

Better *(open-source)* Homes and Gardens. *with*



Presenters: Kevin Tyle (UAlbany) and Drew Camron (Unidata)

NCAR | NATIONAL CENTER FOR
ATMOSPHERIC RESEARCH



 **UNIVERSITY^{AT}ALBANY**
State University of New York

About us:

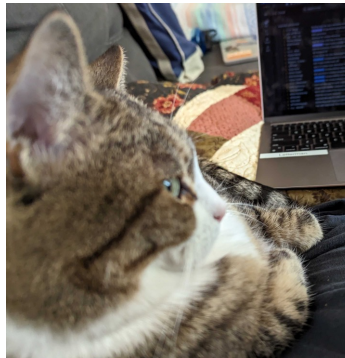


Drew Camron
[Unidata](#)
[@dcamron](#)

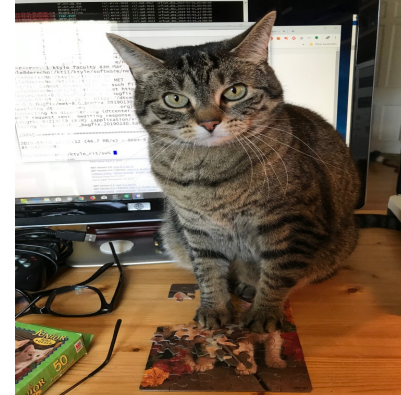


Kevin Tyle
[University at Albany](#)
[@ktyl](#)

Our code testers:



**Lady
Theo
Stormy**



**Sophia
Maya**

What are the tell-tale signs that an open-source home/garden needs some love?



Obsolete dependencies

```
Warning: libmamba Added empty dependency for problem type SOLVER_ROLE_UPDATE
Could not solve for environment specs
The following packages are incompatible
- libgdal is installable with the potential options
  - libgdal [3.5.2|3.5.3] would require
    - icu >=70.1,<71.0a0 , which can be installed;
    - openssl >=3.0.5,<4.0a0 , which can be installed;
  - libgdal [3.5.2|3.5.3] would require
    - geos >=3.11.0,<3.11.1.0a0 , which can be installed;
    - icu >=70.1,<71.0a0 , which can be installed;
    - openssl >=1.1.1q,<1.1.2a , which conflicts with any installable versions previously reported;
  - libgdal [3.5.3|3.6.0] would require
    - geos >=3.11.0,<3.11.1.0a0 , which can be installed;
    - icu >=70.1,<71.0a0 , which can be installed;
    - openssl >=1.1.1s,<1.1.2a , which conflicts with any installable versions previously reported;
  - libgdal [3.5.3|3.6.0|3.6.1|3.6.2] would require
    - icu >=70.1,<71.0a0 , which can be installed;
    - openssl >=3.0.7,<4.0a0 , which can be installed;
  - libgdal [3.5.3|3.6.0|3.6.1] would require
    - icu >=70.1,<71.0a0 , which can be installed;
    - openssl >=1.1.1s,<1.1.2a , which conflicts with any installable versions previously reported;
  - libgdal [3.5.3|3.6.3|3.6.4] would require
    - hdf5 >=1.14.0,<1.14.1.0a0 with the potential options
      - hdf5 1.14.0 would require
        - openssl >=3.0.8,<4.0a0 , which can be installed;
      - hdf5 [1.12.2|1.14.0] would require
        - openssl >=1.1.1s,<1.1.2a , which conflicts with any installable versions previously reported;
      - hdf5 1.14.0 would require
```

No recent activity

<> Code

Issues 39

Pull requests 1

Actions

Projects

Wiki

Security

Insights

Public

Watch 26

10 branches

22 tags

Go to file

Add file

<> Code

Update version file

2b772b6 on Feb 4, 2019

416 commits

5 years ago

6 years ago

5 years ago


5 years ago





5 years ago







5 years ago


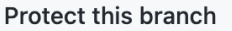

8 years ago



Lack of community




 **albany_nullschool** Public








 Pin  Unwatch **3**  Fork **0**  Star **7**

 master  11 branches  0 tags  Go to file  Add file  Code

 **Your master branch isn't protected**
Protect this branch from force pushing or deletion, or require status checks before merging. [Learn more](#)  Protect this branch 

