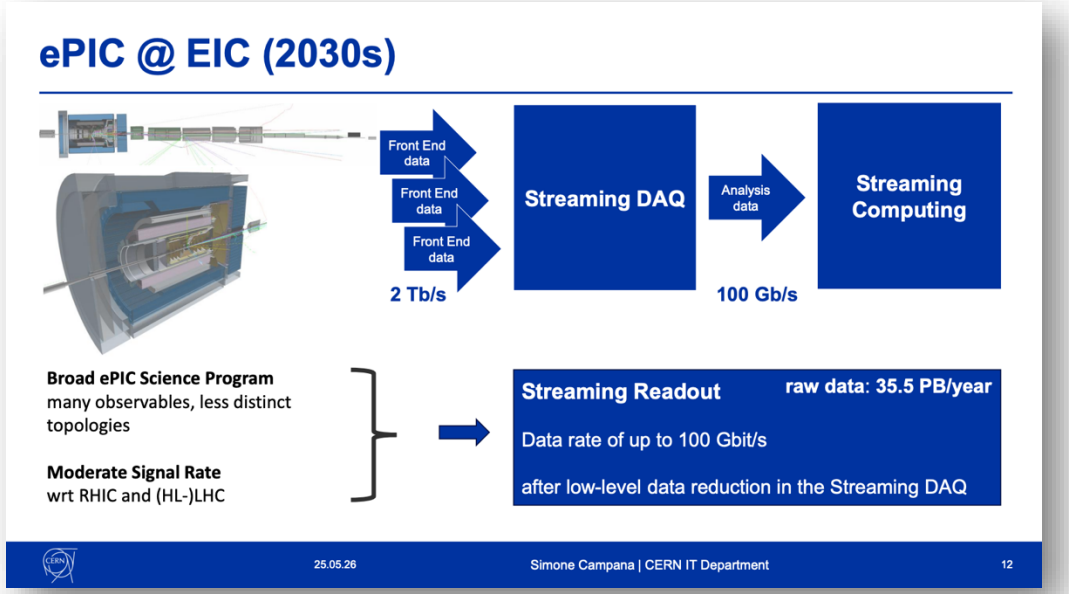
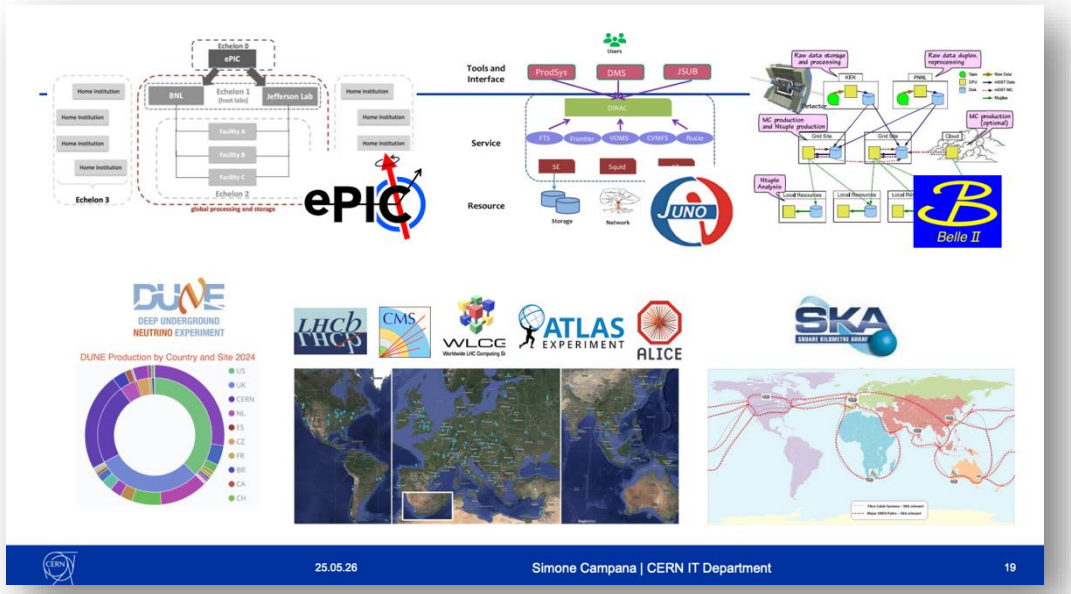
General notes from CHEP

