



# STARFISH SCHOOL

A Virtual Bootcamp for Astronomy Graduate Students

## **PRE-BOOTCAMP INSTALLATION GUIDE**

Version 3.0 (2022-09-07)

# What do we want you to install?

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For Starfish School (and for astronomy research as a whole), there's a number of things we need to have you install on your computers to get you setup. The items we need you to set up are:

- **Development Tools (WSL for Windows, XCode for MacOS, BuildEssentials for Linux)**  
These tools give you access to all of the tools you need to be able to program efficiently on your system
- **A Terminal**  
This 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.
- **Python**  
One of the most versatile programming languages out there, and the industry standard in astronomy.
- **R (and RStudio)**  
This is the programming language of choice for cutting-edge statistical analysis.
- **Git**  
The industry-standard version control system and collaboration tool
- **Visual Studio Code**  
The leading code editor with active development and a wide userbase.

Installation instructions for each of these tools/packages are provided below. In addition, we are asking you to set up online accounts for GitHub, Overleaf, and NASA ADS (instructions at the end of this document).

# Getting your Basic System Setup

## For Windows 10/11:

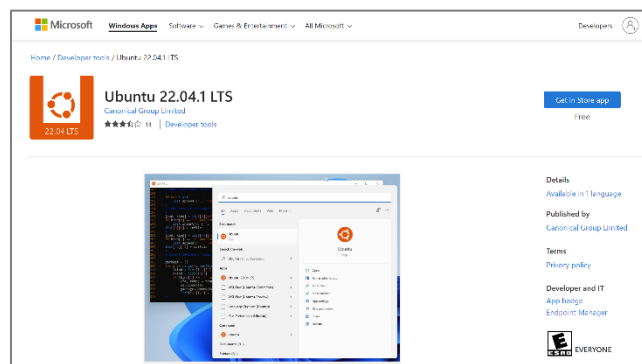
### Windows Subsystem for Linux

Windows has a superpower; you can install nearly any version of Linux to use *within* windows. This system is called “Windows Subsystem for Linux” (or WSL) and this is the environment we suggest for Starfish School (and for your research if using a Windows machine). To install, use the following instructions:

<https://docs.microsoft.com/en-us/windows/wsl/install>

From there, you can install any Linux Distribution through the Windows Store. We suggest using the Ubuntu 22.04.1 LTS distribution:

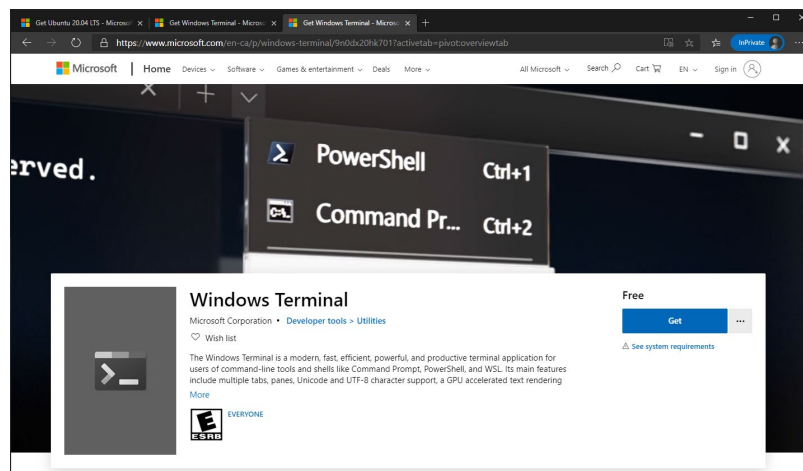
<https://apps.microsoft.com/store/detail/ubuntu-22041-lts/9PN20MSR04DW?hl=en-ca&gl=ca&rtc=1>:



At the time of install, you will be asked to set an administrator password. **Do not forget this password.**

