Friday, 25 November, 2016

FET-Open project MAGicSky is neither about magic, nor about looking at the stars. Its very down-to-earth objective is to significantly improve information storage capacity and speed of information processing. In other words, MAGicSky research aims at developing extremely small and powerful memory elements.

**Spintronics:**

Current data storage devices use the charge of electrons to store and transfer information. Besides the charge though, electrons also have a spin, and this is exploited in the field of spintronics, the combination of spin and electronics. In electronics, the current is driven by electrical fields resulting in ever bigger energy consumption for our growing data transport needs. In spintronics the driving and control are based on magnetic manipulation, which may reduce the energy consumption.

**Magnetic Skyrmions:**

Skyrmions are named after British mathematician Tony Skyrme who first described them theoretically in 1962. Magnetic skyrmions are nano-size spin configurations with stable topological properties. They can be moved by magnetization induced by extremely small electrical currents which makes them very promising for highly efficient memory storage. Until recently, skyrmion structures have been experimentally demonstrated only under external strong magnetic fields or at low temperature in bulk materials and in ultrathin films. Nowadays it is possible to create and manipulate skyrmions with magnetic field, electric field or temperature in a controlled environment.

**The project:**

MagicSky stands for MAGnetic Skyrmions for future nano-spintronic devices. The research partners explore new materials and techniques, with which skyrmions can be stabilised and manipulated. The ultimate goal is to manipulate skyrmions individually in devices at room-temperature. The resulting
stable, nano-scale skyrmions will go far beyond current technology for information storage. The next generation of storage devices based on skyrmions will contain bits of a few nanometers only. Speed and efficiency of the writing and reading of information will be significantly improved compared to current devices. And finally, energy consumption will drop due to the low-density current necessary for skyrmion-based devices.

More information is available on the website of this EU-funded project [2].

**Project:**
Magnetic Skyrmions for Future Nanospintronics Devices

**Project coordinator:**
CNRS, France

**Project Acronym:**
MAGicSky

**Project website:**


Links