OAK RIDGE National Laboratory

OLCF Training

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ORNL is managed by UT-Battelle LLC for the US Department of Energy

U.S. DEPARTMENT OF ENERGY

Types of Training and Live Communication

Group Training/ Communication

- General User training - Focused events given by vendors or labs staff designed to teach a specific tool or technique or new user training. We often collaborate with NERSC and ALCF to host these events and they often feature hands-on work.
- Training Series - HIP Training , AI For Science, etc.
- User Calls, Monthly - Your chance to give the center feedback and ask questions. We start each call with a short topical training that is designed to overview tools or techniques.
- OLCF Training Archive - slides, repos, recordings of most training and meetings.
- Weekly User Message- Comes out on Wednesdays, training events, outages, calls for participation, Did you know?, surveys

Individual Attention

- Hackathons - One-on-one training with mentors and experts with a strong focus on profiling your specific code. Generally you must form a team and apply to participate.
- Office Hours - Short One-on-one training with a mentor for a particular issue

Outreach

- Broadening Participation- HPC Crash Course, Pathways to Supercomputing

DIY

- Self-guided Tutorials
- User Guides

DIY

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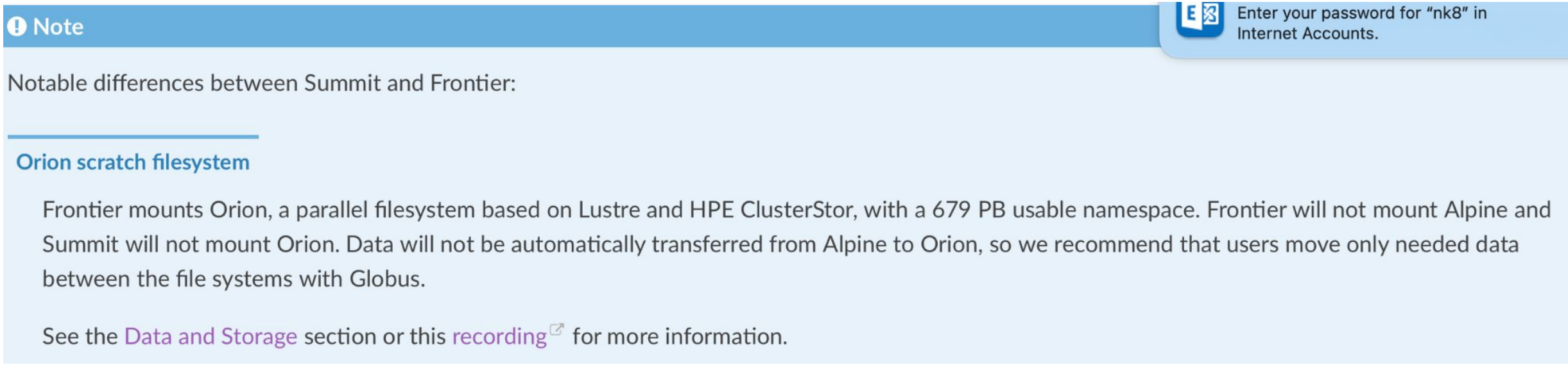
DIY Highlights

Frontier User Guide : https://docs.olcf.ornl.gov/systems/frontier_user_guide.html

- Starts with a quick overview note: This is the area to check for new important information



- Has many examples and in-line tutorials, for example, the running jobs section has many hello_world examples and a code repo, that you can use to explore your job layouts.

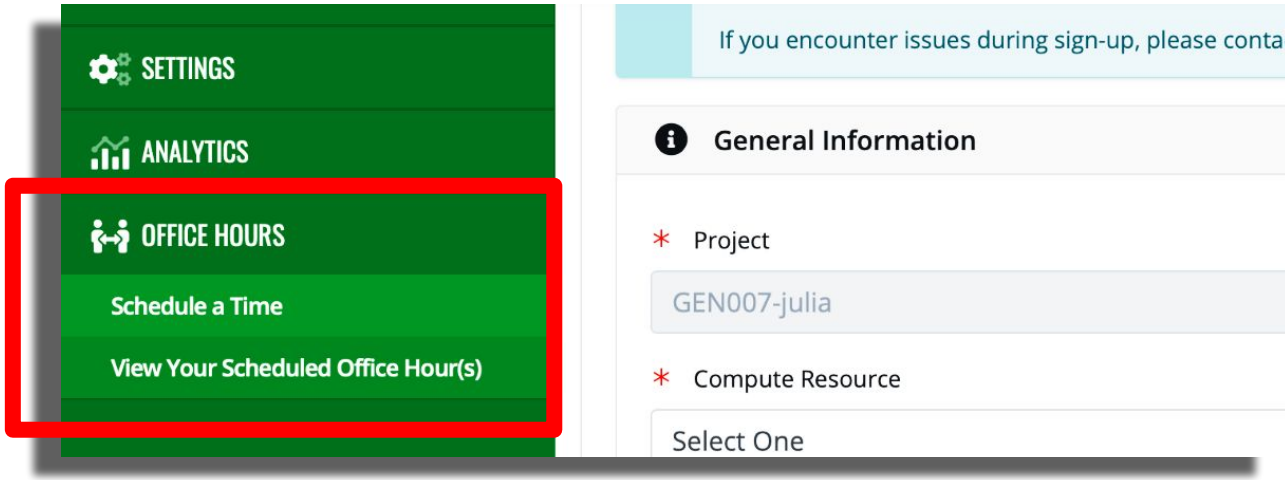
Individual Attention

Office Hours

- **What?** direct access to OLCF, AMD, and HPE staff for current issues or questions. During each session, (up to) 5 teams will move into their own Zoom breakout room to discuss their question/issue directly. Topics can be anything from issues building your code, non-ideal performance, node failures, etc. See: Office Hours