### Terminal

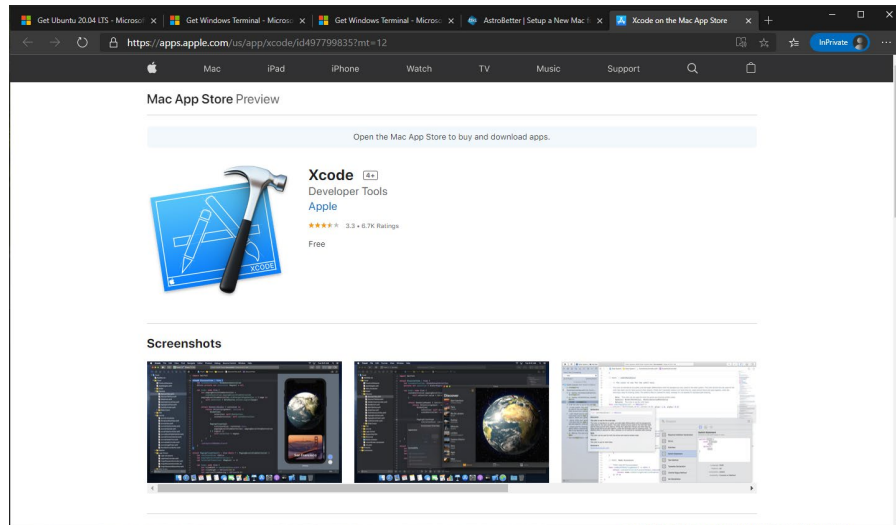
For a terminal, we suggest using the Windows Terminal, also available in the Windows Store: <https://www.microsoft.com/en-ca/p/windows-terminal/9n0dx20hk701>



## For MacOS X:

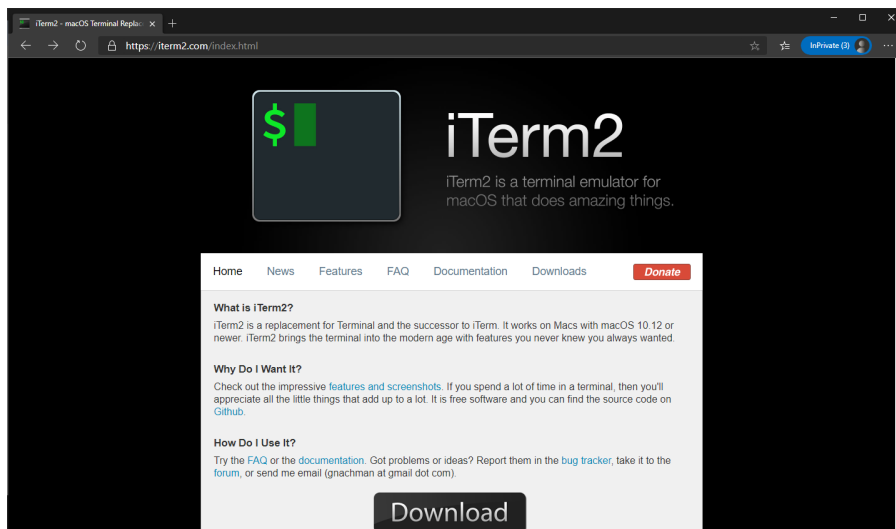
### Xcode Developer Tools

All of your basic command line tools come from the Apple Xcode developer tools. These are your Mac's superpowers, and you'll need them for Starfish School! To install them, you can find them in App Store: <https://apps.apple.com/us/app/xcode/id497799835?mt=12>



### iTerm2

For a terminal, we suggest installing iTerm2. It can be downloaded from its website: <https://iterm2.com/>



## For Linux:

### Distribution

For the purpose of Starfish School, we recommend using Ubuntu (preferable version: 20.04 LTS or 18.04 LTS), or if need be, CentOS (preferable versions: 7 or 8). Please let us know if you intend to use a different version.

### Developer Tools

If you are using Ubuntu, please install the **build-essential** package set by the following command:

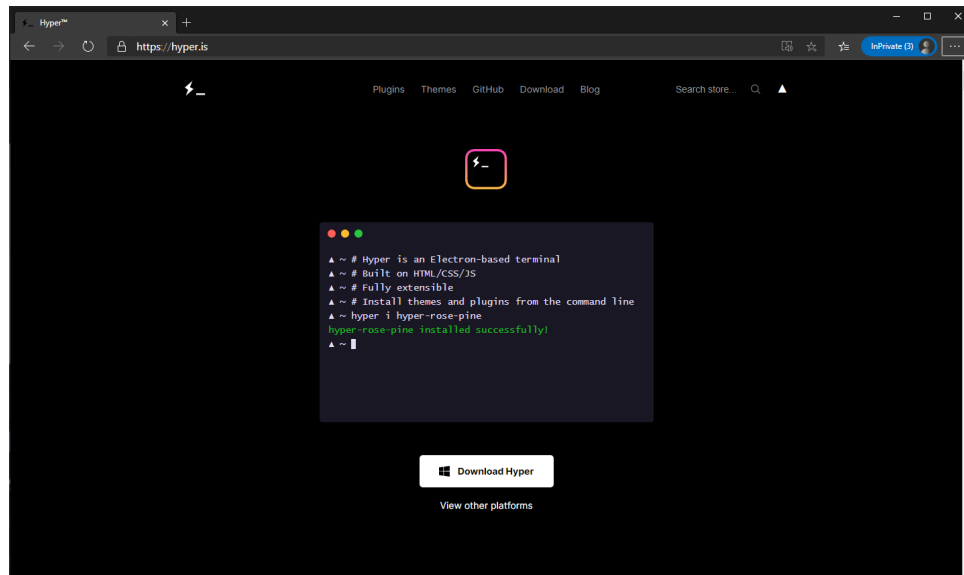
```
sudo apt install build-essential
```

If you are using CentOS, please install the “Development Tools” group by the following command:

```
sudo yum group install "Development Tools"
```

### Hyper

For a terminal, we suggest installing Hyper. It can be downloaded from its website: <https://hyper.is/>:



# Installing Anaconda (for Python)

While there are many ways to install python on your system, the way we'll be using is Anaconda (which is also become the industry standard at this point). To install Anaconda:

1. Navigate to the Anaconda Individual Edition webpage (<https://www.anaconda.com/products/distribution>), and scroll to the "Anaconda Installers":



2. Select the installer for your system (in general, you should be running the 64-Bit versions of Python).
3. Follow the prompts in the installer for your system of choice. A couple of options we'd recommend:
  - a. Choose "Just Me" when choosing who to install for
  - b. Choose "Register Anaconda3 as my default Python 3.9"

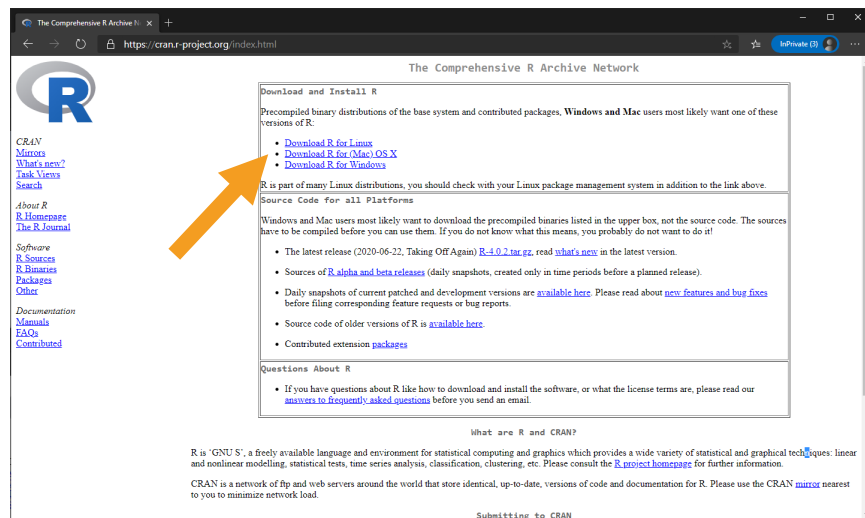
# Installing the R ecosystem

The industry standard way of installing R and RStudio is separately as individual packages.

## Installing R

To install R:

1. Navigate to the “Comprehensive R Archive Network” (CRAN) website <https://cran.r-project.org/>, and select your operating system:

