and Reconciliation Day

[More news](#)

Support the Libraries

Help the University of Toronto Libraries in our mission to strengthen our outstanding collections, transform our accessible study spaces, and offer innovative research services.

[How to Support the Libraries](#)

Robarts Common

A photograph of the Robarts Common building, a modern glass and steel structure with a curved facade, set against a backdrop of other buildings and trees at dusk or night.

E-books

Find and Borrow

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[Explore Our Unique Collections](#)

[Special collections](#)

[Archives](#)

[U of T research repository \(TSpace\)](#)

[Ebook platforms & collections](#)

[Borealis](#)

[Course reserves](#)

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[ABC-CLIO eBook Collection](#)

[ACLS Humanities Ebooks](#)

[Ashgate Publishing](#)

[Biodiversity Heritage Library](#)

[Bloomsbury Collections](#)

[Books@Ovid](#)

[Brepols](#)

[Brill Online Books](#)

[Brill Online Reference Works](#)

[Cambridge Core](#)

[Casalini Torrossa](#)

When you click on the "more eBooks collections" link, it will drop you to this page with all our e-book subscriptions.

Some of these are geared toward the sciences, while others may be geared to humanities/social sciences or multidisciplinary.

Ebook platforms and collections

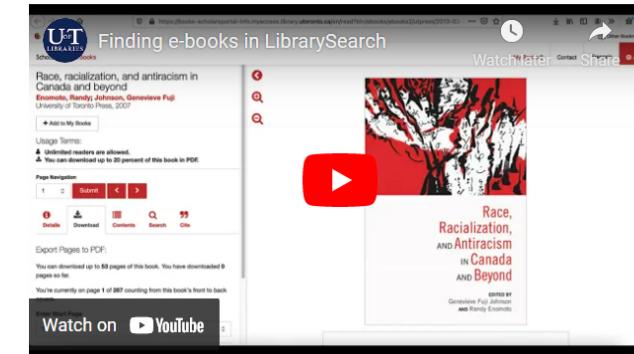
Click on the titles below to learn more about each ebook platform or collection's functionality.

The library doesn't purchase every ebook on every platform, so you might see ebooks to which you don't have access on a publisher's website or platform. The best way to check for access to an ebook is by searching the [library catalogue](#).

If you have the option of downloading a book for offline reading, you may be asked to download [Adobe Digital Editions](#).

If you have questions or need additional help, ask a [librarian](#).

How to find and open an individual ebook



E-books

Some of the e-book publishers you will be interested in will include:

Cambridge Core

Elsevier Science Direct

IOP ebooks

SPIE Digital Library

Springer Books



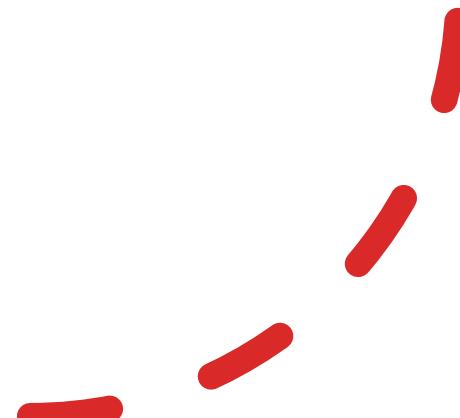
Accessing Library Services

NuRee Lee

Physics, Astronomy & Astrophysics Librarian

Nu.lee@utoronto.ca

- [Gerstein Science Library](#)
- [Physics Library](#)
- Accessing U of T Library off-campus
 - <https://onesearch.library.utoronto.ca/>
- Google Scholar account
 - Add U of T in Settings > Library Links



Exercises

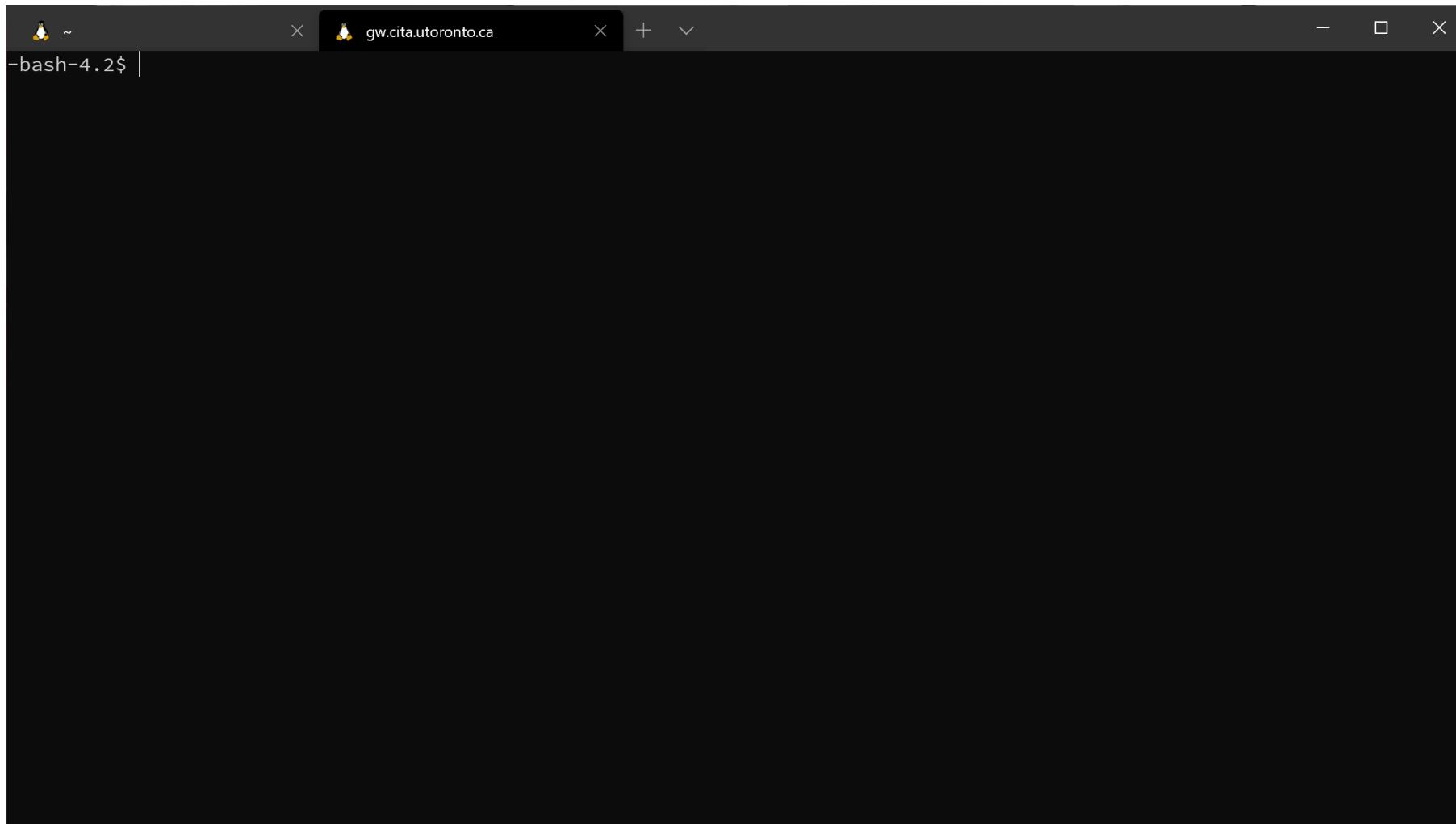
- Create an ADS library and cite it within your LaTeX document



