Project Pythia

Empowering Geoscientists through Open-Source, Open-Science Collaboration

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PROJECT PYTHIA
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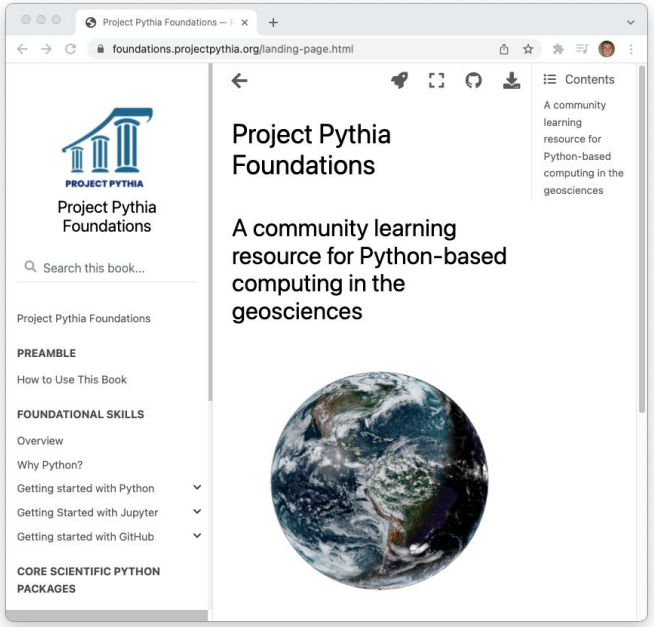
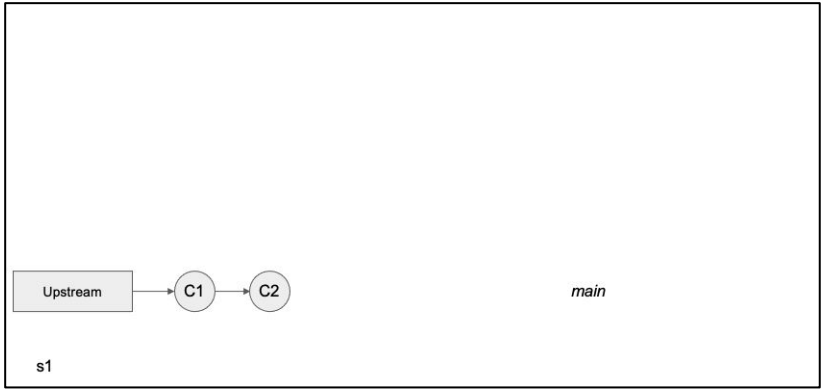
Project Pythia
An education and training hub for the geoscientific Python community
Project Pythia is the education working group for Pangeo and is an educational resource for the entire geoscience community. Together these initiatives are helping geoscientists make sense of huge volumes of numerical scientific data using tools that facilitate open, reproducible science, and building an inclusive community of practice around these goals.
Project Pythia is a home for Python-centered learning resources that are open-source, community-owned, geoscience-focused, and high-quality.
About PROJECT PYTHIA
About PANGEO

Foundations Book





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Resource Gallery

Contribute!

Submit a new resource

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70+

Your First Python Tutorial

Author: Xdev Team
Institution: NCAR

A tutorial for getting started with Python aimed at scientists with experience in at least one other coding language. Designed to teach you Python, not package specific syntax.

pure-python pythia tutorial xdev

Unidata Python Training

Author: Anonymous
Institution: Unidata

Introduction to Python for Atmospheric Science and Meteorology. Unidata is working to create a collection of online training materials focused on the use of Python in the atmospheric sciences. While our examples and scenarios may feature Unidata tools and data technologies, our aim is to present a generic ... more

course unidata

Unidata Python Workshop - Jupyter Notebooks Introduction

Author: Anonymous

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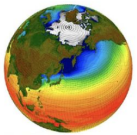
Cookbooks Gallery

Pythia Cookbooks provide example workflows on more advanced and domain-specific problems developed by the Pythia community. Cookbooks build on top of skills you learn in Pythia Foundations.

Cookbooks are created from Jupyter Notebooks that we strive to binderize so each Cookbook can be executed in the cloud with a single click from your browser, but in some instances executing a Cookbook will require running the notebooks locally.

Interested in contributing a new Cookbook or contributing to an existing Cookbook? Great! Please see the Project Pythia Cookbook Contributor's Guide, and consider opening a discussion under the Project Pythia category of the Pangeo Discourse.