 **ktyl**e Minor interface wording edits 511e707 on May 10, 2018  17 commits

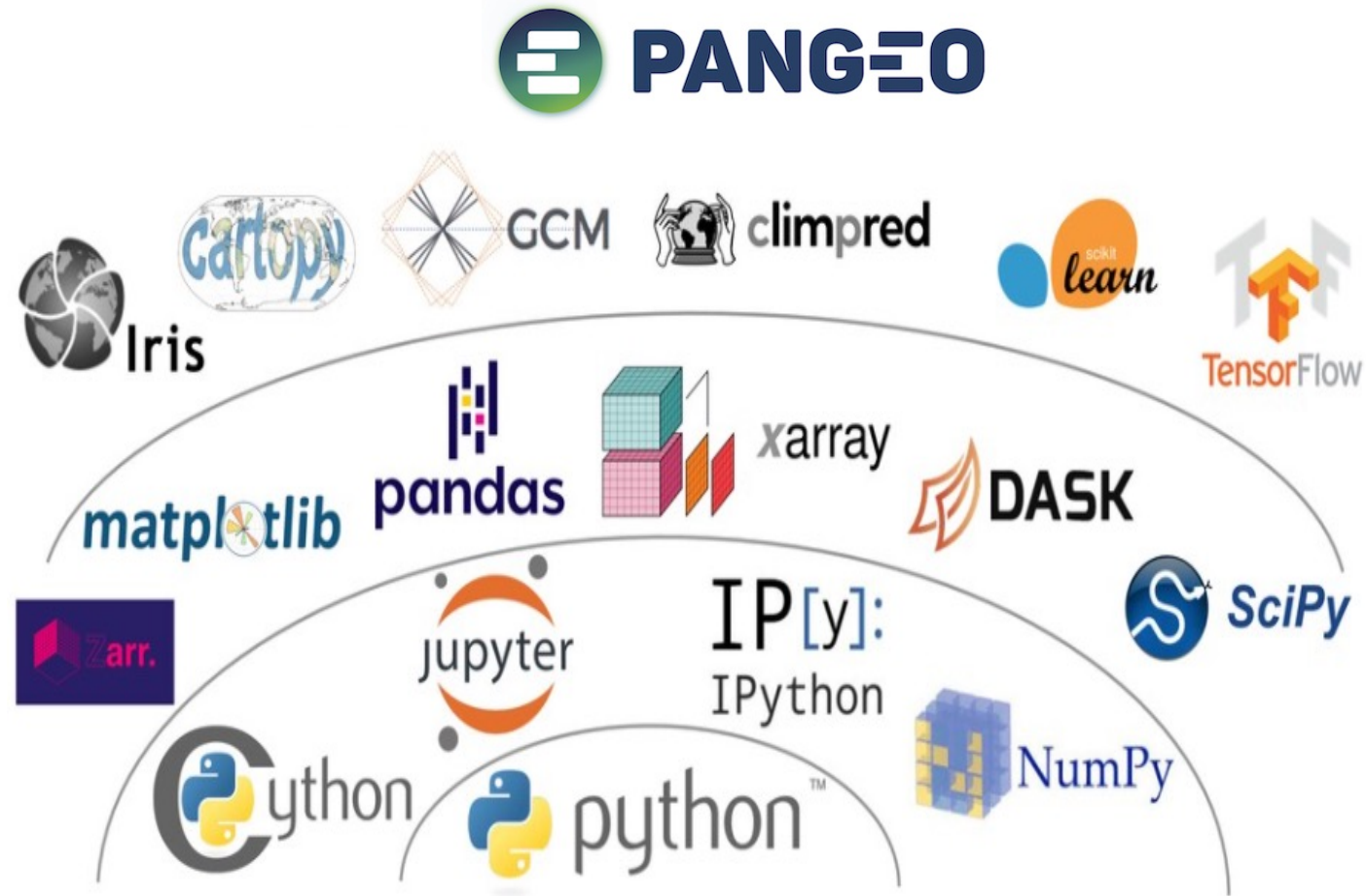
 public	Minor interface wording edits	5 years ago
 scripts	Initial	6 years ago
 .gitignore	Initial	6 years ago