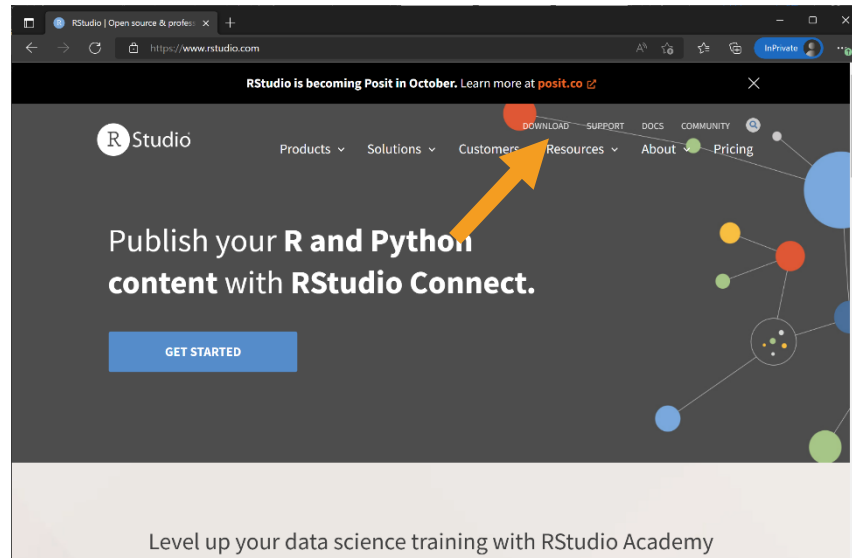


2. For each operating system:
  - a. For **Windows**, choose the “base” distribution, and then click “Download R 4.2.1 for Windows”, and install as you would any other Windows Program
  - b. For **Mac OSX**, choose the “R-4.2.1.pkg” version, and install as any other Mac Program
  - c. For **Linux**, choose your flavour of linux (Ubuntu, or choose Redhat for CentOS), and then follow the installation directions in the readme. **Please let us know if you require help with this.**

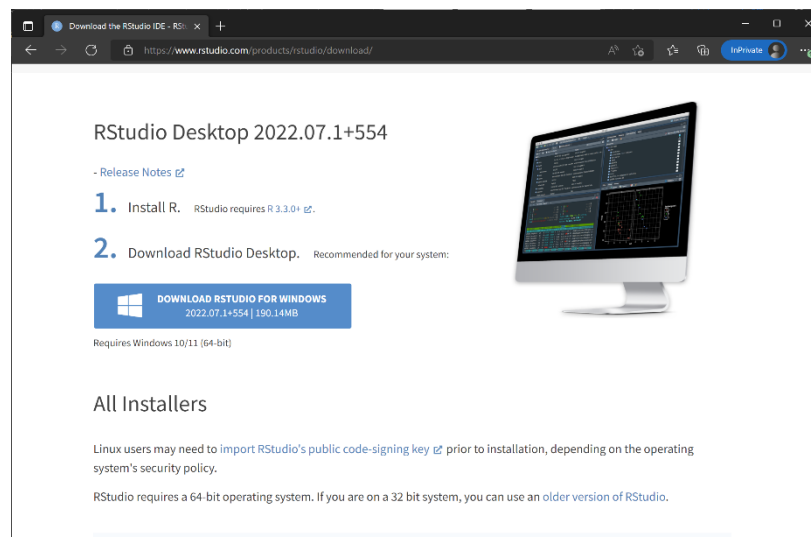
# Installing RStudio

Once you've installed R, you can install the RStudio interface:

1. Navigate to the "RStudio" website (<https://rstudio.com/>), and select "Download":



2. Scroll to RStudio Desktop, and choose the installer for your operating system, and install as you would any other program on your machine:





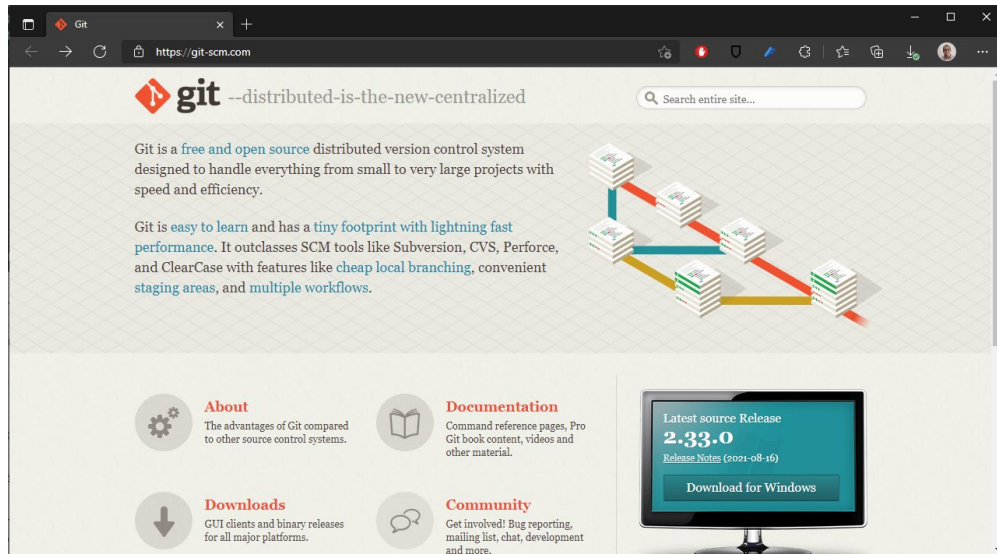
# Installing Git

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## Git (Windows)

To install GitHub Desktop:

1. Navigate to <https://git-scm.com/> and download the appropriate installation file, and install as you would any other program



## Git (MacOS)

Git should have been installed with the XCode Developer Tools. Please let us know if this is not working.

