COMPUTE & ACCELERATOR FORUM

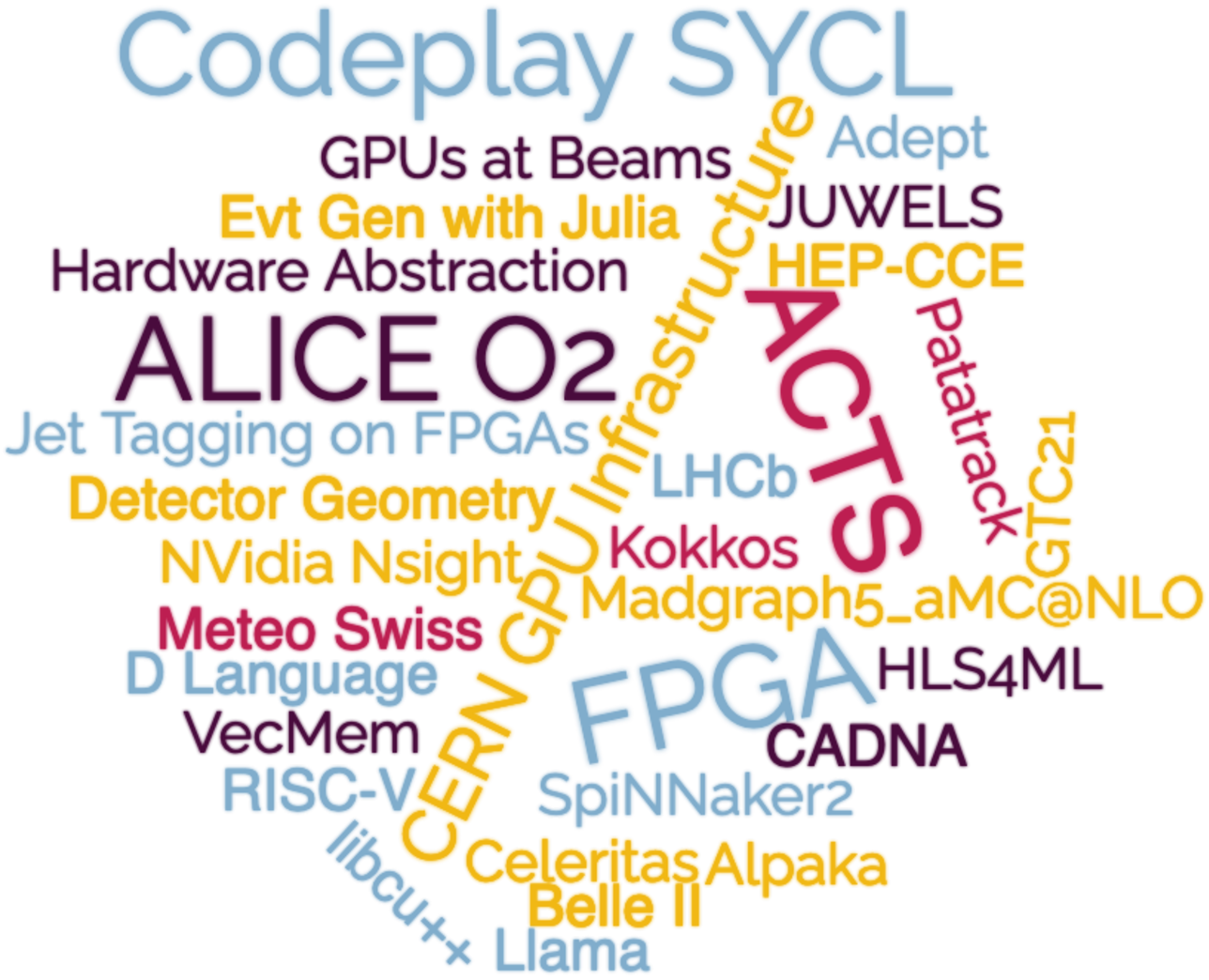
STEFAN ROISER, CERN

GDB, 10 JAN 2024

WHY, WHAT, WHEN, WHO

- Initially devised as a series of seminar style presentations for in-depth presentations and discussions on latest advances in compute acceleration and heterogeneous computing
- Second Wednesday of the month, 16:30, max 1 ½ hours
  - Usually right after GDB in the same room (but different zoom)
  - Presentations also recorded and linked at the event pages