About 
An offshoot of Cameron Beccario's earth.nullschool.net
 Readme
 MIT license
 Activity
 7 stars
 3 watching
 0 forks

Why might a FOSS home/garden decay?

- Few (or just one) core members
- Lead “gardeners” depart
- Not used / not in sync with the broader ecosystem
- Little or no documentation
- Barriers to entry for contributors
- Insufficient TLC
- Lack of funding

The SciPy / Pangeo ecosystem: Thriving and growing community homes and gardens



Inspiration: Stephan Hoyer, Jake Vanderplas (SciPy 2015)

Pangeo ecosystem: Community

PANGEO

all categories all tags Latest New (1) Unread (7) Top Categories + New Topic

Category	Topics	Latest
News & Announcements Pangeo news and announcements Jobs 1 new	366 1 new	22c Technical Content Specialist Jobs 0 3h
Meta Discussion of Pangeo as a project Pangeo Showcase 1 unread	73 3 unread	NSF Pathways to Enable Open-Source Ecosystems (POSE) Meta 1 2d
Education Pangeo in education Project Pythia	37	Proposed cookbook: Interactive dashboard for Sentinel-2 satellite imagery Project Pythia 1 2d
Data Data file formats (netCDF, HDF5, Zarr, TileDB, COG, etc.), metadata, and data catalogs. IPFS	146 1 unread	Proposed Cookbook: Web Map Tile Services (WMTS) Project Pythia 10 2d
Uncategorized Topics that don't need a category or don't fit into any other	69 2 unread	New Working Group for Distributed Array Computing News & Announcements 34 2d

Py-ART 1.15.1.post3 documentation User Guide API Reference Manual Example Gallery Notebook Gallery Blog More

Pangeo Showcase

Pangeo
40 videos 645 views Last updated on Jul 3, 2023

Play all Shuffle

Recordings for the Pangeo Showcase
<https://pangeo.io/pangeo-showcase.html>

- D'explorer** Explore cloud datasets from your notebooks
Pangeo • 95 views • 4 months ago
- Lessons learned teaching Pangeo in the classroom**
Pangeo • 72 views • 4 months ago
- Mental Health in the Geosciences**
Pangeo • 38 views • 4 months ago
- Xarray-Datatree: Hierarchical Data Structures for Multi-Model Science**
Pangeo • 250 views • 4 months ago
- Major advances in HoloViz for Pangeo: GUI explorer, interactive pipelines, and publishing apps**
Pangeo • 456 views • 7 months ago

GeoPandas builds upon Shapely
GeoPandas: Easy, fast and scalable geospatial analysis in Python

The Python ARM Radar Toolkit - Py-ART

Radar Cookbook

The cookbook provides in-depth information on how to use Py-ART (and other open radar packages), including how to get started. This is where to look for general conceptual descriptions on how to use parts of Py-ART, like its support for corrections and gridding.

Reference Guide

The reference guide contains detailed descriptions on every function and class within Py-ART. This is where to turn to understand how to use a particular feature or where to search for a specific tool

Developer Guide

Want to help make Py-ART better? Found something that's not working quite right? You can find instructions on how to contribute to Py-ART here. You can also find detailed descriptions on tools useful for developing

Example Gallery

Check out Py-ART's gallery of examples which contains sample code demonstrating various parts of Py-ART's functionality.

