Strongest magnetic field trapped in a superconductor is a world record

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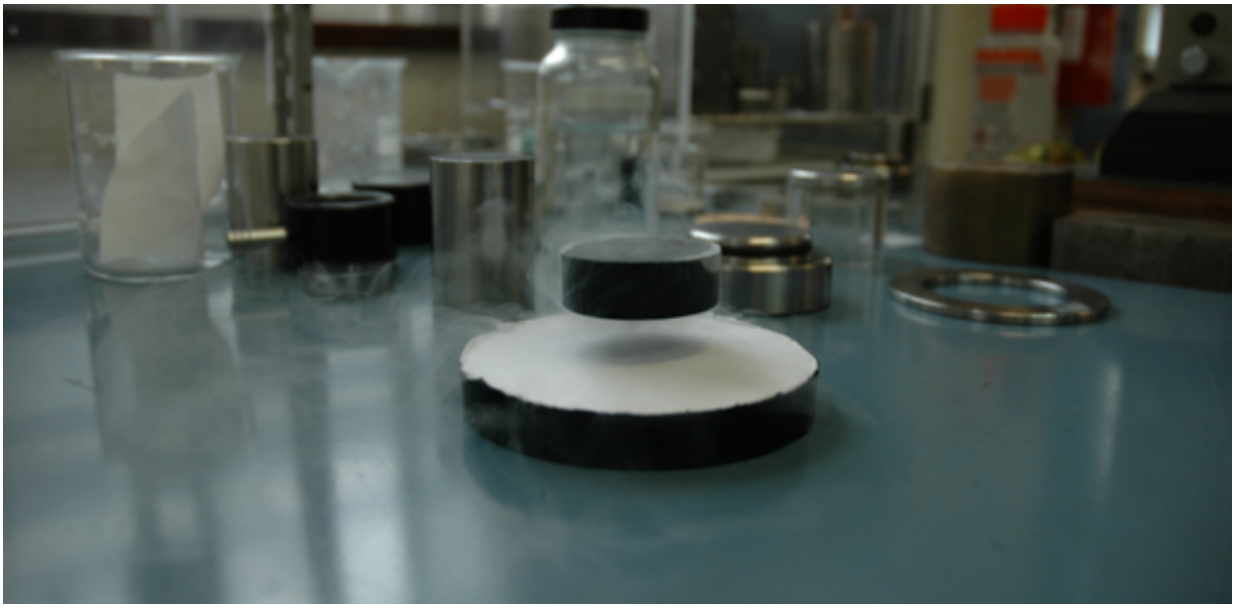

A bulk superconductor levitated by a permanent magnet. Credit: University of Cambridge

A world record for a trapped field in a superconductor, was achieved in 2014 by a team of engineers led by Professor David Cardwell.

Harnessing the equivalent of three tonnes of force inside a golf ball-sized sample of material that is normally as brittle as fine china, the team beat a record that had stood for more than a decade and the record has now been officially recognised by the Guinness World Records.

The Guinness World Records website says "A world record for a trapped field in a superconductor, was achieved in 2014 by a team of engineers led by Professor David Cardwell. The strongest magnetic field trapped in a superconductor is 17.6 tesla, achieved by researchers from the University of Cambridge (UK), the National High Magnetic Field Laboratory and the Boeing Company (both USA), as published in *Superconductor Science and Technology*, on 25 June 2014.

"The team used gadolinium boron carbon oxide (GdBCO) which is typically very brittle, then doped the structure with silver, and 'shrink wrapped' steel around the thumb-sized object to increase its strength. Superconductors which trap strong magnetic fields have a wide variety of applications, from Maglev trains to electricity storage."

17.6 Tesla is roughly 100 times stronger than the field generated by a typical fridge magnet - beating the previous record by 0.4 Tesla.

The research demonstrates the potential of high-temperature superconductors for applications in a range of fields, including flywheels for energy storage, 'magnetic separators', which can be used in mineral refinement and pollution control, and in high-speed levitating monorail trains.

Provided by University of Cambridge