



HSF Training

Program

16:00	HSF Training	<i>Alexander Moreno Briceño</i>
	<i>Hoersaal, DESY</i>	16:00 - 16:10
	HELIOS	<i>Francesca Calegari</i>
	<i>Hoersaal, DESY</i>	16:10 - 16:20
	SMARTHEP	<i>Jamie Gooding</i>
	<i>Hoersaal, DESY</i>	16:20 - 16:30
17:00	ErUM-Data-Hub	<i>Angela Warkentin</i>
	<i>Hoersaal, DESY</i>	16:30 - 16:40
	HEP Experiments	<i>Valeriia Lukashenko</i>
	<i>Hoersaal, DESY</i>	16:40 - 16:50
	EVERSE	<i>Stefan Roiser</i>
	<i>Hoersaal, DESY</i>	16:50 - 17:00
	HSF Training Discussion	
<i>Hoersaal, DESY</i>	17:00 - 17:30	



EVERSE



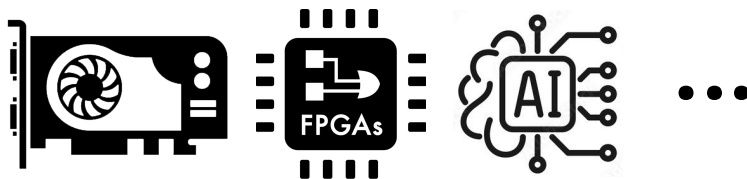
HSF Training WG



Holly Szumila-Vance, Jim Pivarski, **Valeriia Lukashenko** and **Alexander Moreno**

The need for software training

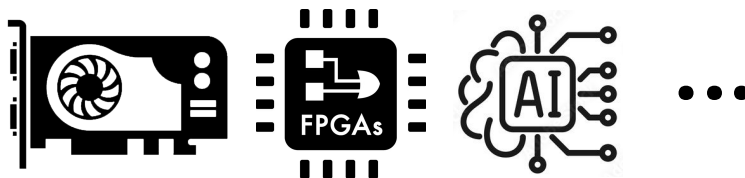
- As we collect more and more data and perform increasingly complex analysis, our **software is mission critical**
→ need to follow **industry standards and best practices**
- The broader **data analysis ecosystem is evolving** faster than ever, but these changes are driven by industry → we **must keep pace**



- (Almost) all scientists write software but few have formal software education
→ **almost every scientist needs to be trained**

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We need a **unified, scalable, and sustainable** software training framework

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Unified

- Material and events should be **centrally listed and discoverable**
- Concentrate efforts by developing **cross-experiment** content
- A **community** must guide, support, and coordinate

Scalable

- Material must be teachable by **multiple instructors**
- **Self-study** must not be an afterthought

Sustainable

- Material must be **open source** and **maintained collaboratively**
- **Incentives and recognition** important motivators