Focus on: What are others doing? What are we missing? What are the lessons learned?

ePIC was well-represented in the opening plenary by Simone Campana: [slides]



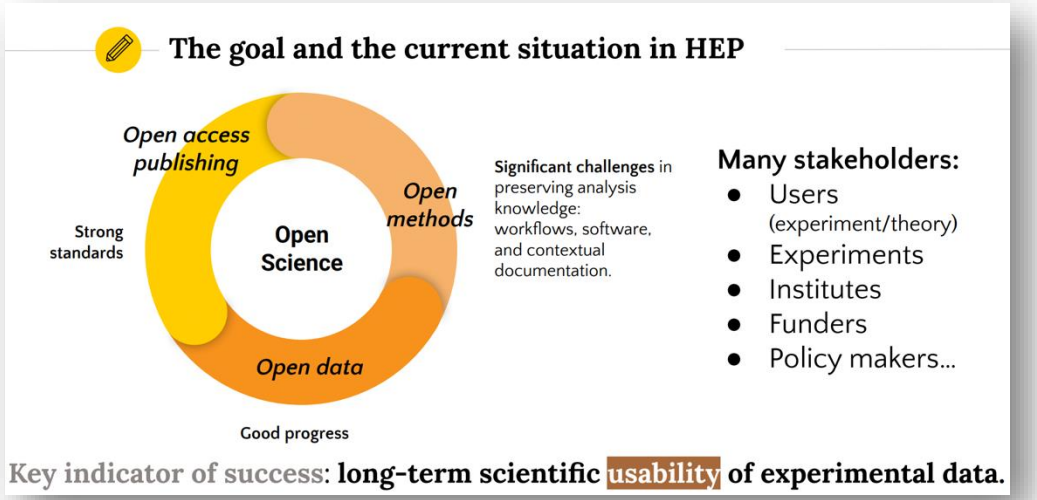


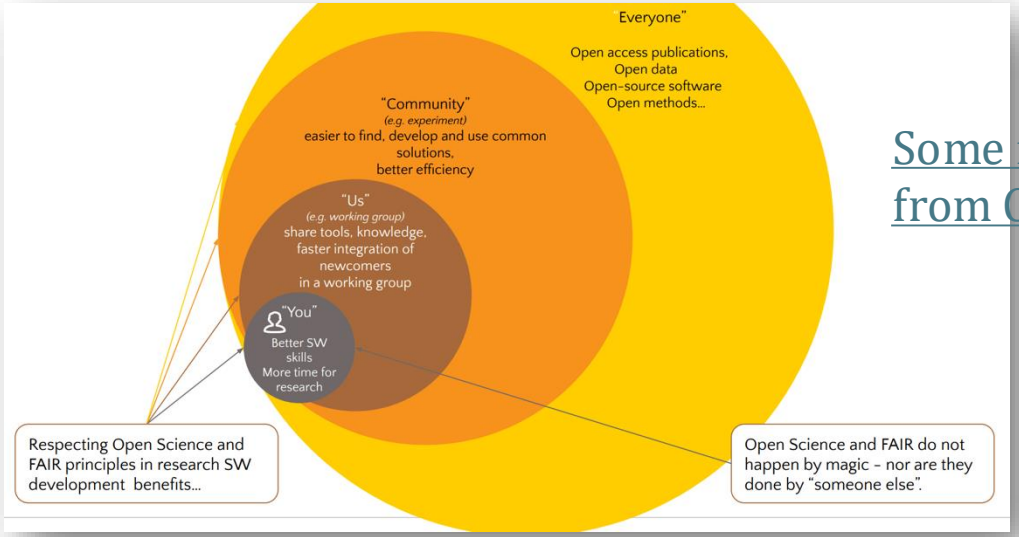
As a track convener for Track 8 (see description below), I will include notes specific from Track 8:

Track 8 - Analysis infrastructure, outreach and education

Infrastructure for interactive computing; applications and use-cases; experience with analysis facility production systems and pilots; aspects of reproducibility in interactive computing; collaboration enabling tools; reinterpretation tools; analysis preservation and reuse; data preservation for collaboration; outreach activities; open data for education and training; training initiatives; event displays.

