ARCHER2 Services

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www.archer2.ac.uk

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Reusing this material

ARCHER2 Partners

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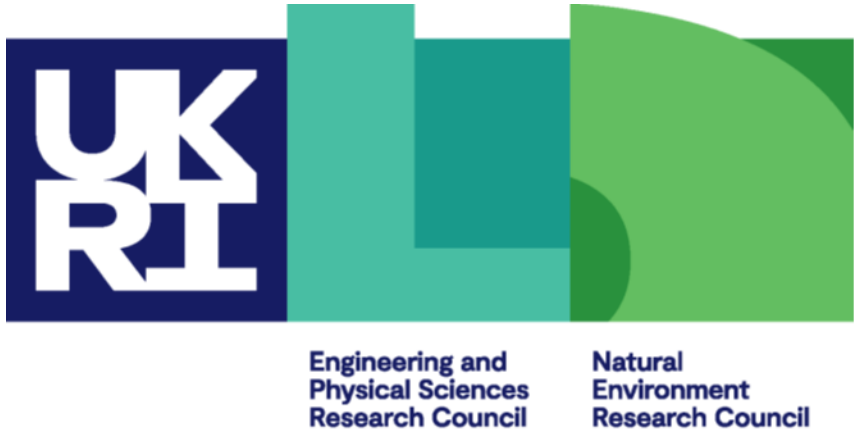

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THE UNIVERSITY *of* EDINBURGH

Hewlett Packard
Enterprise

Outline

- ARCHER2 Overview
  - Hardware/Software
  - Usage

- CSE Services run by EPCC
  - Training
  - Helpdesk
  - Service improvement

ARCHER2 Overview

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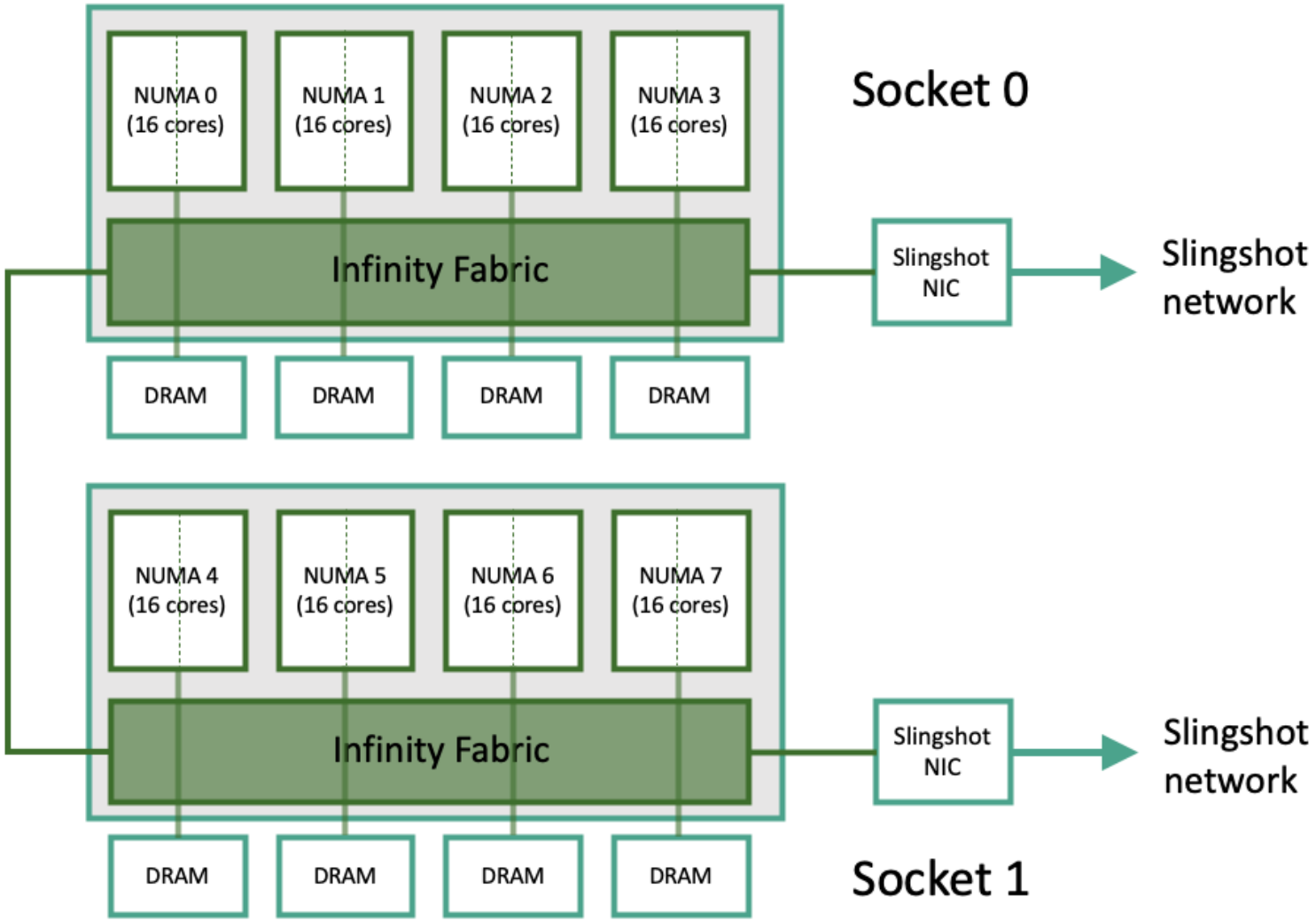
ARCHER2 - HPE Cray EX Supercomputer