- Agenda category @ https://indico.cern.ch/category/12741/
- Co-organised by Maria Girone, Graeme Stewart, SR (all CERN), Ben Morgan (Univ Warwick), Michael Bussmann (Helmholtz)
  - Contact us at compute-accelerator-forum-organizers@cern.ch

TOPICS SO FAR



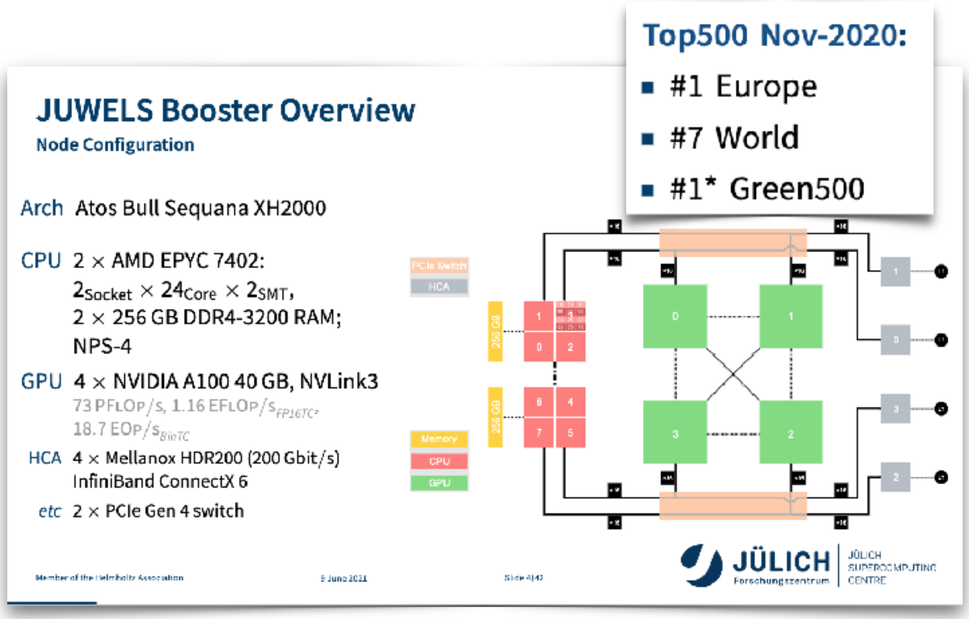
In order to reflect on the very diverse set of topics being touched on the series title changes as of this year to “Compute & Accelerator Forum”

