



QUANTUM COMPUTING APPLICATION CLUSTER



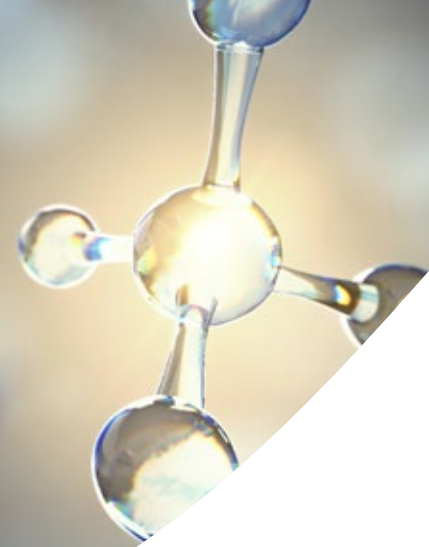
THE UNIVERSITY
of EDINBURGH



University of
Strathclyde
Glasgow



University
of Glasgow



WHY QUANTUM COMPUTING?

Quantum computers have the potential to revolutionise computation by making certain types of conventionally intractable problems solvable. Quantum software and hardware together have the potential to dramatically speed-up computation over conventional algorithms and hardware.

Quantum computers already have the power to access challenging scientific problems, and have promising applications across a variety of industrial sectors, including in

- **Engineering**
- **Aerospace**
- **Finance and FinTech**
- **Pharmaceuticals**
- **Chemical and Petro-chemicals**
- **Supply chain logistics**

WHY THE QUANTUM COMPUTING APPLICATION CLUSTER?

We leverage expertise across discipline boundaries in physics, engineering, computer science and HPC from the Universities of Edinburgh, Glasgow, and Strathclyde. With strong links across the National Quantum Technologies Programme, we develop quantum hardware and software solutions driven by end-user applications.

This includes major hardware platforms:

- Neutral Atoms
- Superconducting qubits
- Silicon qubits

And software expertise across all facets of the full software stack, including:

- Applications from simulation of materials to machine learning and quantum cyber security
- Benchmarking, testing, and verification of quantum technologies
- Quantum programming languages, compilers, and interfaces
- Emulation of quantum hardware for algorithm design and testing

Managing the risk of quantum software development

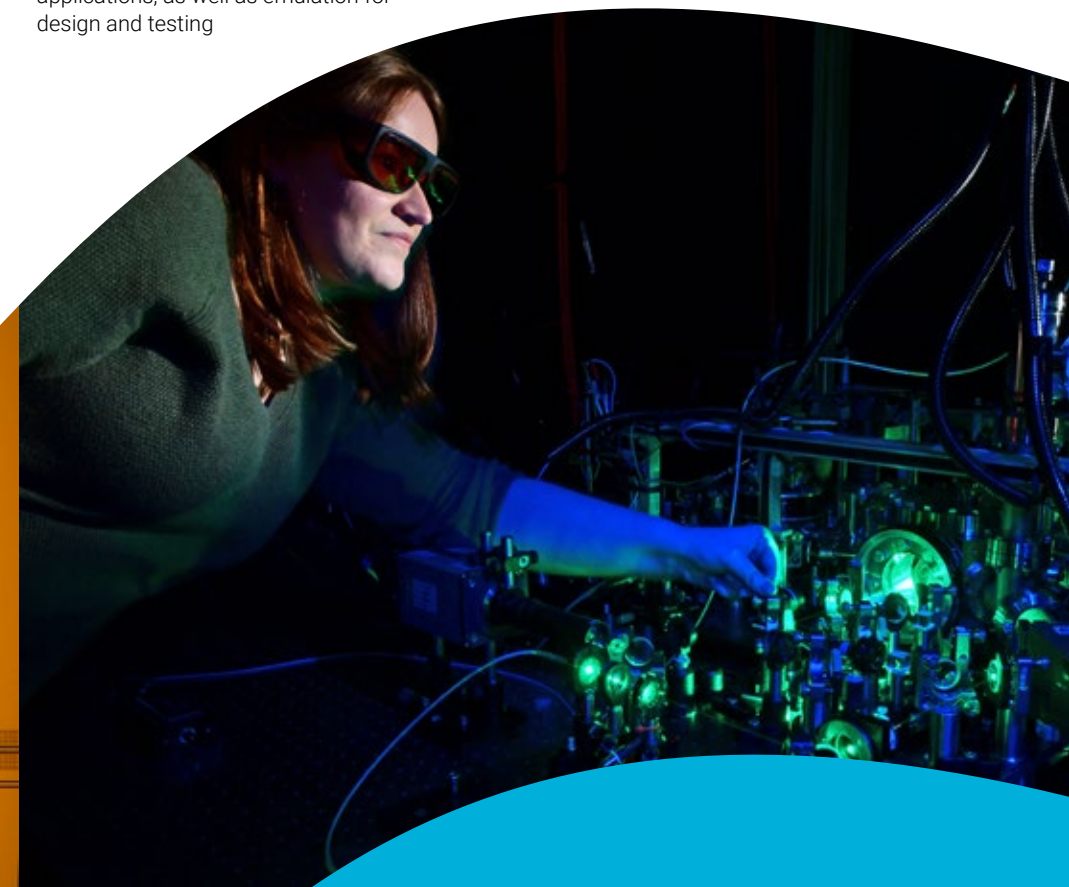
Quantum algorithms can be hard to develop and programme, and the most promising applications hard to identify. The QCA Cluster can help you understand and respond to the problems you may face – or those you don't yet know you will face – in developing quantum algorithms to meet your computational challenges by:

- Working with leading academic groups developing quantum software and hardware to identify the most promising opportunities
- Connecting you with training opportunities and a wealth of talent through the Scottish University sector
- Interacting with classical high performance computing at the Edinburgh Performance Computing Centre, with expertise on applications, as well as emulation for design and testing

Well-connected quantum ecosystem

The QCA Cluster provides:

- strong connections with the rest of the UK National Quantum Technologies Programme, especially the National Quantum Computing Centre and the QCS Hub
- direct links into the development of the full quantum computing stack, including hardware & software, with interlinks to high-performance conventional computing capability
- research that integrates hardware and software design, recognising and develop opportunities to solve computational challenges on practical quantum computers across a range of fields and industry sectors
- access to talent through our PhD programmes





QUANTUM COMPUTING APPLICATION CLUSTER

CONTACT

For more information please visit <http://qca-cluster.org>, or contact
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