

SAGI Summer School 2024 (3S24)

Software Setup

July 15, 2024

Abstract

Welcome to the 2024 SAGI Summer School¹ on Astronomical Techniques! This document provides instructions for configuring your software environment. To make the most of your experience, we ask that you make an effort to follow this document to have the **Anaconda and Git** software installed on your laptops you are bringing before the summer school begins, by **Jul 20, 2024**. We will start the school with a session to help everyone complete installation if this is not possible. Should any questions arise while following the instructions outlined in this document, please reach out to the following instructors via email:

- 1. **Sam Condon (IC/DAQ):** sscondon@stanford.edu
- 2. **Logan Foote (IC/DAQ):** lfoote@caltech.edu
- 3. **Bang Nhan (Radio Astronomy):** bnhan@nrao.edu

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1 Software Installation

Follow the download links below to download Anaconda and Git.

¹<https://icisequynhon.com/conferences/2024/3S24/overview.html>

1.1 Anaconda

Anaconda provides a python distribution and a built in package manager to install various essential libraries. We will use Anaconda to manage our Python computing environment throughout the school. Click this download link which should take you to the Anaconda installer download page.

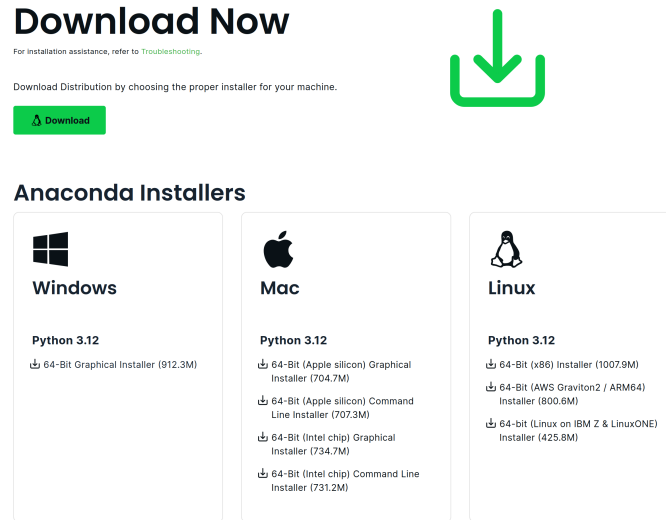


Figure 1: Anaconda Installer Download Page

Download the appropriate installer for your operating system. If you are using Windows or Mac, execute the graphical installer and keep all of the default options. If you are using Linux, then complete the following:

1. Navigate to the .sh installer file in your downloads folder via:

```
cd ~/Downloads
```

2. Add execution permissions to the installer file and run the installer, keeping all of the default options:

```
sudo chmod +x Anaconda3-2024.06-1-Linux-x86_64.sh
sudo ./Anaconda3-2024.06-1-Linux-x86_64.sh
```

3. Note that the name of the .sh file may differ on your system.

Verify your installation in the following manner for your operating system:

1. **Windows:** Search "Anaconda Prompt" in the taskbar and run this application. Run the command "conda list" in the terminal window that appears.
2. **macOS and Linux:** Open a terminal application and run "conda list"

A successful installation will then print a list of all of the default installed python packages.

1.2 Git

The official SAGI summer school lecture material and code is hosted on GitHub. We will use Git to clone this repository to our local computers. Generally speaking, Git is an incredibly useful software tool for software version control. Version control is outside the scope of this school, but it is a very helpful skill so it is a good idea to have Git installed on your machine. Click this download link to navigate to the Git installer download page.

