

By: [Magdalena Torneanu](#), Science Editor

## [Magnetic Handedness Points to Improved Magnetic Storage Devices for Computers](#)

### *Chirality in nanoscale magnets*

New findings prove that nanoscale magnets and their chirality could lead to the fabrication of greatly improved magnetic storage devices for computers, with the help of the emerging field of spintronics. Chirality is an asymmetry property important in several branches of science. An object or a system is called chiral if it differs from its mirror image and its mirror image cannot superimpose on the original object. Matthias Bode, a scientist at the Center for Nanoscale Materials at Argonne National Laboratory and his colleagues performed the new study and found out that this chirality, a spiral-like handedness appears in nanoscale magnets and could be used in data transmission and manipulation in spintronic devices. "Spintronics" is an emerging field that deals with the use of the "spin" of an electron for storing, processing and communicating information and it has known an important recent advance that may one day manifest itself in a new generation of smaller, smarter and faster computers, sensors and other applications... "In nature many systems have chirality, such as elementary particles with electro-weak interactions organic molecules, hurricanes and even galaxies. Solids with magnetic order of unique chirality are prime candidates for applications, because their peculiar symmetry allows the mixing of electronic, optic, magnetic and structural properties," said Bode. Using spin-sensitive scanning tunneling microscopy (STM) and first-principles electronic structure calculations, the scientists were able to identify the magnetic order and observe the magnetism of single atoms. Their results proved that under a magnetic field the pattern shifted in a given direction, which identified the unique chirality. "In the past, this interaction had been considered unimportant in the scientific community," Bode said. "Now its relevance in nanostructures of any dimensionality such as thin films or magnetic particles is realized." Future applications, even if still distant, are promising, with far-reaching technological consequences, even besides the storage and processing of data.