## Git (Linux)

If you are using Ubuntu, use the following command:

```
sudo apt-get install git
```

If you are using CentOS, please use the following command:

```
sudo yum install git
```

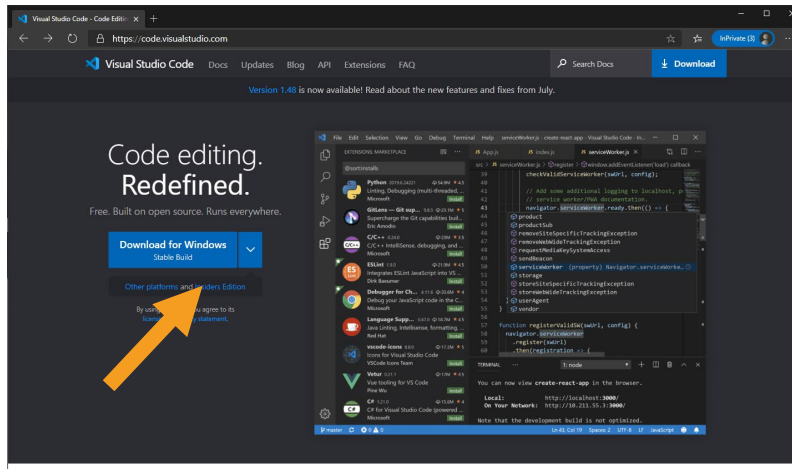
or

```
sudo dnf install git
```

# Visual Studio Code

For Starfish School, we're encouraging you to use a full-featured Code Editor. We will be using Visual Studio Code (which is available for all platforms). To install:

1. Navigate to the Visual Studio Code website: <https://code.visualstudio.com/>



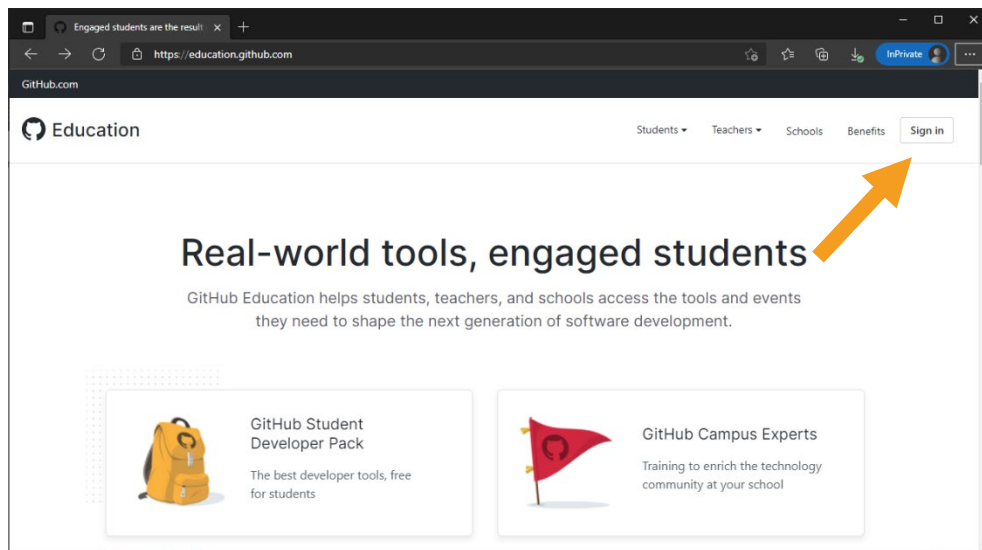
2. Choose the appropriate version of Visual Studio Code for your OS, and install as you would normally.