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Scalable

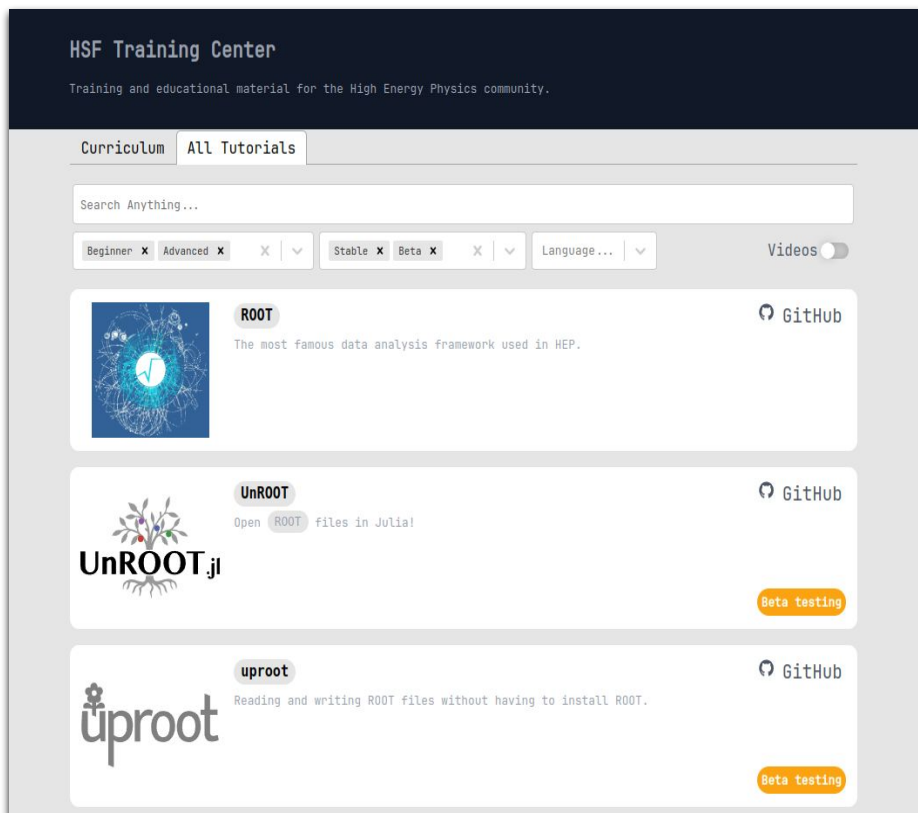
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Sustainable

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The HSF Training group is building a community around these principles

A unified Training Center for HEP



HSF Training Center
Training and educational material for the High Energy Physics community.

Curriculum All Tutorials

Search Anything...

Beginner x Advanced x x Stable x Beta x Language... Videos

ROOT GitHub
The most famous data analysis framework used in HEP.

UnROOT GitHub
Open ROOT files in Julia!
UnROOT.jl Beta testing

uproot GitHub
Reading and writing ROOT files without having to install ROOT.
Beta testing

- New [HSF Training Center](#) currently lists **25 training modules** (including material developed by IRIS-HEP/HSF, The Carpentries, and individual authors)
- Want to become **focal point for all HEP Training activities**
- Central **list of training events** (everyone can add)

HEP Software Training Events

To add an event to this list, follow the instructions on [this page](#) ("Adding a training event").

