Cloning, Compiling, and Running Celestia-G2

These are instructions that ensure Celestia-G2 will run on any Ubuntu Virtual Machine. Some of the packages may already be installed on your computer and it may seem simple to follow some of the steps, but we are new to using the terminal and wanted to be very specific with our instructions so that anyone can compile and run the code at any level of proficiency.

Make sure you have enough space on your Ubuntu Virtual Machine - you definitely need at least 16GB.

To check which version of Ubuntu you are currently on you can type the following command in the terminal:

```
lsb_release -a
```

1.Upgrade Ubuntu to version 16.04:

Original instructions found at:
https://www.digitalocean.com/community/tutorials/how-to-upgrade-to-ubuntu-16-04-lts

This can be done from the **/home/** directory.

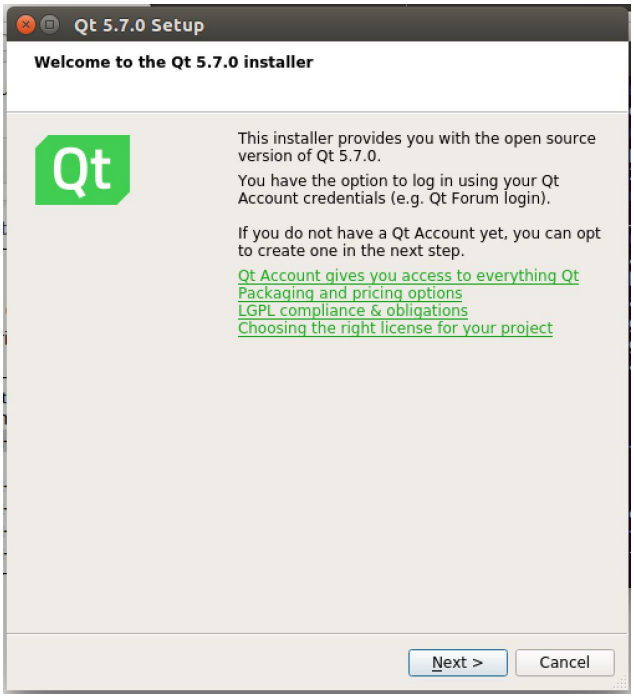
```
sudo apt-get update
sudo apt-get upgrade
sudo apt-get dist-upgrade

sudo apt-get install update-manager-core
```

2. Install Qt-5 on Ubuntu in /usr/local/ directory:

Original instructions found at: https://wiki.qt.io/Install_Qt_5_on_Ubuntu

```
sudo wget http://download.qt.io/official_releases/qt/5.7/5.7.0/qt-opensource-linux-x64-5.7.0.run
sudo chmod +x qt-opensource-linux-x64-5.7.0.run
sudo ./qt-opensource-linux-x64-5.7.0.run     (QT Installer window should pop up here, follow
                                                installer steps and click Finish)
sudo apt-get install build-essential
sudo apt-get install libfontconfig1
sudo apt-get install mesa-common-dev
sudo apt-get install libglu1-mesa-dev -y
```

This is what the QT Installer window should look like:

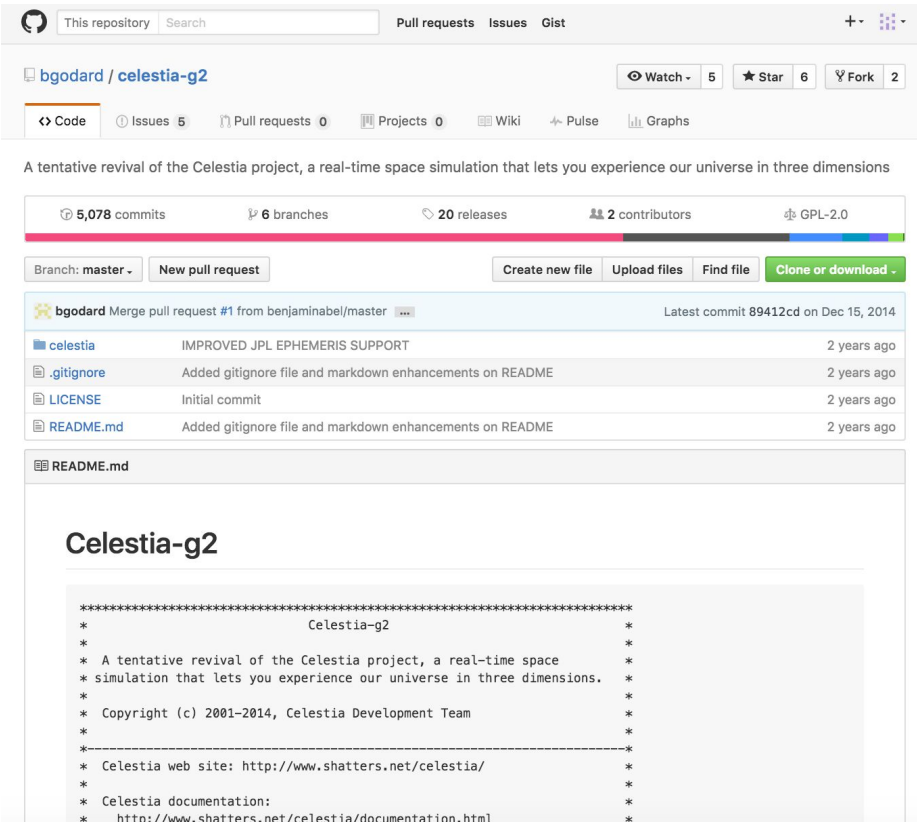


3. Get the source code from bgodard's GitHub repository:

Can be found here: https://github.com/bgodard/celestia-g2

Clone the repository to wherever you want - we used our **/home/** directory.

```
sudo apt install git     (if you haven't already got it)
git clone https://github.com/bgodard/celestia-g2.git
```



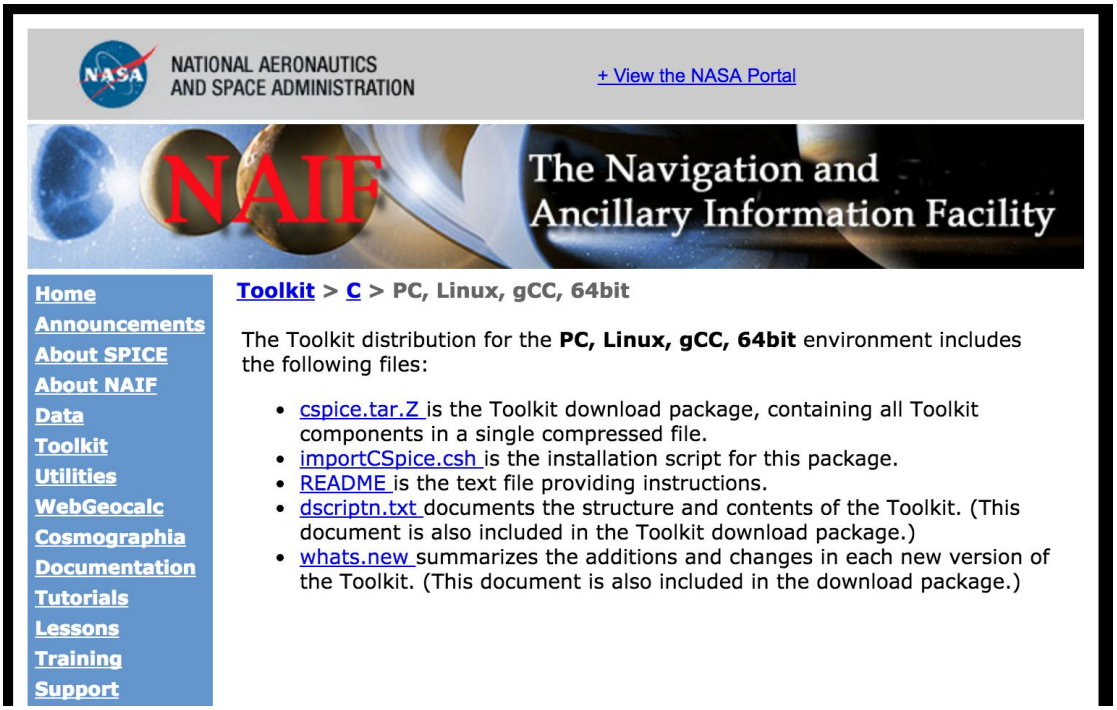
4. Navigate to source folder and install some dependencies:

Here, we installed the SDK for QT, libraries for Lua, Theora, etc.

```
cd celestia-g2/celestia/src/celestia

sudo apt-get install qt-sdk
sudo apt-get install liblua5.1-0-dev  (still need png)
sudo apt-get install libsdl-mixer1.2-dev
sudo apt-get install libtheora-bin
sudo apt-get install libtheora-dev
sudo apt-get install libjpeg62-dev
```

