Introduction to Git

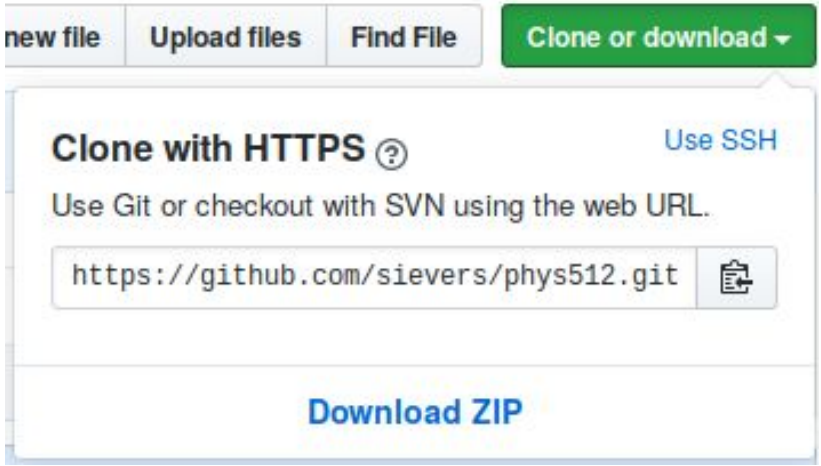
PHYS 512

What is git/Github?

- Git is a Version Control System (VCS) used to keep a running history of code across potentially numerous branches. It is prolific in many areas of science, and indispensable for software engineers and computer/data scientists.
- See here for a more comprehensive introduction
- Installing git is simple, and it may already be on your computer. Try running **`git --version`** to see if your computer already has git installed
    - If not, follow the relevant instructions here

Getting Started

- The first things you'll want to do with git for this class are create a local directory that is linked to Sievers' course repository. This is where the lecture/tutorial resources will go, and it will be useful to have a local copy.
- To make a local copy of the repository, you're going to want to **`git clone <url>`** the relevant repository. This will create a directory with the same name as the repository on your local machine in the directory from which you ran the command in on your terminal



Git Pull

- Once you have a local copy of the repository, you can **`git pull`** whenever the repository is updated with new content to make the changes on your machine!
- Note: you won't be making changes to this repo -- you won't have permissions anyways -- so try not to make/edit files in this directory!

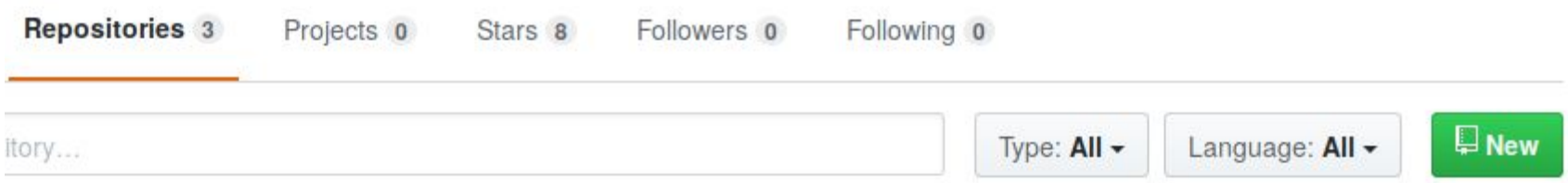
```
marcus@latitude:~/McGill/PHYS512/phys512$ ls
lecture_1  tutorial_1
marcus@latitude:~/McGill/PHYS512/phys512$
```