On this page

- What is Py-ART?
- Citing Py-ART
- What can Py-ART do?
- Short Courses
- Install
- Dependencies
- Optional Dependencies
- Getting help
- Contributing

Show Source

Pinned Tweet

MetPy @Metpy · Jul 7

MetPy 1.5.1 has been released with a few bug fixes for 1.5.0, including fixing stationary fronts looking flipped by default with WPC bulletins. For full release notes, see:

New Release v1.5.1

1.5.1

Highlights

- `el` and `lfc` handle NaN values in passed in profiles
- Clarification of `advection` docs...

4 Contributors

github.com

Release 1.5.1 · Unidata/MetPy

Highlights `el` and `lfc` handle NaN values in passed in profiles
Clarification of `advection` docs Fixed bug in `(log_)interpolate_1d` with ...

What is Project Pythia?



How does Project Pythia tend its garden?

We can't *just* reduce barriers.

Technical
interfaces

Educational
resources

Community

all require *active* participation and support



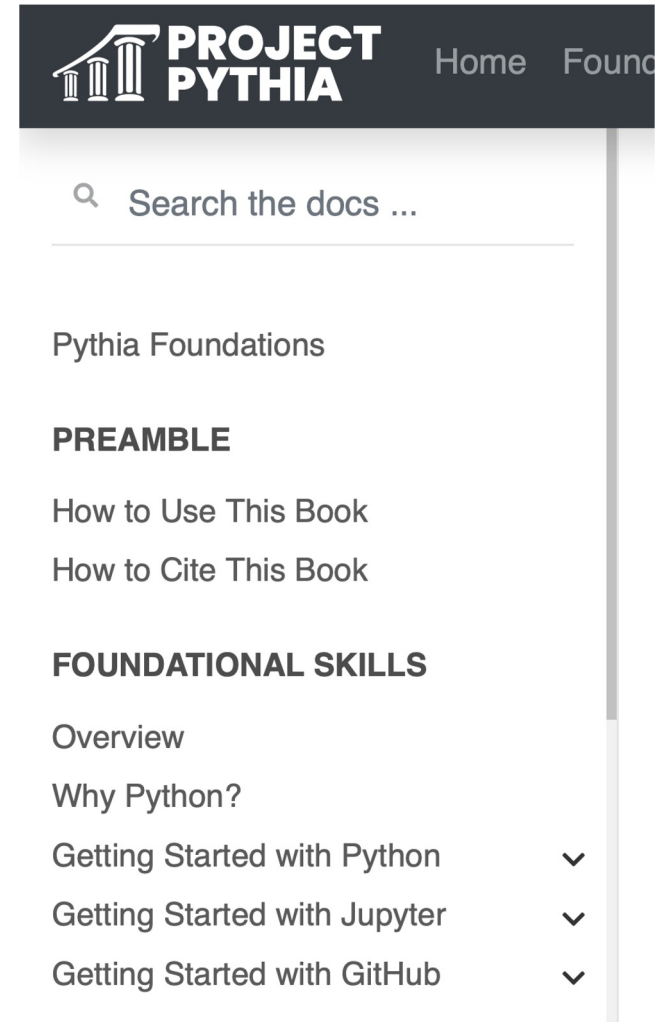


Desire to garden

Foundations in Python

Jupyter training

Spaces (asynchronous, synchronous)





Join us!

If you have questions or want to share anything with the [Project Pythia Team](#), please reach out to us through the [Project Pythia category on the Pangeo Discourse forum](#) or join us at our Weekly Working Group Meetings.

[Go to Pangeo Discourse](#)

[Getting Started with Jupyter](#) 

[Getting Started with GitHub](#) 



Joining community garden

open, accessible **and** retaining a sense of community and safety
a low wall

Communal, public – open, but must be safe

Comfort: direct e-mail, synchronous spaces, word of mouth

New places?