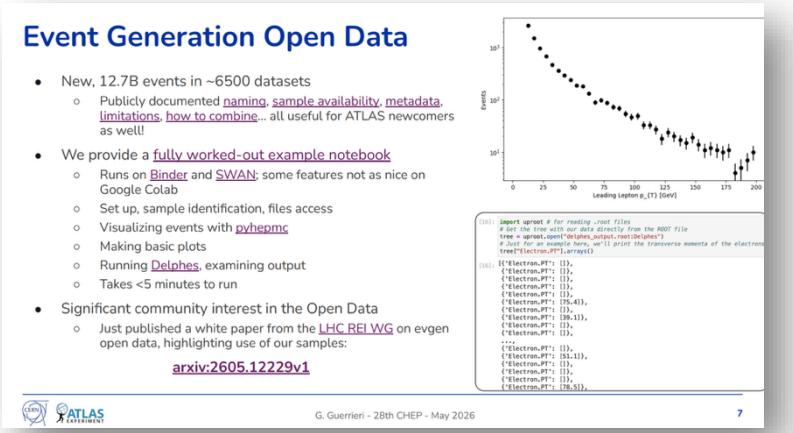
A lot of focus on reproducible workflows and training, support of open data and findability

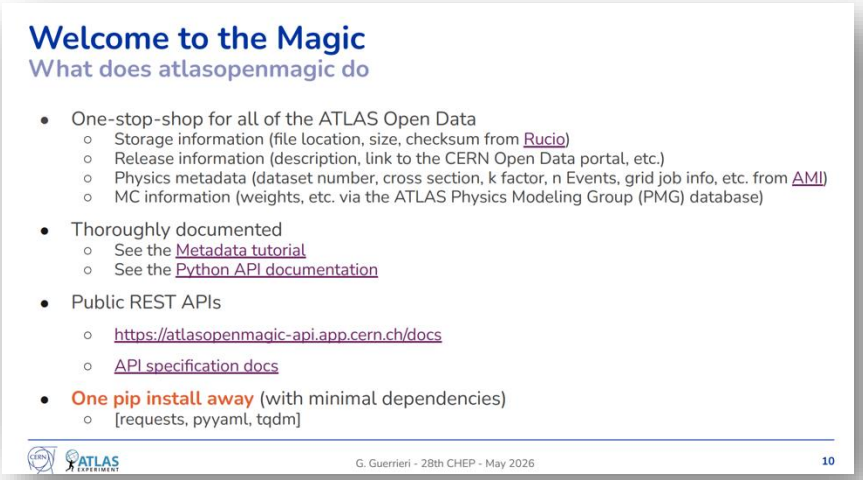




[Some feature slides from Caterine Doglioni]

ATLAS providing fully worked out example notebooks for datasets:





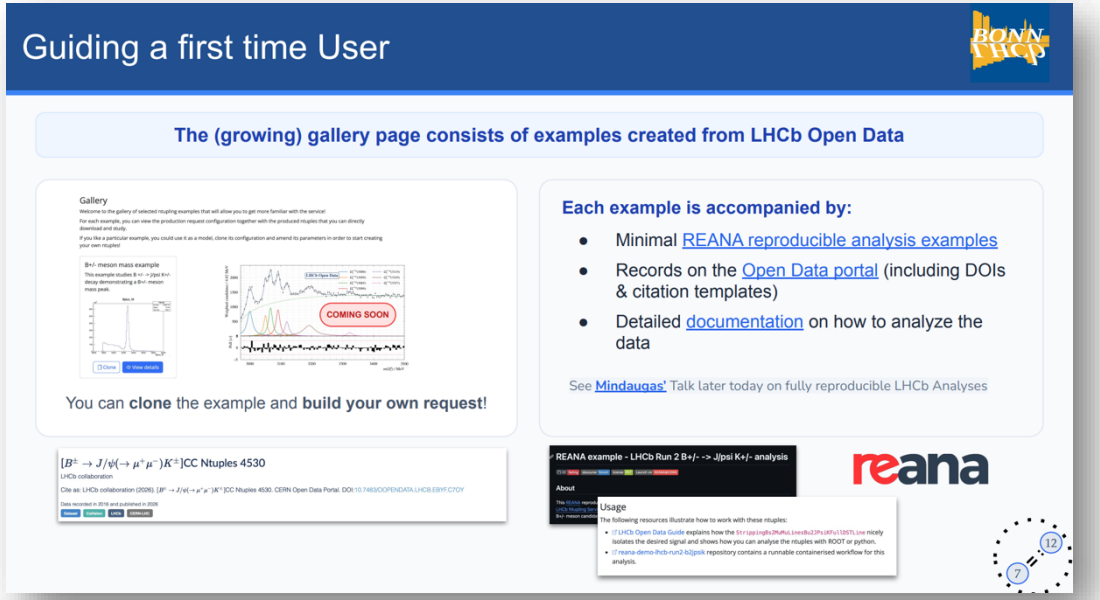
Also developed Lumi as AI support for CERN open data with relevant mcp

[Some feature slides from Giovanni Guerrieri]

https://opendata.atlas.cern/docs/tutresearch/openevgentut

LHCb ntupling service

[REANA example]