- **When?** Mondays from 2-3 PM EDT and Wednesdays from 1-2 PM EDT.

- **How?** Sign up through Myolcf: https://my.olcf.ornl.gov/
  - Login to your Moderate account at myOLCF
  - Expand the OFFICE HOURS dropdown (on the sidebar navigation)
  - There are 2 options to select: Schedule a Time and View Your Scheduled Office Hour(s)



Frontier Hackathons

- **What?** direct access to OLCF, AMD, and HPE staff for problem solving with a strong focus on profiling your specific code. Generally you must form a team and apply to participate. We take upto 10 teams. The hackathon lasts 3-4 days. Usually takes advantage of a virtual format, where teams working in breakout rooms and slack and come together for updates and to help one another. Mentors move between the teams as needed.

- **When?** two to four times a year depending on interest

- **How?** Watch for announcement in the Weekly Message and on the Frontier Hackathons page: Hackathons

General User Training

General User Training Highlight

Frontier workshop : https://www.olcf.ornl.gov/calendar/frontier-training-workshop-february-2023/

Time (EST)	Topic	Speaker	Slide,Videos
1:00 – 1:15 PM	Welcome Address	Ashley Barker, Section Head, Operations, National Center for Computational Sciences, ORNL	slides, video
1:15 – 1:45 PM	Frontier Architecture Overview	Joe Glenski, Sr. Distinguished Technologist, HPE	slides, video
1:45 – 2:00 PM	AMD MI250X Overview	Nick Malaya, Principal Member of Technical Staff, Exascale Application Performance, AMD	slides, video
2:00 – 2:15 PM	AMD Optimized 3rd Gen. EPYC CPU	Nick Malaya, Principal Member of Technical Staff, Exascale Application Performance, AMD	slides, video
2:15 – 2:45 PM	Frontier Programming Environment	Wael Elwasif, Computer Scientist, ORNL	slides, video
2:45 – 3:15 PM	Using Frontier's Programming Environment	Matt Belhorn, HPC Engineer, ORNL	slides, video
3:15 – 3:30 PM	Break		
3:30 – 4:00 PM	Storage Areas & Data Transfers	Suzanne Parete-Koon, HPC Engineer, ORNL	slides, video
4:00 – 4:30 PM	Slurm on Frontier	Tom Papatheodore, HPC Engineer, ORNL	slides, video
4:30 – 5:00 PM	Job Submission Examples	Tom Papatheodore, HPC Engineer, ORNL	slides, video

Time (EST)	Topic	Speaker	Slides,Video
1:00 – 1:15 PM	Welcome Back	Suzanne Parete-Koon, HPC Engineer, ORNL	slides
1:15 – 1:45 PM	GPU Programming Models	Subil Abraham, HPC Engineer, ORNL	slides ,video
1:45 – 2:15 PM	HPE Cray MPI	Tim Mattox, HPC Performance Engineer, HPE	sides, video
2:15 – 2:45 PM	Python on Frontier	Michael Sandoval, HPC Engineer, ORNL	slides, video
2:45 – 3:15 PM	AI on Frontier	Junqi Yin, Computational Scientist, ORNL	slides, video
3:15 – 3:30 PM	Break		
3:30 – 3:45 PM	NVMe Usage	Chris Zimmer, Group Leader, Technology Integration, ORNL	slides, video
3:45 – 4:15 PM	Node Performance	Tom Papatheodore, HPC Engineer, ORNL	slides , video
4:15 – 4:45 PM	Orion Lustre and Best Practices	Jesse Hanley, Senior HPC Linux Systems Engineer, ORNL	slides, video

Time (EST)	Topic	Speaker	Slides,Video
1:00 – 1:15 PM	Welcome Back	Suzanne Parete-Koon, HPC Engineer, ORNL	slides
1:15 – 2:00 PM	Application Profiling	Trey White, Master Engineer, HPE	slides, video
2:00 – 2:45 PM	GPU Profiling	Alessandro Fanfarillo, Senior Member of Technical Staff, Exascale Application Performance, AMD	slides , video
2:45 – 3:15 PM	GPU Debugging	Mark Stock, HPC Applications Engineer, HPE	slides, video
3:15 – 3:30 PM	Break		
3:30 – 4:00 PM	Frontier Tips & Tricks	Balint Joo, Group Leader, Advanced Computing for Nuclear, Particles, & Astrophysics, ORNL	slides , video
4:00 – 4:30 PM	Checkpointing Tips	Scott Atchley, HPC Systems Engineer, Distinguished R&D Staff, ORNL	slides , video

Series User Training

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Performance Portability Training Series

This series, offered by OLCF and NERSC, features training sessions on various performance portable programming solutions to help ease developer transitions between current and emerging high-performance computing (HPC) systems. The series aims to inform users on currently available performance portable programming solutions.

