Derivation of the gravitational constant

In the previous Chapters we have dealt with the particles in the microcosm. The universe is dominated by gravity in the macrocosm, in the solar systems and galaxies. In contrast to the other fundamental forces the gravitation can not be shielded and only acts attractive.

The gravity is noticeable from certain magnitude dimensions and it is only a modified form of elementary magnetism. It applies since its discovery by Newton as a universal attraction that holds together the entire universe. Here, the magnetism in the space balls is the actual universal force that holds the universe together. Mit der Massenanziehung, die die Gravitation beschreibt, kann man das gesamte Universum nicht erklären weil das Universum hauptsächlich aus "leeren" Raum besteht und die beobachtbare Masse nach den jüngsten Forschungsergebnisse nur 4 Prozent ausmacht.

In the 2^{nd} Chapter, we have already learned that mass and charge belong together and each particle with mass also includes a charge. This relationship between mass and charge becomes noticeable as of a certain size dimension of the gravitational force. The interaction of charge and mass can be calculated with the following gravitational constant.

$$G = 3\frac{1}{3} \cdot \hbar \cdot c \cdot \frac{1}{4\pi \cdot \mu_0}$$

The gravitational constant G is the ratio between the attraction force $\hbar \cdot c$ in the space balls and the magnetic factor with the vacuum permeability factor on a spherical surface $\frac{1}{4\pi \cdot \mu_0}$ in the form of $\frac{\hbar \cdot c}{4\pi \cdot \mu_0}$.

With the quantized charge $Q_P = \frac{\hbar \cdot c}{\pi^2}$ and the induction constant $\mu_0 = 4\pi$, it is possible to formulate this context as follows:

$$G = 3\frac{1}{3} \cdot \frac{Q_P}{16}$$

The coefficient of 3.333 ...in gravitational constant is a time factor and this topic, we will discuss in the next Chapter.

In summary form we finally obtain the gravitational constant with:

$$G = \frac{Q_P}{48}$$

With the calculated Value of:

$$G = 6{,}6751190736246400 \cdot 10^{-11}.$$

According to CODATA, the gravitational constant is:

$$G = 6{,}67384 \cdot 10^{-11}.$$

The deviation from the CODATA value is

$$0{,}001279073624637630 \cdot 10^{-11}.$$

The measurement of the gravitational constant in different laboratories showed the following values and the average value is very consistent with our calculation:

Laboratory	**G · 10^11**
New Zealand MSL	6,6742000
Zürich	6,6749000
Wuppertal	6,6735000
BIPM	6,6830000
Karagioz (Russia)	6,6729000
Luther/Towler 1982	6,6726000
Average	**6,6751833**

In macroscopic length scales, the relation between the quantized charge and the special proton density, makes itself noticeable according to the gravitational acceleration which was derived in the last Chapter. The density as the ratio between the mass and volume knowingly describes how the particulate mass is dispersed in a particular space. The bonding force between the particles ensures the cohesion of the particles, and this is caused by the charge/load. Accordingly, there is a direct relationship between the gravity of charge and the mass of particles.

The gravitational force between two objects at a distance of r is defined as:

$$F_G = G \cdot \frac{m_1 \cdot m_2}{r^2}$$

We use the derived gravitational constant, and obtain the relationship between the mass and the quantized charge in the gravitational force with:

$$F_G = \frac{Q_P}{48} \cdot \frac{m_1 \cdot m_2}{r^2}$$

The gravitational force thus describes the interaction of the charges and masses between the particles. The charges of the microscopic particles and the resulting mass as inertial force cause a mutual attraction between the particles and ultimately also between the macroscopic bodies.

The gravitational force is created at the smallest dimensions, but due to their low strength and low particle density other forces do dominate. The quantized charge with their interactions namely dominates the smallest dimension. Only with large dimensions, the immense force of gravity is noticeable, because the volume increases with the material it contains.

The gravity makes itself noticeable in the presence of mass and charge. Like any other power this not an infinite range- as previously thought, but it is limited. Nevertheless, its coverage in the macrocosm is enormous. Even the gravitational attraction between the Earth and the Sun over a distance of about 150 million kilometers alone shows its immense macroscopic effect.

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The gravity, like all other physical phenomena also has its origin in the Planck level. The principle of the summation causes that even the smallest forces in the smallest dimension do reach unbelievable levels in larger dimensions by summation. However, this only works because the other forces lose their effect as of certain scales because of their short reach.

The magnetism in the space balls that produces charge by interaction with other space balls and brings them into fore as counterforce mass, simultaneously causes gravitation. Intuitively this can be imagined as follows: Due to the charges and the resulting mass smallest particles are created; and between these particles the gravitations acts as a gravitational attraction. Thus, infinitely many tiny particles in a vacuum do exist between the earth and the sun in the smallest dimensions, which combine the particles of earth with the particles of the sun like a pearl necklace by the mutual attraction in the form of gravity.

It is possible to describe these tiny particles as "**dark matter**". Due to their small size, they show little interaction with the macroscopic particles. However, they continue to transmit the gravitational force over long distances. With increasing distance from the Sun in the interstellar medium, the particle density of the "dark matter" becomes smaller in the quantized level and thus, the gravity force increasingly loses its influence.

The futile search for gravitational waves and the principle of action at a distance for the gravity can thus be explained by the new world model. In the later Chapter on the expansion of the universe, we will discuss the limited reach of the gravity.