



Credit: University of Glasgow

Scientists have developed the most sensitive Micro Electromechanical gravity Sensor (MEMS) ever.

Smartphones contain a MEMS which rotates the image on the screen when the phone is tilted. Larger and more sensitive gravity sensors can also be used to look for things underground, such as fossil fuels.

These more sensitive gravity sensors are bulky and expensive, weighing in at over 8kg and costing more than \$100,000.

The new MEMS system is less than 2cm in size and is sensitive enough to detect the orbit of the Moon around the Earth, and the Earth around the Sun.

The orbits can be detected from the "Earth tide", where the Moon and Sun's gravity interact with the Earth's gravity. This result has been published in the prestigious journal Nature.

The development of the new MEMS was funded by an STFC Global Challenge Concepts award and the Royal Society's Paul Instrument Fund.

MEMSs are cheaper to produce than other gravity sensors.

This means they could be used for security to detect illicit tunnel digging. A network of small and sensitive gravity sensors could also provide early warning of volcanic eruptions, allowing quicker evacuation and saving lives.

The research team is part of QuantIC, the UK's centre of excellence for research, development and innovation in quantum enhanced imaging. This will allow them to continue developing the MEMS to help deal with weighty issues.

“ There are a lot of potential industrial, and humanitarian applications for gravimeters, but their cost and bulkiness have made them impractical in many situations... ”

Richard Middlemiss, University of Glasgow