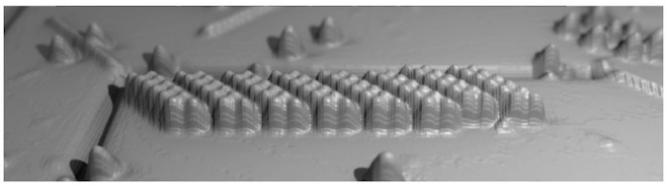
Written by Marco Attard
19 January 2012

Researchers at IBM manage to store one bit of data using just 12 atoms-- creating the smallest magnetic storage device in the world while determining the atomic limits of magnetic storage.



In comparison, today's HDDs use around 1 million atoms to store 1 bit of data.

The atom-scale breakthrough seen at IBM could result in magnetic storage devices with data densities at least 100 times more than current HDDs and solid state memory. IBM says "as components continue to shrink, the march continues to the inevitable end point: the atom. We're taking the opposite approach and starting with the smallest unit-- single atoms..."

How does one get to store data one 12 atoms? IBM researchers used a scanning tunneling microscope (STM) to build the 12-atom structure using the properties of "antiferromagnetism" (where atoms point in opposite directions, stopping them from interfering with each other). The operation took place at 1 degree Kelvin-- or -272 degrees Celsius.

Atom-scale storage is still far away from commercial applications-- no one knows how to work on such tiny scales cheaply and outside a lab... yet. IBM still predicts a future of charm-sized storage devices carrying immense amounts of data. We just hope to get to see in our lifetimes...

Go IBM Research Determines Atomic Limits of Magnetic Memory