



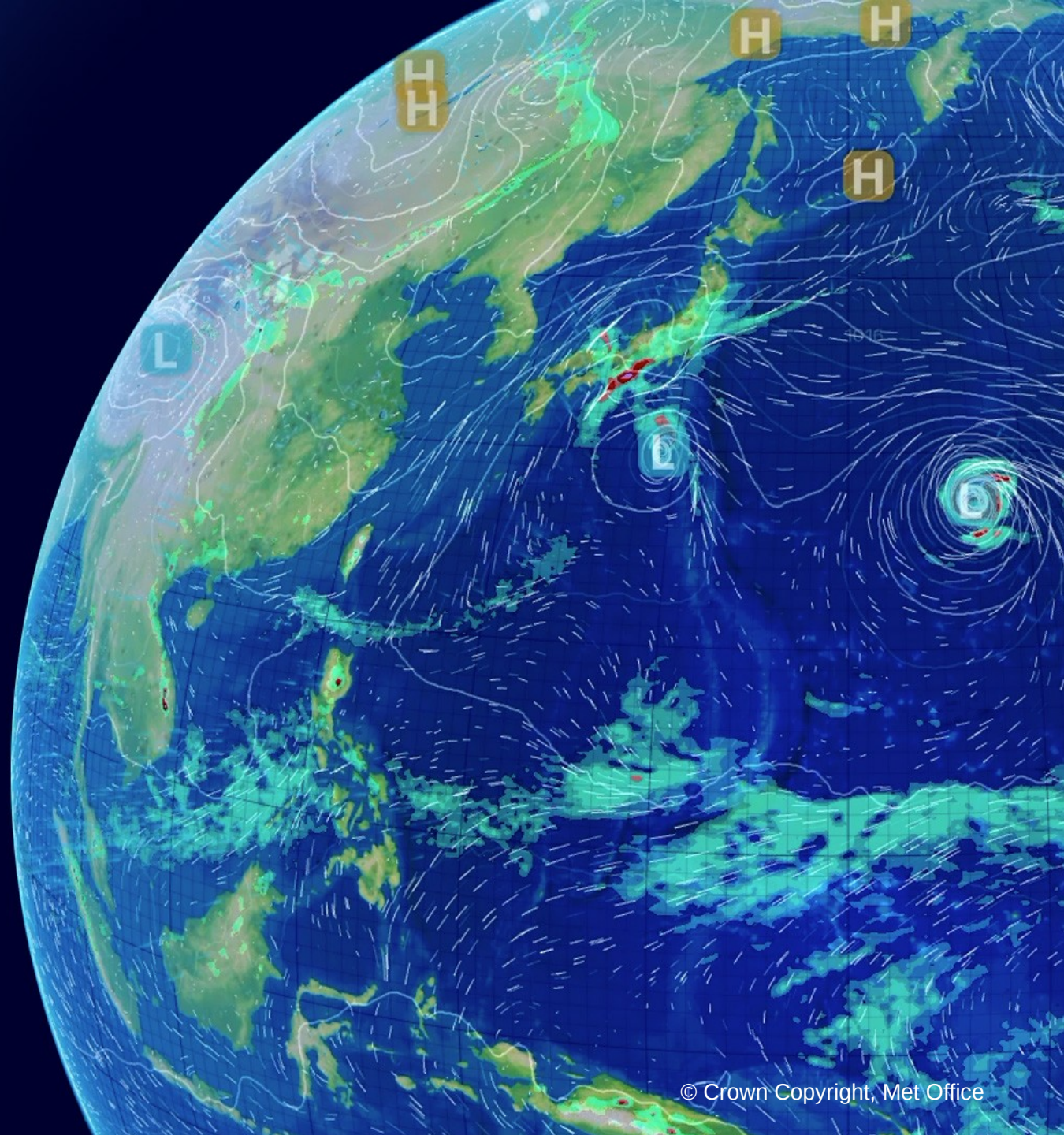
UK Research
and Innovation

ExCALIBUR

Hardware & Enabling
Software Programme

*DiRAC Day
September 2020*

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The ExCALIBUR Initiative

- Exascale Computing Algorithms and Infrastructures Benefitting UK Research
 - £45.7M from the Strategic Priorities Fund (SPF)
 - Led by UKRI and the Met Office with UKAEA
 - The UK's 5 year Exascale programme
 - Focus on software and algorithms
 - Find out more:

<https://www.metoffice.gov.uk/research/approach/collaboration/spf/excalibur>

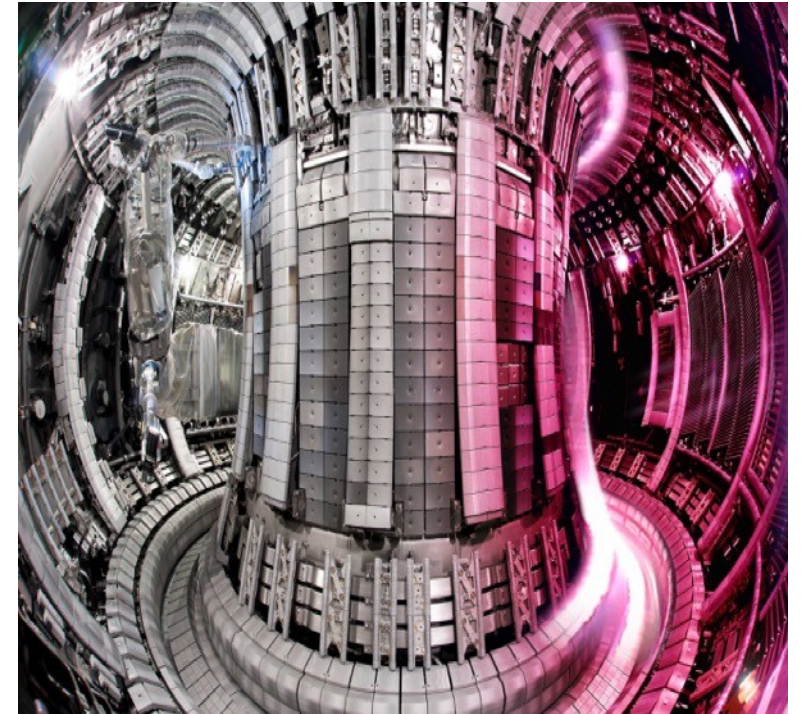


Photo credit: UK Atomic Energy Authority (UKAEA)



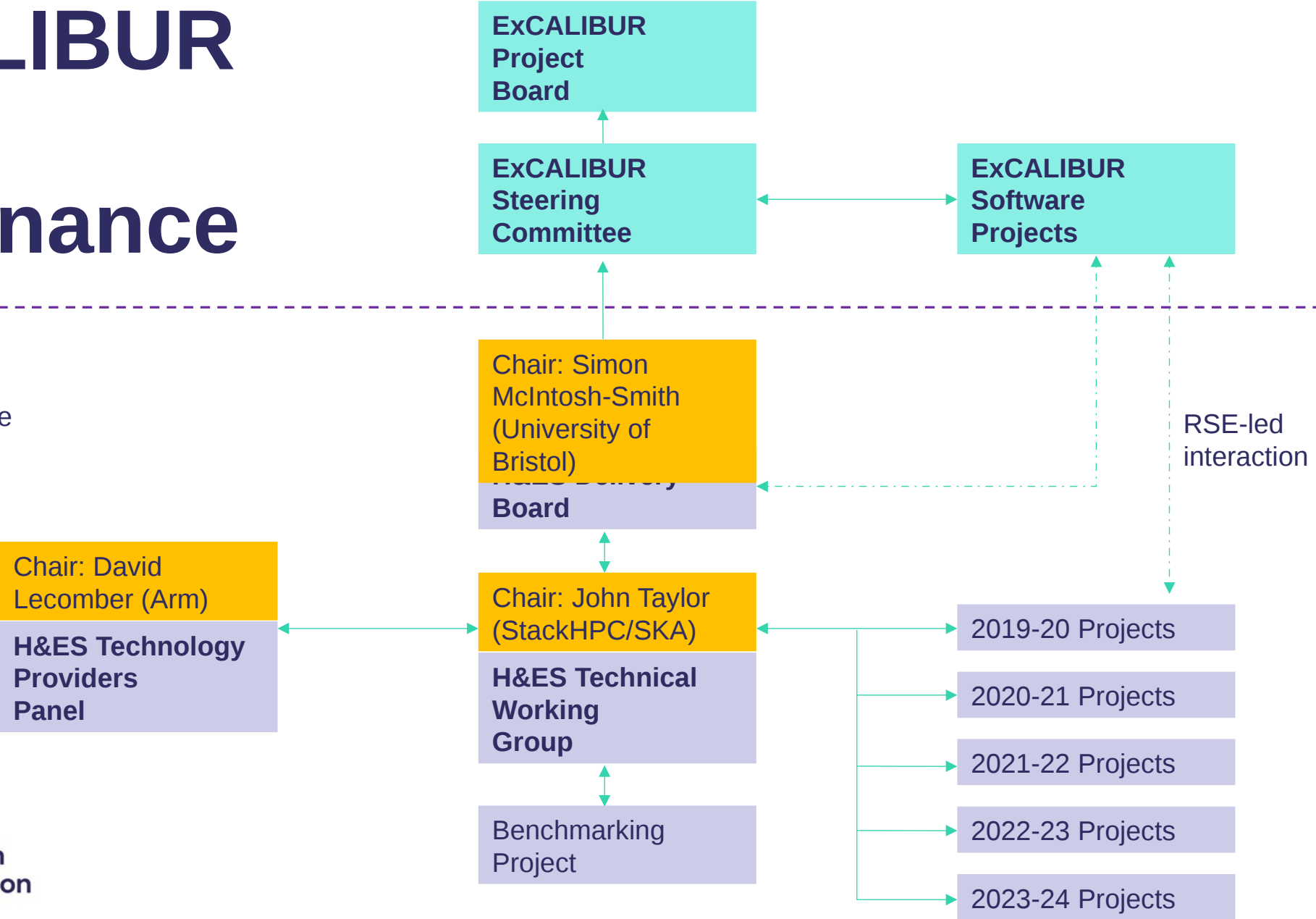
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ExCALIBUR H&ES Programme