FLASHING A FEW PRESENTATIONS

WITH POSSIBLE CONNECTIONS / OVERLAP TO THE GDB

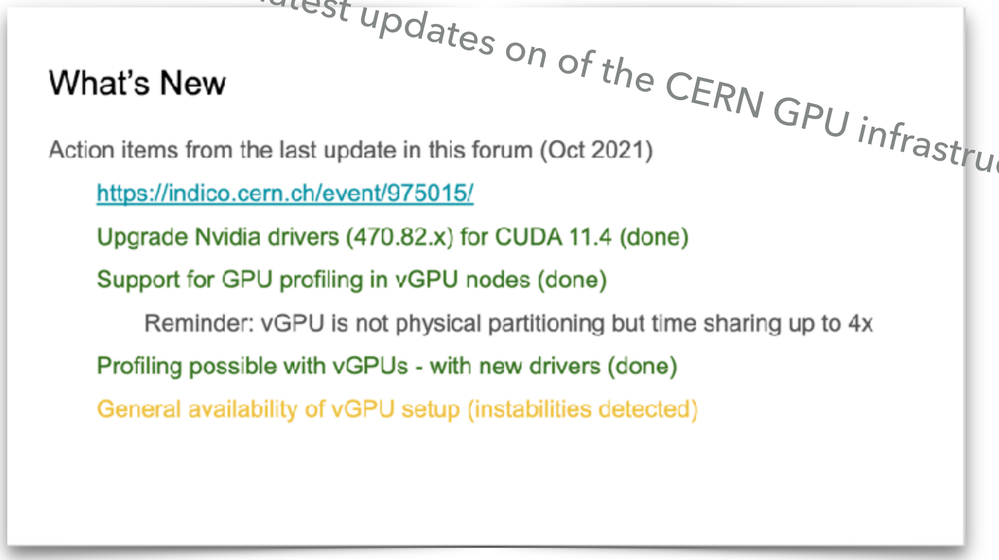
Please see the indico links for details and video recording

DATA PROCESSING INFRASTRUCTURES



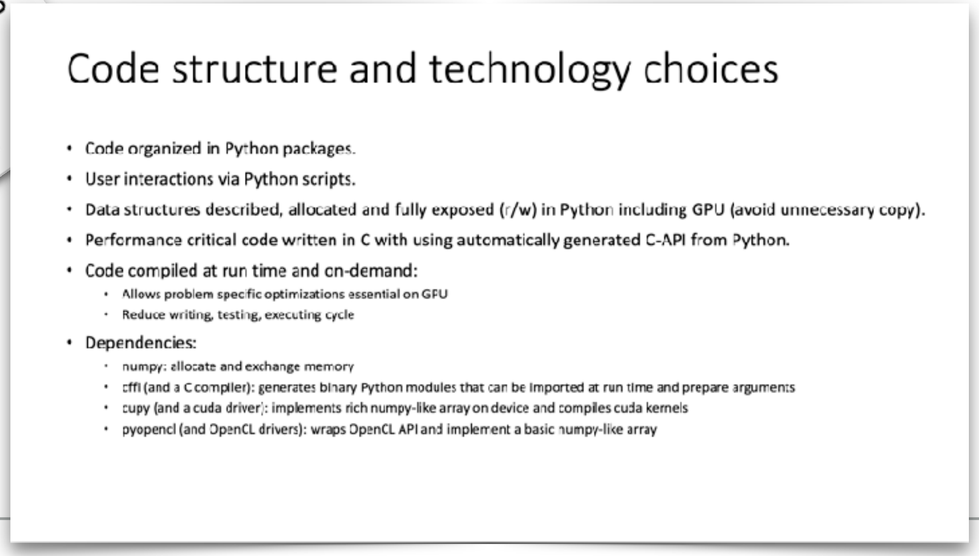
A Herten (Jülich), 9 Jun 2021, https://indico.cern.ch/event/975011/

latest updates on of the CERN GPU infrastructure



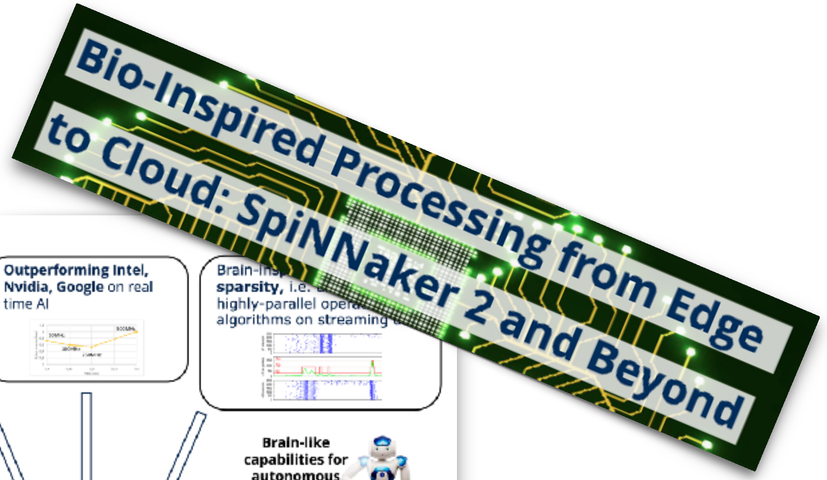
R Rocha (CERN), CERN GPU Infrastructure Updates
8 June 2022, https://indico.cern.ch/event/1073643/
13 Oct 2021, https://indico.cern.ch/event/975015/
20 Oct 2020, https://indico.cern.ch/event/950196/