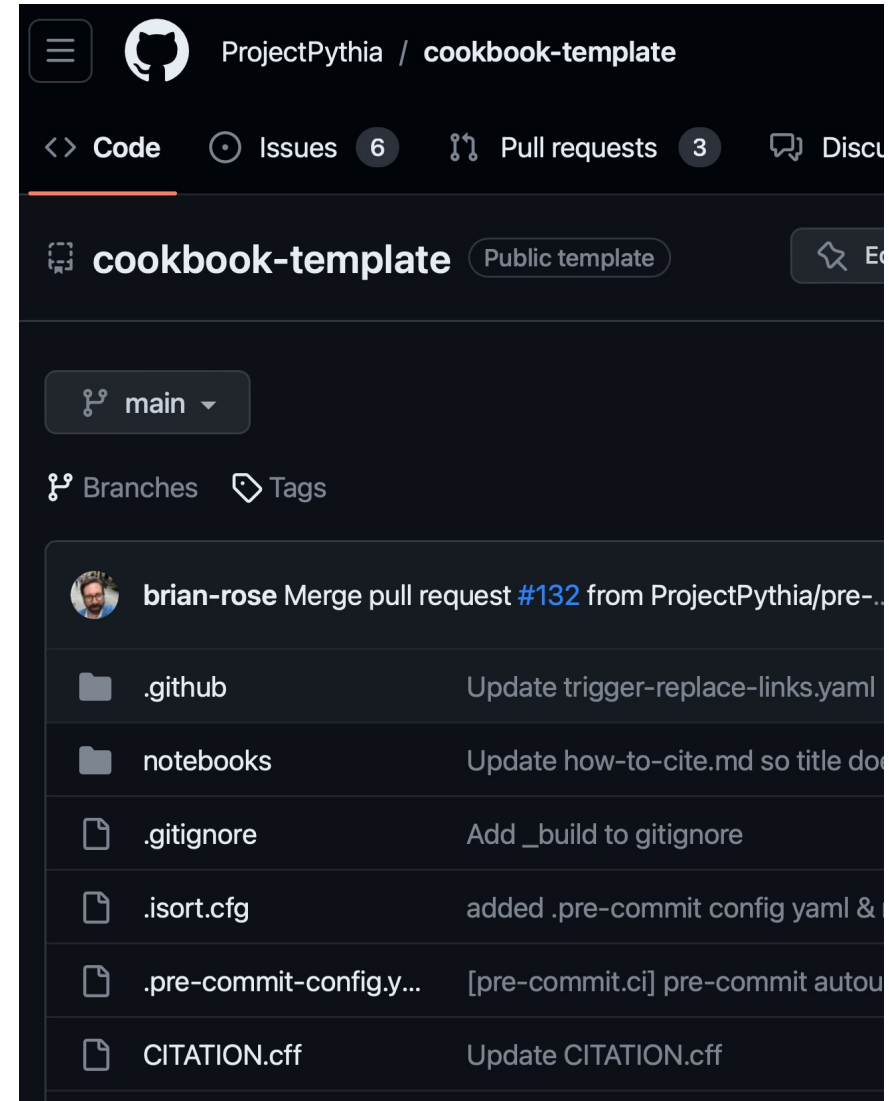
Seedlings, plant starts

GitHub templates

Events, technical training

Guides & documentation

Meeting spaces and Discourse





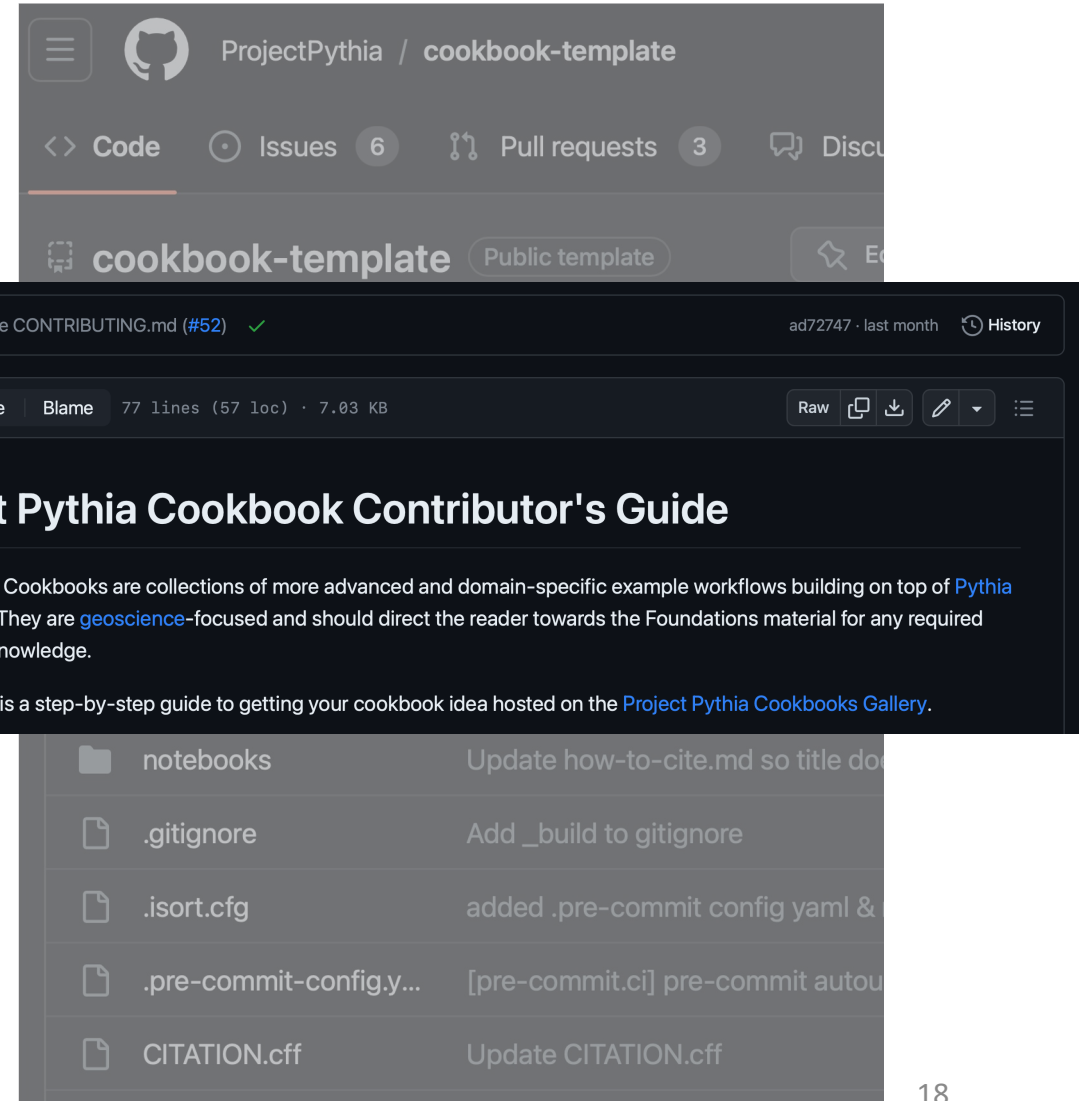
Seedlings, plant starts

GitHub templates

Events, technical training

Guides & documentation

Meeting spaces and Discourse





Radar Cookbook

PREAMBLE

How to Cite This Cookbook

WEATHER RADAR

FOUNDATIONS

The Basics of Weather Radar

RADAR SOFTWARE

FOUNDATIONS

Py-ART Basics

Py-ART Corrections

Py-ART Gridding

Interactive Radar Visualization

EXAMPLE WORKFLOWS

Looking at NEXRAD Data from Moore, Oklahoma



Radar Cookbook

 nightly-build
  launch binder
 DOI [10.5281/zenodo.8075855](https://doi.org/10.5281/zenodo.8075855)

This Project Pythia Cookbook covers the basics of working with weather radar data in Python.

