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Unification of gravitational and electromagnetic forces

It has been a dream of physicists to unify all the fundamental forces over at least a century. The Grand Unification Theory (GUT) requires an unbelievably high energy in the order of 10^{16} GeV and an accelerator larger than the solar system. It is apparently beyond our reach in the foreseeable future. The last stage of this dream is the Theory of Everything (ToE), which includes the gravitational force in its unification, which requires an even higher energy—known as the Planck energy scale, about 1000 times higher than the GUT energy scale. Moreover, it has been realized that general relativity is incompatible with quantum mechanics. The approach of describing gravity in the framework of quantum field theory fails at short distances of the order of the Planck length. Recently, we have developed a theory with mathematical rigor to unify the gravitational and the electromagnetic forces strictly within the classical framework by generalizing Newton's law of gravitation to include a dynamic term inferred from the Lorentz force of electromagnetic interaction. An entire dynamic theory including a wave equation of gravitation is developed without any additional ad hoc hypothesis. The wave equation and its solution naturally solve the mystery of action-at-distance. It has been discovered that the inverse square law of the static and the dynamic forces is the result of the conservation of mass (Gauss's Law) and the total momentum (Wang's Law). The gravitational and the electromagnetic forces are unified in the sense that these two forces and their propagation can be described by exactly the same set of equations.

Biography

Ling Jun Wang is a physics professor at University of Tennessee at Chattanooga of USA. His major interest is in theoretical physics (particle physics, relativity and cosmology). He has many fundamental issues with relativity and the Big Bang cosmology. The details can be found in his publication "Hundred years of general relativity – a critical view" and other related publications. Ling Jun Wang have proposed an alternative theory "Dispersive Extinction Theory (DET)" to explain the cosmic red shift instead of ascribing it as due to the expansion of the universe [Physics Essays, 18, 2 (2005)]. DET allows a stable universe infinite in space and time. My most recent work is "Unification of gravitational and electromagnetic fields" which is published in Physics Essays 31, 1(2018).

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