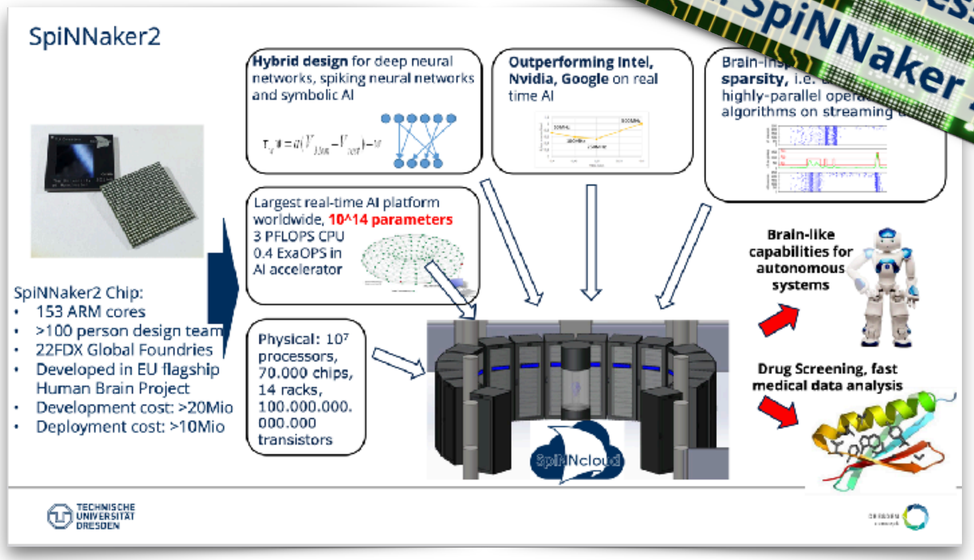
Recent development and status of beam physics codes for heterogenous platform



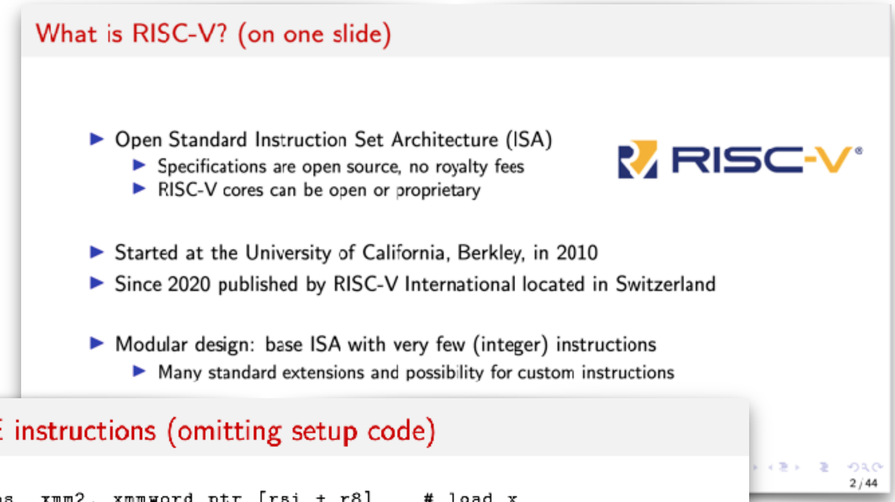
R De Maria (CERN),
8 Dec 2021, https://indico.cern.ch/event/975017/