Motivation

This cookbook provides the essential materials to learning how to work with weather radar data using Python.

Most of the curriculum is focused around the Python ARM Toolkit, which is defined as:



Boxes, watering, tending

Actions: testing, health-checks, publishing, citation

Interactivity via JupyterBook and/or BinderHub

GitHub, GitHub, GitHub

Investment from creator and from users

Review? Iteration? Technical support?



<> Code

Issues 5

Pull requests 2

Discussions

Actions

Actions

New workflow

All workflows

- nightly-build
- pages-build-deployment
- preview-book
- publish-book
- trigger-book-build
- trigger-delete-preview
- trigger-link-check
- trigger-preview

Management

All workflows

Showing runs from all workflows

1,502 workflow runs

Event ▾

Status ▾

Branch ▾

Actor ▾



nightly-build

nightly-build #392: Scheduled



nightly-build

nightly-build #391: Scheduled



nightly-build

nightly-build #390: Scheduled



New Gardener of the Year!

Citation

Elevation of voice

Idea

Conversation

Jup

ARM

Radar Cookbook

 nightly-build  passing  launch  binder DOI [10.5281/zenodo.8075855](https://doi.org/10.5281/zenodo.8075855)

This Project Pythia Cookbook covers the basics of working with weather radar data in Python.

New Gardener of the Year!

Authors

[Max Grover](#), [Zachary Sherman](#), [Milind Sharma](#)

Citation

Elevation of voice

Contributors





Signing up for next year

Individual ownership/responsibility

Group support and care

Evolution, living materials



Takeaways

Gardening itself takes work

Tending a community garden is no easier

Needs nuance

Requires responsiveness

Iterate, iterate, iterate!

Takeaways

Gardening itself takes work

Tending a community garden is no easier

Needs nuance

It feels incredible!

Requires responsiveness

Iterate, iterate, iterate!

Keeping Pythia's garden thriving: next steps



Technical growth

- More community contributions → more infrastructure

Technical growth

- As the community grows ...



“We’re gonna need a bigger ~~boat~~ Binderhub”

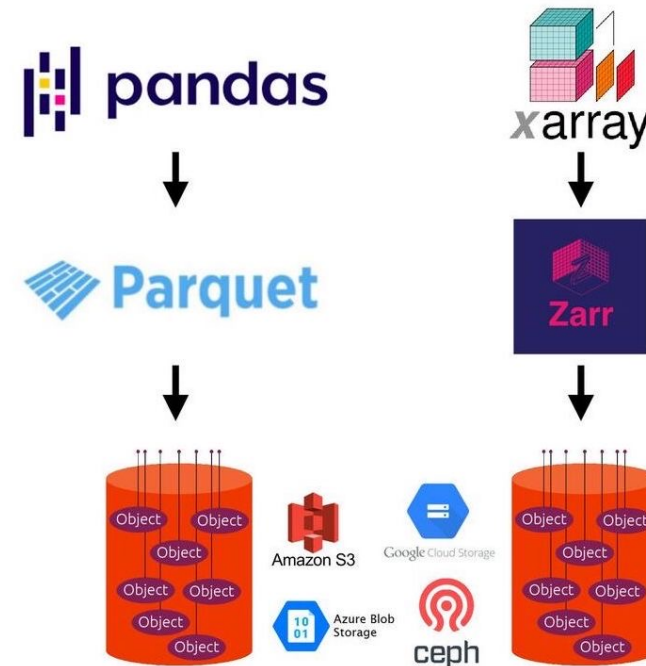
Technical growth

Discoverable ARCO data repository

Analysis Ready, Cloud Optimized

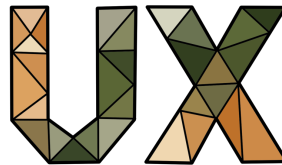
What is “Cloud Optimized”?