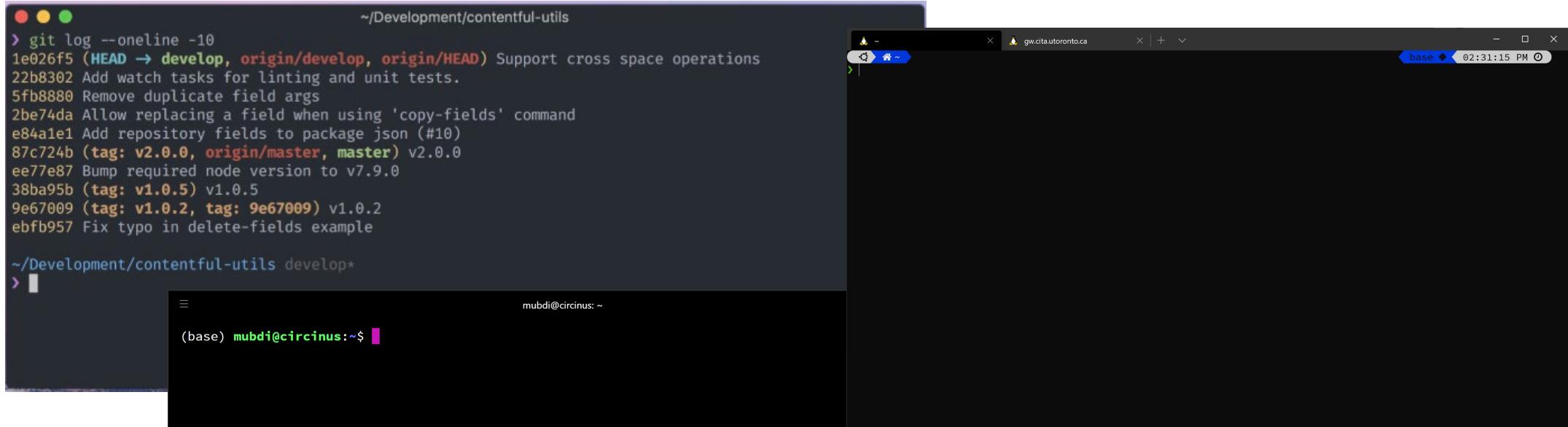
BREAK!

Your friend, the Terminal

This is your terminal. You will come to love this little box!



They come in all sorts of shapes and sizes



The image displays three separate terminal windows, each with a distinct shape and size, illustrating the variety of window shapes available in different environments.

- Top Left Terminal:** A standard rectangular terminal window with rounded corners. It shows a command-line interface with a dark background and light-colored text. The command `git log --oneline -10` is run, displaying ten commits from the `develop` branch. The window title is `~/Development/contentful-utils`.
- Top Right Terminal:** A rectangular terminal window with a black background and white text. It shows a command-line interface with a title bar indicating the URL `gw.cita.utoronto.ca` and the current time `02:31:15 PM`. The window title is `base`.
- Bottom Center Terminal:** A rounded rectangular terminal window with a dark background and light-colored text. It shows a command-line interface with a title bar indicating the user `howtogeek@ubuntu` and the current directory `~`. The window title is `howtogeek@ubuntu`.

What is a Terminal?

A Terminal Program (sometimes also called a “console”) is a way of interacting directly with your computer using text commands. This is an alternative way of interacting with your computer to a mouse, and often, more powerful.

Not all terminals are built the same, and we have the following recommendations for terminal programs:

- **For Windows:** Windows Terminal (available on the Windows Store)
- **For MacOS:** iTerm2 (available on its website: <https://iterm2.com>)
- **For Linux/or Crossplatform:** Hyper (available on its website: <https://hyper.is/>)

What is a Terminal?

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HOT TIP

The terminal programs we’re recommending all have the ability to open multiple tabs and panes, and hot keys to switch between them. This makes it easy to compare two things side-by-side.



Some terminal basics...

```
> cd <directory name> # change your current directory to <directory name>  
  
> cd ~ # change your current directory to your home directory  
  
> ls # list all the files in the current directory  
  
> ls -ahl # the same, but show me all the files in a list  
  
> ls <directory name> # list all the files in <directory name>  
  
> mkdir <directory name> # make a directory called <directory name>  
  
> rmdir <directory name> # remove the directory called <directory name>  
(only works if it's empty)  
  
> pwd # list what directory you're in
```

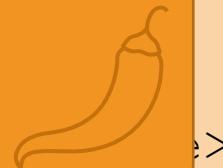


Some terminal basics...