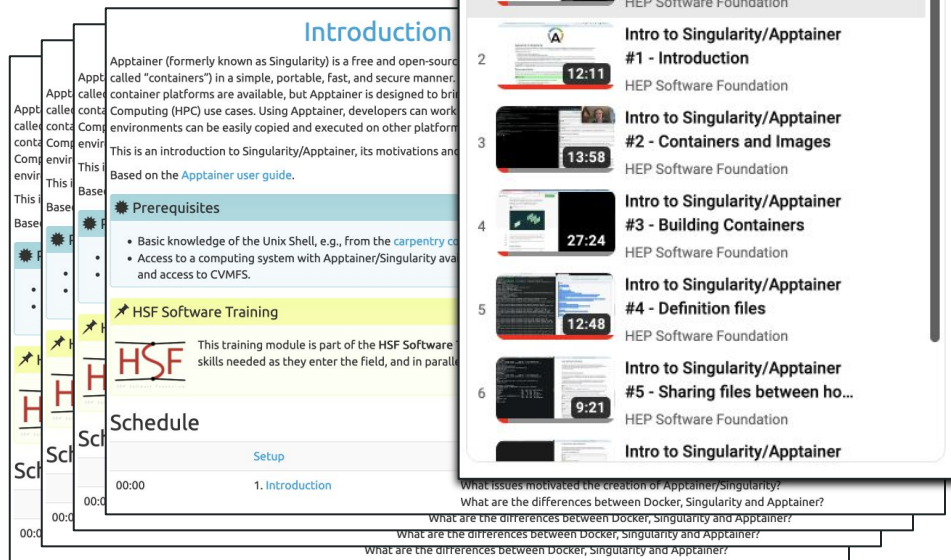
Past Events

- 15 Apr - 19 Apr 2024 - First steps with Geant4
- 26 Feb - 1 Mar 2024 - Training on Analysis Pipelines (Virtual) 
- 22 Nov - 22 Nov 2023 - HSF/IRIS-HEP Python for Analysis Training (Virtual) 
- 13 Nov - 14 Nov 2023 - HSF/IRIS-HEP Software Basics Training (Virtual) 
- 6 Nov - 9 Nov 2023 - JuliaHEP 2023 Workshop 
- 4 Oct - 12 Oct 2023 - ESC23 - XIV edition of the ESC (Efficient Scientific Computing) School
- 29 Aug - 1 Sep 2023 - 8th HEP C++ Course and Hands-on Training - The Essentials @ Manchester 
- 7 Aug - 11 Aug 2023 - Open Science Grid User School 2023
- 17 Jul - 21 Jul 2023 - CODAS-HEP 2023

Scalable and Sustainable Trainings

Example: Training on Analysis Pipelines (Preservation)

Bundling 5 Modules



Introduction

Apptainer (formerly known as Singularity) is a free and open-source called "containers" in a simple, portable, fast, and secure manner. container platforms are available, but Apptainer is designed to bring Computing (HPC) use cases. Using Apptainer, developers can work environments can be easily copied and executed on other platform.

This is an introduction to Singularity/Apptainer, its motivations and Based on the [Apptainer user guide](#).

Prerequisites

- Basic knowledge of the Unix Shell, e.g., from the [carpentry course](#)
- Access to a computing system with Apptainer/Singularity available and access to CVMFS.

HSF Software Training

This training module is part of the HSF Software skills needed as they enter the field, and in parallel

Schedule

Time	Module
00:00	1. Introduction

What issues motivated the creation of Apptainer/Singularity?
 What are the differences between Docker, Singularity and Apptainer?
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Intro to Singularity/Apptainer
 HEP Software Foundation - 1/8

- 1. Intro to Singularity/Apptainer #0 - Setup (5:48)
- 2. Intro to Singularity/Apptainer #1 - Introduction (12:11)
- 3. Intro to Singularity/Apptainer #2 - Containers and Images (13:58)
- 4. Intro to Singularity/Apptainer #3 - Building Containers (27:24)
- 5. Intro to Singularity/Apptainer #4 - Definition files (12:48)
- 6. Intro to Singularity/Apptainer #5 - Sharing files between ho... (9:21)

- Teaching Docker/Podman, Singularity/Apptainer, CI/CD with github/gitlab, REANA (soon)
- Emphasis on **self study with videos + live lectures**
- **Small-group virtual mentoring sessions**
- **24h support on slack**

Scalable and Sustainable Trainings

Example: C++ Course and Hands-on Training

Intro base OO Core exp Tool conc py

554 slides, 698 pages, > 1.1k commits

HEP C++ course

B. Gruber, S. Hageboeck, S. Ponce
sebastien.ponce@cern.ch

CERN

March 28, 2024

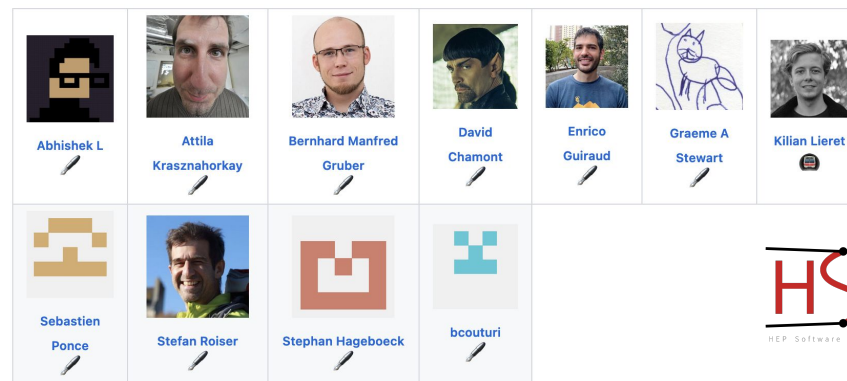
10 events till now

- 6th HEP C++ Course and Hands-on Training (2023 March - essentials)
- 5th HEP C++ Course and Hands-on Training (2022 October - advanced)
- 4th HEP C++ Course and Hands-on Training (2022 March - essentials)
- 3rd HEP C++ Course and Hands-on Training (2021 August)
- 2nd HEP C++ Course and Hands-on Training (2021 January)
- 1st HEP C++ Course and Hands-on Training (2020 October)