# Signing up for Online Services

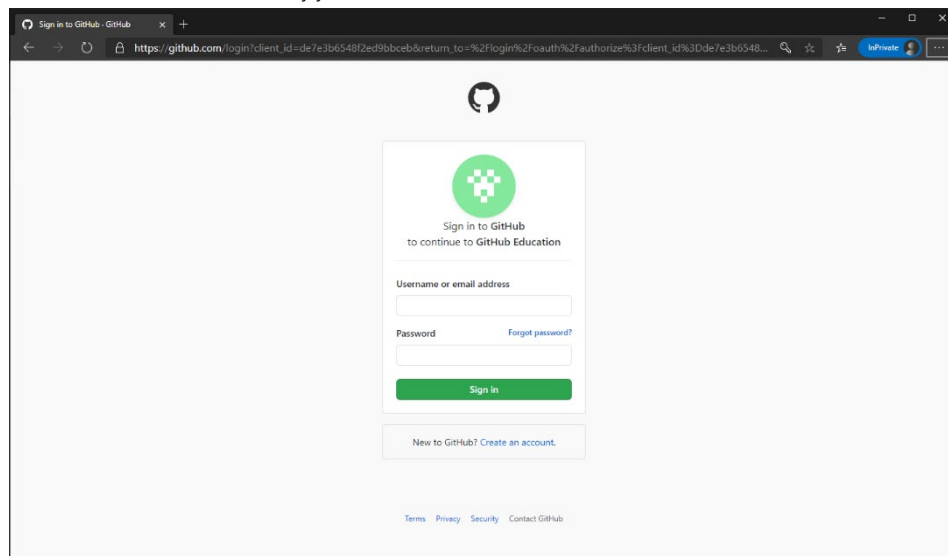
## Github

Everyone participating in Starfish School should sign up for an academic github account. By getting an academic account, you get access to various features that would otherwise require a subscription. Importantly, you will need to verify your academic email address to get access to these features. If you already have a github account, you can upgrade to an academic account. To sign up for an academic account:

1. Go to <https://education.github.com> and click on "Sign In"



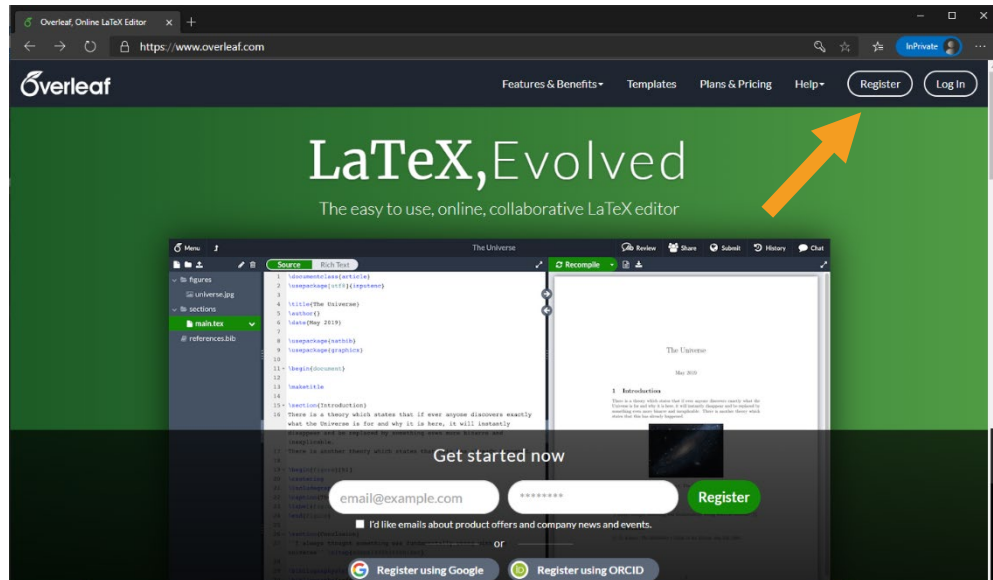
2. If you already have a github account, sign in here, otherwise click on "Create an account."
3. Follow the instructions on how to verify your academic status.