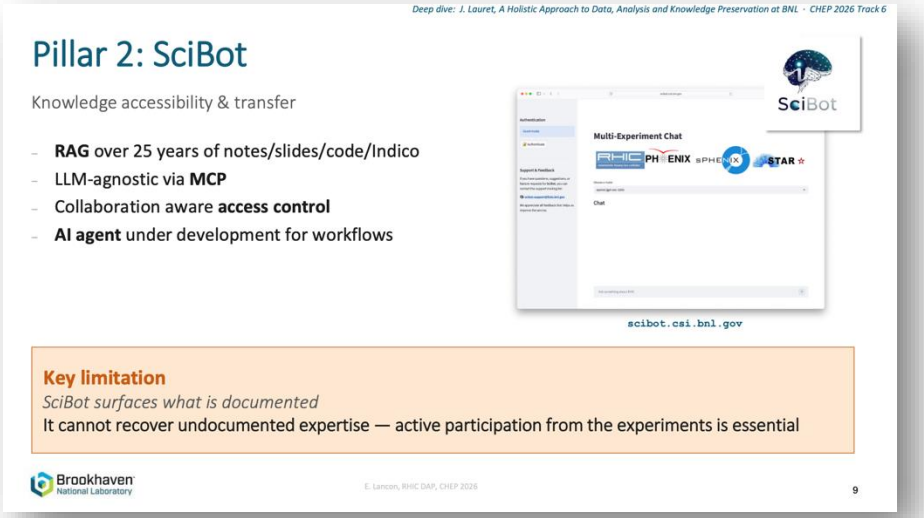


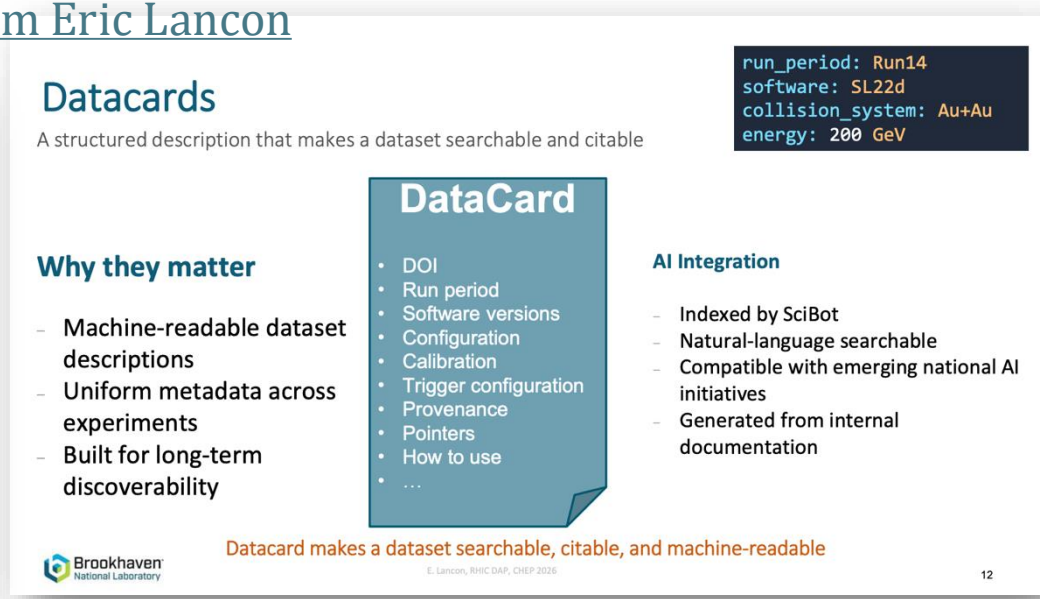
[Slide from Piet Nogga]

RHIC datacards, data preservation and workflows

[slides from Eric Lancon]

Use of SciBot

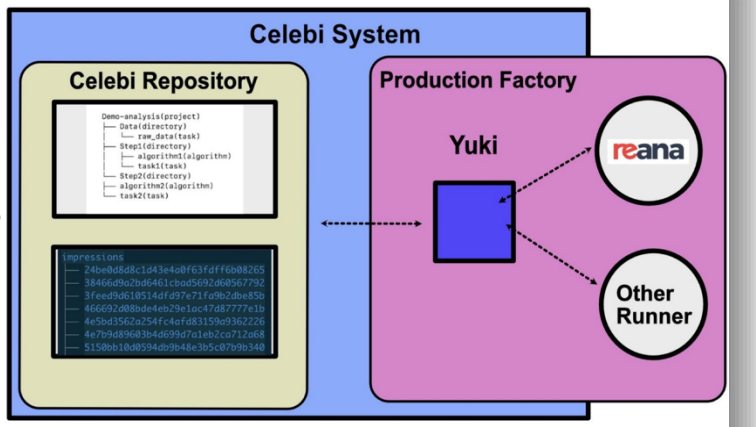




Increasing use of automated workflows for reproducibility

Overview of the celebi system

- **Celebi repository**
  - Workflow system.
  - Versioning system (impressions).
- **Yuki (DITE) middleware.**
- **Runners (external)**
  - REANA.
  - Local runner.
  - Other runners.



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[Use of Celebi, slide from Mingrui Zhao]

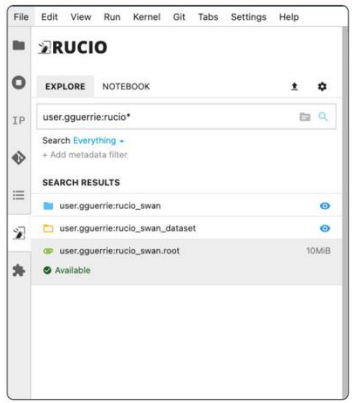
Jupyter workflows as the standard

The Rucio Jupyterlab extension

What does it do?