- Has been taught **in-person, virtual and hybrid**
- **Live lectures and exercise sessions**
- Full videos available

<https://github.com/hsf-training/cpluspluscourse>

Originally developed by **S. Ponce**, now community effort driven by B. Gruber, S. Hageboeck et. al.



SIDIS
Software Institute for
Data-Intensive Sciences



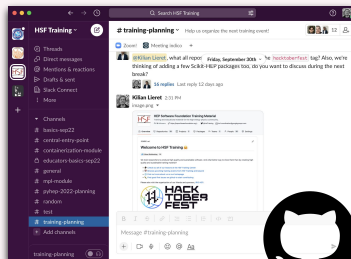
HSF
HEP Software Foundation

Building a community

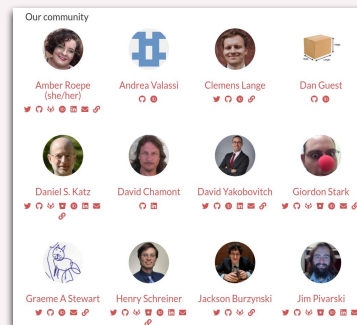
Weekly meetings

June 2024	
24 Jun	Training WG Planning Meeting
17 Jun	Training WG Planning Meeting
10 Jun	Training WG Planning Meeting
03 Jun	Training WG Planning Meeting
May 2024	
27 May	Training WG Planning Meeting
20 May	Training WG Planning Meeting
13 May	Training WG Planning Meeting
06 May	Training WG Planning Meeting

Platforms



Community pages



Monthly Hackathons

Overview

Timeline

Registration

Participant List

Videoconference

Code of Conduct

Group Photo

Contact

✉ k5775@princeton.edu

✉ mhik@twi.gov

✉ tishui@unimelb.edu.au

✉ walter.deconinck@ulb.ac.be

Containerization Training Hackathon

🎯 The big goal!

Training in software and computing is an essential ingredient for the success of any HEP experiment. As most experiments have similar basic prerequisites we want to join our efforts and create one introductory software training curriculum that serves HEP newcomers from all experiments. This curriculum is made up of independent training *modules* and should contain all software skills needed as they enter the field while instilling best practices for writing sustainable software.

We have started this work [here](#) and have completed and tested several of our modules to great success.

Recognition

Authors

Thanks goes to these wonderful people (emoji key) who contributed to the content of the lesson:

Meirín Dan Evans	amornogr	Guillermo A. Fidalgo-Rodríguez	Marchalid01	eksauffa	Aman Desai	Kilian Lieret
Wouter Deconinck	Michel H. Villanueva					

How-to guides

HSF Training Workshop Checklist

Let's streamline our organization and make sure we don't forget anything!

Note: there's also a [Hackathon checklist](#).

Before the workshop

Setting up documents and more

- Create a new folder in our drive in the folder "20YYour_workshops/YMM_name_of_workshop"
- Copy this document there and call it "YMM_name_checklist"
- Create an overview document "YMM_name_planning". Use this for all the relevant planning info
- Create a document "YMM_name_post_workshop". Collect everything that goes wrong in this document