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> cd ~ # change your current directory to your home directory  
  
> ls # list all the files in the cu  
  
> ls -ahl # the same, but show me a  
  
> ls <directory name> # list all th  
  
> mkdir <directory name> # make a d  
  
> rmdir <directory name> # remove t  
(only works if it's empty)  
  
> pwd # list what directory you're in
```

HOT TIP

This is just a very basic list to give you a flavour, and everyone has their own versions/options of these commands that they love. Use what makes the most sense!



Some terminal basics...

```
> cd <directory name> # change your current directory to <directory name>  
  
> cd ~ # change your current directory to your home directory  
  
> ls # list all the files in the current directory  
  
> ls -ahl # the same, but show me all the files in a list  
  
> ls <directory name> # list all the files in <directory name>  
  
> mkdir <directory name> # make a directory  
  
> rmdir <directory name> # remove the directory  
(only works if it's empty)  
  
pwd # list what directory you're in
```

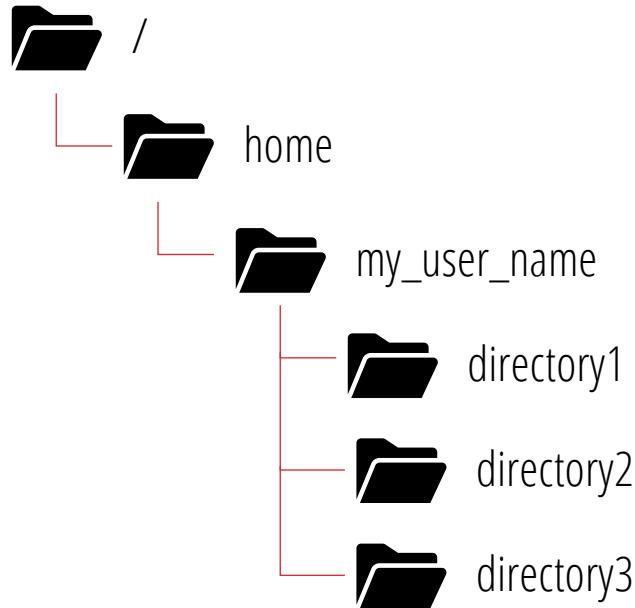
HOT TIP

You can type in “man <command name>” to get the manual page of the command, which shows you all of the options for that command and how to use it.



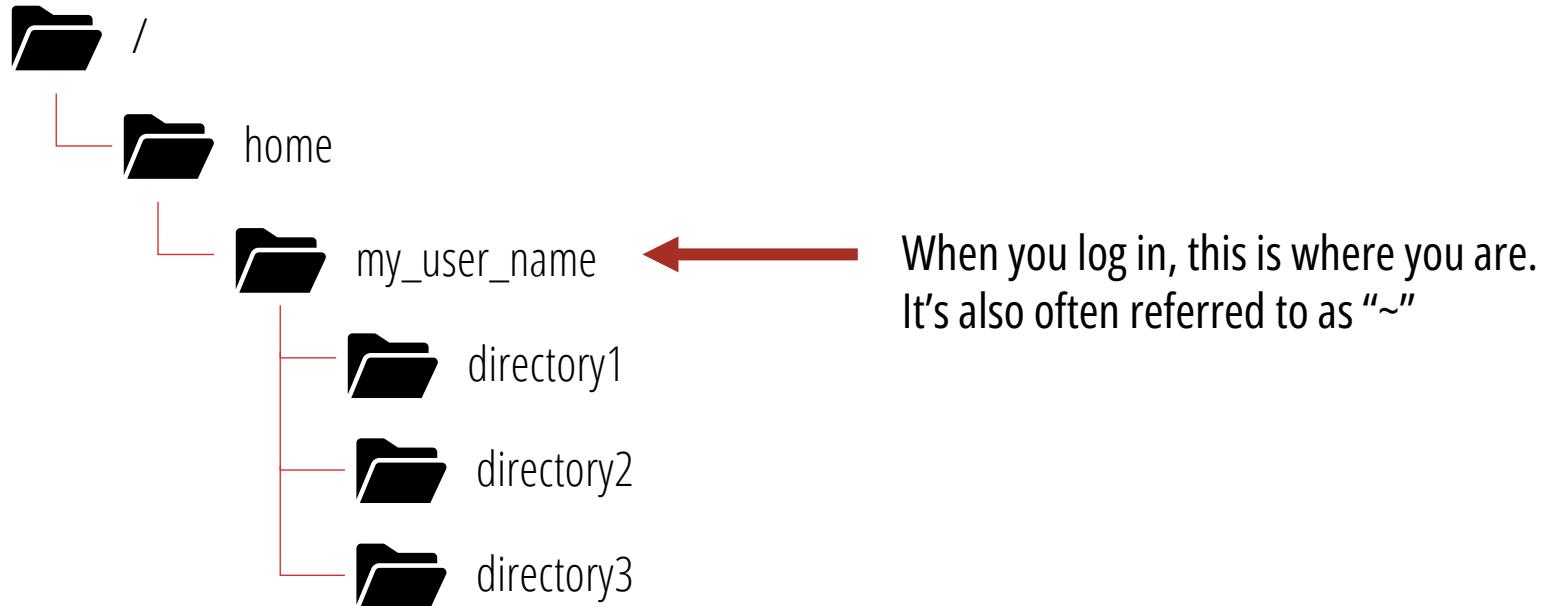
Navigating your directories

Typically, on your computer, there's a tree of directories:



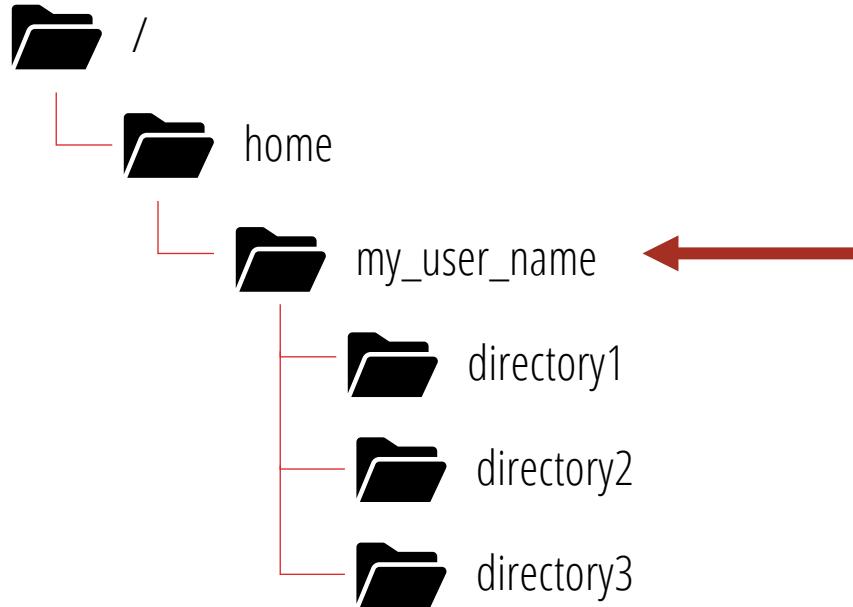
Navigating your directories

Typically, on your computer, there's a tree of directories:



Navigating your directories

Typically, on your computer, there's a tree of directories:



When you log in, this is where you are.
It's a

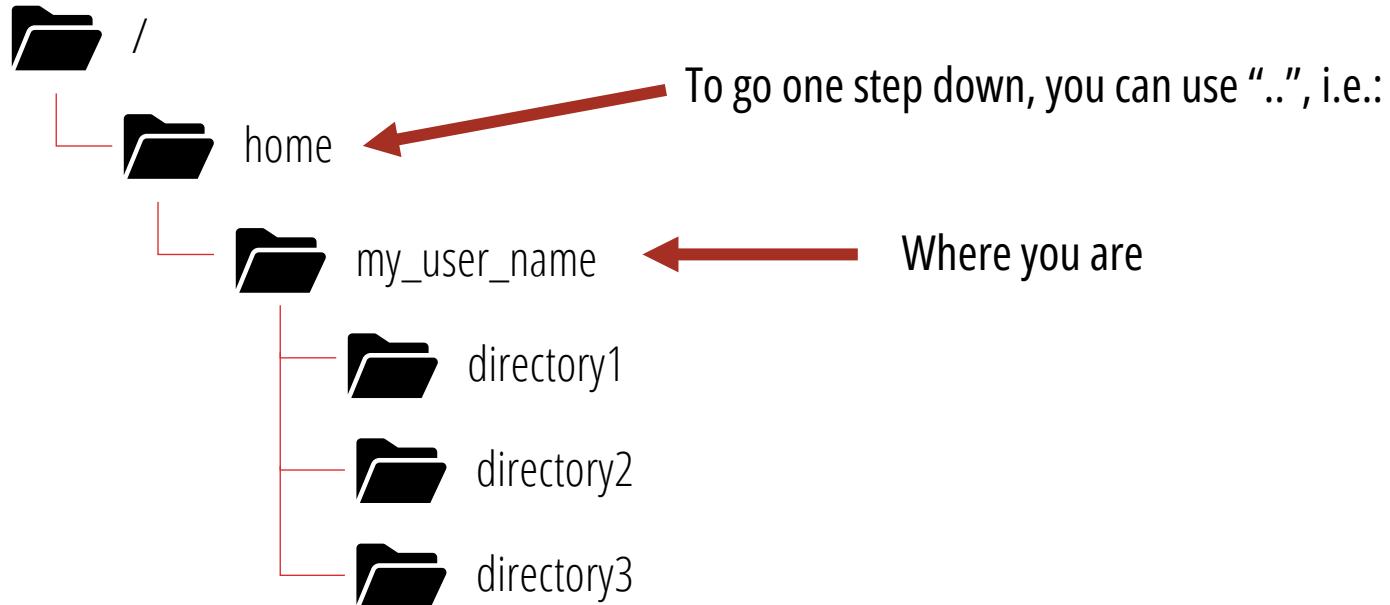
COOL CATCH

In Windows (not using WSL), this location is usually
in your User directory. For instance, for me, it is
located in "C:\Users\mubdi"



Navigating your directories

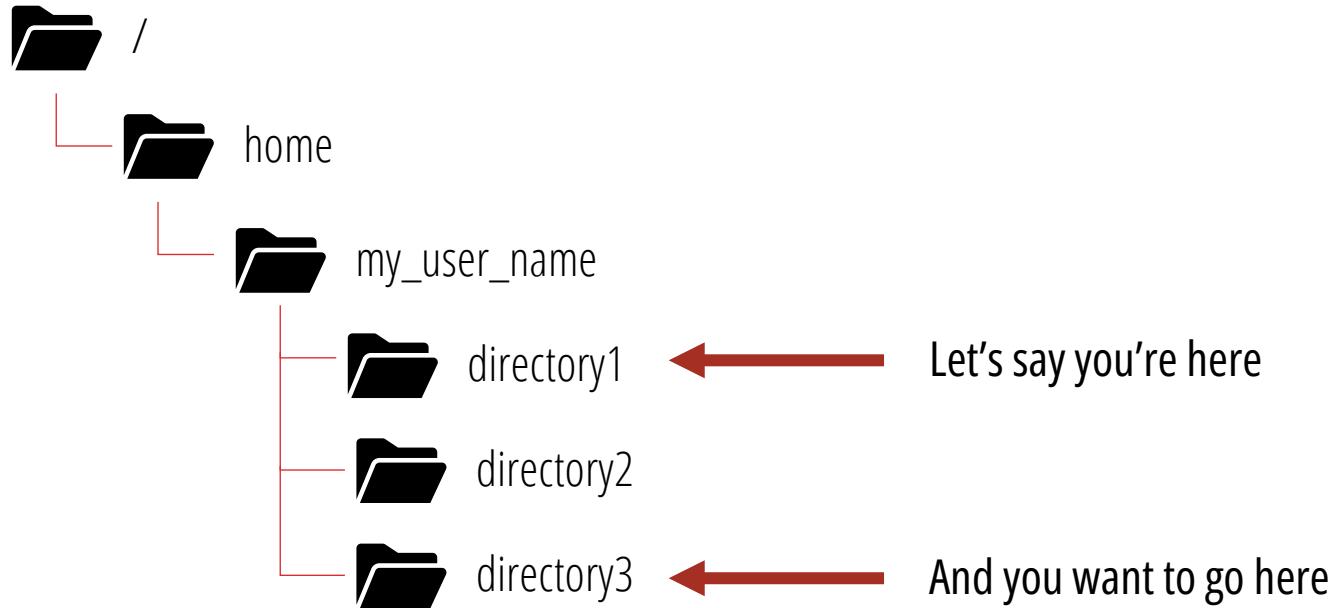
Typically, on your computer, there's a tree of directories:



```
cd ..
```

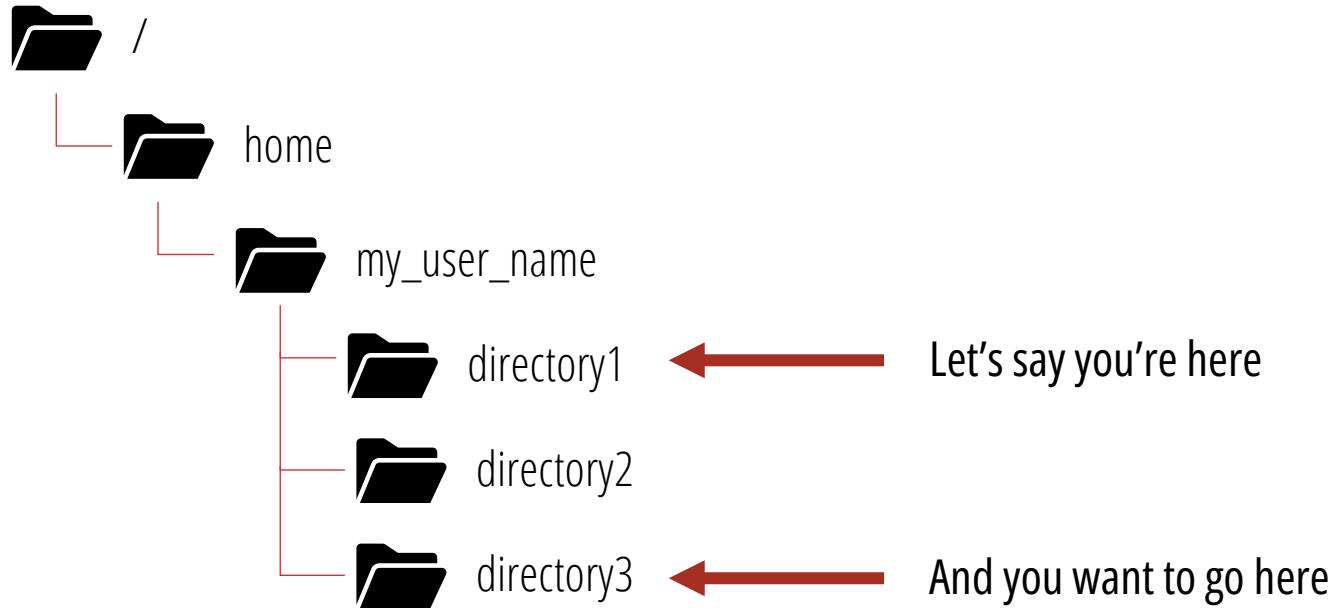
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Navigating your directories

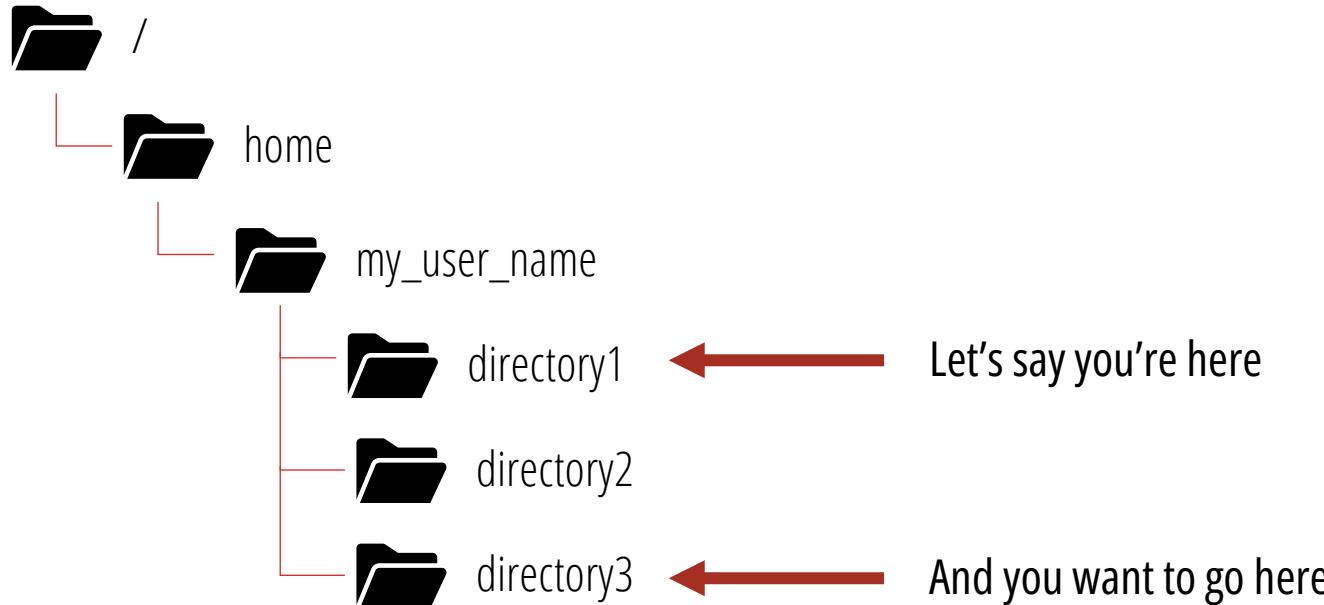
Typically, on your computer, there's a tree of directories:



```
cd ../directory3
```

Navigating your directories

Typically, on your computer, there's a tree of directories:

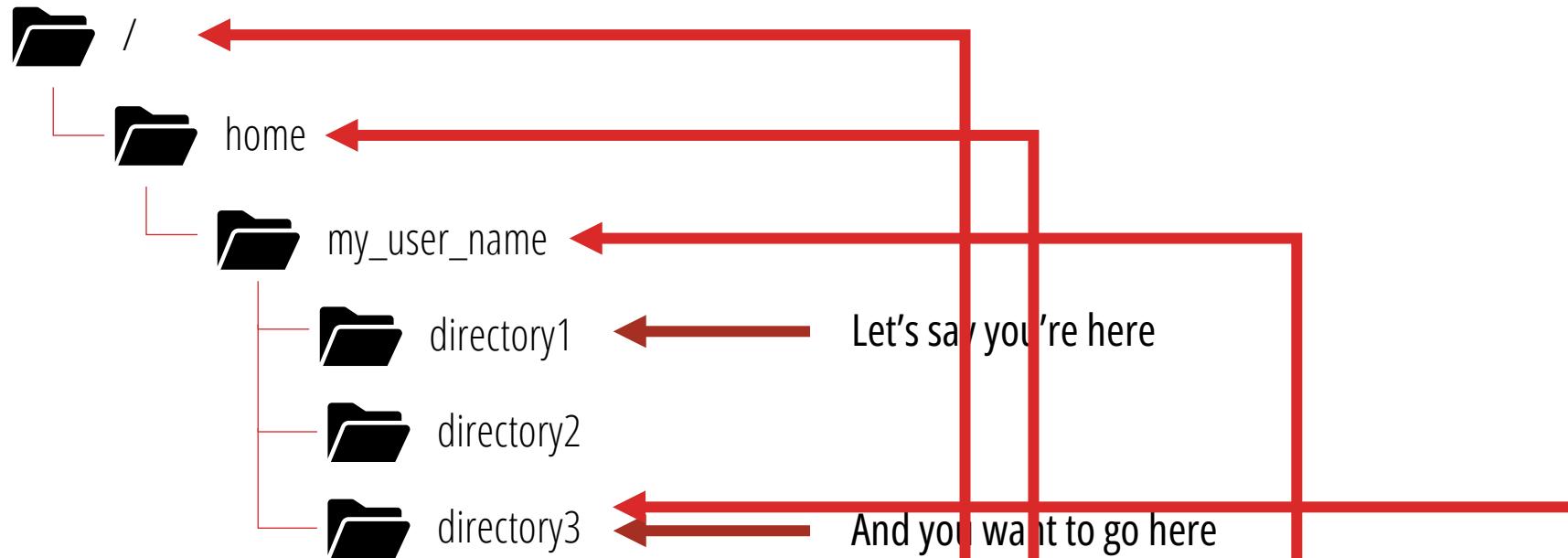


Or you could use absolute paths (i.e., right from the top):

```
cd /home/my_user_name/directory3
```

Navigating your directories

Typically, on your computer, there's a tree of directories:

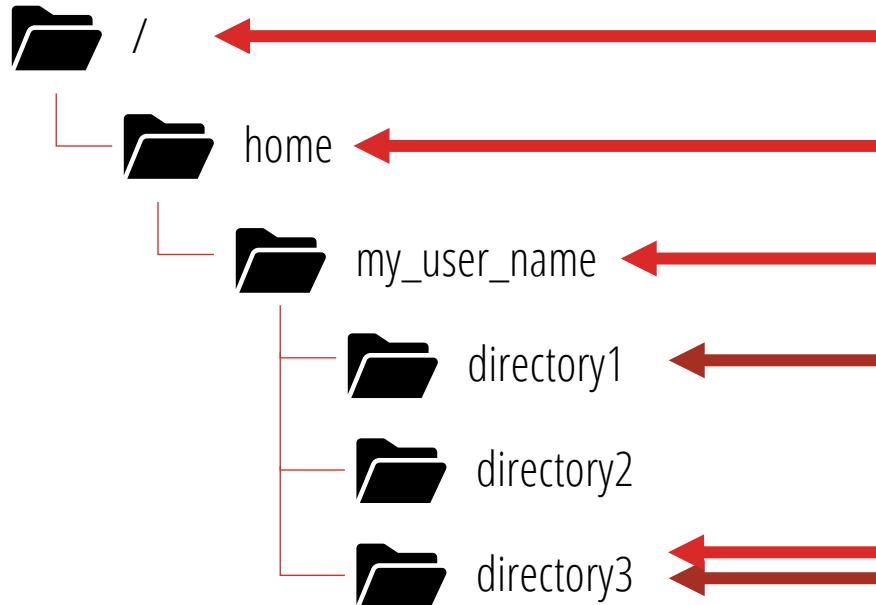


Or you could use absolute paths (i.e., right from the top):

