



ExoCore: An open science curriculum for enhanced reproducibility and equity in exoplanet research

AAS245 Splinter Meeting

Monday, January 13, 2024

10:00 am - 12:00 pm ET

**National Harbor 8, Gaylord National Resort & Convention Center
National Harbor, Maryland**

Workshop Handout

A major challenge of modern research lies in overcoming barriers to accessing data and resources. This can limit the discovery potential in a field or lead to spurious results. Open Science addresses this by promoting the transparent sharing of software and methodologies that enhance reproducibility, democratizing research, and making the scientific community more inclusive and dynamic.

This splinter meeting will focus on ExoCore, a curriculum focused on open-science practices in exoplanet research, which has been developed as part of NASA's Transform to Open Science (TOPS). ExoCore is a network of Jupyter notebooks

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with interactive content, including narration and prompts, to render the material suitable for self-learning. The modules cover reproducible workflows that highlight open data or codes; data visualization packages that enhance the accessibility and impact of open data; cloud computing and machine learning libraries; analysis and modeling software for light curve, imaging, and radial velocity data relevant to exoplanet research; benefits of software version control for open science; data repositories for major space- and ground-based telescopes (e.g., MAST); large science collaborations in exoplanet research with publication policies; and open catalogs (e.g., NASA Exoplanet Archive, SIMBAD).

The primary audience for the meeting is graduate and undergraduate students and postdocs working or expecting to work on exoplanets, as well as anyone looking to transition into exoplanet research or learning more about the ethos and methods of open science in general.

The main Intended Learning Outcomes (ILOs) of this workshop will be for the participants to follow and implement open science practices in their research, acknowledge and articulate the benefits of open science, and be familiar with software tools, databases, journals, repositories, and collaborations that support open science in the field of exoplanets.

The splinter session will include activities of a variety of formats, including formal presentations, a hands-on tutorial on OS 101 and ExoCore, and a guided discussion among the participants.



Tell us a bit of
why you're here
with our short
pre-survey!

Registering for Open Science 101 (OS101):

1. Create an **ORCID iD**
 - a. Go to: orcid.org/register
2. Register for OS101 using your ORCID iD
 - a. Go to: openscience101.org/
3. You're all set to take OS101, Module 1!

Accessing ExoCore:

1. Ensure you have a working Conda distribution
 - a. Download **MiniConda**: anaconda.com/download/success
(Download at the **bottom**)
2. Ensure you have **Git** installed
 - a. Download **Git**: git-scm.com/downloads
3. Ensure you have **Jupyter Notebooks**:
 - a. Windows: Open **Powershell**
Mac/Linux: Open the **Terminal**
 - b. Start Python by typing:
python
 - c. Install Jupyter Notebooks:
pip install jupyterlab
4. Clone the ExoCore repository in PowerShell/Terminal session by:
git clone <https://github.com/AstroMusers/ExoCore.git>
5. Navigate to ExoCore.ipynb and locate the relevant lessons. You're all set!

Stay in touch! Sign up for ExoCore's monthly newsletter to receive updates from the development team on new lessons, updates, events, and features.



Help us improve ExoCore through your feedback by completing this exit survey!



Schedule:

10:00 am	Introduction	Tansu Daylan
10:10 am	Overview of Open Science + OS101	Nathan Whitsett
10:15 am	Complete Module 1 of OS101	All
10:40 am	Open data and software	Bryce Wedig
10:50 am	Exocore Overview + Motivation	Aavik Wadivkar
11:00 am	Exocore Modules + Technical	Nathan Whitsett
11:10 am	Exocore Lesson: Lightkurve	All
11:45 am	Open Discussion/Feedback + Wrap-Up	Nathan Whitsett

Acknowledgements:

ExoCore is funded by a NASA TOPST22 grant, 80NSSC23K0865 (September 2023 - August 2025), and a McDonnell Center for the Space Sciences (MCSS) WashU internal grant.

This ExoCore Splinter Meeting / Workshop is funded by this year's AAS Education & Professional Development (AAS-EPD) Mini-Grant Program.