

ePIC Software training and support

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ePIC Software User Learning Co-Conveners

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EICUG Early Career Workshop 2025
Jefferson Lab

User-centered design

EIC SOFTWARE: Statement of Principles

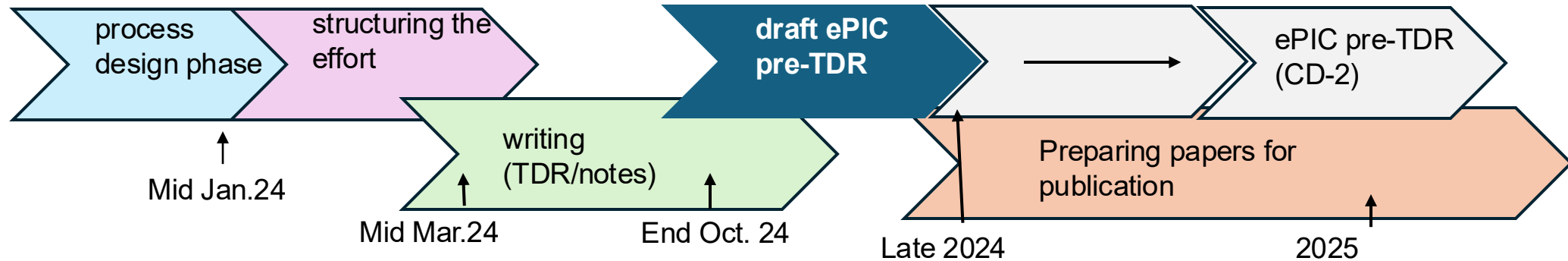
4 We will aim for user-centered design:

- We will enable scientists of all levels worldwide to actively participate in the science program of the EIC, keeping the barriers low for smaller teams.
- EIC software will run on the systems used by the community, easily.
- We aim for a modular development paradigm for algorithms and tools without the need for users to interface with the entire software environment.

7 We will embrace our community:

- EIC software will be open source with attribution to its contributors.
- We will use publicly available productivity tools.
- EIC software will be accessible by the whole community.
- We will ensure that mission critical software components are not dependent on the expertise of a single developer, but managed and maintained by a core group.
- We will not reinvent the wheel but rather aim to build on and extend existing efforts in the wider scientific community.
- We will support the community with active training and support sessions where experienced software developers and users interact with new users.
- We will support the careers of scientists who dedicate their time and effort towards software development.

Software deliverables



ePIC Software & Computing is essential to the Technical Design Report, providing advanced **software and simulation productions** that are the input for **detector and physics studies**

Organization structured around user's needs



Guiding Principles:

- *Statement of Software Principles*
- *Sustainability*



Software and Computing Coordinator
Markus Diefenthaler (Jefferson Lab)

Cross-cutting Working Group:

- *Data and Analysis Preservation*



Deputy Coordinator (Operations)
Wouter Deconinck (U. Manitoba)

Operation Working Groups:

- Production
- User Learning
- Validation



Deputy Coordinator (Development)
Dmitry Kalinkin (U Kentucky)

Development Working Groups:

- Physics and Detector Simulation
- Reconstruction Framework and Algorithms
- *Analysis Tools (not yet activated)*



Deputy Coordinator (Infrastructure)
Torre Wenaus (BNL)

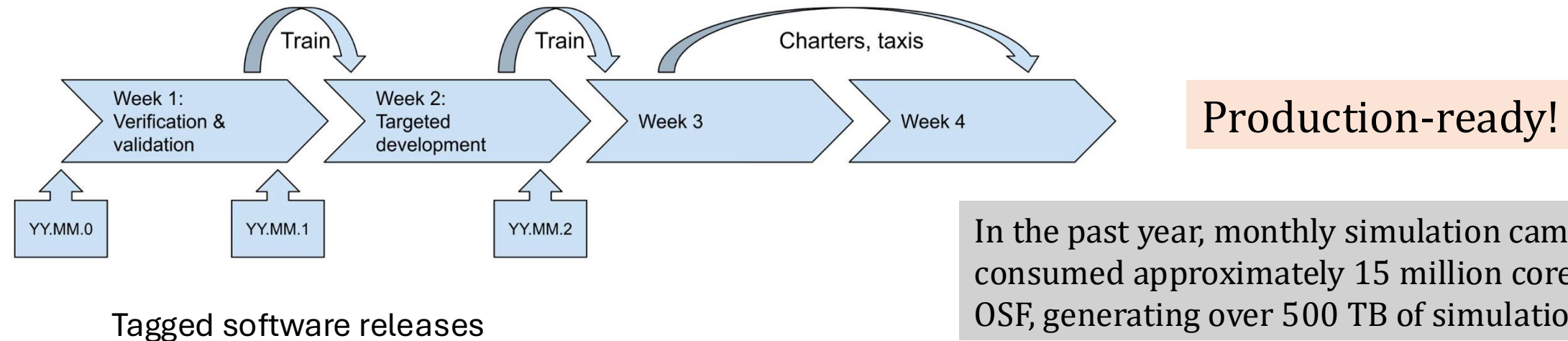
Infrastructure Working Groups:

- Streaming Computing Model
- *Multi-Architecture Computing (not yet activated)*
- *Distributed Computing (not yet activated)*

Simulation Campaign Strategy

Objectives:

1. Achieve continuous deployment of the software used for detector and physics simulations
2. Ensure regular updates of simulation productions for detector and physics studies, and for geometry and algorithm development
3. Implement timely validation and quality control for simulation productions on datasets that require substantial time and resources



In the past year, monthly simulation campaigns consumed approximately 15 million core hours on the OSF, generating over 500 TB of simulation data.

