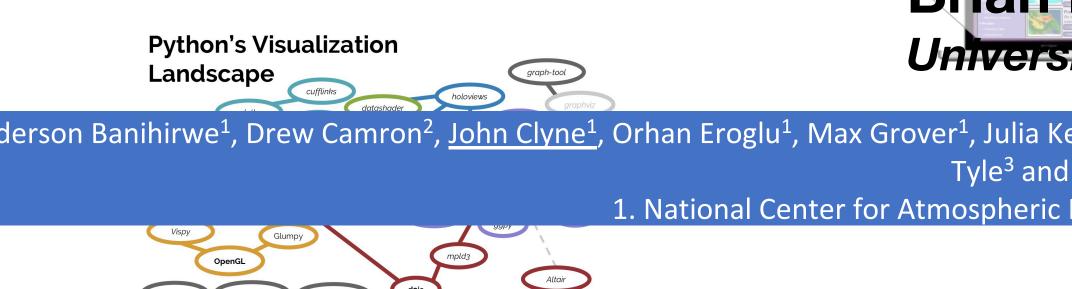


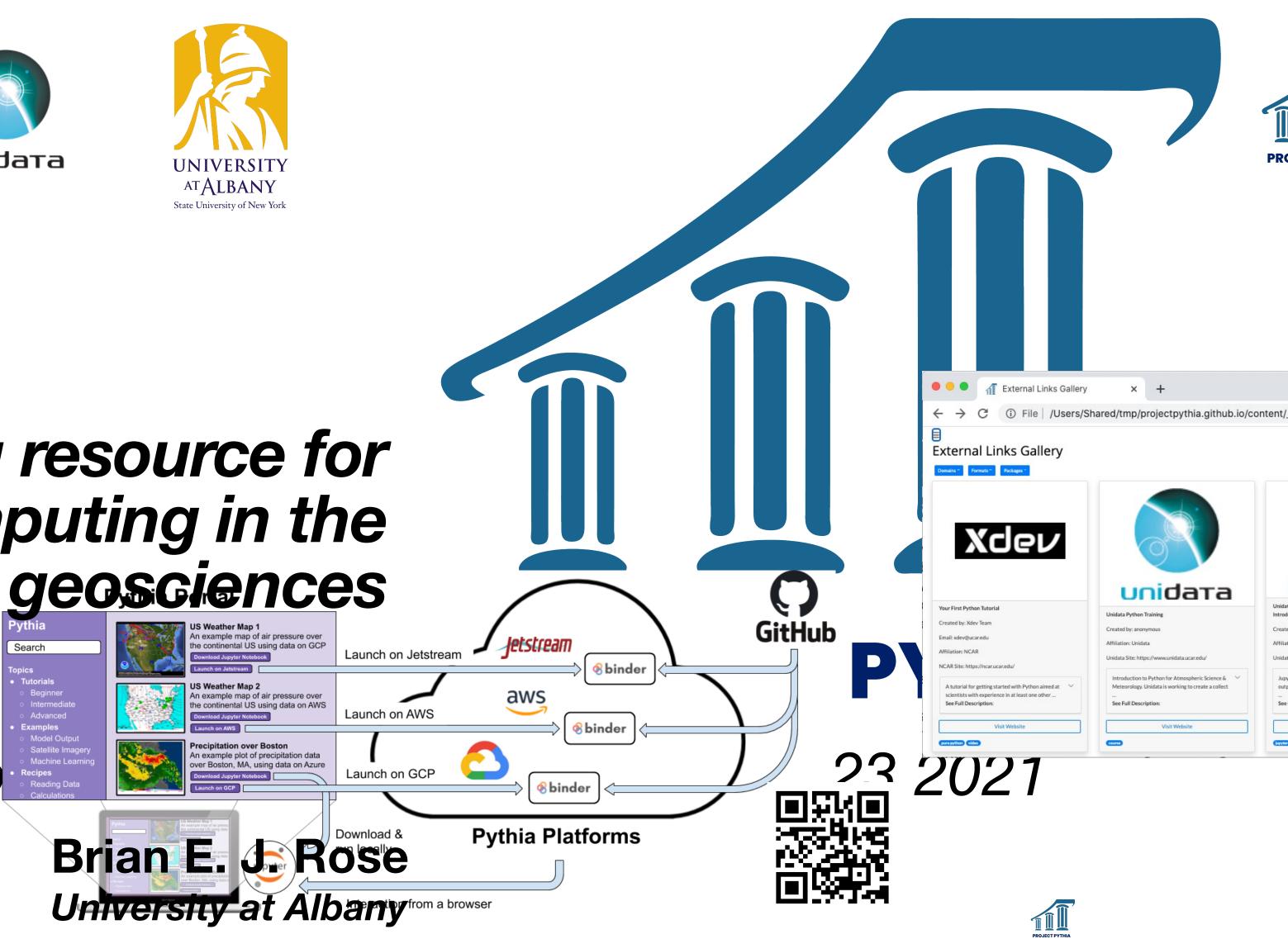




A community learning resource for **Python-based computing in the**



A quick update fo



Anderson Banihirwe¹, Drew Camron², John Clyne¹, Orhan Eroglu¹, Max Grover¹, Julia Kent¹, Austin Kootz¹, Matt Long¹, Ryan May², Kevin Paul¹, Brian Rose³, Michaela Sizemore¹, Kevin Tyle³ and Anissa Zacharias¹

1. National Center for Atmospheric Research, 2. Unidata, 3. University at Albany













unidata



The **Pythia** (/pɪθiə/;^[1] Ancient Greek: Πυθία [pyː't^hi.aː]) was the name of the high priestess of the Temple of Apollo at Delphi who also served as its oracle, also known as the Oracle of Delphi.

Project Pythia: Education and Training

potential impact if scientists have access to high-quality training for learning to use them!

A new NSF EarthCube grant, awarded to NCAR and the University at Albany, will fund the development of Project Pythia: a community educational resource. The Project Pythia portal aims to provide geoscientists at any point in their career with the educational content and realworld examples needed to learn how to navigate and integrate the myriad packages within the burgeoning Scientific Python Ecosystem. Pythia will cover a range of topics from beginning Python programming to advanced subjects such as developing scalable workflows. A particular emphasis will be placed on migrating workflows to the cloud. Educational content in the Pythia portal will be developed and vetted in part through integration with graduate and undergraduate-level coursework at the University at Albany.

https://en.wikipedia.org/wiki/Pythia

PROJECT PYTHIA

Pangeo has driven forward the capabilities of Python tools for geosciences massively in the past years. But these tools will only realize their

https://medium.com/pangeo/pangeo-2-0-2bedf099582d







Most Geoscientists...



A mountain of languages, software packages, environments, and tools

To reduce barriers to tool adoption and participation; To empower more people to do better, more reproducible data-heavy science; To organize the community around a well-maintained set of learning resources





PROJECT PYTHIA



Happy Pangeans





Who?