For more information, see this presentation

- Browse Rucio data from the Lab sidebar
- Replicate data with just **one click**
- **Resolves file path automagically**
- **Inject** path to notebook as a variable
- Supports three methods of authentication
  - Username & Password
  - X.509 User Certificate (or Proxy)
  - OIDC tokens (with limitations)
- Supports two modes of operation:
  - **Replica mode:** uses network-attached storage as a Rucio Storage Element (RSE), utilizes Rucio's file transfer capability.
  - **Download mode:** downloads data directly to the user's directory

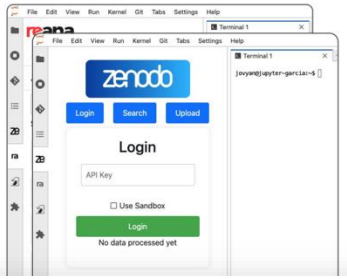


G. Guerrieri - 28th CHEP - May 2026 10

More Jupyter magic

Supporting the end-to-end user analysis

- REANA Jupyter extension
  - To browse, create, and run workflows
- Zenodo Jupyter extension
  - To browse the Zenodo Catalog, and be able to pull / push to the repository without getting out of the session



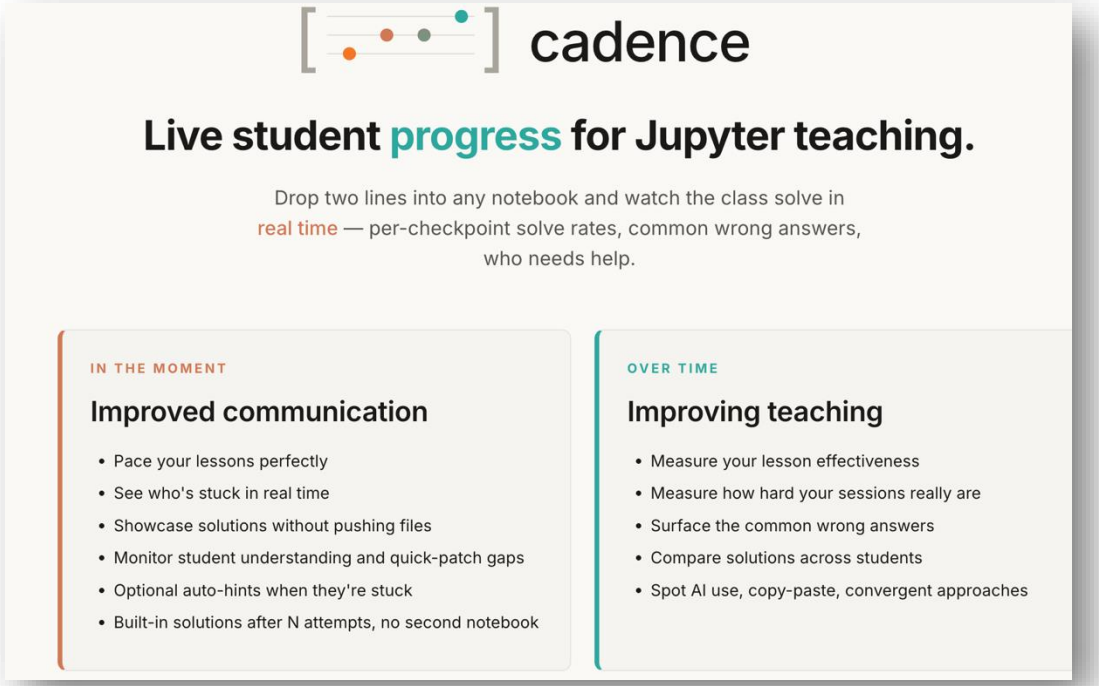
[Presentation link]

