NQG (Nova Quantum Gravity): Theory of initial generation of only one particle in the Big Bang

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Abstrast

In contrary to the Standard Model, we present a theory and modality by which in the Big Bang not all elemental particles and antiparticles that exist today were produced at once and in the same amount, but very probably initially only one type of particle, the down-quarks, which were emitted by the extreme thermal radiation during Big Bang. This is a much more realistic scenario compared to the Standard Model. The theory can be proofed impressively by the anomalous magnetic moment of the muon. In the further we describe the generation mode of all other common elemental particles starting from the down-quarks during the expansion phase of the young universe.

The new theory

The core of this theory is that in the Big Bang initially only one type of particle, the down-quarks, were formed by an extreme thermal radiation (heavy bosons), which is a much more realistic scenario compared to the Standard Model (1), by which all particles and antiparticles were created in the same amount. The universe directly after the Big Bang and inflation was just as big as the earth. At this time, first duplets and triplets of down-quarks (d-quark) were formed. From this, (ddd)-Δ(-)-baryons were created, which are not stable and decayed in neutrons and protons. This process characterizes the initial nuclear power. Shortly after, at about 1.3 $.10^{20}$ K, collisions favored the splitt off of a down-quarks in neutrons, the exchange particle of the d-quark splitt off, a up-quark (u-quark), was held and formed the duu-proton. Neutrons predominated at this time, which, as a sphere, have an inertia factor of 2/5. Shortly thereafter, a muon with a mass of 48.489-

times the up-quark mass and an emission velocity of 0.9976c, was emitted to fulfill the energy maintanance principle (answer to quark bond rupture). The separated d-quark was decelerated, which was slowing down from 0.994c to $8.75.10^7$ m/s, and losed 88.99% of its mass, while an electron was created. The exchange force, which is mediated by collisions and leads to quark bond rupture, is approx. 100 times greater during the 1st d-quark splitting off and is expressed in the muon emission.

Within 5 µs, the muon energy decays and the neutron has now been converted into a proton. The decay of the muon creates two neutrinos, which are emitted. The created electron characterizes the Coulomb force. The decay of the W-boson, which takes place in exactly the same way at much lower temperatures (2nd neutron decay), characterizes the weak interaction. Due to the lower temperature, the gravitational collision force in this process is 10^{11} times smaller than in the first neutron decay and accordingly occurs much less frequently.

The d-quarks were originally neutral and received their charge after the electron was separated from neutrons (2d + u = 0, d + 2u = +1, d = -1/3, u = 2/3). The nuclear force orignitates from the answer to quark bond breakage, while the split off of a d-quark, releasing an u-quark, has defined a new force interaction, which was not described before.

The second d-quark spiltt off was favored after a significant increase in collisions, at $3.16.10^5$ times lower temperatures, at a time when the universe was as great as the distance from Earth to the Moon, at which residual neutrons decayed to protons, releasing a W-boson (borrowed energy from neutrons) and decayed to protons. The W+-boson was formed after collision with other protons or neutrons, releasing a u-quark, which decays into a positron and a neutrino.

Unification of the four fundamental forces

Since all exchange particles have wave properties, the resolved binding energy can be described as

$$ov = m_a c^2 = \frac{hc}{\lambda} \qquad (1)$$

(o is the potential between the interacting particles, v is the interacting property, ma is the mass of the exchange particle, and λ is the wavelength of the particle wave). Since

$$hc = \frac{e^2}{2\varepsilon_0 \alpha} \qquad (2)$$

it follows that

$$nov\alpha = 1; n = 2\frac{\lambda\varepsilon_0}{e^2} \qquad (3)$$

(α is the fine structure constant, $\lambda = h/2m_a v_a$, m_a and v_a the mass and velocity of the exchange particle).

This means that from the initially emitted d-quarks out from an extreme heat radiation in the course of the expansion of the young universe, many other particles were created.

