Welcome to OpenMP Training Series, May - Oct 2024

Helen He, NERSC
May 6, 2024
OpenMP

- The OpenMP API is the de facto standard for writing parallel applications for shared memory computers supported by multiple scientific compilers on CPU and GPU architectures.
- MPI+OpenMP for CPUs and OpenMP device offload for GPUs are recommended portable programming models on Perlmutter, Frontier, and Aurora.
- OpenMP Training Series, May-Oct 2024
# OpenMP Training Series

- Part of the NERSC/OLCF/ALCF Performance Portability Series

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<td>Advanced SYCL Techniques and Best Practices</td>
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<td><strong>OpenMP Training Series</strong></td>
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<td>Other solutions</td>
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- SYCL: June 20
- Julia: June 18, 21
- HPX: TBD
Introduction of Speakers

● Both Michael Klemm and Christian Terboven
  ○ OpenMP Language Committee members
  ○ Among a group of experts who regularly give technical talks and tutorials on OpenMP, at SC, ISC, IWOMP, and other HPC centers, etc.

● Dr. Christian Terboven
  ○ Leads HPC group at RWTH Aachen University as a senior scientist
  ○ Co-chair of OpenMP Affinity Subcommittee

● Dr. Michael Klemm
  ○ Principal Technical staff in the Compilers, Languages, Runtimes & Tools team of Machine Learning & Software Engineering group at AMD
  ○ CEO of the OpenMP Architecture Review Board
  ○ Lead author of book “High Performance Parallel Runtimes: Design and Implementation”
Sessions and Topics

- Session 1: OpenMP Introduction (May 6)
- Session 2: Tasking (Jun 10)
- Session 3: Optimization for NUMA and SIMD (Jul 8)
- Session 4: What Could Possibly Go Wrong Using OpenMP (Aug 5, guest session from Ruud van der Pas)
- Session 5: Introduction to Offloading with OpenMP (Sept 4)
- Session 6: Advanced OpenMP Offloading Topics (Oct 7)
- Session 7: Selected / Remaining Topics (Oct 28)

Homework assigned for each session will be reviewed at next session.
Follow-on sessions will become more advanced over time.
Some Logistics

- Users are muted upon joining Zoom due to large number of attendees
- Please change your name in Zoom session as “first_name last_name (nersc_user_name)”, such as “Helen He (yunhe)”: Click “Participants”, then “More” next to your name to rename
- You can click the CC button to toggle captions and view full transcript
- Trainings are recorded. Feel free to unmute and ask questions
  - If prefer not to record your voice, please type questions in Slack
- Slides have been uploaded. Recording to be available in a few days
  - https://www.nersc.gov/openmp-training-series-may-oct-2024/
- Please join OpenMP-series-2024 Slack
  - #general: Q&A and discussions
  - #perlmutter-accounts: training accounts issues
- Please take our survey to help us improve!
NERSC Code of Conduct

As NERSC collaborators, we are all bound by the Code of Conduct:

- **Team Science**
- **Service**
- **Trust**
- **Innovation**
- **Respect**

We agree to **work together professionally and productively** towards our shared goals while respecting each other’s differences and ideas.

We should all feel free to speak up to maintain this environment and remember there are resources available to **report violations** to foster an inclusive, collaborative environment. Email **nersc-training@lbl.gov** for any concerns.

[https://www.nersc.gov/nersc-code-of-conduct](https://www.nersc.gov/nersc-code-of-conduct) or search “NERSC Code of Conduct”