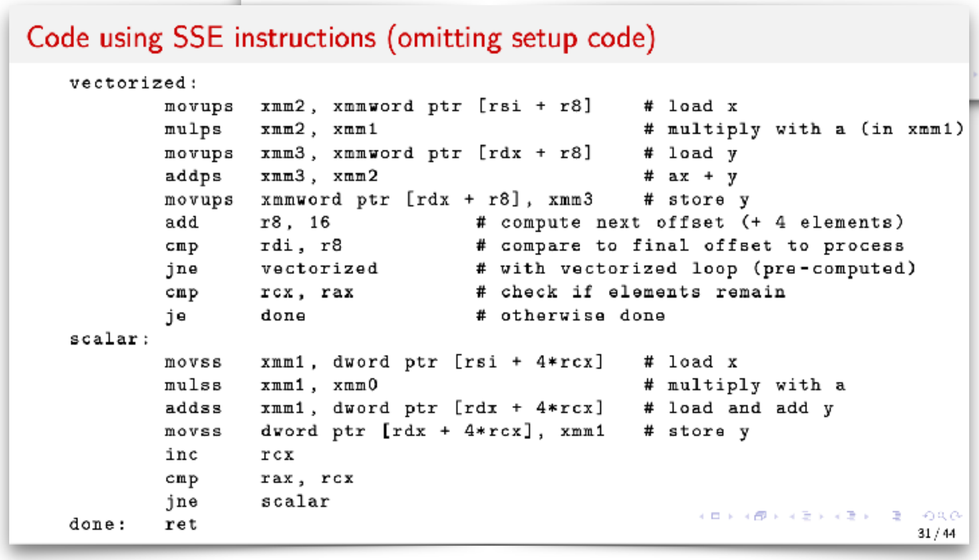
HARDWARE PLATFORMS





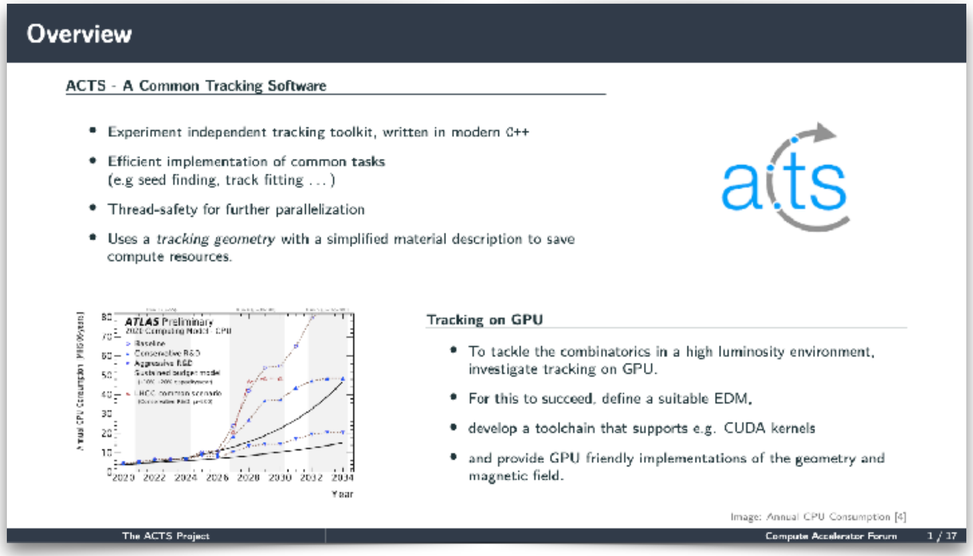
C Mayr (TU Dresden), 14 Sep 2022, https://indico.cern.ch/event/1073646/



