

Pushing the limits of hard disk storage

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Just how much data can we cram onto a hard disk? In a paper appearing online today in *Physical Review Letters*, EPFL (Ecole Polytechnique Federale de Lausanne) Professor Harald Brune and his colleagues report what they believe to be the ultimate density limit of magnetic recording.

His group created a self-assembled lattice of non-interacting two-atoms-high islands of cobalt on a single-crystal gold substrate. The islands' density -- 26 trillion islands per square inch -- is the highest yet recorded and 200 times the bit density of current computer hard disks. The magnetic properties of the islands are the most uniform ever recorded, and because the islands don't interact with each other, they can each hold one bit of data.

However, it's not a storage medium "ready to use" because these records were posted at the uncomfortably cold temperature of -223 C! Above this temperature, thermal excitation starts to reverse the magnetization and the information in the memory gets volatile.

Brune and his colleagues are still trying to solve this blocking temperature problem using bi-metallic islands of 500-800 atoms that can maintain the desired magnetic properties at room temperature.

On the web: ipn2.epfl.ch/LNS/index.htm

Source: Ecole Polytechnique Fédérale de Lausanne

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