- 5,860 compute nodes (750,080 cores)
  - Dual socket AMD EPYC 7742, 64c, 2.0 GHz
    - CPU frequency adjustable within Slurm [1.5, 2.0, 2.25]
  - 256 GiB / 512 GiB memory per node
  - Two 100 Gbps Slingshot interfaces per node

- HPE Cray Slingshot interconnect
  - Dragonfly topology

- 4x ClusterStor L300 Lustre file systems, each 3.6 PB
  - Also 1 PB ClusterStor E1000F solid state storage

ARCHER2 compute node



Each 16-core NUMA region is made up of two 8-core complexes.

Each 8-core complex contains:

- 8 compute cores with 256-bit AVX2 and FMA;
- Each compute core with 32 kB L1 cache and 512 kB L2 cache;
- Shared 16 MB L3 cache for every 4 cores.

https://docs.archer2.ac.uk/user-guide/hardware/

Jobs & Software

- Slurm Job Scheduling System
  - `sbatch` – launch jobs
  - `sacct` – obtain info on completed jobs

- HPE Programming Environment:
  - Compilers
    - CCE (Cray), GCC, AOCC;
  - Parallel libraries
    - HPE Cray MPICH (OFI/UCX)
    - OpenSHMEM, Global Arrays, PGAS
  - Numerical and IO libraries
    - LibSci (BLAS/LAPACK/ScaLAPACK)
    - FFTW, HDF5, NetCDF;
  - Debugging and profiling tools
    - CrayPAT, Arm Forge, gdb4hpc

- Software provided by Lmod module system
- Support for SingularityCE containers

Current QoS

QoS	Size limits per user	Size limits per job	Time limits	Job limits (running/queue)	Notes
standard	1024 nodes	1024 nodes	24 hours	16 / 64	
highmem	256 nodes	256 nodes	24 hours	16 / 16	
taskfarm	512 nodes	16 nodes	24 hours	32 / 128	
short	32 nodes	32 nodes	20 mins	4 / 16	
long	512 nodes	64 nodes	48 hours	16 / 16	
largescale	5860 nodes	5860 nodes	12 hours	1 / 8	
lowpriority	1024 nodes	1024 nodes	24 hours	16 / 16	Uncharged
serial	32 cores and/or 128 GB memory	32 cores and/or 128 GB memory	24 hours	4 / 12	Uncharged

