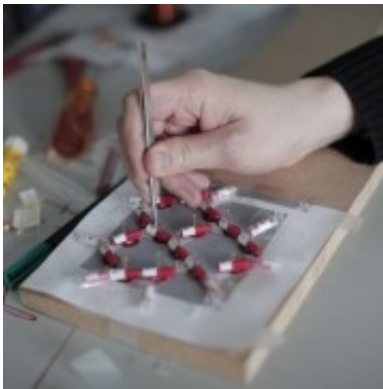


New material is a breakthrough in magnetism

April 12 2010, By Lucy Goodchild



(PhysOrg.com) -- Researchers from Imperial College London have created a structure that acts like a single pole of a magnet, a feat that has evaded scientists for decades. The researchers say their new *Nature Physics* study takes them a step closer to isolating a 'magnetic monopole.'

Magnets have two [magnetic](#) poles, north and south. 'Like' poles, such as north and north, repel one another and 'opposite' poles, such as north and south, attract. Whichever way a magnet is cut, it will always have these two poles.

Scientists have theorised for many years that it must be possible to isolate a '[magnetic monopole](#)', either north or south on its own, but until

recently researchers have been unable to show this in experiments.

Researchers at Imperial have now enabled tiny nano-sized magnets to behave like magnetic monopoles, by arranging them in a honeycomb structure. In late 2009, [various teams of scientists](#) reported they had created monopole-like behaviour in a material called ‘spin ice’. In these materials, monopoles form only at extremely low temperatures of -270 degrees Celsius. The Imperial researchers’ structure contains magnetic monopoles at [room temperature](#).

[In this video](#), Dr Will Branford and Dr Sam Ladak, from the Department of Physics at Imperial, explain how magnets work and why they are so excited by their new breakthrough.

More information: “[Direct observation of magnetic monopole defects in an artificial spin-ice system](#)” *Nature Physics*, Sunday 11 April 2010.

Provided by Imperial College London

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