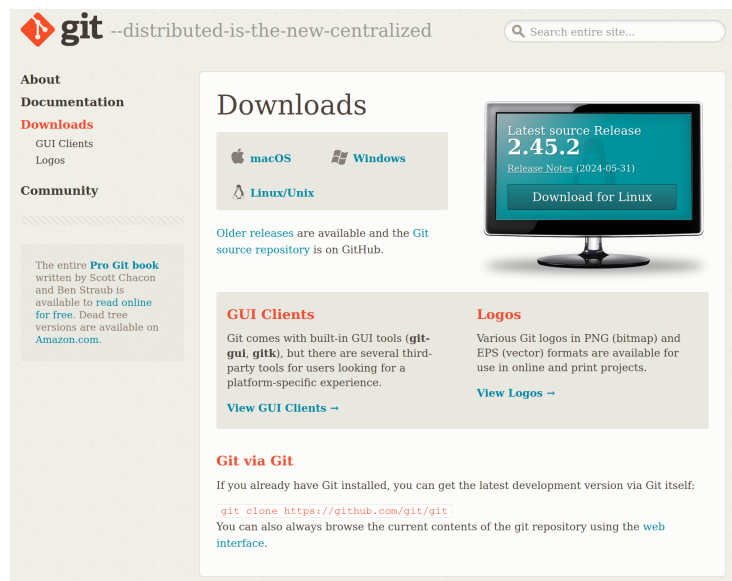


Figure 2: Git Installer Download Page

A graphical installer is available for Windows and instructions are provided on the download page for Linux and macOS.

Verify your installation by opening the "Git Bash" application in Windows or a terminal in Linux and macOS and running the following command:

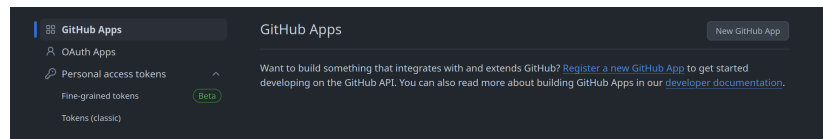
```
git --version
```

A string like "git version 2.X.X" will be printed with a successful installation.

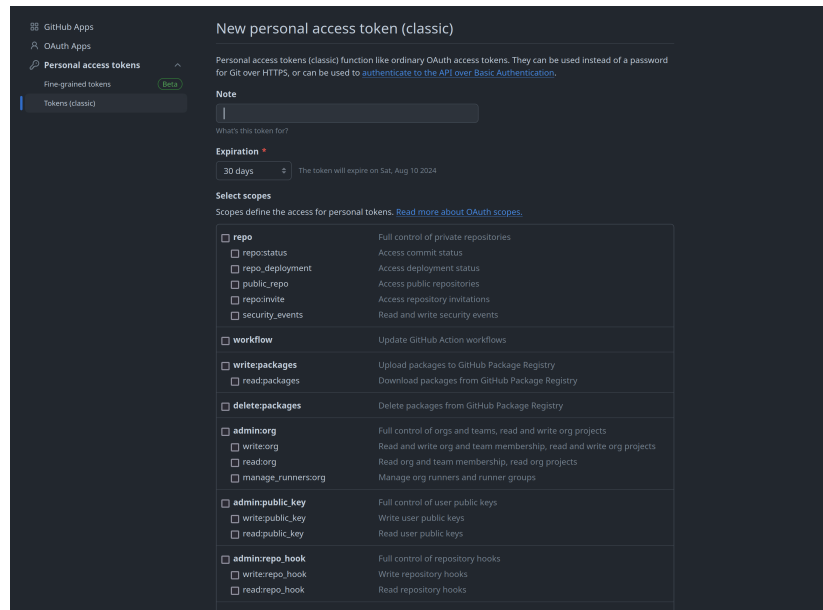
2 Configuration

2.1 Cloning the Official Repository

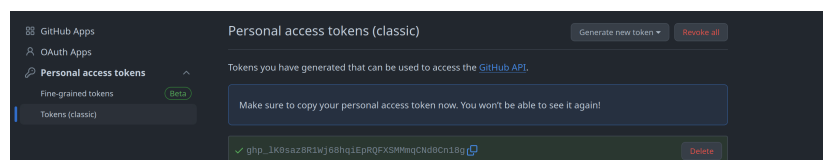
1. All of the official SAGI 2024 lecture material and python code is hosted on GitHub. Here we will clone this material to our local machines. If you do not already have an account, begin by setting up an account on GitHub.
2. There are two methods of authentication that can be used to clone a GitHub repository. One can use an *SSH key pair* or a *personal access token*. This document outlines the configuration of a *personal access token*, but please refer to the GitHub SSH configuration page if you prefer this option.
3. A personal access token serves as a password to perform actions, such as cloning a repository, on GitHub. To configure a personal access token, log in to your GitHub account, click on your profile icon in the top right of the page, then open the "settings" option. This will open a page with your personal profile settings.
4. Scroll to the bottom of the page and locate the **Developer settings** option. Open this link. You should see a page with the options shown in the screenshot below. Select Personal access tokens → Tokens (classic).