https://docs.archer2.ac.uk/user-guide/scheduler/#quality-of-service-qos

ARCHER2 Usage

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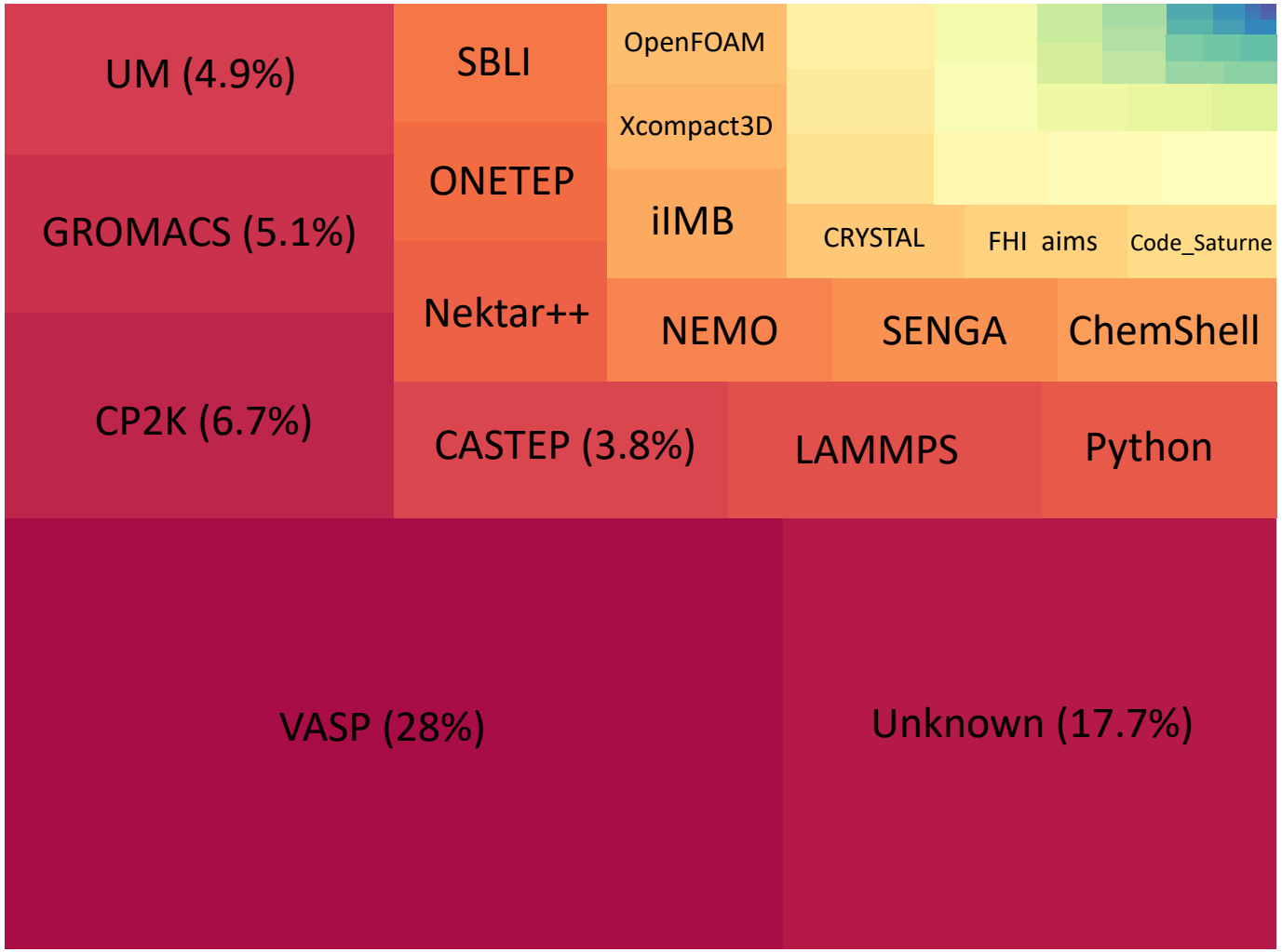
ARCHER2 Usage % by Code

