

Challenging our Understanding of Gravity



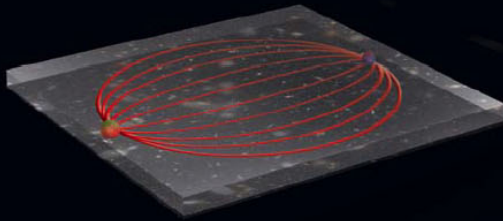
Tabletop Experiments

Some paradoxes of particle physics can be investigated in surprisingly direct ways. Measuring the force of gravity extremely carefully with a tabletop apparatus could reveal the existence of hidden dimensions.

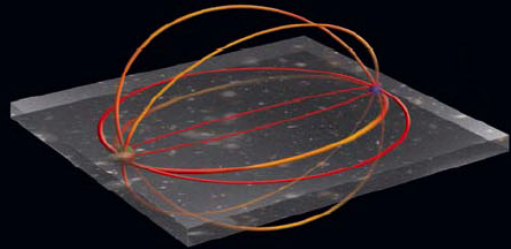
The astonishing possibility is that, at very short distances, gravity may no longer follow Newton's Law (force of gravity varies inversely with distance squared). The actual strength of gravity at less than 1/32 inch (0.8 mm) is being tested using exquisitely sensitive instruments, such as the precision torsion pendulum at the left. A deviation from Newton's Law would be evidence for hidden dimensions.

Gravity and Hidden Dimensions?

Gravity is so weak that a tiny magnet can hold up a paper clip against the gravity of the entire Earth. Perhaps gravity is weak because its effect is spread out over more than three space dimensions, while stronger forces like magnetism are confined to just the three dimensions we perceive. Notice that the field lines below are more spread out in three dimensions than in two dimensions. The same would be true comparing four dimensions to three dimensions.



ELECTROMAGNETISM?



GRAVITY?

A tiny magnet exerts greater force than Earth's gravity.

General relativity tells us that gravity warps all of space and is therefore sensitive to all the dimensions of space.