```
cd /home/my_user_name/directory3
```

Navigating your directories

Typically, on your computer, there's a tree of directories:



HOT TIP

It's okay to be lazy, and something you want to be lazy about is typing. You can usually press "tab" to try to complete the name of directories and/or files, if you start typing the first few letters.



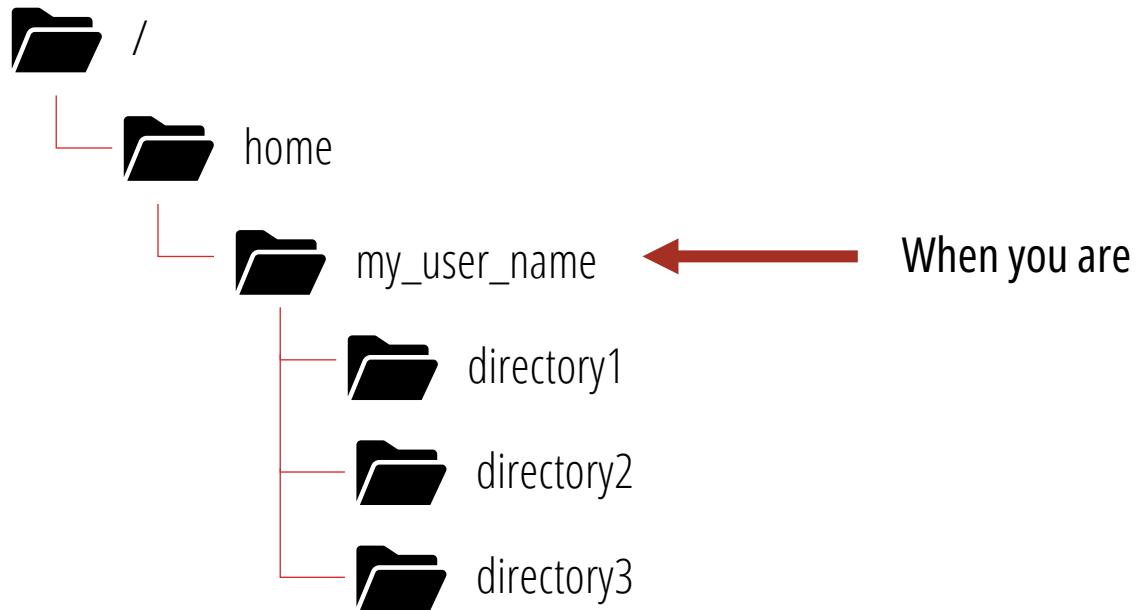
Or you could use absolute paths (i.e., right from the top):

```
cd /home/my_user_name/directory3
```



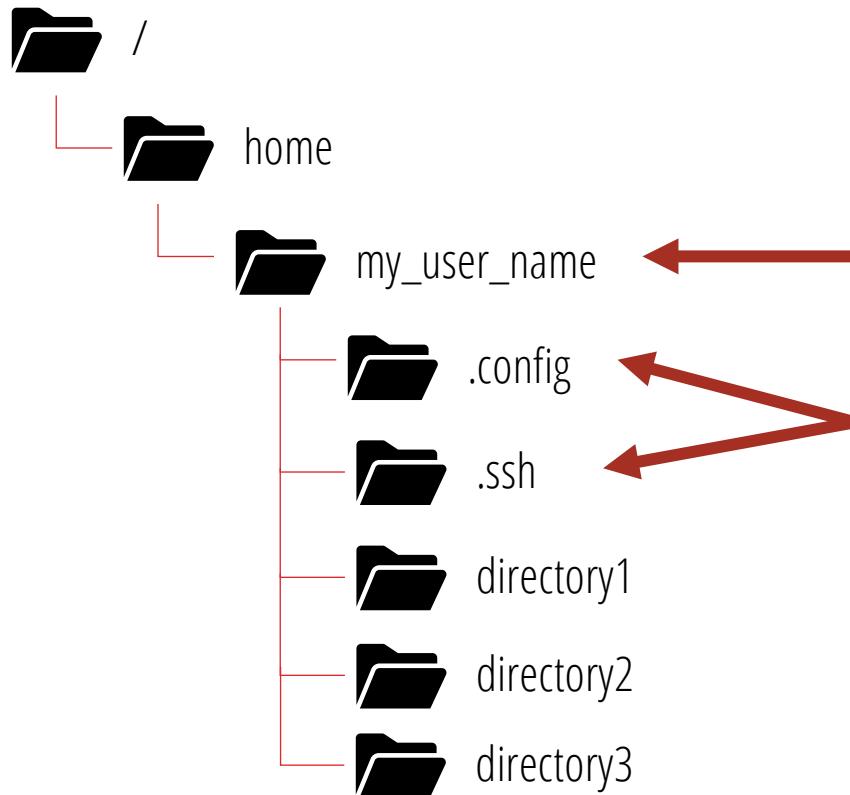
Hidden Directories

When you run an “ls”, you don’t see everything. In your home directory, try running “ls –a”



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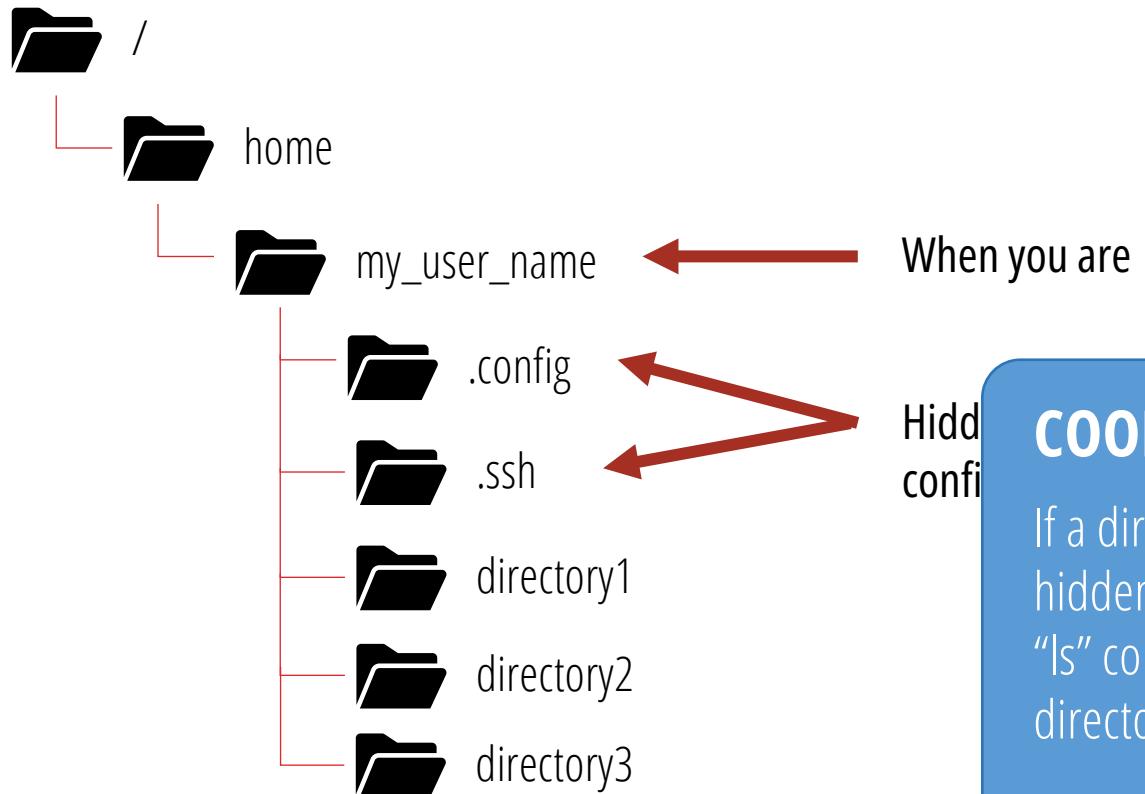
When you are

Hidden directories: These are where your computer stores various configuration files. For instance, for python, or for ssh



Hidden Directories

When you run an “ls”, you don’t see everything. In your home directory, try running “ls –a”



COOL CATCH

If a directory or file starts with a period (.), it is a hidden file, and won’t show up by default with the “ls” command. We’ll be playing with a bunch of such directories and files in this bootcamp.



SSH

One of the most powerful things about computing is often connecting to other computers! The way most computers that you'll encounter doing this is through the command line through a program called "ssh". That stands for "secure shell".

Importantly, anything you communicate across different computers will be encrypted.

If you're going to use a system like Compute Canada/SciNet or CITA, this will be important for you.

Some Basic SSH Commands