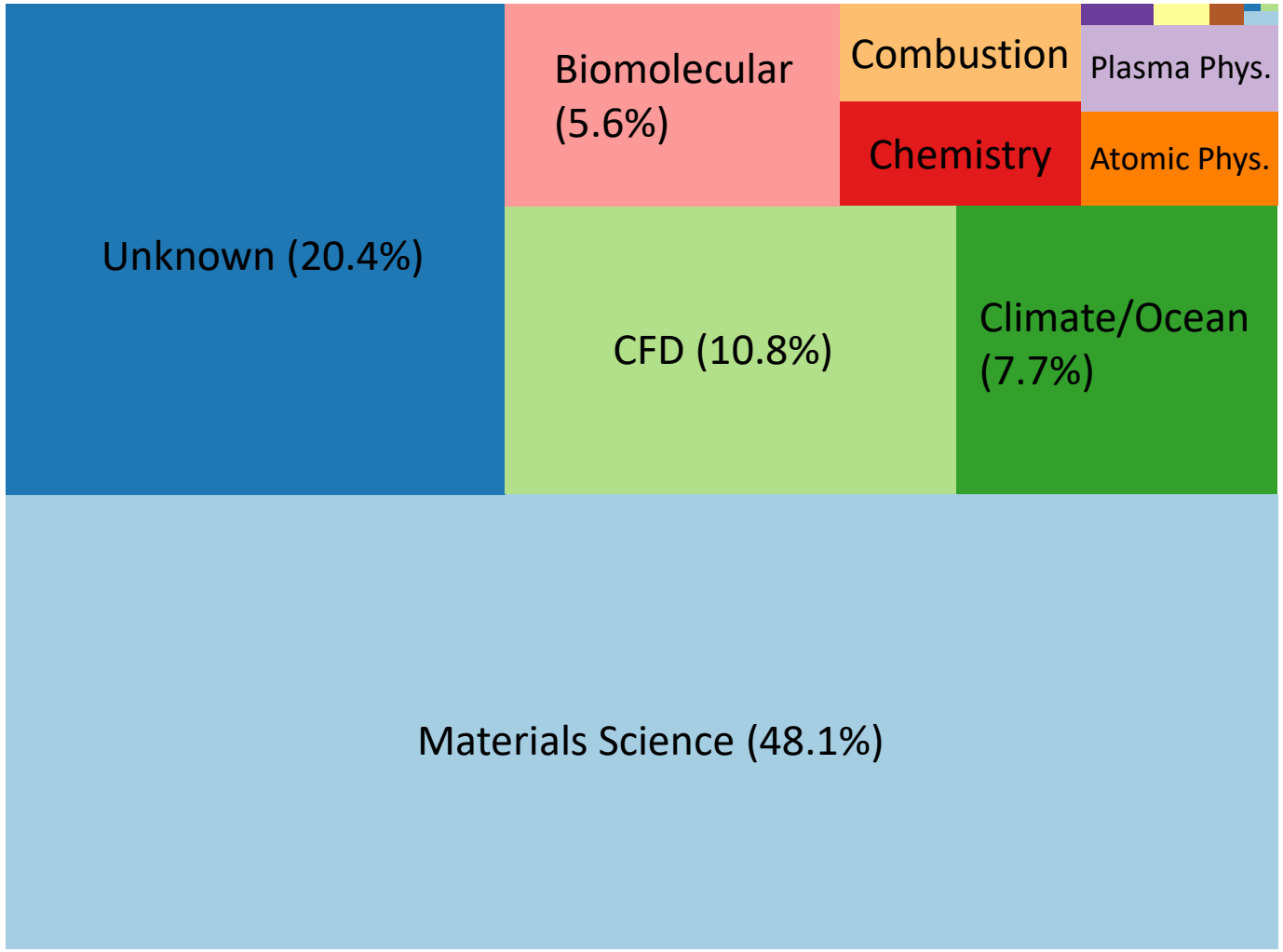


- Unlabelled boxes account for 8%

Dec 2021 to Jan 2023 (49.3 million node hours)

Analysis by Michael Bareford

ARCHER2 Usage % by Research Area



- Unlabelled boxes account for 0.5%
  - Optical Phys.
  - Monte Carlo
  - Engineering
  - Med. Phys.
  - Mesoscale
  - Seismology

Dec 2021 to Jan 2023 (49.3 million node hours)