John Clyne

<u>NCAR</u>

<u>@clyne</u>

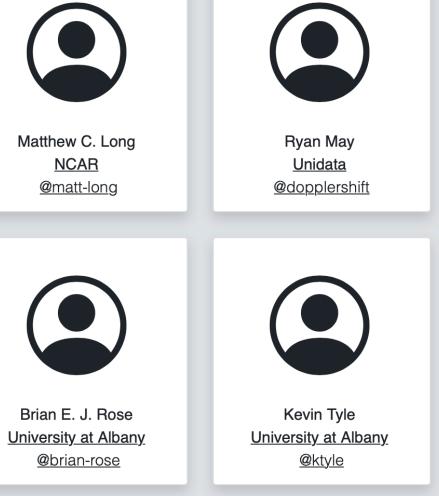
Kevin Paul

<u>NCAR</u>

<u>@kmpaul</u>



<u>NCAR</u> @matt-long



Project Members



Anderson Banihirwe <u>NCAR</u> @andersy005



Drew Camron <u>Unidata</u> <u>@dcamron</u>



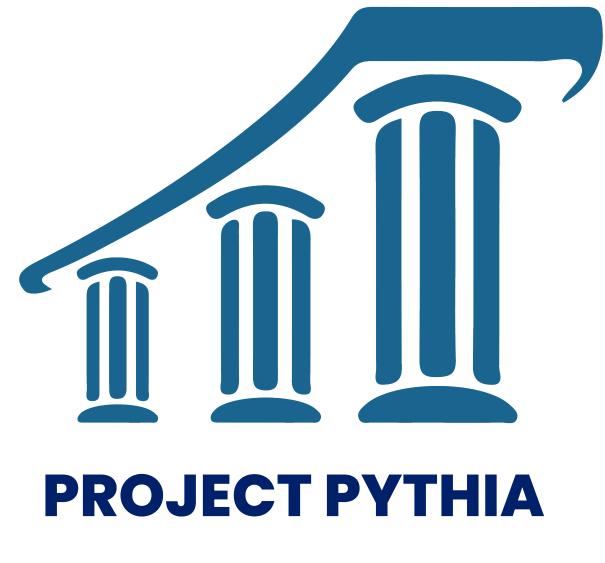
Julia Kent <u>NCAR</u> <u>@jukent</u>



Orhan Eroglu <u>NCAR</u> @erogluorhan



Max Grover <u>NCAR</u> @mgrover1



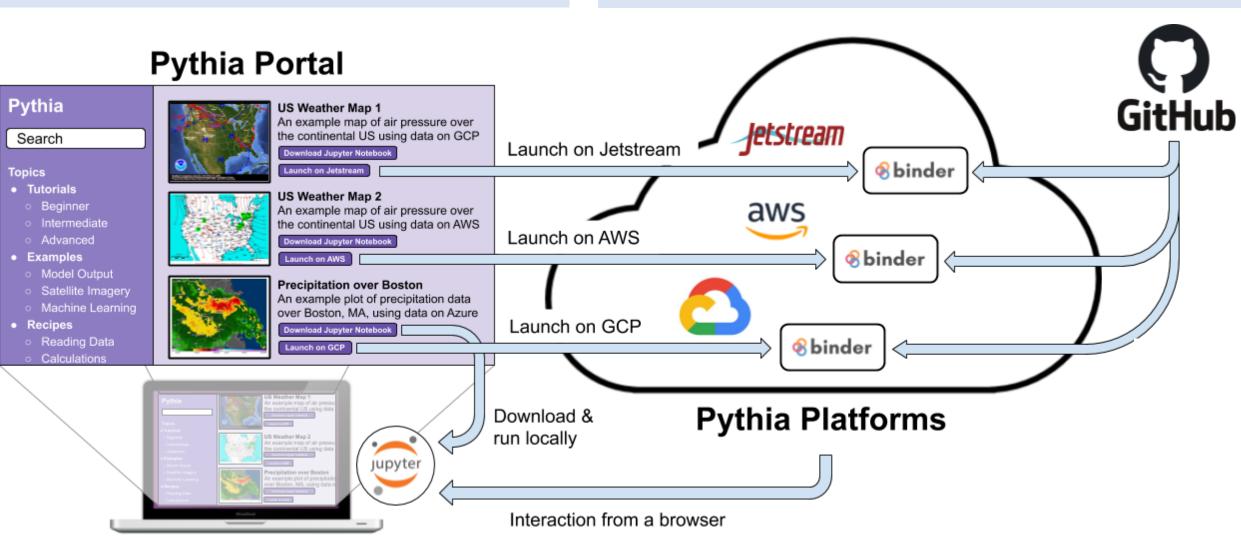
Hopefully we'll add some mugshots to the Portal site soon!

Big picture goals

Goals

- **1.** Pythia Portal: A *go-to* resource for learning the Scientific Python Ecosystem
 - Geoscience focused
 - From novice to power user
 - Tutorials, videos, examples, on-line • courses, and sample data
 - Community owned \bullet
- 2. Pythia Platforms: Binder-like infrastructure for launching workflows on a cloud platform
 - Customizable \bullet
 - Cloud vendor agnostic \bullet

- •
- Helping identify and prioritize content needs • Helping develop **new** content or identifying \bullet existing content for inclusion
- Responding to questions from other users • Reporting or correcting problems
- ... and more