User Learning

- Supports the users by providing training, documentation and support
- Preliminary Technical Design Report (deliverable) is upcoming
- User Learning supports the user's needs (i.e. simulation, analysis....)

Eic-shell Easy to get started locally... in only 1 line!

```
curl -L get.epic-eic.org | bash
```

Based on container images, the same images are used for simulation campaigns.

- Organize hybrid (live/virtual) tutorials every 1-2 months
- Support the trainers in developing engaging material and documentation
- Goal to develop discoverable software



Past year training events

2025

May: HSF India/ePIC Workshop

April: Inclusive kinematics reconstruction tutorial

March: Getting started with a physics analysis tutorial

February: Analysis and working the simulation output,
Understanding the simulation output

2024

October: Validation and benchmarking tutorial

September: Working with simulation output

April: ePIC Software tutorials at CERN

Overview of ePIC software,
working with simulation output,
simulating detectors and their readout,
reconstruction algorithms

Landing Page

<https://eic.github.io/documentation/landingpage.html>



Software ▾

Resources ⚙ ▾

Activities 💡 ▾

Organization 🏢 ▾

Policies ⚙ ▾

Get Started 📖 ▾

About 💡 ▾



Landing Page

Get started

ePIC Tutorials

HEP Software
Training Center

FAQ

ePIC Image
Viewer

Welcome to the **ePIC Landing Page!**

Our mailing list: ✉ eic-projdet-comp-sw-l@lists.bnl.gov

Subscribe here: <https://lists.bnl.gov/mailman/listinfo/eic-projdet-comp-sw-l>

Independent user onboarding

[Software](#) ▾[Resources](#) ⚙ ▾[Activities](#) 💡 ▾[Organization](#) 🏢 ▾[Policies](#) ⚙ ▾[Get Started](#) 📖 ▾[About](#) 💡 ▾

Get Started

Welcome to the **Get Started** section. This page will guide you through the steps to get setup for contributing and working in our software framework.

1. Join GitHub: <https://github.com/eic>

- GitHub serves as a central platform for version control, code review, issue tracking, and documentation. We maintain the EIC organization on GitHub for collaborative development of all software related to the EIC.
- **Read Access:** Contact ✉ eic-software-l-request@lists.bnl.gov from your institutional email address. Include in your email your GitHub username and confirmation of whether you or your sponsor/advisor is a member of the EICUG or ePIC.
- **Write Access:** For access to specific repositories, you can request to join various GitHub teams. For example, join 'EPIC Devs' for software development within the ePIC collaboration.

2. Join Mattermost: <https://chat.epic-eic.org/>

- We use Mattermost for our main communication channel.
- You can join by emailing any group member to be added.

3. Sign up for our mailing lists:

- Collaboration mailing list ([subscribe here](#)): ✉ eic-projdet-collab-l@lists.bnl.gov
- Software mailing list ([subscribe here](#)): ✉ eic-projdet-comp-sw-l@lists.bnl.gov

4. Join a project! Checkout the [ePIC wiki](#) to get involved:

- [Physics Working Group](#)
- [Detector Subsystems](#)
- [Software Working Group](#)

5. Refer back to the [landing page](#) to checkout [HEP Software](#) and [ePIC tutorials](#)

Refer to HSF
training Center for
common tools

Current documentation of tutorials

[Software](#)[Resources](#)[Activities](#)[Organization](#)[Policies](#)[Get Started](#)[About](#)