Analysis by Michael Bareford

CSE Services

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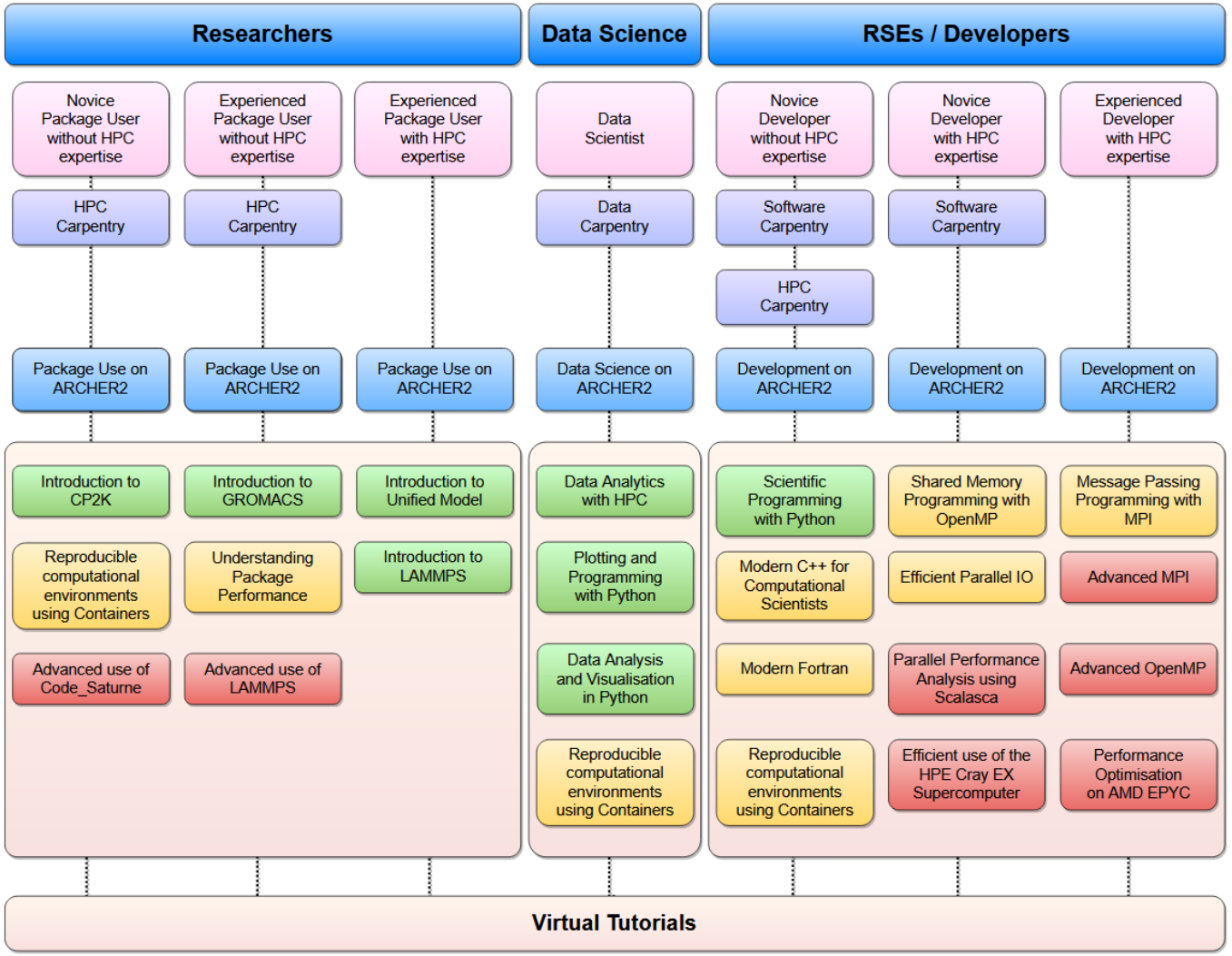
Training

- Online webinars or in person
- Different levels from introductory to advanced
- Free for academics
- Access to past recordings and materials

- https://www.archer2.ac.uk/training/



Training

- **ARCHER2 for Package Users**
  - 7 December 2023 09:30 - 15:30 GMT
  - https://www.archer2.ac.uk/training/courses/231207-package-users/

- **ARCHER2 for Software Developers**
  - Online already accessible
  - https://www.archer2.ac.uk/training/courses/221202-software-developers/