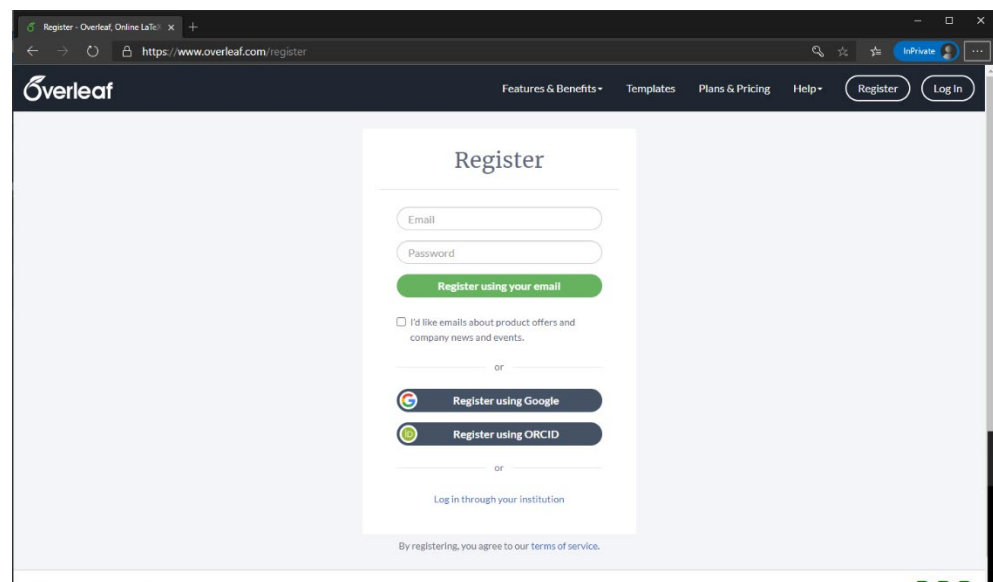
# Overleaf

This online service will allow you to collaboratively write and edit your own latex documents. To sign up for an account:

1. Go to <https://www.overleaf.com/> and click on “Register”



2. Follow the steps to register (using your utoronto e-mail address):

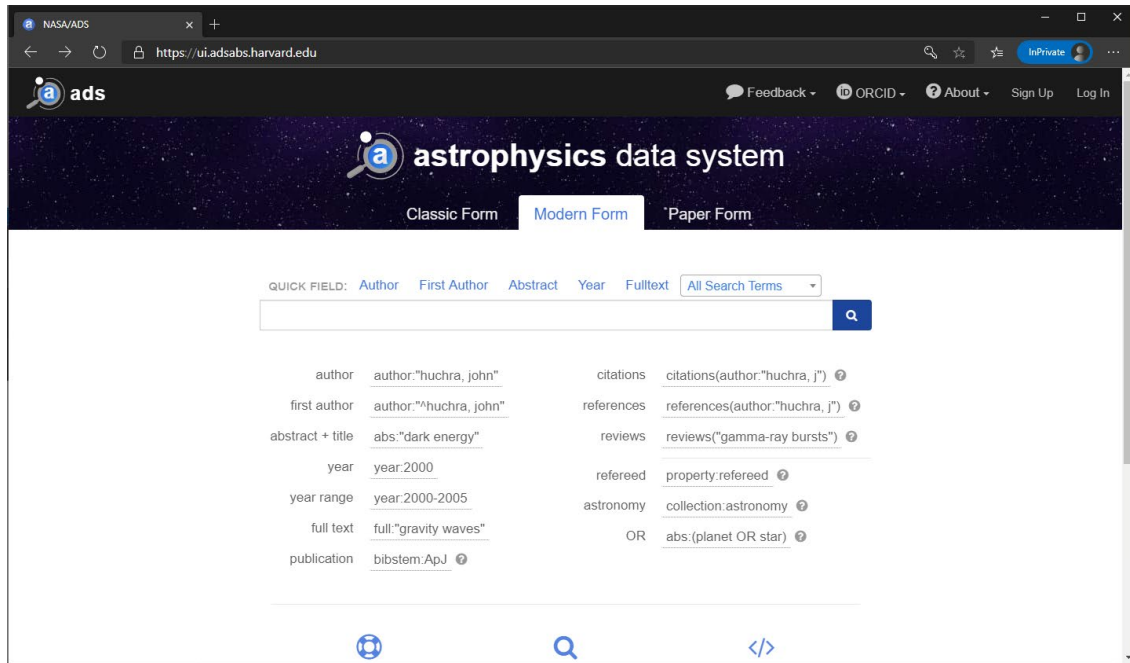


3. Follow the steps to create an account and verify your e-mail address.

# NASA ADS

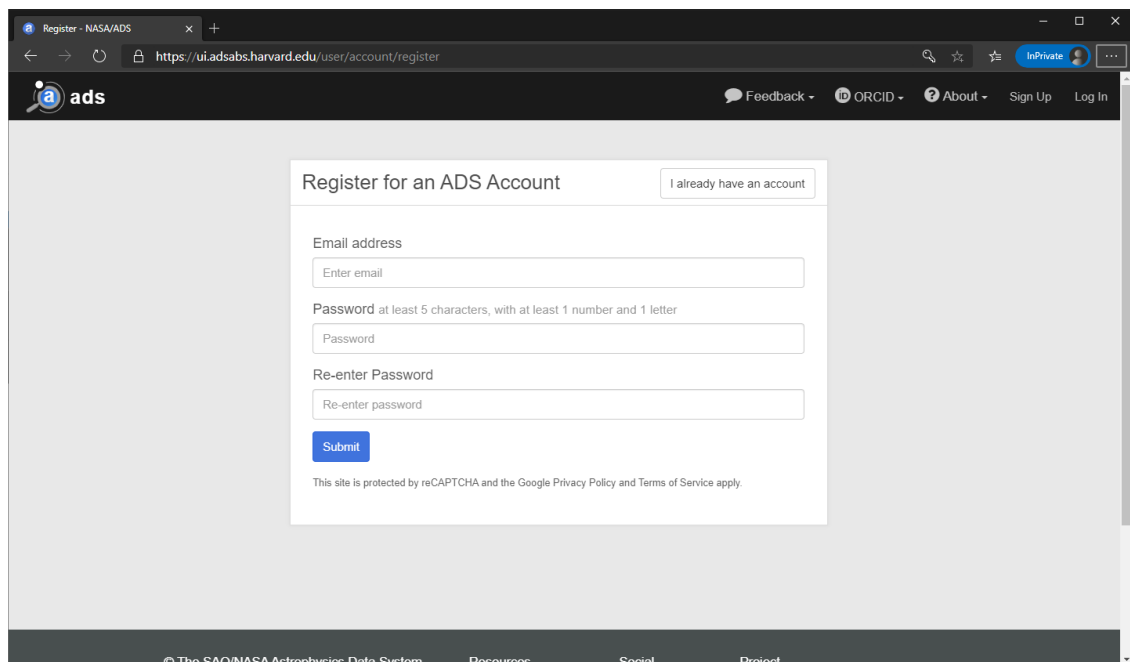
This is the site through which you will be able to search through the astronomical literature. Features such as “ADS Libraries” allow you to save and share groups of articles together. To sign up:

1. Go to <https://ui.adsabs.harvard.edu/> and click on “Sign Up”



The screenshot shows the NASA ADS homepage. The browser address bar displays <https://ui.adsabs.harvard.edu>. The page features a dark header with the 'ads' logo and navigation links: Feedback, ORCID, About, Sign Up, and Log In. Below the header is a banner for the 'astrophysics data system' with tabs for 'Classic Form', 'Modern Form' (selected), and 'Paper Form'. A search bar is present with a 'QUICK FIELD' dropdown menu showing options: Author, First Author, Abstract, Year, Fulltext, and All Search Terms. Below the search bar, there are several search filters and examples, including: author (author:"huchra, john"), first author (author:"^huchra, john"), abstract + title (abs:"dark energy"), year (year:2000), year range (year:2000-2005), full text (full:"gravity waves"), publication (bibstem:ApJ), citations (citations(author:"huchra, j")), references (references(author:"huchra, j")), reviews (reviews("gamma-ray bursts")), refereed (property:refereed), astronomy (collection:astronomy), and OR (abs:(planet OR star)).

2. Follow the prompts to register with your Utoronto email address:



The screenshot shows the NASA ADS registration page. The browser address bar displays <https://ui.adsabs.harvard.edu/user/account/register>. The page features a dark header with the 'ads' logo and navigation links: Feedback, ORCID, About, Sign Up, and Log In. Below the header is a banner for the 'astrophysics data system'. The main content area is titled 'Register for an ADS Account' and includes a link for 'I already have an account'. The registration form consists of the following fields: Email address (with a placeholder 'Enter email'), Password (with a requirement 'at least 5 characters, with at least 1 number and 1 letter'), and Re-enter Password (with a placeholder 'Re-enter password'). A blue 'Submit' button is located below the form. At the bottom of the page, there is a footer with the text: '© The SAO/NASA Astrophysics Data System Resources Social Project'.