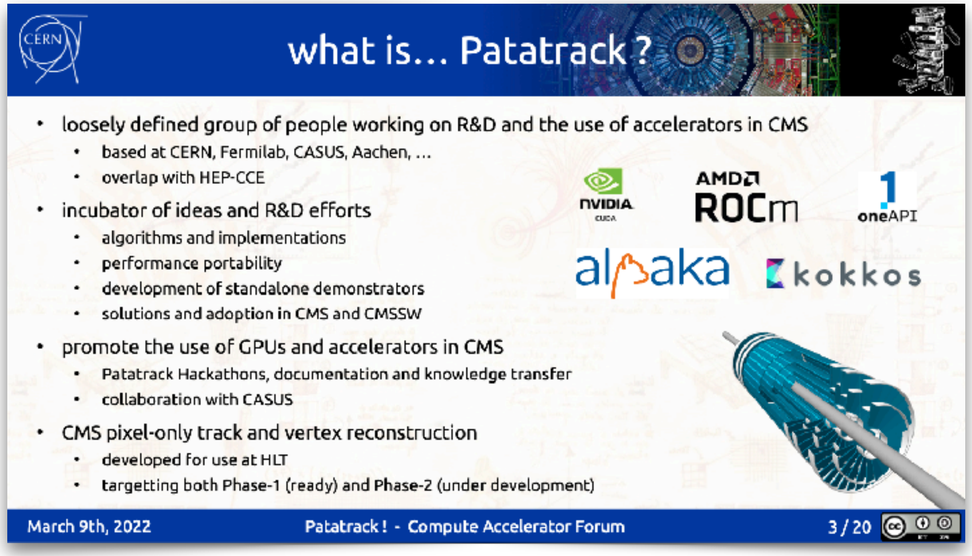


J Hahnfeld (CERN), 13 Sep 2023, https://indico.cern.ch/event/1264300/

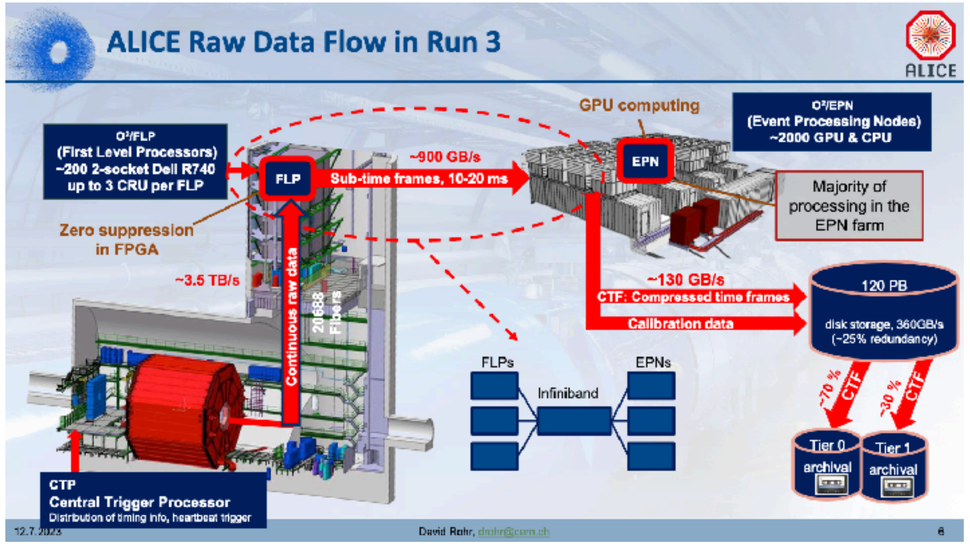
GPU DEVELOPMENTS IN THE CONTEXT OF LHC EXPERIMENTS



