**Introduction**

Solving complex problems in planetary science often involves complicated codebases, making published results difficult or impossible to reproduce [1]. Planetary science has also been slow to adopt new tools for sharing code and publishing transparent analyses. We present a new initiative to educate and advocate for reproducible research best practices in the planetary sciences.

**Open Source Learning**

*open-source: software for which the source code is freely available and may be modified and redistributed*

Plutopy is an open-source collection of tutorials, examples, and code snippets which are free and publicly available on GitHub. Examples are built using open-source tools like Python, Jupyter, and GDAL which have gained popularity in planetary science [2-3]. Membership is open to all and the knowledge base is built up by collaborators over time.

**Objectives**

Plutopy’s core objectives are to:

1) Foster a supportive community where we can learn to do more reproducible science.
2) Teach version control (Git and GitHub) to snapshot share and publish research code.
3) Provide tutorials and resources for common planetary image analysis tasks.
4) Crowd-source a set of best practices for reproducibility in planetary science.

Specific skills taught by Plutopy:
- Collaboration with Git and GitHub
- Planetary image analysis with Python / GDAL
- Reproducibility with Jupyter notebooks
- Packaging and publishing code
- … and more as the community grows!

**Learning with Plutopy**

Plutopy is an open-source repository hosted on GitHub. It is structured as a Python code package to serve as an example for scientists who may want to publish their scientific code on GitHub.

Plutopy teaches in three main ways:

1) **Passive**: Interactive tutorials that are publicly available as Jupyter notebooks (see right)
2) **Active**: Members write new tutorials and contribute them to Plutopy to learn version control with Git.
3) **Community**: Get advice from the community by posting to a public Plutopy forum (issues board).

The open-source model of Plutopy will allow it to grow over time, making it robust to changes in the available tools. New members are encouraged to fix tutorials that they find outdated or update Plutopy with new tutorials if new tools have emerged.

**Contributing to Plutopy**

Reasons to contribute to Plutopy:
- Learn and practice Git
- Grow the knowledge base of the repository over time.
- Get feedback from the community in code reviews.

A step-by-step tutorial makes contributing easy for newcomers (no GitHub experience required). After the tutorial, members are encouraged to practice Git by contributing examples related to their own research or interests.

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**Future Work**

Plutopy is live and in early stages on GitHub. New members can currently go through an introductory tutorial to learn collaboration with Git and GitHub, and there is a short tutorial for getting started with installing the plutopy Python package to visualize New Horizons data.

Future work will develop new tutorials for how to write reproducible code in Python, how to create fully transparent analysis with Jupyter notebooks, and how to package research code so that it can be installed and run on any computer.

**Join Plutopy**

Plutopy is looking for collaborators with all levels of experience! To learn more, head to the homepage at: [github.com/cjtu/plutopy](https://github.com/cjtu/plutopy).

If you support plutopy, let us know by starring it on GitHub 🌟

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Dr. Planet Hacker 🐊 @Plutopylover

Want to share your code but don’t know how? Want to work with planetary data in a more reproducible way? Join plutopy! @TaiUdovicic #LPSC2019 #abs3218

7:00 PM - 21 Mar 2019

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**References**