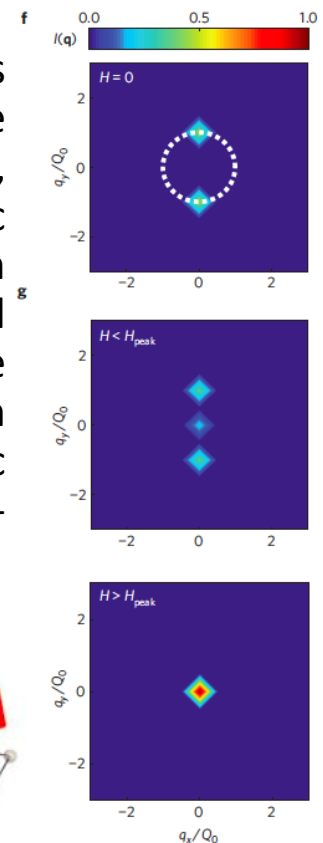
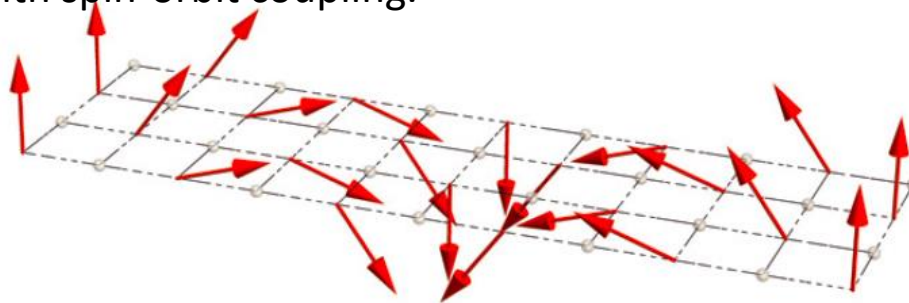


OSU Researchers Offer Explanation for Strange Magnetic Behavior at Semiconductor Interfaces

Discovery Could One Day Lead to Electronic Materials that Provide Both Computation and Data Storage

The electronic properties of the polar interfaces between insulating oxides has been intensely investigated in recent years. An exciting new development is the observation of robust magnetism at the interface of two non-magnetic materials, LaAlO_3 (LAO) and SrTiO_3 (STO). OSU researchers have presented a microscopic theory for the formation of local moments and their ordering that depends on essential features of the LAO/STO interface, such as the splitting of orbital degeneracy and a gate-tunable Rashba spin-orbit coupling. They predict that the zero-field ground state is a long-wavelength spiral and show that its evolution in an external field accounts semi-quantitatively for existing magnetic measurements. Many of the ideas developed are relevant more generally for two-dimensional magnetic systems with spin-orbit coupling.

The zero-field spiral ground state is shown immediately right. The evolution of the spin structure factor as a function of applied field H is shown on the far right.



More info available: <http://cem.osu.edu/2013/10/01/cem-researchers-theory-first-to-explain-phenomenon/>