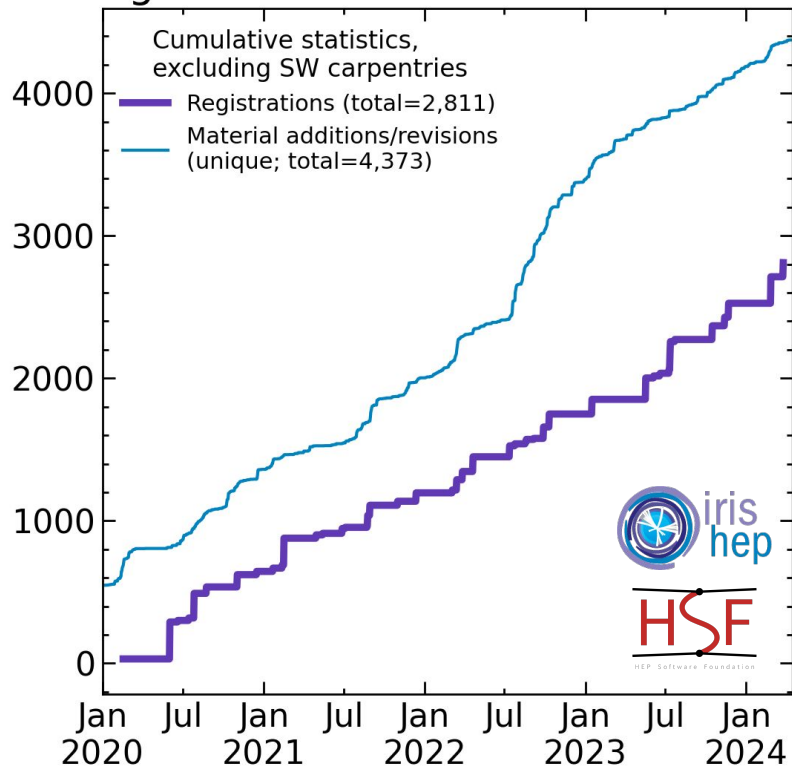
➡ Check your tasks against the guide

Recruitment

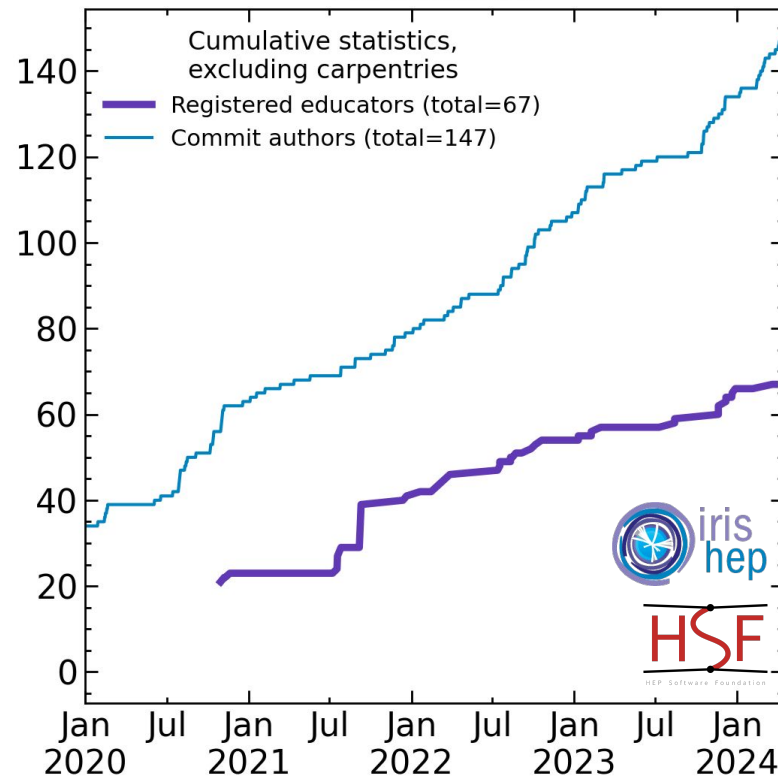
- Announce on twitter
- Announce on mailing list

We scale!