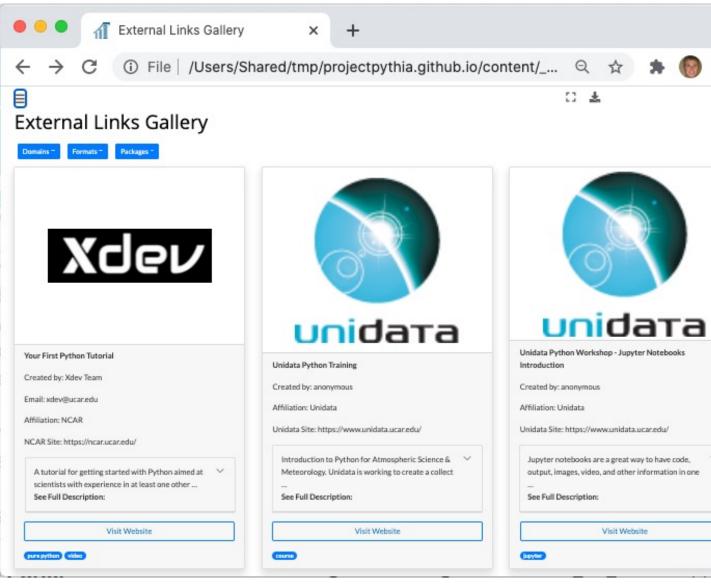
Community owned

> A community-owned resource enabled by the Open Development model. The user community is expected to contribute by:

Providing feedback



PROJECT PYTHIA







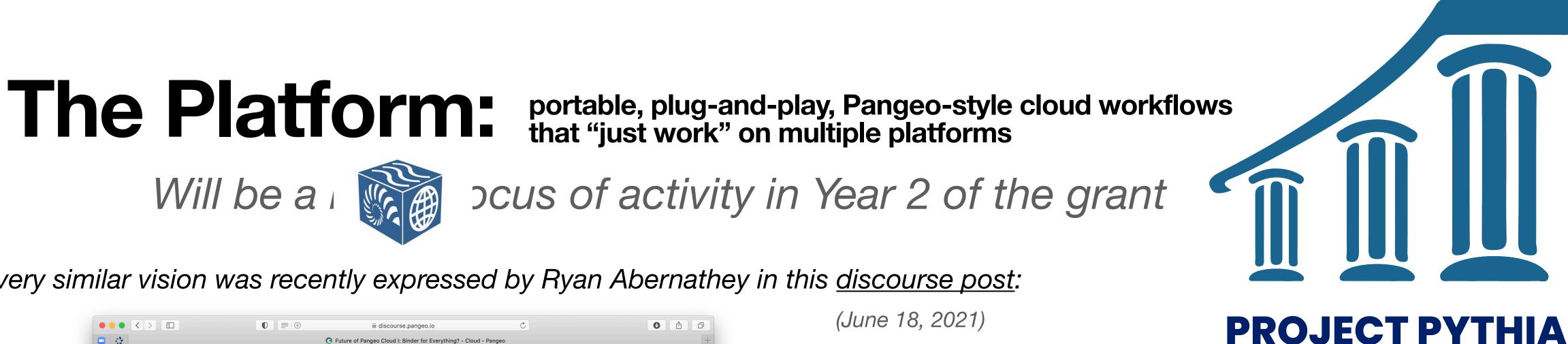




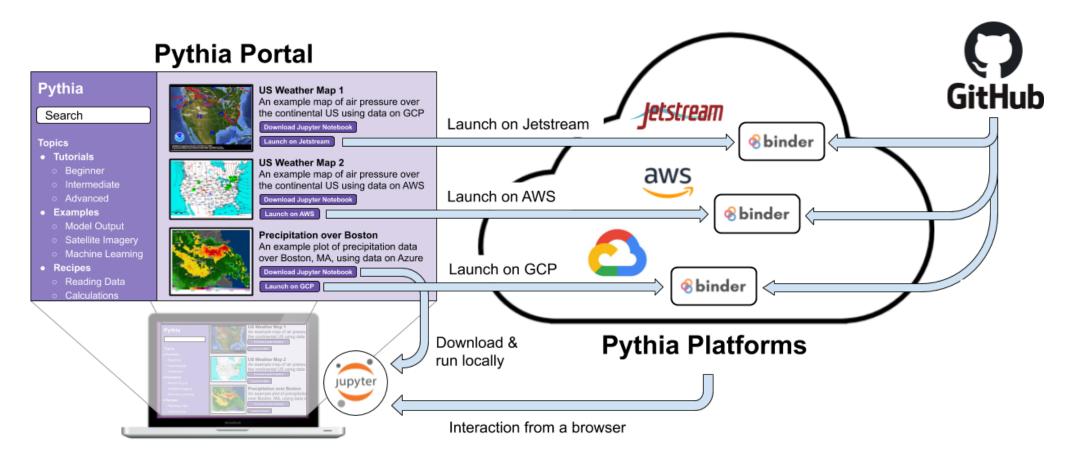
A very similar vision was recently expressed by Ryan Abernathey in this <u>discourse post</u>:

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javascript bakan pandas pandas Yellow brick



Project Pythia brings NCAR-based developer resources and External an Infrastructure Working Group to push this vision forward







The Portal

Is live now, will keep evolving

Project Pythia PROJECT Start Learning Join us! Team About **Project Pythia** Scientists working in a multitude of disciplines rely heavily on computing technologies for their research Numerical simulations run on supercomputers are used in the study of climate, weather atmospheric fires, space weather, and more. Similarly, a tremendous volume of digital data produced tions, or observations made with instruments, are analyzed with the help of powerful vare. Thus, today's scientists require not only expertise in their scientific discipline. but also require high-level technical skills to effectively analyze, manipulate, and make sense of potentially vast volumes of data. Computing environments change rapidly, and two technologies that have emerged and are being adopted by scientific communities relatively recently are Cloud Computing platforms and a software ecosystem of scientific tools built around the open source programming language called Python. Project Pythia will provide a public, web-accessible training resource that will help educate current, and aspiring, earth scientists to more effectively use both the Scientific Python Ecosystem and Cloud Computing to make sense of huge volumes of numerical scientific data

Project Pythia has two main resources for you to use to start learning how to use Python and the technology in the Python ecosystem for the geosciences: the Pythia Foundations Book and the Pythia Resource Gallery.

The Pythia Foundations Book is a Jupyter Book that we are currently developing to act as a comprehensive set of tutorials covering the foundational skills everyone needs to get started with computing in the open-source Python ecosystem. These foundational tutorials will serve as common references for more advanced and domain-specific content to be housed here in the Pythia Portal.

There is a wealth of educational resources out there on the internet for learning Python and how to use it in the geosciences! We have attempted to gather together as many of these resources as possible into our Pythia Resource Gallery. Click the link below to see a hand-picked selection of resources for learning at your own pace.

projectpythia.org	

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Photo by Jeff Stapleton from Pexe

Read more about Project Pythia

Start Learning

The Foundations Book

Read the Project Pythia Foundations Book

The Resource Gallery

Visit the Pythia Resource Gallery

Join us!

If you have questions or want to share anything with the Project Pythia Team, please reach out to us on -l- \\/----

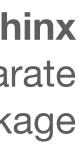


PROJECT PYTHIA

https://projectpythia.org/

... with a beautiful new custom Sphinx theme, to be published as a separate installable and customizable package





The Foundations book

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Q Search this book...

Project Pythia Foundations

PREAMBLE

How to Use This Book

FOUNDATIONAL SKILLS

Overview

Why Python?

Getting started with Python	
Getting started with Jupyter	

Getting started with GitHub

CORE SCIENTIFIC PYTHON PACKAGES

Xarray	`
Data Formats	`
Pandas	`
Datetime	`
Cartopy	`
Matplotlib	`
NumPy	`
Overview	

APPENDIX

Pythia Foundations contributor's guide

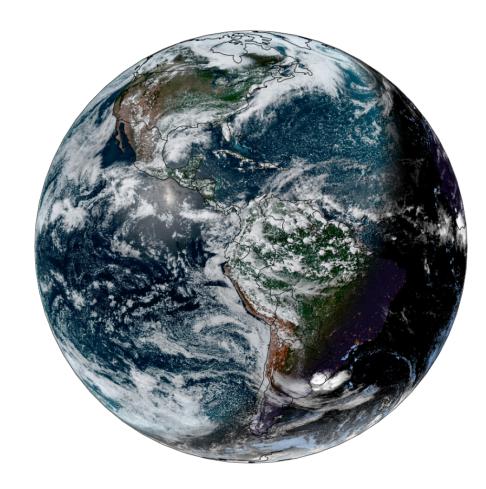
Powered by Jupyter Book

foundations.projectpythia.org

👖 Project Pythia Foundations — Project Pythia Foundations

Project Pythia Foundations

A community learning resource for Pythonbased computing in the geosciences



Brought to you by Project Pythia, this growing collection covers the foundational skills everyone needs to get started with scientific computing in the open-source Python ecosystem

How to Use This Book >>

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By the Project Pythia community © Copyright 2020.