More Jupyter magic

Supporting the end-to-end user analysis

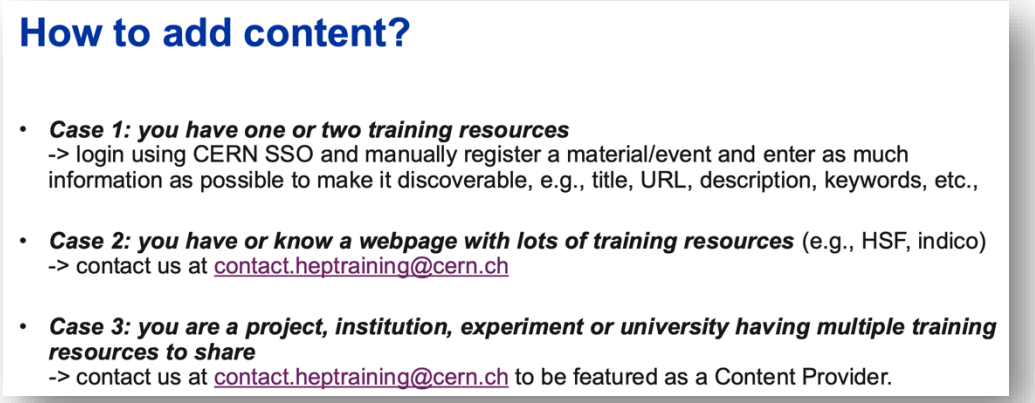
- REANA Jupyter extension
  - To browse, create, and run workflows

Live student progress when teaching in a Jupyter notebook: https://cadence-dash.com/



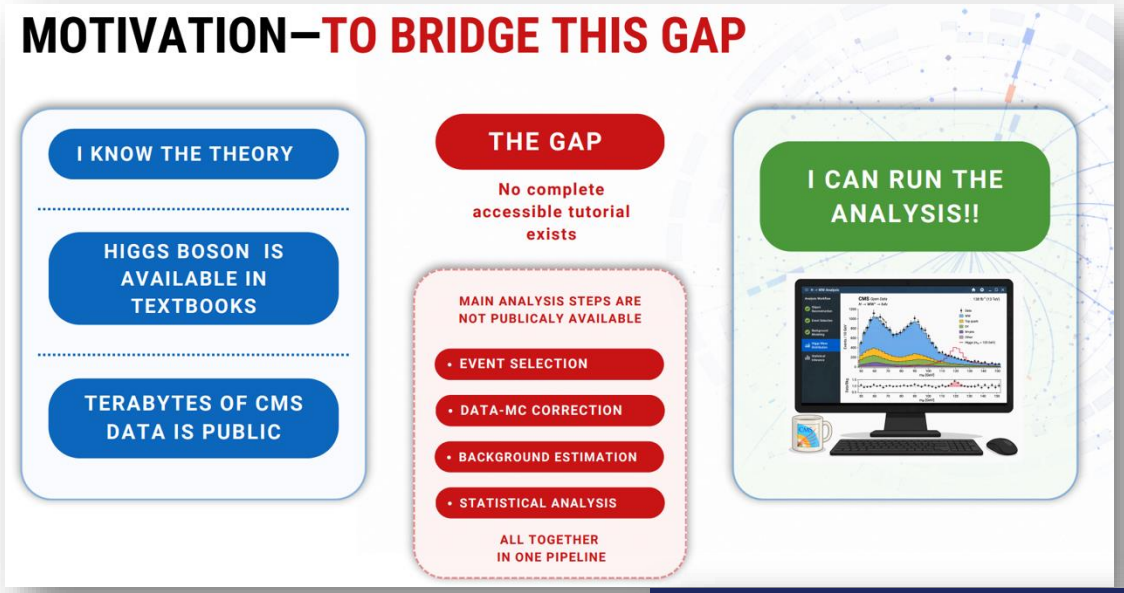
Check out slides for Liv Helen Vage

HEP training, HSF training, and ROOT training all using Jupyter notebooks for teaching!