`git pull`

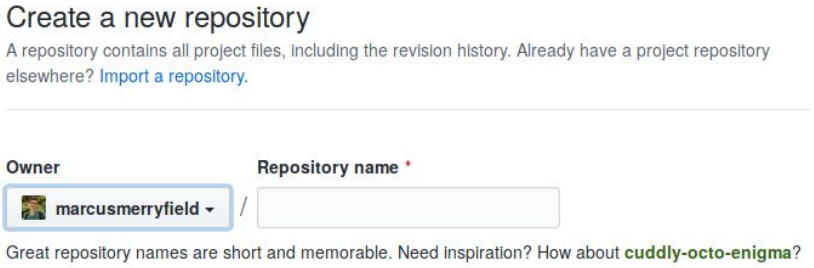
```
marcus@latitude:~/McGill/PHYS512/phys512$ git pull
remote: Enumerating objects: 16, done.
remote: Counting objects: 100% (16/16), done.
remote: Compressing objects: 100% (13/13), done.
remote: Total 14 (delta 1), reused 14 (delta 1), pack-reused 0
Unpacking objects: 100% (14/14), done.
From https://github.com/sievers/phys512
   4c0094c..538acc8  master     -> origin/master
Updating 4c0094c..538acc8
Fast-forward
 lecture_2/bad_parabolas.py       |  17 +++++++++++++
 lecture_2/cubic_interpolation.py |  25 +++++++++++++++++++
 lecture_2/delta_polys.py         |  24 ++++++++++++++++++
 lecture_2/integrate_linear.py    |  23 +++++++++++++++++
 lecture_2/integrate_things.py    |  53 +++++++++++++++++++++++++++++++++++++++++
 lecture_2/legendre.py            |  25 +++++++++++++++++++
 lecture_2/phys512_2.pdf          | Bin 0 -> 1923444 bytes
 lecture_2/simpsons.py            |  25 +++++++++++++++++++
 lecture_2/spline_example.py      |  18 +++++++++++++
 9 files changed, 210 insertions(+)
 create mode 100644 lecture_2/bad_parabolas.py
 create mode 100644 lecture_2/cubic_interpolation.py
 create mode 100644 lecture_2/delta_polys.py
 create mode 100644 lecture_2/integrate_linear.py
```

Making Your Own Course Repository

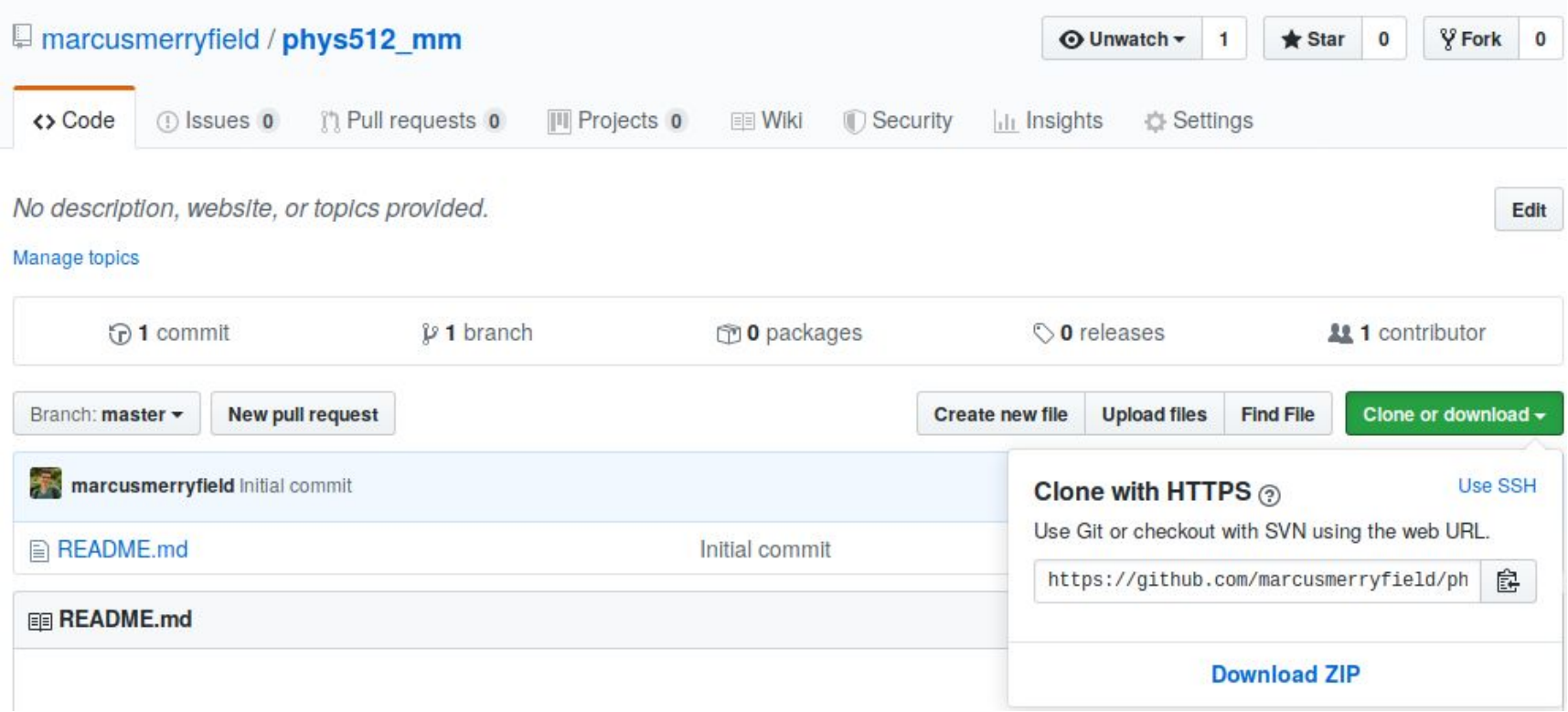
- On Github (make an account with your **@mail.mcgill.ca** email if you haven't yet!), navigate to your repositories and select `new`