Helpdesk service

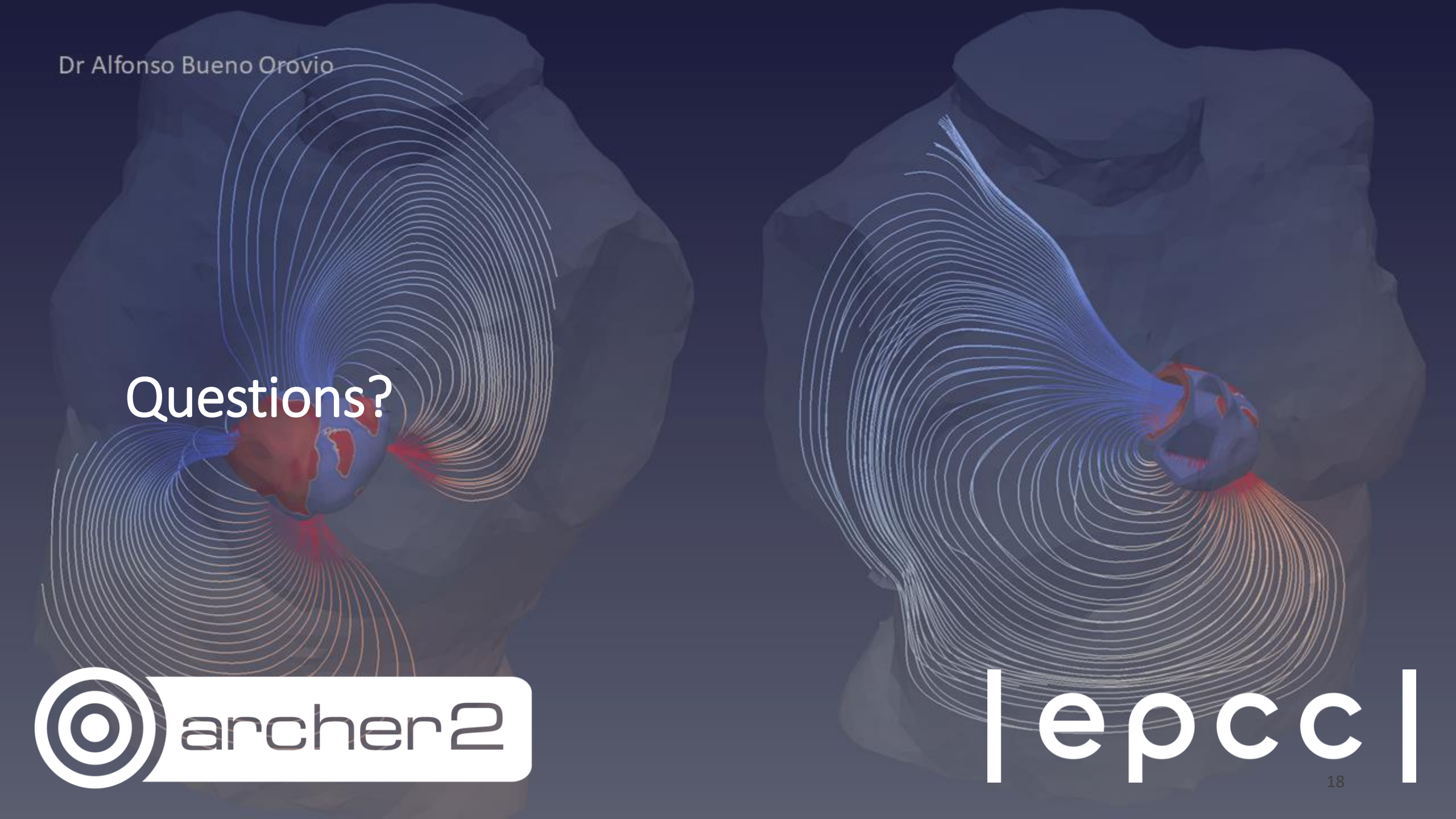
- Team of 4-5 HPC specialists
- 15 days to help you understand/solve your problems on ARCHER2
  - Compilation issues
  - Performance discrepancies
  - Investigating software/parallelisation bugs

- Documentation: https://docs.archer2.ac.uk
- Email: support@archer2.ac.uk

Service Improvement

- Team working on improving the user experience:
  - Writing documentation
  - Testing and documenting new tools
  - Benchmarking the system (IO performance, networking etc.)
  - Testing new versions of software before being rolled out to everyone
  - Testing bug fixes
  - …

Questions?



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