- £4.5M in capital funding over 4.5 years to develop a hardware foresighting programme using pre-commercial equipment for software prototyping and development to:
 - enable the software community to be ready to use commercial products effectively as soon as they come on to the market;
 - provide the UKRI community with the ability to influence the technology industry and the necessary knowledge to guide their purchase decisions.
- H&ES projects will take a co-design approach, working closely with ExCALIBUR software projects and industry partners.
- H&ES projects will include RSE/ResOps effort, and a core activity for H&ES is to support “Benchmarking for Exascale”

ExCALIBUR H&ES Governance

Hardware &
Enabling Software



ExCALIBUR H&ES Technology Providers Panel



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ExCALIBUR H&ES First Wave Testbeds

PI	Institution	Project Title	Award /£k	What it will deliver
Hailes	UCL	Interconnect Testing and Developing: the adaptable cluster.	370	With Mellanox: Ethernet and InfiniBand interconnects to support ~60 nodes. Measure Application performance as a function of component action
Basden	Durham	Exascale solutions for Storage and RAM as Services: Phase 1 and AMD test System.	380	With Dell: Gen-Z – Resource lending via the Fabric With Mellanox: BlueField-2 – data control in a cluster With AMD: Servers, CPU and GPU

PI	Institution	Project Title	Award /£k	What it will deliver
Calleja	Cambridge	File Systems for Exascale	195	With Dell & Intel: Hardware and Software solutions
McIntosh -Smith	Bristol	Novel Accelerators	150	With Dell & Graphcore: Characterising new architectures
Wilkinson	Leicester	Improving Application performance using Arm Processor units and attached accelerators	200	With HPE & Arm: Insights into Architectural diversity for a range of applications
Parsons & Boyle	Edinburgh	Testing and improving APIs for a range of processor unit and accelerator systems:	250	Deep level look at accelerator interaction with other processing units and components (industry partners TBC)



ExCALIBUR AMD GPU testbed (Durham)

- 2 x Dell R7525 servers purchased, each with:
 - 2 x AMD EPYC 7542 32 core 2.9GHz CPUs
 - 3 x AMD MI50 GPUs
- AMD software, ROCM, AOCC, AOMP, GCC with offload support installed
- Extends Durham AMD cluster
- Already in use by researchers at various sites including the University of Bristol and the Hartree Centre
 - First journal submission for research using this testbed already submitted!



ExCALIBUR H&ES 1st Open Call

- Open call: <https://dirac.ac.uk/excalibur/> (£1m budget!)
- Timeline:
 - **14th September 2020** – the call formally opens
 - **19th October 2020** – final date to submit proposals
 - Proposals are then peer reviewed and any clarifications sought
 - **30th November 2020** – outcomes communicated to applicants
 - UKRI will then issue grant letters to allow PIs to prepare
 - **6th April 2021** – grants become active and work can begin
- Contact us to discuss: excalibur-hes@jiscmail.ac.uk



The ExCALIBUR Hardware and Enabling Software (H&ES) Programme:

Project name and lead institution

Principal investigator's name and affiliation

Contents

If your proposal is more than five pages in length, we suggest you include an auto generated table of contents here for convenience.

Proposal

The underlying proposal that you are seeking ExCALIBUR support for, e.g. a testbed system to trial a promising new technology or approach. Some evidence is welcome here that you are aware of other potentially similar systems and projects, which you should be able to differentiate your project from. If your project would build on existing resources or facilities, e.g. extending or repurposing existing hardware then describe these here. We encourage you to find potential users of a testbed before seeking support for it, in particular from the ExCALIBUR and wider UKRI research community, and these people and/or projects should also be listed here.

Justification of resources

Here you should indicate any capital spend you wish to make on hardware and software as part of the project, and any research operations (ResOps) or Research Software Engineering (RSE) costs that you wish to charge to the project. We encourage projects to build on existing teams, e.g. by buying out staff time to act as contractors, rather than seeking to recruit staff specifically for this work. You are encouraged to provide two or three options for the scale of your project, as this will allow the ExCALIBUR H&ES resource allocation panel to make the most efficient use of the available funds.