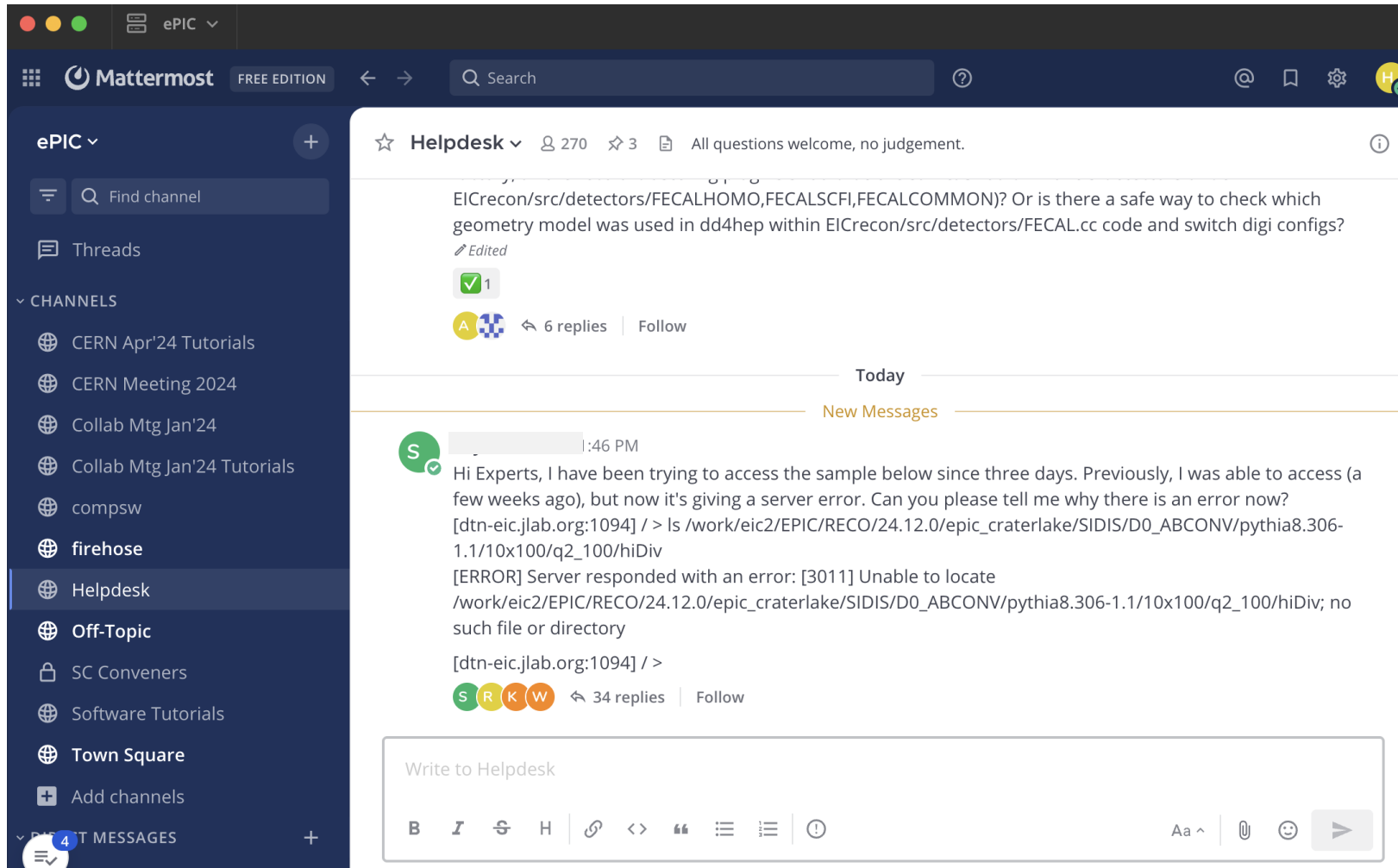
Please join the [Mattermost Software Tutorials](#) channel for updates/announcements and questions about tutorials.

Note that the tutorials as presented below are not intended to be followed in a strict sequence. New users should start with the “Setting up an environment” tutorial. Beyond this, we encourage users to pick and choose the tutorials on topics they want to explore.

Current tutorials are summarised in the table below -

Tutorial	Difficulty	Tags	Description	Resources
Setting up an environment	Beginner	[Setup] [Environment]	Get started with the ePIC software environment	Video 1 • Video 2
Analysis and simulation output	Beginner/Advanced	[Analysis] [Data]	Learn how to analyze simulation data	Video Video2
Simulating detectors	Expert	[Simulation] [Detector] [DD4hep]	Development of detector geometry using DD4hep	Video
Modifying geometry and digitization	Advanced	[Geometry] [Digitization]	Learn to customize detector configurations	-
Understanding simulation output	Advanced	[Simulation] [Data]	Deep dive into simulation data structure	Video
Getting started with physics analysis	Advanced	[Physics] [Analysis]	Physics analysis introduction	Video
Inclusive kinematics reconstruction	Advanced	[Reconstruction] [Kinematics]	Learn kinematics reconstruction techniques	Video
Reconstruction algorithms	Expert	[Algorithms] [Reconstruction]	Study different reconstruction approaches	Video 1 • Video 2

User support



Helpdesk channel provides crucial near/real-time support to users

Software Tutorials channel for tutorial announcements and information

firehose for simulation production files and information

You are the future of the EIC

- We want to support you!
- Most interested to hear about how you interact with the software and what your needs are:

[EICSoftwareSurvey](#)

Many thanks to the **ePIC Collaboration**, my User Learning co-convener **Stephen Kay**, our Software & Computing Coordinator **Markus Diefenthaler**, and our software deputies **Wouter Deconinck**, **Dmitry Kalinkin**, and **Torre Wenaus**