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Nanomagnetism[1]

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Nanomagnets have excellent potential for enhancing existing technologies such as magnetic storage media and magnetic sensors and they may also find new applications in biomedicine and spintronics, devices that exploit not only the charge of the electron but also its spin. In general, the magnetic properties of ferromagnets can be understood in terms of competition among the magneto-crystalline, exchange, and magnetostatic energies due to long range dipole-dipole interactions. Confinement in nanomagnets alters their energetics and leads to new magnetic states and interfaces also become increasingly important on these length scales. We have used a variety of time- and frequency domain experimental techniques, combined with numerical micromagnetic simulations to explore and understand the magnetization dynamics in nanomaterials. I will discuss some of the interesting research topics in the field, including the dynamic properties of magnetic vortices that are often found in the ground state of magnetically soft patterned structures.

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