

# World's first timing centre to protect UK from risk of satellite failure

- £36 million investment in new, world-first National Timing Centre to provide additional resilience to public services and the economy against the potential impact of satellite systems failure
- the centre will aim to provide accurate time to 999 responders and the energy grid without relying on satellite technologies
- a further £40 million will be invested in a new research programme, Quantum Technologies for Fundamental Physics, to help the UK lead the world in unlocking the benefits of quantum technologies

The UK's emergency service responders and other critical services could be set for more resilient time systems through the world's first National Timing Centre here in the UK, Science Minister Amanda Solloway announced today (19 February 2020).

The new centre will see a team of researchers, based at sites across the UK, work together to make UK public services and the economy less reliant on satellites through a network of atomic clocks – clocks that use atoms and surrounding electrons to keep track of time – housed at secure locations.

The centre will provide additional resilience for the country's reliance on accurate timing which is currently provided by satellite technologies, and underpins many every day technologies including emergency response systems, 4G/5G mobile networks, communication and broadcast systems, transport, the stock exchange, and the energy grid.

All these currently depend on precision timing from these Global Navigation Satellite Systems (GNSS). Satellite based timing from GPS and similar systems is the most common source. If there were a large-scale GPS failure, economic impact to the UK would be £1 billion a day. Therefore additional land-based technologies will improve the UK's resilience and provide important back-up.

Loss of this accurate data would have severe and life-threatening effects, such as on getting ambulances to patients or getting power to homes around the country.

That is why the government is investing £36 million to create the National Timing Centre, which will ensure the UK economy and public services have additional resilience to the risk of satellite failure.

Science Minister Amanda Solloway said:

Our economy relies on satellites for accurate timing. Without satellites sending us timing signals, everything from the clocks and maps on our phones, to our emergency services and energy grid would be at risk.

I'm delighted that this world-first centre will see our brightest minds, from Surrey to Strathclyde, working together to reduce the risks from satellite failure.

## Leading the world in quantum technologies

Alongside investment in the new Centre, the government is investing a further £40 million in a new research programme, [Quantum Technologies for Fundamental Physics](#). This will help the UK take a commanding lead in quantum technologies on the global stage, by ensuring investment keeps step with similar programmes in the US and China.

Researchers specialising in particle physics, astrophysics and nuclear physics will use quantum sensors – which can detect the very smallest particles – to help locate answers to some of the greatest scientific questions of our time, such as how gravity works.

Results may enable researchers to make important advances in quantum technologies and enable UK businesses to use the new discoveries and developments to create new products and services.

[UK Research and Innovation](#) Chief Executive Professor Sir Mark Walport said:

Our emergency services, energy network and economy rely on the precise time source that global satellite navigation systems provide.

The failure of these systems has been identified as a major risk, and The National Timing Centre programme will help to protect both vital services and the economy from the disruption this would cause while delivering considerable economic benefits.

The Quantum Technologies for Fundamental Physics programme will harness the power of these powerful new technologies to address some of the deepest questions in the physical sciences, bringing together world-leading UK researchers and technologists to make further breakthroughs.

[The National Physical Laboratory](#) CEO Dr Pete Thompson said:

We are proud to be leading the way in providing trusted and assured time and frequency. The work undertaken by the team here has ensure the National Timing Centre programme will provide huge benefits to society, whilst underpinning secure applications in the future.

Today's £76 million investment furthers the government's commitment to significantly boost R&D investment across every part of the UK, including funding transformational technologies and increasing the number of

researchers.

The funding is provided through the [Strategic Priorities Fund](#), which supports high-quality discipline research and development priorities, with investment also going towards autonomous systems and national collections.

## Notes to editors

The centre is not a physical building, but a group of researchers based across several locations. Those locations are the University of Birmingham, the University of Strathclyde, University of Surrey, BT Adastral Park, Suffolk, BBC, Manchester, and the National Physical Laboratory in Teddington.

The investment will build a resilient network of clocks across the UK. It includes £6.7 million which will be made available via [Innovate UK](#) funding calls to SMEs and industry to innovate around timing and clocks.

The UK's current dependence on satellite technologies has been identified by the government as a potential security risk if a satellite were to experience a failure. The Blackett Review in 2018 looked at the UK's vulnerabilities to over-reliance on Global Navigation Satellite Systems (GNSS).

Total investment through the [National Quantum Technologies Programme](#) is set to pass £1 billion since its inception in 2014.

The investment has secured the UK's status as a world-leader in quantum science and technologies, keeping pace with the US and China.

The Quantum Technologies for Fundamental Physics programme will be led by UKRI's Science and Technologies Facilities Council and will demonstrate how quantum technologies can be applied to address fundamental physics questions.

## About the Strategic Priorities Fund

The £830 million Strategic Priorities Fund (SPF) supports high quality multidisciplinary research and development priorities and is delivered through UK Research and Innovation.