All code in Pythia Foundations is licensed under Apache 2.0. All other non-code content is licensed under Creative Commons BY 4.0 (CC BY 4.0). We want your feedback! See our Contributor's Guide.

Is live now, will keep evolving

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

 Ξ Contents

PROJECT PYTHIA

https://foundations.projectpythia.org/

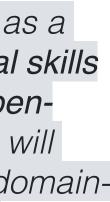
a Jupyter Book that we are currently developing to act as a comprehensive set of tutorials covering the foundational skills everyone needs to get started with computing in the opensource Python ecosystem. These foundational tutorials will serve as common references for more advanced and domainspecific content to be housed here in the Pythia Portal.

All tutorials are Binderized for exploratory learning



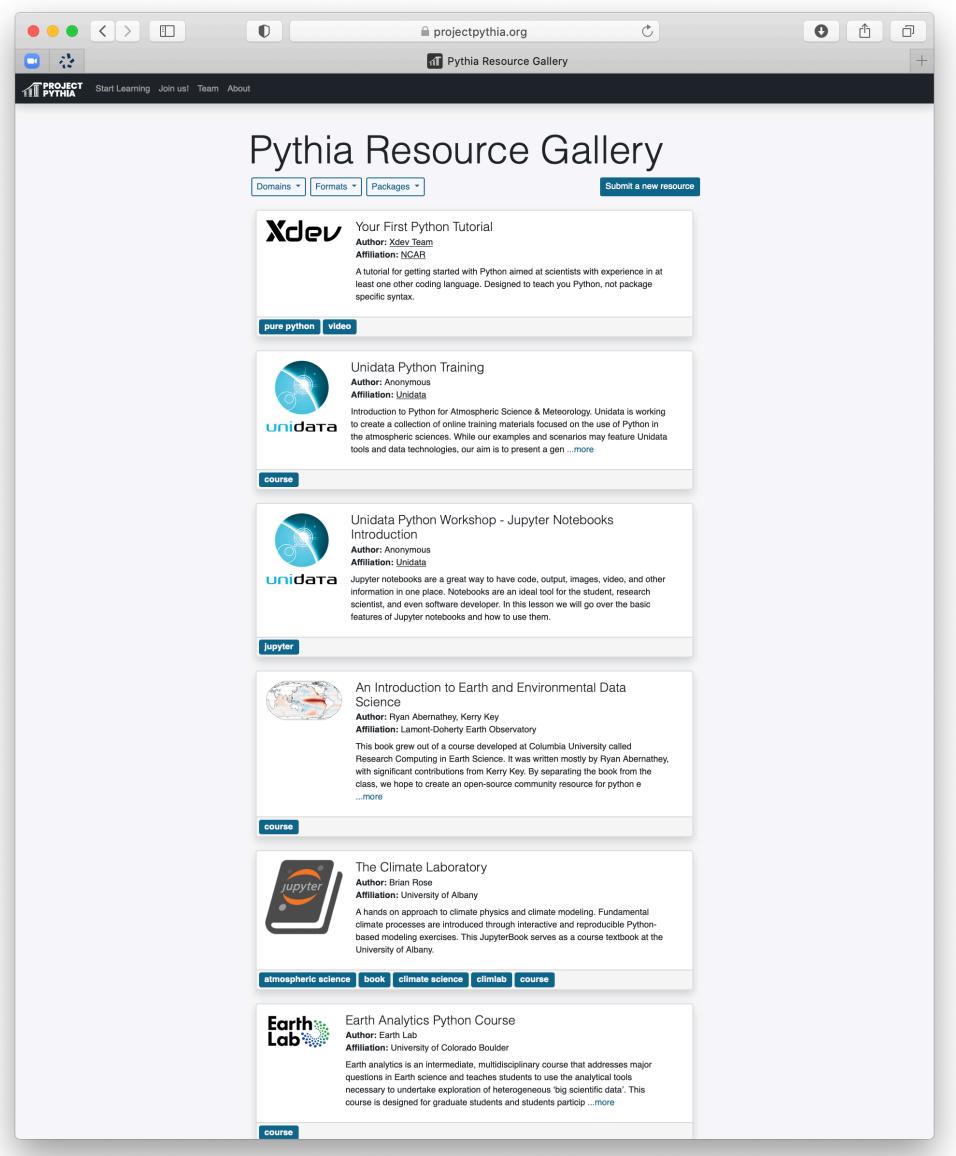








The Resource Gallery



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PROJECT PYTHIA

https://projectpythia.org/gallery.html

A curated, searchable, and extensible gallery of links to external learning resources