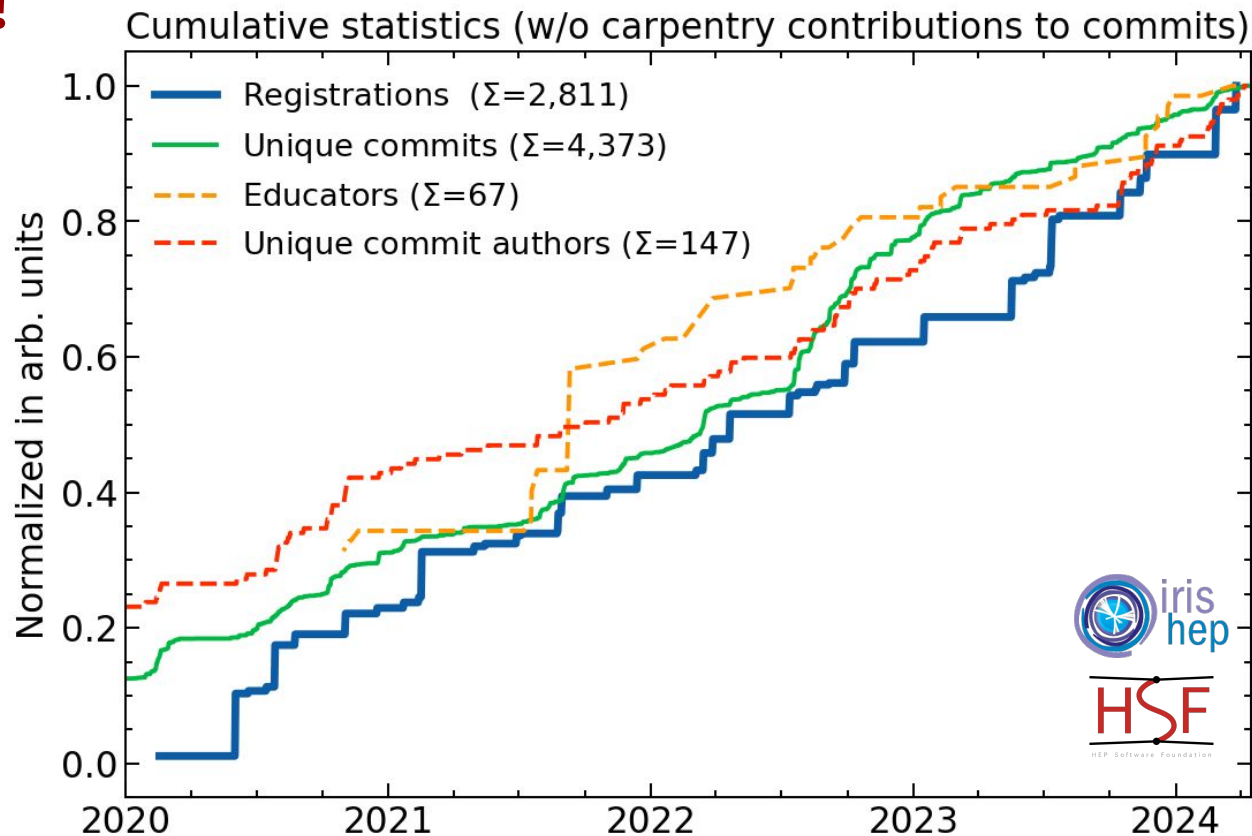
Registrations and material revisions



Educators

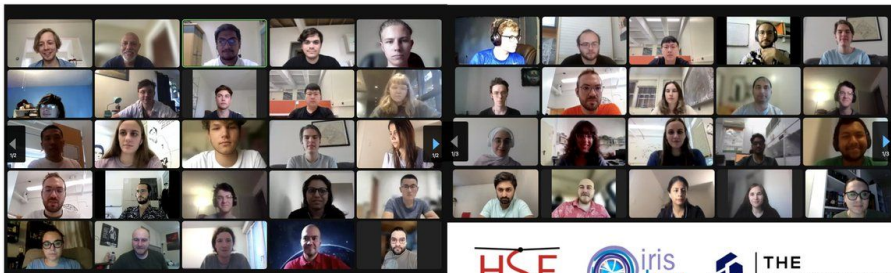


We scale!



Final comments...