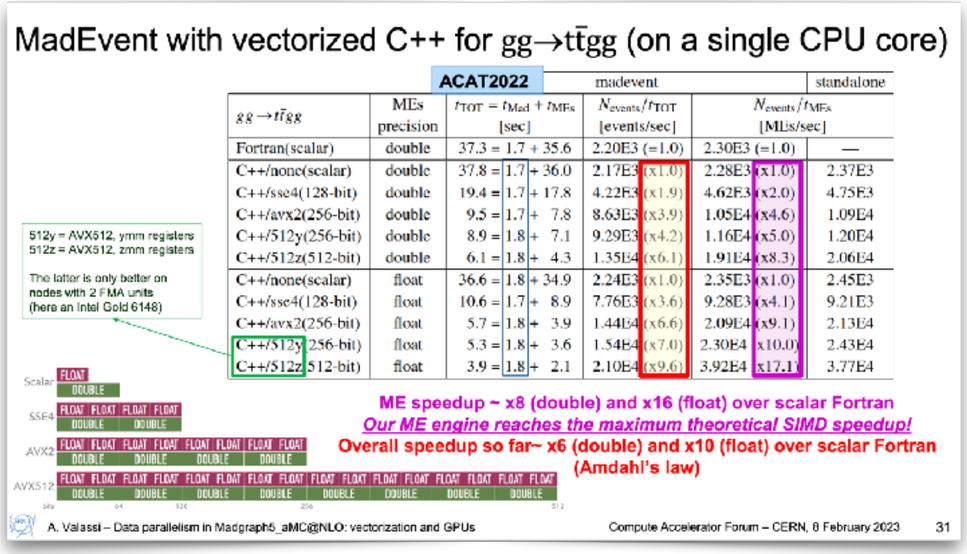
J Niermann (Univ Goettingen), 14 Dec 2022, https://indico.cern.ch/event/1160623/



