theory if it were found to take the form

$$F_{12} = \frac{G m_1 m_2}{|\underline{x}_2 - \underline{x}_1|^2} \frac{(\underline{x}_2 - \underline{x}_1)}{|\underline{x}_2 - \underline{x}_1|}$$

since the first is form invariant under the Galilean transformation, but the second is not. In particular laws of physics may not involve velocities in determining forces, since velocities are not value invariant under Galilean transformation but forces are taken to be, the law would not be form invariant.

In Newtonian theory planets describe ellipses around the Sun at (approximately one focus), just as Kepler deduced. In fact, Kepler's and Galileo's empirical laws of motion of ~~heavenly bodies~~ planets and bodies near the earth respectively can be deduced from Newton's law of gravity.

Newton thought of light as particles but (his own) refraction experiments and diffraction experiments by Young implied light as waves. Waves have no mass; they would therefore be unaffected by the force of gravity and should move in straight lines.

Newtonian theory was very successful, ~~predi~~ explaining much, and predicting for example, the existence of the planets Uranus and Neptune, later found.

Electromagnetism developed as a science in the 19th and was put on