- The HSF Training WG is building a **community of educators** around training material that is **open source, verbose and sustainably maintainable**
- Covering most **basics/intermediate needs**, now aiming at expanding **intermediate/advanced training**
- **To grow and sustain our efforts:**
 - **Need instructors and mentors**
 - **We welcome and support new material**
 - **Cross-linking our training center/ material will increase readership**
- Contributions to training must be
 - **encouraged** (by supervisors)
 - **rewarded** (service work credits, hiring, ...)
- **Join us to**
 - Make your training **discoverable**
 - **Avoid reinventing the wheel**
 - Ensure **sustainable maintenance**
 - Get help with **logistics and advertisement**



HSF/IRIS-HEP Software Basics Training (Virtual)



HSF/IRIS-HEP Software Basics Training (Virtual)

20–21 May 2024
Europe/Zurich timezone

Enter your search term

- Overview
- Code of Conduct (Read)
- Timetable
- Registration
- Participant List
- Videoconference
- Past training events
- Pre-requisites
- Contact us



We are very excited to announce a workshop on software basics in HEP organised through the [HEP Software Foundation](#) and [IRIS-HEP](#) together with [Software carpentry](#).

The times for the workshop are in US Eastern time zone.

Over two days we will cover the fundamentals of:

- Unix (e.g. shell, bash and scripting)
<https://swcarpentry.github.io/shell-novice/>
- Git and Github – how to version control your code
<https://mambelli.github.io/git-novice/> (extended version of <https://swcarpentry.github.io/git-novice/>)
- Python – fundamentals of using the Python language
<https://swcarpentry.github.io/python-novice-inflammation/>
<http://swcarpentry.github.io/python-novice-gapminder/>

Contact us

✉ hsf-training-may24-orga...

- May 20-21
- **Registrations are open!**

<https://indico.cern.ch/event/1395323/>

HSF/IRIS-HEP Python for Analysis Training (Virtual)



HSF/IRIS-HEP Python for Analysis Training (Virtual)

5 June 2024
Europe/Zurich timezone

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- Timetable
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- Videoconference
- Past training events
- Pre-requisites
- HSF pre-survey
- Contact us



We are very excited to announce a workshop on Python for Analysis in HEP organised through the [HEP Software Foundation](#) and [IRIS-HEP](#).

The times for the workshop are in US Eastern time zone.

We will cover the fundamentals of:

- Python for analysis – how to analyze data in Python either with PyROOT or with the tools from Scikit-HEP

Contact us

✉ hsf-training-py4an-jun24...

- Jun 5

<https://indico.cern.ch/event/1408846/>

pre-CHEP Workshop

CHEP 2024



October 19 - 25, 2024

CHEP 2024

Conference on Computing in High Energy and Nuclear Physics

19–25 Oct 2024
Europe/Zurich timezone



**international
conference**

**Cracow
Poland**

General
Announcements
Scientific Programme
Registration
Important Dates
Organization, Program Committee and Conveners
The conference format
L Call for Abstracts
Code of Conduct

Welcome!

The CHEP conference series addresses the computing, networking and software issues for the world's leading data-intensive science experiments that currently analyse hundreds of petabytes of data using worldwide computing resources.

The CHEP conference location rotates between the Americas, Asia and Europe, and is typically held eighteen months apart. The CHEP 2024 conference will be hosted by the AGH University of Kraków, Institute of Nuclear Physics Polish Academy of Sciences and Jagiellonian University.

pre-CHEP Workshop

CHEP 2024

October 19 - 25, 2024

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19-25 Oct 2024
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pre-CHEP workshop

The HSF Training Working Group is organizing a workshop prior to the CHEP conference in Krakow. We will focus on training techniques in the computing skills needed to produce high quality and sustainable software in HEP. Anyone interested and/or involved in training in HEP is welcomed to participate.

The workshop will take place over two half days, Saturday PM and Sunday AM.

General

[Announcements](#)

[Scientific Programme](#)

[Registration](#)

[Important Dates](#)

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international
conference

Cracow
Poland

Join us!



@hsf-training



hepsoftwarefoundation.org

