Government backs UK’s first quantum computer

$CTA * The UK’s first commercially available quantum computer to be hosted in Abingdon, backed by £10 million government and industry investment * quantum computers could help solve issues including accelerating new drug treatments and improving traffic flow in cities and towns * Science Minister sets out bold new vision for the UK to become the world’s first quantum-ready economy and launches the new National Quantum Computer Centre in Oxfordshire

The UK’s first quantum computer to be commercially available to businesses will be located in Abingdon in Oxfordshire, Science Minister Amanda Solloway announced today (2 September 2020).

The new machine will be developed alongside experts from Oxford, London, Bristol and Edinburgh, and forms part of the Minister’s radical ambition for the UK to become the world’s first quantum-ready economy.

Backed by £10 million government and industry investment, this new machine will strengthen the UK’s offer to businesses wanting to explore how they could harness the power of quantum computing in the future.

Quantum computing offers the chance for businesses to find better or quicker ways to solve problems, many of which are not possible using standard computers. Industries including pharmaceuticals, aerospace and transport that substantially contribute to the UK economy are set to benefit most. This is because this technology could help them to accelerate the discovery of new drug treatments, improve the efficiency of global supply chains including across food, automotive and aerospace sectors, and cut road traffic in towns and cities, shortening people’s commuting times while reducing pollution levels – and benefiting people’s lives and businesses.

By 2024, quantum computing is expected to provide £4 billion of economic opportunities globally, while in the coming decades productivity gains resulting from quantum computing are expected to surpass over £341 billion globally – resulting in new jobs, skills and knowledge across the UK.

The new quantum computer will be developed by leading tech company Rigetti Computing, which also developed a cloud-based platform allowing computer programmers to write quantum algorithms. It will work alongside Oxford Instruments, Standard Chartered and Bristol and London-based quantum software start-up Phasecraft, as well as the University of Edinburgh.

Rigetti’s decision to base the computer in the UK is testament to the country’s strong network of leading companies and talent focused on this emerging technology.

Speaking after the Quantum Summit, Science Minister Amanda Solloway said:

> Our ambition is to be the world's first quantum-ready economy, which could provide UK businesses and industries with billions of pounds worth of opportunities. Therefore, I am delighted that companies across the country will have access to our first commercial quantum computer, to be based in Abingdon.
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> This a key part of our plan to build back better using the latest technology, attract the brightest and best talent to the UK and encourage world-leading companies to invest here.

CEO of Rigetti Computing Chad Rigetti said:

> We are excited to deliver the UK's first quantum computer and help accelerate the development of practical algorithms and applications.
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> By providing access to quantum hardware, the collaboration aims to unlock new capabilities within the thriving UK ecosystem of quantum information science researchers, start-ups, and enterprises who have already begun to explore the potential impact of quantum computing.

There are currently only a small number of quantum computing platforms being developed around the world – presenting an opportunity for the UK to be at the forefront of this technology. The activities announced today will help promote quantum computing across the UK economy, providing businesses with the best opportunity to take advantage of these new technologies in the years to come.

Speaking at the Quantum Summit and marking the start of London Tech Week today, Minister Solloway also set out the government's ambition for the UK to become the first quantum-ready economy in the world. This bold new move will make sure the UK is taking advantage of these technologies and that they underpin industries and business models, delivering economic and societal benefits for all, while nurturing talent and expertise and creating new jobs across the UK.

Driving the UK towards its quantum-ready ambition, Minster Solloway also launched the UK's the National Quantum Computer Centre, based at the Harwell Campus in Oxfordshire, which will place the UK at the forefront of this transformative new technology.

The Centre will bring together academia, businesses and the government to address key challenges to quantum computing, such as scaling-up this technology and making it commercially viable and explore how they can create economic value. Working closely with industry and the research community, the Centre will also provide businesses and research institutions with access to quantum computers as they are developed around the world and grow the UK's

thriving quantum computing industry.

The government first announced it would establish the National Quantum Computing Centre in 2018 and has committed to invest £93 million in the venture.

UK Research and Innovation Chief Executive, Professor Dame Ottoline Leyser, said:

> Quantum computers are extraordinary new tools with the potential to allow us to tackle previously insurmountable challenges, promising benefits for all of society through applications in areas such as drug discovery and traffic optimisation.
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> The National Quantum Computing Centre will tackle the key bottlenecks in quantum computing by bringing together experts from across the UK's outstanding research and innovation system from academia and industry to unlock the potential of this exciting new technology.

Dr Michael Cuthbert National Quantum Computing Centre Director said:

> I am pleased with the progress made on the formal structures and governance of the centre. The next steps initiating centre recruitment and commissioning technology work packages are very welcome tangible steps as the centre moves from initialisation and conceptual design to facility construction and operational delivery.

Today's announcement furthers the government's commitment through its R&D Roadmap to put the UK at the forefront of transformational technologies, and is part of a wider £1 billion government and industry investment through the National Quantum Technologies Programme to commercialise quantum innovations and secure the UK's status as a world-leader in quantum science and technologies.

Notes to editors

Quantum science involves harnessing the unique ways that light and matter behave at tiny atomic or subatomic levels. This science has already transformed people's lives by developing the building blocks of modern computers, the mobile phone, and the MRI scanner.

The funding for Rigetti UK is part of the government's Quantum Technologies Challenge, led by UK Research & Innovation. In June this year, the government announced 38 new projects that are benefiting from over £70 million funding.

At the time of release, Rigetti's computer is the only known commercially available quantum computing platform that will be both physically based in

the UK, and available on the cloud to commercial clients.