- Compatible with object storage (access via HTTP)
- Supports lazy access and intelligent subsetting
- Integrates with high-level analysis libraries and distributed frameworks



Technical growth

Develop content supporting emerging Pangeo ecosystem packages



Community growth

Engage with the broader FOSS community



contributor-experience.org

CHA⁰SS

Community growth

Help make our garden grow!

- Join our [weekly meetings](#)



Community growth

Help make our garden grow!

- Join our [Discourse](#)

[Sign Up](#)

[Log In](#)

Education ▾

Project Pythia ▾

all tags ▾

Latest

Top

Topic

Replies

Views

Activity

Project Pythia Category

Project Pythia (<https://projectpythia.org/>) 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... [read more](#)

1

255

Oct '22

Proposed cookbook: Interactive dashboard for Sentinel-2 satellite imagery

1

139

4d

Proposed Cookbook: Web Map Tile Services (WMTS)

10

186

4d

Propagating changes in cookbook templates

6

143

29d

Interested in submitting a new cookbook

6

106

30d

Sign up now for the Project Pythia Summer 2023 Hackathon!

1

309

May 16

Community growth

Help make our garden grow!

- Open an issue and/or submit a PR on <https://github.com/ProjectPythia>

The screenshot shows the GitHub repository page for Project Pythia. At the top, the repository name "Project Pythia" is displayed with a description: "Community learning resource for Python-based computing in the geosciences". It shows 61 followers and links to the website, Twitter, and email. Below this is the README section, which includes a link to the Pangeo Discourse forum for discussions. The "Pinned" section features four repositories: "pythia-foundations" (Jupyterbook source for the Foundations collection, 49 stars, 31 forks), "projectpythia.github.io" (Python, 31 stars, 15 forks), "cookbook-template" (Project Pythia Cookbook template, 12 stars, 12 forks), and "cookbook-gallery" (Root site for the ProjectPythiaCookbooks GitHub Pages, 8 forks). The "Discussions" section prompts users to set up discussions to engage with the community. The "People" section shows a grid of avatars of community members. At the bottom, there is a "Repositories" section with a search bar and filters for Type, Language, and Sort, along with a "New" button.

Community growth

Help make our garden grow!

- Add a [Cookbook](#), a [Resource](#), or contribute to our [Foundations](#)

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](#)

Resource Gallery

[Submit a new resource](#)

[Clear all filters](#)

[Affiliation](#)

[Domains](#)

[Formats](#)

[Packages](#)

Xdev

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](#)

Search the docs ...

Pythia Foundations

PREAMBLE

[How to Use This Book](#)

[How to Cite This Book](#)

FOUNDATIONAL SKILLS

[Overview](#)

[Why Python?](#)

[Getting Started with Python](#)

[Getting Started with Jupyter](#)

[Getting Started with GitHub](#)

CORE SCIENTIFIC PYTHON PACKAGES

[Overview](#)

[NumPy](#)

[Matplotlib](#)

[Cartopy](#)

[Datetime](#)

[Pandas](#)

[Data Formats](#)


[Xarray](#)

APPENDIX

[Pythia Foundations Contributor's Guide](#)

Pythia Foundations

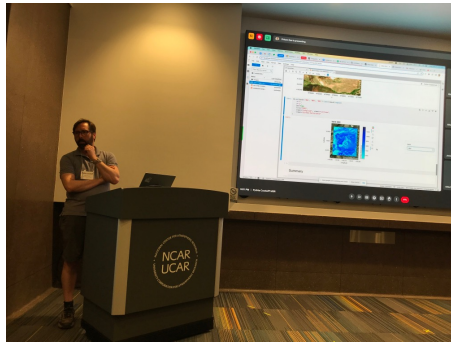
A community learning resource for Python-based computing in the geosciences



Community growth

Help make our garden grow!

- Annual Summer Hackathon



Thanks for creating and sustaining our garden!



Thanks for creating and sustaining our garden!

And especially ...

Thanks for creating and sustaining our garden!

And especially ...



All of you!!

Thanks for creating and sustaining our garden!



PROJECT PYTHIA

Come see us to get a sticker!!