A Bocci (CERN), 9 Mar 2022, https://indico.cern.ch/event/1073640/

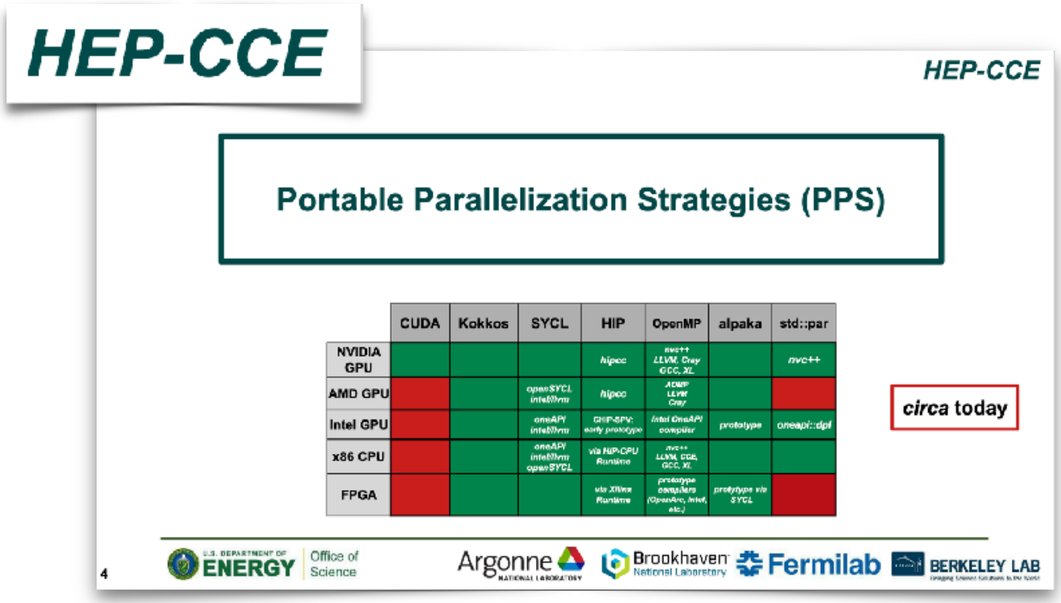


D Rohr (CERN), 12 July 2023, https://indico.cern.ch/event/1264298/

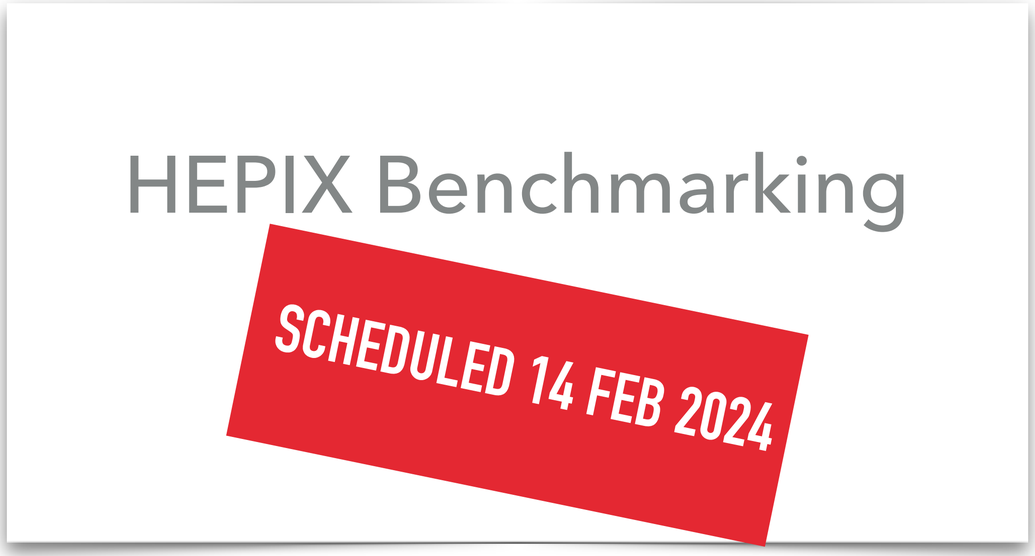


A Valassi (CERN), 8 Feb 2023, https://indico.cern.ch/event/1207838/

MORE HEP PROJECTS



C Legget (LBNL), 14 June 2023, https://indico.cern.ch/event/1264297/



D Giordano (CERN), 14 Feb 2024, https://indico.cern.ch/event/1329686/

C&A FORUM AND GDB?

- Last year organised a combined event "CA Forum & HSF Reco WG" –> also w/ GDB?
- Would you be interested in more topics with a GDB connection?
  - Individual sites adoption of GPUs, FPGAs
  - WLCG strategy towards hardware acceleration
  - Scheduling of hardware accelerated applications
  - …
- Please contact any of us (*) or at compute-accelerator-forum-organizers@cern.ch

(*) Stefan Roiser, Graeme Stewart, Maria Girone, Ben Morgan, Michael Bussmann

WHAT DID WE LEARN IN THE PAST 3 YEARS

- Many in-depth presentations on interesting tools, languages, etc. GPU abstraction layers, CADNA,
- The computing world is getting ever more diverse with more architectures and chip types coming up
- No clear winner to heard the cats: oneAPI/SYCL, Alpaka/Llama, Kokkos, pragmas, …
  - Changing the code conceptually is the major effort, how to abstract across platforms is less of an issue
  - C++ standard is also / will provide ways to cope
- New languages to cope with the new hardware landscape: D, Julia, …

THANK YOU!!

Info on upcoming meetings: compute-accelerator-forum-announce@cern.ch

10 Jan 2024, J Pivarski (Princeton), “Garbage Collectors: Java, Python, Julia”,
https://indico.cern.ch/event/1329685/

14 Feb 2024, D. Giordano, “HEPIX Benchmarking”,
https://indico.cern.ch/event/1329686/

BACKUP

TOPICS POSSIBLY OVERLAPPING / INTERESTING FOR THE GDB

- Data processing infrastructures, e.g. JUWELS, GPUs @ CERN, GPUs at CERN Beams
- Hardware platforms: SpiNNaker2, RISC-V,
- Status of GPU developments at the LHC: ACTS, Patatrack, Madgraph, Adept, Celeritas, ALICE O2, LHCb Allen, Belle II
- More HEP projects: HEP-CCE, HEPIX Benchmarking,