```
> ssh <server_name> # ssh into <server_name> with whatever your current  
username is  
  
> ssh <username>@<server_name> # ssh into a server with a specific  
username  
  
> ssh <server_name> -l <username> # same as above, but longer  
  
> ssh-keygen # generates a security key to allow you to login to places  
without a password  
  
> ssh-copy-id <server_name> # copies your generated security key over to  
<server_name>
```



Some Basic SSH Commands

```
> ssh <server_name> # ssh into <server_name> with whatever your current  
username is
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username
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```
> ssh <server_name> -l <username> # same as above, but longer
```

```
> ssh-keygen # generates a security key to  
without a password
```

```
> ssh-copy-id <server_name> # copies your  
<server_name>
```

HOT TIP

You can save settings for different ssh servers in your `~/.ssh/config` file, for instance, if you'd like ports forwarded, or if you'd like to use a specific user name



Some Basic SSH Commands

```
> ssh <server_name> # ssh into <server_name> with whatever your current  
username is
```

```
> ssh <username>@<server_name> # ssh into a server with a specific  
username
```

```
> ssh <server_name> -l <username> # same as above, but longer
```

```
> ssh-keygen # generates a security key to  
without a password
```

```
> ssh-copy-id <server_name> # copies your  
<server_name>
```

HOT TIP

If you need to forward a **port** from another computer to yours, you can use the **-L** flag. For instance, if you wanted to forward port 8888 to your computer's port 8888, you can use the flag:

-L 8888:localhost:8888



Moving Files around

More often than not, you'll want to move files around a system, or between systems. Here's how to do it on your own computer:

```
> cp <file_name> <destination_name> # copy a single file from one location  
to another
```

```
> cp -r <directory_name> <destination_name> # copy a whole directory (and  
everything in it) from one location to another
```

```
> mv <file_name> <destination_name> # move a file or directory from one  
location to another
```



Moving Files around

More often than not, you'll want to move files around a system, or between systems.

Let's look at how to do this on a computer:

HOT TIP

Wildcards (*) are your friend! If you want to copy a selection of files that match a certain bit of the filename, you can use a wildcard to represent everything that's *not* supposed to match. For instance:

*.txt

Will match:

a.txt, b.txt, c.txt



```
time> # copy a single file from one location
```

```
location_name> # copy a whole directory (and its contents) to another
```

```
time> # move a file or directory from one
```



Moving Files around

How about on another system? You can copy over ssh using `scp`:

```
> scp <file_name> <user_name>@<server_name>:<destination_name> # copy a  
single file from your computer to a server.
```

```
> scp <user_name>@<server_name>:<file_name> <destination_name> # copy a  
single file from a server to location on your computer.
```

```
> scp -r <user_name>@<server_name>:<directory_name> <destination_name> #  
copy a directory from a server to location on your computer.
```



Moving Files around

How about on another system? You can copy over ssh using `scp`:

```
> scp <file_name> <user_name>@<server_name>:<destination_name> # copy a  
single file from your computer to a server.
```

```
> scp <file_name> <user_name>@<server_name>:<destination_name> # copy a  
file from a server to a destination on your computer.
```

```
:<directory_name> <destination_name> # copy an entire directory and its  
location on your computer.
```

HOT TIP

For individual files, or if you don't remember exactly what the file was called, don't be a hero – use a GUI. For Windows, I use the WinSCP client. For Mac OSX, Cyberduck is a popular choice.



Moving Files around

How about on another system? You can copy

```
> scp <file_name> <user_name>@<server_name>:  
single file from your computer to a server
```

```
> scp <user_name>@<server_name>:<file_name> <local_directory>  
single file from a server to location
```

```
> scp -r <user_name>@<server_name>:<directory> <local_directory>  
copy a directory from a server to local computer
```

HOT TIP

Is the file you want openly available on the internet? If so, an easy way to grab the file is using the command **wget**. If you have a particular URL, you can download the file to your current directory by:

```
wget <url_of_file>
```



#



Moving Files around

How about on another system? You can copy over ssh using `scp`:

```
> scp <file_name> <user_name>@<server_name>:<destination_name> # copy a  
single file from your computer to a server.
```

HOT TIP

Do you have a more complicated/larger transfer that you need to complete? Perhaps you need to run it regularly? Take a look at `rsync` which is beyond the scope of this bootcamp, but will help you immensely. There's a lot of options, so best to Google/Search for what you'd like to do for the correct command.



```
<file_name> <destination_name> # copy a  
file from a server to your computer.
```

```
<source_directory_name> <destination_name> #  
copy a directory and its contents to a destination on your computer.
```