Want to add or update a link in the gallery*? Take a look at our Contributor's Guide! https://projectpythia.org/contributing.html

> or anything else on our sites! *

We have some nice collaboration infrastructure in place on GitHub for auto-rendering Pull Requests, triggering reviews, etc.







Future content directions a non-binding list...

- Complete "Getting Started" and Python package tutorials in Foundations book
- Tutorials on cloud computing and scaling up through the Pythia platform
- Galleries of community-contributed, domain-specific exemplar science content. Emphasis on teaching and learning, with thorough cross-references to Foundations tutorials. A permanent home for Pangeo Galleries?
- User-contributor gateway material:
 - Beginner-friendly Contributors Guide including spin-up tutorials on GitHub etc.
 - Guidance on packaging, testing, and documenting scientific software
 - Commitment to open-source tools for all our content, use of Pythia sites themselves as learning models
- A robust working group organization and PR review cycle to keep things moving and up-to-date
- A fundamental commitment to open development, inclusivity, and putting learners first.

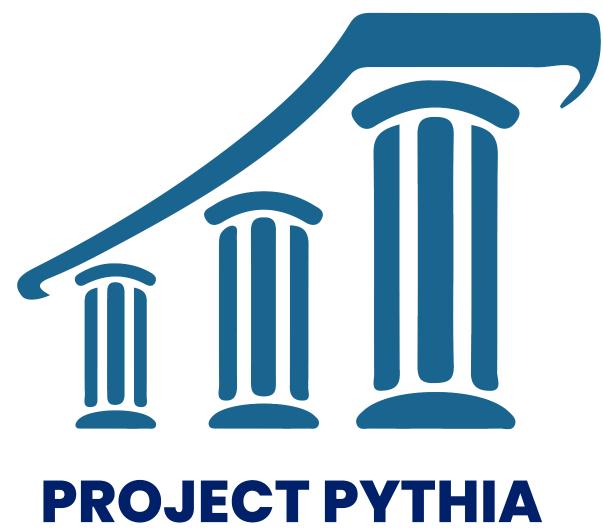




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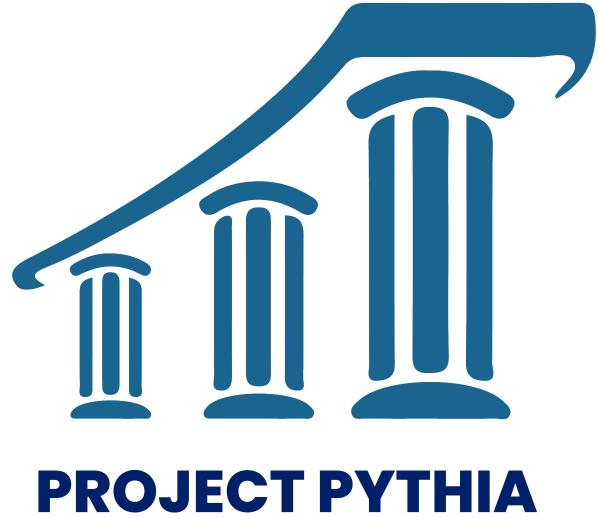
Questions for the community

- What are the biggest barriers to new users getting started with the Pangeo stack?
- What topics should the Foundations book cover?
- What resources should appear on the Portal?
- How can we best catalyze community involvement?
- ... what should Pythia do next?



Links

- Portal home: <u>https://projectpythia.org/</u>
- Foundations book: <u>https://foundations.projectpythia.org/</u>
- GitHub org: <u>https://github.com/ProjectPythia</u>



Discussion board: https://github.com/ProjectPythia/projectpythia.github.io/discussions

Meeting calendar: <u>https://projectpythia.org/index.html#meeting-event-calendar</u>