



Art Topic: Spin

People of all ages find the behavior of rapidly rotating objects, such as tops and gyroscopes, fascinating. They can seem to defy gravity. As their spin increases, they get harder to re-orient, and they show strange “sideways” responses to being pushed. These effects are entertaining to children, helpful to bicyclists, and useful to engineers. Gyros help to keep airplanes and spacecraft on course.

The Earth’s spin gives us night and day, and those cycles drive wind and weather.

In the quantum world, spin is a basic property of elementary particles. Electrons never cease spinning. This makes electrons into tiny magnets, like the earth. We can store information in the direction of electron spins, with two opposite directions encoding “1” and “0”. Classical computers do this crudely, using many electrons that are roughly aligned. Eventually, we hope, computers will use individual electron spins. If we can learn to manipulate electron spins skillfully, we will gain new powers to process information much faster, while producing less heat.

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