Facilitator: John Holmen (holmenjk@ornl.gov)

Session	Date
Advanced SYCL Techniques & Best Practices	May 23, 2023
HIP Training Series	August - October 2023
Introduction to OpenMP Offload Part 1 : Basics of Offload	September 29, 2023
Introduction to OpenMP Offload Part 2: Optimization and Data Management 2023	October 6, 2023
RAJA	October 10, 2023
Other Solutions	TBD

HIP Training Series

https://www.olcf.ornl.gov/hip-training-series/

AMD presents a multi-part HIP training series intended to help new and existing GPU programmers understand the main concepts of the HIP programming model and the AMD GPU platform. Each part will include a 1-hour presentation and example exercises. The exercises are meant to reinforce the material from the presentation and can be completed during a 1-hour hands-on session following each lecture. The list of topics is shown in the table below.

Facilitator: Subil Abraham (abrahams@ornl.gov)

#	Topic	Date
1	Intro to GPUs and HIP	Monday, August 14, 2023
2	Porting Applications to HIP	Monday, August 28, 2023
3	AMD Memory Hierarchy	Monday, September 18, 2023
4	GPU Profiling (Performance Timelines: Rocprof and Omnitrace)	Monday, October 2, 2023
5	GPU Profiling (Performance Profile: Omniperf)	Monday, October 16, 2023

AI for Science Training Series

The OLCF is proud to offer the AI Training Series. The AI Training Series is meant to highlight workflows, tools, software, and techniques used for machine learning and deep learning in the HPC realm.

This repository contains the tutorials relevant to the various AI Training Series events that have already happened or will happen in the future.

Repo: https://github.com/olcf/ai-training-series

Facilitator: Michael Sandoval

Date	Event	Material
04/26/23	AI for HPC	Recording, Slide
06/15/23	AI for Science at Scale - Introduction	Recording, Slides
07/13/23	SmartSim at OLCF	Recording, Slides, Q&A, Tutorial
10/12/23	AI for Science at Scale - Part 2	Recording, Slides

Data Visualization and Analytics Training Series

Facilitator: Michael Sandoval

The OLCF is proud to offer the Data Visualization and Analytics (DVA) training series. The DVA training series is meant to highlight workflows, tools, software, and techniques used for common data visualization and analytics tasks -- specifically targeted at OLCF systems.

This repository contains the tutorials relevant to the various DVA events that have already happened or will happen in the future.
Repo: https://github.com/olcf/dva-training-series

Date	Event	Material
09/15/22	ParaView at OLCF	Recording, Tutorial
10/13/22	VisIt at OLCF	Recording, Tutorial
06/28/23	Blender on Frontier	Recording, Slides
08/17/23	In Situ Visualization with Ascent	Recording, Slides

Quantum Training

Facilitator: Ryan Landfield

The OLCF is proud to offer the first event in our training series in the new frontier of Quantum Computing (QC), coming in early 2024. This training series is meant to introduce members of the HPC community to the unique aspects and challenges in the field of Quantum Computing, while also providing in-depth examples of QC code and algorithm implementations for users already fluent in QC methods. This series will highlight current quantum vendor offerings through the Quantum Computing User Program (QCUP), ORNL-specific QC capabilities and codes, and potential hybrid HPC+QC applications via OLCF systems.

Info : https://www.olcf.ornl.gov/olcf-resources/compute-systems/quantum-computing-user-program/

Upcoming Plans

- Office Hours, User Calls, Outreach continue

- Frontier Hackathon
  - Spring 2024

- Continuing Series
  - Performance Portability
    - OpenMP Offload
  - AI for Science
  - Data Visualization

- Possible New Series
  - Quantum
  - Profiling
  - Workflows
  - Others?

Last year you asked for:

- AI training
- Office hours
- Julia, HIP

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What training would you like to see in the coming year?

ⓘ Click **Present with Slido** or install our Chrome extension to activate this poll while presenting.

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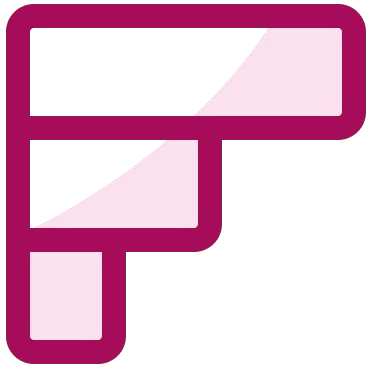

We have been doing Virtual Hackathons since 2019. What is your preferred format?

ⓘ Click **Present with Slido** or install our Chrome extension to activate this poll while presenting.