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The origin of gravity and velocity of light

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Abstract

The classical Newton formula $F = G\frac{Mm}{r^2}$ reveals the law of gravity of celestial bodies and everything, but does not explain the cause of gravity. General relativity says that gravity doesn't exist, but is a curvature of space-time. Quantum mechanics suggests the existence of so-called gravitons, but so far none have been found. Quantum mechanics can't explain gravity, relativity can't explain quantum mechanics, and gravity and electromagnetic theory are still not unified. It is pointed out that the gravitational constant $G = \frac{1}{16\pi c}$, π is PI, c is numerical value of velocity of light. The essence of gravity is the fluctuating pressure of particles in a vacuum.This paper is also an attempt to unify the theories of gravity and electromagnetism.

Keywords: The gravitational constant； velocity of light； Vacuum fluctuation； Particle pressure

Introduction

1 The formula for gravitation

Newton's formula for gravitation:

$F=G\frac{\mathbf{Mm}}{\mathbf{r^2}}$, $G\approx 6.67\times \mathbf{10^{-11}m^3kg^{-1}s^{-2}}$, G is the gravitational constant.

Between two objects (particles),gravitation is proportional to the product of the mass and inversely proportional to the square of the distance.

Let us suppose $\mathbf{G=\frac{1}{16\pi c}}$, π**is PI**, c **is numerical value of velocity of light**, The dimension of c is the reciprocal of the gravitational constant G.

$\boldsymbol{\pi}\approx 3.14159$, $c\approx 2.997\times \mathbf{10^{8}m^{-3}kgs^{2}}$, $\mathbf{G}\approx 6.64\times \mathbf{10^{-11}m^{3}kg^{-1}s^{-2}}$

Since $\frac{\mathbf{1}}{\mathbf{16}}$ is the limit value, the current experimental value of the gravitational constant G is slightly larger than normal value.

2 The relationship between gravity and the density of celestial body

Let the mass of the earth be M, the radius be r, and the mass of an object on the earth be m,

$F=G\frac{\mathbf{Mm}}{\mathbf{r^2}}$, $\mathbf{G=\frac{1}{16\pi c}}$

$F=\frac{r}{12c}\times\frac{\mathbf{Mm}}{\mathbf{4/3\pi r^3}}=mg$,

The acceleration of gravity at the Earth's surface $g=\frac{r}{12c}\times\rho$, $\rho=\frac{\mathbf{M}}{\mathbf{4/3\pi r^3}}$

ρ is the average density of the earth, $r\times\rho$ is the density pressure of the earth，

$\frac{r}{12c}\times\rho$ is the earth's particle pressure.

$\frac{1}{12}$,That's the difference of infinity.

Particle pressure $=$ density pressure $\times\frac{1}{12c}$, $c\approx 2.997\times \mathbf{10^{8}m^{-3}kgs^{2}}$

That is, the two are multiples of Lightspeed value.

The particle pressure of the Earth is numerically equal to the acceleration of gravity at the surface of the Earth.

Let the density of the earth 5520$\mathbf{kgm}^{-3}$, The radius of the earth r 6370000m,

The acceleration of gravity at the Earth's surface

$g=\frac{r}{12c}\times\rho=\frac{5520}{12c}\times 6370000\mathbf{kgm}^{-2}\approx 9.78\mathrm{m}\mathbf{s}^{-2}$

For any celestial body with constant radius r, the higher the density, the greater the acceleration of gravity, the greater the gravity.

For any celestial body, the higher the density pressure, the greater the gravitational acceleration, the greater the gravity.

If this object m is 2r from the center of the earth, the density pressure is 1/4 of the original pressure,

$\mathbf{g}'=\frac{2r}{12c}\times\frac{\mathbf{M}}{\mathbf{4/3}\pi(\mathbf{2r})^{\mathbf{3}}}=\frac{1}{4}g$, Its centripetal acceleration is also 1/4 of the original,

Its centripetal acceleration is equivalent to the gravitational acceleration of the Earth's surface when the Earth's mass is unchanged, the radius is expanded by 2 times, and the volume is expanded by 8 times.

3 Particle pressure comes from quantum vacuum fluctuations

Gravity is impossible in an absolute vacuum.

Dirac thought: vacuum is not empty, vacuum is full of electron plus and minus the Dirac sea, thus forming the quantum vacuum fluctuation.

Conclusion

In this paper, we give a new expression to the classical law of gravitation. We believe that gravitation is closely related to velocity of light, and also to quantum mechanics.

References

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