5. Click Generate new token → Generate new token (classic). You should arrive at the following page:



6. Give your personal access token a name, pick an expiration (how long you can use this token) select all of the scope options, scroll to the bottom of the page and click the green **Generate token** button.
7. You will be presented with a screen that displays the text string corresponding to your access token. An example is shown below:



8. **Make sure to copy the text corresponding to your access token and save it to a secure place.** This text will serve as a password with which you can authenticate your GitHub account when performing actions such as cloning repositories.
9. We are now ready to clone the SAGI repository. On Windows open the "Git Bash" application. On Linux or macOS open a terminal. Navigate to the directory where you would like to store the code and lecture material and run the following command:

```
git clone https://github.com/loganfoote/sagi.git
```

10. You will now be prompted for a username and password. For your username, enter the email address associated with your GitHub account. For your password **copy your personal access token text** into the prompt. The sagi repository will begin to transfer to your computer.

2.2 Configuring Anaconda

Anaconda provides several tools for managing python environments. An environment is a collection of python packages and an interpreter allowing us to execute code and manage various third-party libraries. We have pre-configured an environment for use in the SAGI school. To configure this environment on your system follow the steps below:

1. On Windows, open the "Anaconda Prompt" application. On Linux and macOS open a terminal.
2. In the prompt or terminal, navigate into the cloned *sagi* repository.
3. Open, in a text editor, the *environment.yml* file located in the *sagi* repository. Navigate to the bottom of the file and locate the line:

```
prefix: /home/sam/anaconda3/envs/sagi
```

4. Edit this line to point to your Anaconda installation. If you kept the default options during installation then this line should become:

On Windows:

```
prefix: C:\Users\<your username>\anaconda3\envs\sagi
```

On macOS:

```
prefix: /Users/<your username>/opt/anaconda3/envs/sagi
```

On Linux:

```
prefix: /home/<your username>/anaconda3/envs/sagi
```

In all cases above, you should replace `<your username>` with the username that you use on your computer.

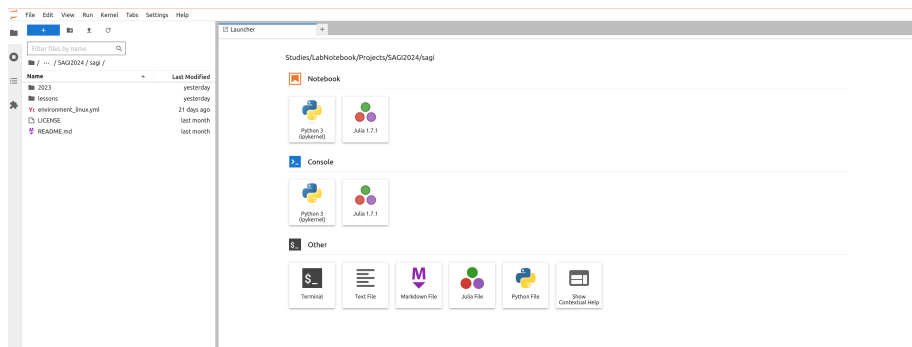
5. Save the edited *environment.yml* file and execute the following command to install python and all of the packages required for participation in the summer school lessons:

```
conda env create -f environment.yml
```

6. After the installation completes, verify a successful install by running:

```
conda activate sagi  
jupyter-lab
```

7. You should see a window like the following open in a browser window:



8. In the file browser pane on the left side navigate to:

lessons/instrument_control/lesson1/basic_data_types.ipynb

9. On the top of the screen select: *Run* → *Run All Cells*. This will execute the python code in each of the cells of the notebook file. If this runs successfully then your computer is ready to run the python code written for the SAGI summer school.

3 Troubleshooting

Please reach out via email to the instructors listed at the start of this document should you encounter any issues. Google and ChatGPT are also great resources for troubleshooting common installation problems.