Image: Commercially available atom interferometer

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Credit: ESA–G. Porter

A commercially available 'atom interferometer' – exploiting clouds of ultra-cold atoms to make extremely precise measurements of variations in local gravity – on show during ESA's inaugural Quantum Technology workshop.

"We've been looking at applying the latest quantum technology to space," explains ESA's Bruno Leone. "Quantum physics is still regarded as abstract, but products based on its effects are commonplace today, such as microprocessors, solid-state imaging devices and lasers.

"What we're interested in harnessing more advanced, subtle, aspects of quantum mechanics, including superposition and entanglement, made feasible by recent advances in experimental techniques and equipment."

This desk-sized atom interferometer, produced by M Squared in the UK, is one example. Finely tuned laser beams confine clumps of atoms kept cooled close to absolute zero. Like ripples meeting on a pond, their resulting interference patterns can highlight tiny changes in the surrounding environment.

Topics at last week's event included ultra-accurate quantum-based measuring devices and clocks for space and wider commercialisation of the underlying technologies.

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