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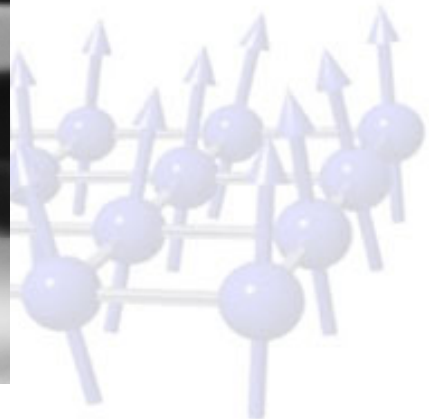
**Solitary spikes and self-propelled streams -
an experimentalist's voyage into the mag(net)ic world of
ferrofluids**

Ferrofluids are an outcome of nano technology long before this term even existed. These colloidal dispersions of magnetic nanoparticles respond to magnetic fields in many ways. Particularly interesting is a plain layer of ferrofluid in a constant, homogeneous magnetic field. When a critical value of the applied magnetic field is surpassed, a hexagonal array of liquid spikes emerges. Moreover square and stripe-like patterns as well as solitary spikes can be observed. We are measuring the surface relief by means of an X-ray technique and compare the results with the predictions of linear and nonlinear theory and FEM simulations.

Another spectacular effect is found when the ferrofluid is exposed to a rotating magnetic field. We measure the spin up of flow due to a magnetic surface stress ("magnetic pump") and compare it with model descriptions. Experimental demonstrations are included.



Abb. Ferrosoliton



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