Written by Marco Attard
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A team of IBM researchers manage to observe an "elusive gravitational effect" on Earth-- a phenomenon previously thought possible only "hundreds of light years away," and one that could lead to improvements in the energy-conversion process in electronic devices.

But what does an elusive gravitational effect involve? It is, essentially, an unusual quantum effect scientists theorised could take place within quark-gluon plasma (GDP), the strange, soupy substance that made the universe back when it was little more than a few microseconds old. The quantum effect involved in the IBM experiments is known as the axial-gravitational anomaly, and breaks the conservation laws of classic physics such as charge, energy and momentum.

To observe the axial-gravitational anomaly here on Earth, the scientists used Weyl semimetal, a material similar to 3D graphene, inside a cryolab at the University of Hamburg using high magnetic fields. Weyl semimetal has two kinds of electrons, but when placed inside the cryolab mimicking the conditions of the early universe the electrons change from one type to the other.

"For the first time, we have experimentally observed this fundamental quantum anomaly on Earth which is extremely important towards our understanding of the universe," lead researcher Johannes Gooth says. "We can now build novel solid-state devices based on this anomaly that have never been considered before to potentially circumvent some of the problems inherent in classical electronic devices, such as transistors."

IBM claims the discovery can affect the computing industry in its entirety, from tiny transistors to cloud datacentres, and will open a "rush of new developments" in sensors, switches and thermoelecric coolers, as well as energy-harvesting devices.

Go IBM Scientists Observe Elusive Gravitational Effect in Solid-State Physics