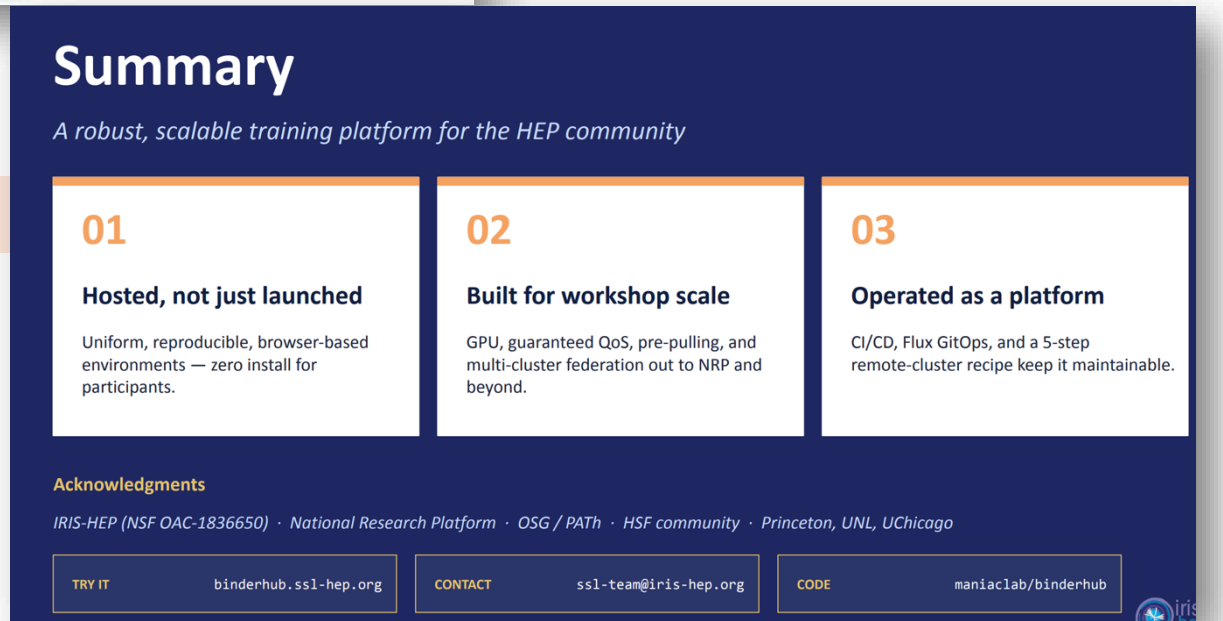


Can register course content with HEP training catalog (HEP talk slides)

Full student analysis of open data with reproducible workflow (CMS):
- Using only open data, reproduce published result workflow, example is here



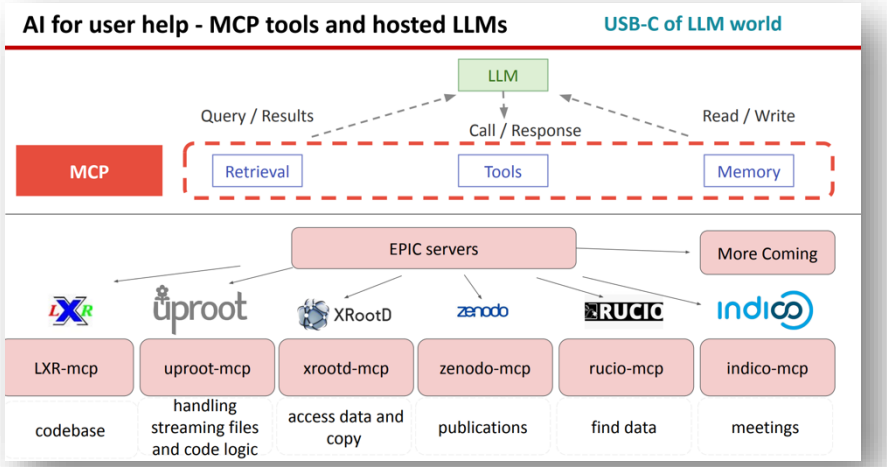
Hosted BinderHub for tutorials:



Slides from Fengping Hu

So how's ePIC doing?

Nice talk from Sasha with demo!



Link to slides

- Use of AI to support documentation ✅
- Moving towards reproducible workflows with JupyterHub ✅
- Use of datacards, and already setting up "data" preservation ✅

"With great software comes great responsibility
— to teach the people who'll use it."

Food for thought:

- Would new students/collaborators be interested in creating a workflow to reproduce TDR/early science plots?
- Database for reproducible workflows, linked to "published" plots, tutorials

"Every hour we save a collaborator is an hour returned to physics." (also featured in Track summary)