- Then just follow the instructions to make a public repository!



- Now you can **`git clone`** your personal PHYS512 repo (just like we did with Sievers' repo before!) wherever you'd like on your machine!



`git status/add/commit/push`

- Once you’ve got a local version of your repository, you can add contents to it. For example, I can make a file called `test.py` which contains some code I want to put on Github. Then, if I **`git status`** in the directory:

```
marcus@latitude:~/McGill/PHYS512/phys512_mm$ git status
On branch master
Your branch is up to date with 'origin/master'.

Untracked files:
  (use "git add <file>..." to include in what will be committed)

        test.py

nothing added to commit but untracked files present (use "git add" to track)
marcus@latitude:~/McGill/PHYS512/phys512_mm$
```

- My changes not yet online show up! Let’s get them online.

- The steps to getting our changes online are adding the new/edited files (**`git add <filename>`**), committing them to a local commit with a message of what you changed (-m), which is basically just a version stamp of the code at that moment (**`git commit -m “test commit”`**), and then pushing those commits to the online (‘remote’) repository (**`git push`**)

```
marcus@latitude:~/McGill/PHYS512/phys512_mm$ git add test.py
marcus@latitude:~/McGill/PHYS512/phys512_mm$ git commit -m "test commit"
[master bcf7591] test commit
 1 file changed, 1 insertion(+)
 create mode 100644 test.py
marcus@latitude:~/McGill/PHYS512/phys512_mm$ git push
Username for 'https://github.com': marcusmerryfield
Password for 'https://marcusmerryfield@github.com':
Counting objects: 3, done.
Delta compression using up to 4 threads.
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 293 bytes | 293.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0)
To https://github.com/marcusmerryfield/phys512_mm.git
   f74b4e7..bcf7591  master -> master
marcus@latitude:~/McGill/PHYS512/phys512_mm$
```

Now you know the basics of git!

- These are just the barebones basics, but should be able to carry you through most of what you need in the course. For a more comprehensive list of commands, try **`git --help`** which will show many of the more advanced options.
- I highly recommend playing around and getting used to git and Github. If you have any interest in working for a developer in the future, or even in a scientific collaboration, git is an extremely important skill, and good knowledge of it will make your life much easier. :)
- If you have any more questions, just send us an email!