5. Download, save, and install CSpice:

From your web browser, download the appropriate **tar.Z** and **csh.** files - **save them, don't open them:** https://naif.jpl.nasa.gov/naif/toolkit_C_PC_Linux_GCC_64bit.html



Navigate to where your default Downloads folder is - this is why you **save** the file (don't open it) - if you type **ls** you should see your downloaded CSpice files:

```
cd <downloaded directory>
```

Move the files to the **usr/local** folder and install:

```
sudo mv cspice.tar.Z /usr/local
sudo mv importCSpice.csh
(if you type ls now, the files should not be here anymore)
```

Navigate to the **usr/local** folder:

```
cd /usr/local
sudo chmod 755 importCSpice.csh
sudo apt-get install csh  (you need this in order to read a csh file)
sudo ./importCSpice.csh
```

5. Navigate back to the Celestia folder /celestia-g2/celestia folder and build the project:

If you have successfully completed every command up to this point, you should have all the dependencies to build and run Celestia.

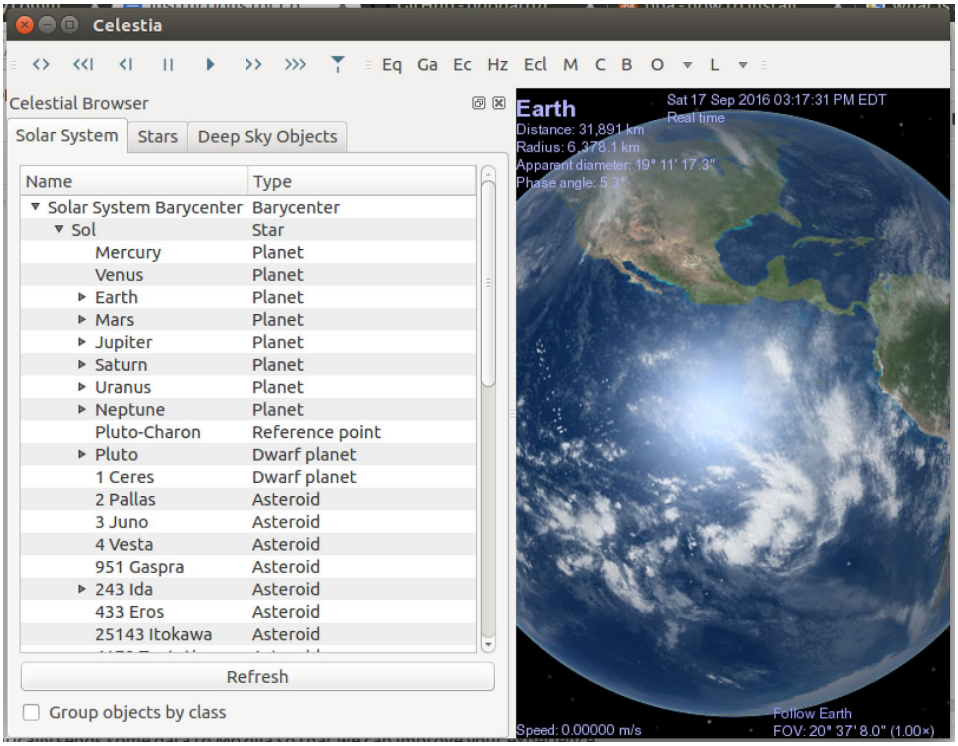
```
qmake
make
sudo make install
```

6. Run the Celestia program!

If you don't get any error problems, then you should be able to run everything!

```
./celestia
```

Celestia should look like this:



*** If all of these instructions go through with no Errors, then the program should be running now. If you are getting errors, then we came across some common ways to solve them:

1. Install required packages - sometimes we were missing packages like Lua or OpenGL and had to install the basic packages.

```
sudo apt-get install <package name>
```

Usually Googling the package and how to install it with the command line will help with this problem, but we also found the **search tool** to be useful.

If you need to search for which package to install then you can run the following command in the terminal:

```
sudo apt-cache search <package name>
```

2. Common problems with the **make** command:
   When attempting to run the make command. If you get a **fatal error: QGLWidget: No such file or directory**, run the following command:

```
sudo apt-get install libqt4-opengl-dev
```