Submit a new Cookbook Clear all filters Domains Packages



CESM LENS on AWS Cookbook

Author: Banihirwe, Anderson, Bonnlander, Brian, de La Beaujardière, Jeff, Henderson, Scott, CESM LENS on AWS Cookbook contributors

Notebooks developed to demonstrate analysis of CESM LENS data publicly available on Amazon S3 (us-west-2 region) using Xarray and Dask.

climate dask intake-esm xarray

nightly-build passing launch binder DOI 10.5281/zenodo.8088114

Citable!

CMIP6 Cookbook

Author: Abernathey, Ryan, Drake, Henri, Ford, Robert R., CMIP6 Cookbook contributors

Examples of analysis of Google Cloud CMIP6 data using Pangeo tools.

climate intake-esm xesmf

nightly-build failing launch binder DOI 10.5281/zenodo.8075799

HRRR AWS Cookbook

Author: Tyle, Kevin, HRRR-AWS Cookbook contributors

A cookbook for working with AWS-served HRRR model output data.

AWS-cloud HRRR-model xarray zarr

nightly-build passing launch binder DOI 10.5281/zenodo.8066445

4 → 16

Cookbook Cook-Off Hackathons!

Next year: **64**? **256**?

Cookbook Topics:

- CESM Lens Data on AWS
- CMIP6 Data on Google Cloud
- Zarrified HRRR Data on AWS
- Weather Radar Data
- Creating Intake Catalogues with HRRR Data
- Machine Learning on Landsat Vegetation Data
- Kerchunk
- xbatcher Machine Learning of Ocean Currents
- ARCO ERA5 Visualization
- Dask
- VAPOR Python API
- Advanced Visualization Techniques
- Unstructured Grids
- WebMap NASA Earthdata GIBS Explorer
- Interactive Visualization of Sentinel-2 L2A satellite imagery
- Re-gridding Xarray

If Cookbook Topics are Representative of our Community:

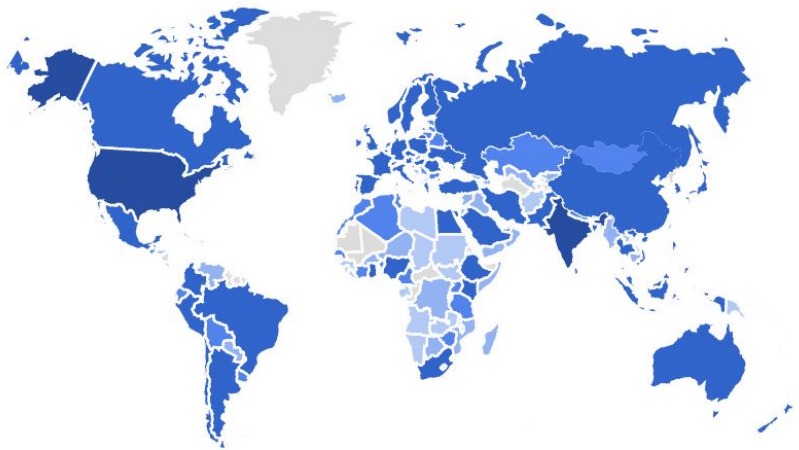
- Heavy Atmospheric Skew (Lots of Climate and Meteorology Data)
- Analysis-Ready Cloud-Optimized (ARCO) Data Across Platforms
- Growing Interest in Leveraging Machine Learning
- Interactive Visualization

Room to Grow:

- Invite Contributors from Across Fields

  We have ARCO, we need ARGO

Growing Global Community



Foundations users - last 12 months

COUNTRY	USERS	
United States	8.2K	↑95.6%
India	2.4K	↑163....
United Kingdom	1.4K	↑156....
Germany	1.3K	↑184....
France	892	↑141....
Canada	775	↑157....
China	737	↑13.6%

Climatematch Academy

Community Owned

Community Driven

Community Building

Open Source on GitHub

Open Meetings

Contributor’s Guides

Hackathons

Moving from PI directed management to community-driven Steering Council model

Summary

Email: jkent@ucar.edu
GitHub: @jukent

Main components:

- Foundations Book
- Cookbooks Gallery
- Resource Gallery
- Tutorial Series

Open source successes:

- Everything on GitHub
- Extensive Contributor's Guides
- Communication Channels
- Open Meetings
- Outreach Efforts (e.g., social media)
- Growing Partnerships

Open source challenges:

- Cookbook Citations are Findable?
- Cookbook Data Storage
- Lowering Barrier to Contribute
- Bridging Sub-Field Gaps

Acknowledgements:

- NSF EarthCube program (award #2026899)
- Pangeo community
- Numerous technical staff