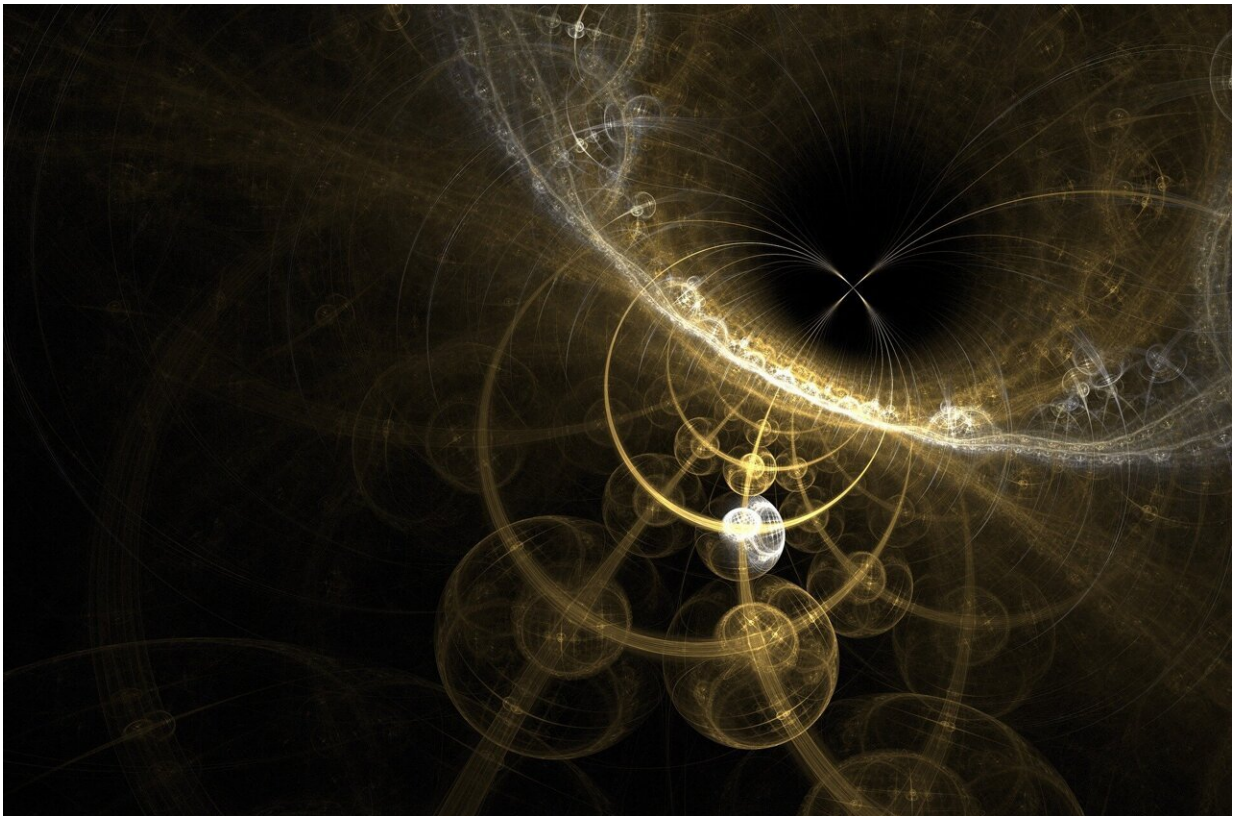


# Importance of the science of measurement in the quantum revolution

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In an article recently published in *Nature Physics*, experts from NPL and partner organizations from around the globe explore the critical role of National Metrology Institutes (NMIs) in the quantum revolution.

You may have heard how [quantum science](#) is causing an impending revolution of science and technology, and its potential to enable quantum computing, uncrackable cryptography and teleportation. This new quantum era is underpinned by metrology, the science of measurement.

Quantum effects are inherent to the international system of measurements, SI—which makes the world go around in a harmonious way. NMIs are in charge of the SI implementation, which demands of them to master the highest level of quantum control.

Based on this expertise, NMIs play a leading role in the evolving world of quantum technologies. From developing new devices for generating and detecting individual quanta, to improving understanding of the latest materials such as graphene, the international NMI community is helping to make the far-reaching possibilities of quantum a reality.

With the quantum revolution underway, the need for independent and impartial testing and evaluation is critical. As National Laboratories, it falls to us to provide this support which enables responsible quantum innovation and industrialization. From established technologies such as [random number generation](#) to less mature technologies such as [quantum computing](#), their development is underpinned by metrology and the unbiased testing it enables. Our expertise and impartiality is needed to write the rulebooks—standards—for new quantum technologies. In a virtuous cycle, we are able to exploit novel quantum technologies for the benefit of [metrology](#) itself, which in turn benefits society.

**More information:** Alexander Tzalenchuk et al, The expanding role of National Metrology Institutes in the quantum era, *Nature Physics* (2022). [DOI: 10.1038/s41567-022-01659-z](https://doi.org/10.1038/s41567-022-01659-z)

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