

The logo for ExCALIBUR 10, featuring the word 'ExCALIBUR' in white and '10' in white inside a red circle, all set against a background of a server room with glowing blue lines.

**ExCALIBUR
10**

VIEW FROM THE BRIDGE

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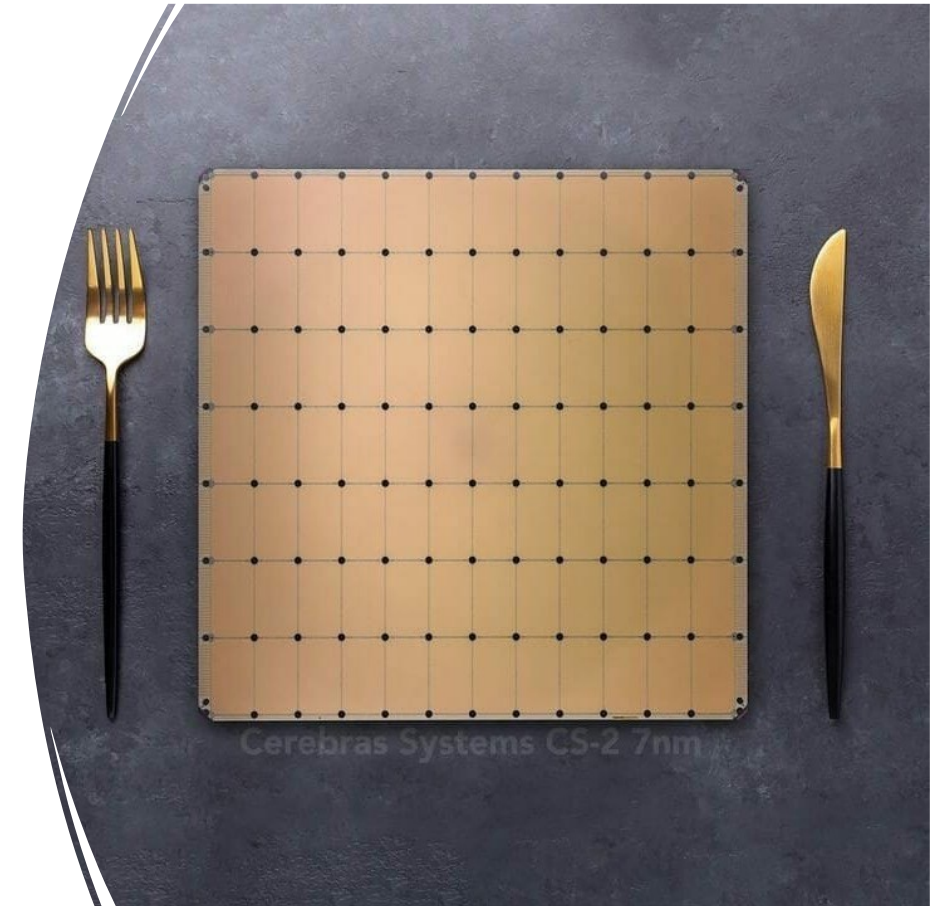
**UK Research
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You Are Here

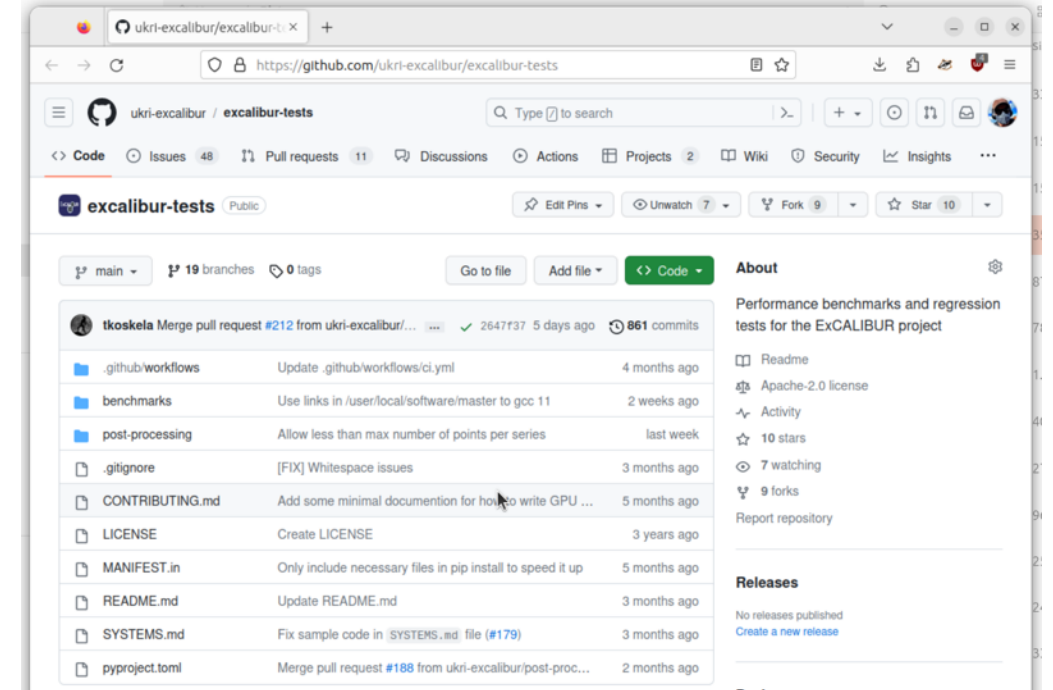
- H&ES - £4.5M or roughly 10% of the overall 2019-2025 ExCALIBUR budget, ring-fenced for horizon scanning and technology foresight.
- Testbeds and enabling software projects you've heard from today - more this afternoon!
- Changing landscape for scientific computing – dedicated AI accelerators, new GPUs and CPUs, new (to HPC) architectures, code portability and performance characterisation.
- Choppy waters – COVID-19, supply chain disruption, the generative AI bubble, climate breakdown, conflict and regime change.
- Course corrections – commercial tides ebb and flow, supercomputing sands shifting in the midst of projects.



Cerebras Wafer Scale Engine
AI Accelerator testbed at EPCC

What Did We Learn?

- Testbeds weren't originally part of ExCALIBUR, however the need for a horizon scanning component quickly became clear.
- Growing recognition of the importance of enabling software and knowledge exchange – programme iterated to include these.
- Formation of a community of practice with different / diverse skill sets, with centres of excellence emerging in key technologies / techniques.
- Opportunity to test ideas and approaches on small scale yielded massive insights, informing co-design and procurement of new systems / services.
- Realisation that Digital Research Infrastructure can be considered an object of study in its own right.



Exascale Benchmarking suite

UCL, Bristol, Reading, Met Office

(builds on earlier StackHPC / Cambridge work)

<https://github.com/ukri-excalibur/excalibur-tests>

Future Trends?

- Federate Everything, Everywhere, All of the Time - whilst enforcing policy / security requirements (currently testing practical solutions via AIRRFED)
- Major exits / consolidation impending – succession planning, avoid vendor lock-in where feasible (open source, open protocols, open hardware like RISC-V and LoongArch, but beware patent trolls!)
- Ethical AI foundation models for science – source material declared and licenced, fair working practices, carbon neutral or negative, small language models as soon as feasible.
- Blast radius when the AI bubble bursts, impact of Trump 2.0 tariffs *etc*, degrowth approaches to (partially) mitigate global warming.
- At least one break-through technology, e.g. quantum, neuromorphic computing, organoids...



Human Cerebral Organoids

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