Proof of the theory

From this unified formula novα =1 one can also calculate the W-boson mass, using the life time of the W-boson (3.10^{-25} s) and the mean velocity and the fact that the W-boson emission is the answer to the quark bond breakage. The result is a value of 80,433.6189 MeV fits the data of the many runs (4), which is 70 MeV greater than the Standardmodell predicts and no longer compatible with this, as also found by the most recent exact measurements (4) (80435 +/- 9.6 MeV). These new measurements have recently challenged the Standard Model (4). From this formula the exchange particle of the 1. fundamental force, the u-quark, can also be calculated as 2.15121184999 MeV/c^2.

Also, the muon's anomalous magnetic moment is 4.2 standard deviations larger than the Standard Model predicts and is no longer consistent with it (5). The emission velocity of a muon from the neutron is not c but only 0.994c, the moving mass of a muon can be calculated according to DeBroglie as E/vc and has the same value like the mass, which can be calculated using the nova formula. If one consider that the muon is emitted together with the down quark, one has to use a mass correction, the term ($1+m_q/12\pi m$) actually gives a number of the size 1.0011659 (mq = 4.64 MeV/c2, m is the mass of the muon = 105.658369 MeV/c^2), which corresponds to the anomalous magnetic moment of the muon (5). From this, one can also calculate the exact mass of a down quark, since the anomalous magnetic moment is well known: it is 4.644125534 MeV/c^2. This also shows that muons were actually emitted from neutron decay during the expansion phase shortly before the Colomb force was created. The muon emission at the 1st neutron decay would be a 5th fundamental force, already assumed, which is slightly larger than the Coulomb force and was split off at approx. 10^{20} K, resulting in a so-called leptoquark, a combination of a d-quark and a muon, in the 2nd neutron decay another combination of a W-boson and a d-quark, which are only short-lived and decay into an electron and its antineutrino. This could help to understand the extraordinary measurements of recent times. When applying the mass correction proposed here, all number series and corrections contained in the Standard Model are omitted.

Derivation: The magnetic flux density B and the magnetic and rotation moment are calculated from

$$F=evB=\frac{e\hbar}{(2m*(1+m_q/12\pi m)r)}*B;\gamma=-2*1.00116592040=-2.00233184080 \qquad (5)$$

(m = mass of the muon, m_q = mass of the d-quark).

From the anomalous magnetic moment of the electron, whose correction term k' is equal to 0.99421247 times the correction term k of the anomalous magnetic moment of the muon, one can determine the exact velocity of the muon: it is equal to 0.99421247c. Derivation:

$M=Fr/B=ecBr/B= ecr=e\hbar/2m(1+m_q/12\pi m)cr*cr= e/2m\hbar(1+k)$ with $k=m_q/12\pi m$ for the muon and $M=Fr/ B=ecBr/B=e\hbar/(2mcr+m_qvr/3*2\pi)*cr=e/2m\hbar(1+k')$ for the electron, for which h = mvr/3.

From the anomalous magnetic moment of the neutron and the proton, the speed at which the quarks rotate can be determined: v=7.1687 10^7 m/s = 1.913c/8 for the neutron and 1.04664 10^8 m /s = 2.793c/8 for the proton. From this, the exact mass of the u-quark can be determined: it is 2.1790083231 Mev/c^2. Derivation: $M=Fr/B=evBr/B=evr=ev*4\hbar$ $/mc =e/2m\hbar*8v/c$, $r=4\hbar/mc$ (7).

After splitting off of the d-quark, it is emitted together with the muon and transported for 5 microseconds before the muon decays. In general, during decay, parts of the decay energy can be transferred to particles that are difficult to detect. For example, an electron-antineutrino is generated during beta decay, and the kinetic energy of the split-off quark is completely transferred to the electron, which flies on at 8.75×10^7 m/s. Derivation: $m_d v^2 = m_u v^2 = hf = hv_m/\lambda = hvmc/2h = m_e \gamma vc/2$, $\gamma = 1.0455$.

From the nova=1 formula it follows that $\alpha = 2\pi r_B/\lambda$. If you solve this equation,

$$\alpha = \frac{2\pi r_B}{\lambda} = \frac{2\pi r_B}{\frac{c}{f_a}} = \frac{2\pi r_B f_a}{c} = \frac{v}{c} \rightarrow f_a = f;\, v = \frac{h}{4\pi r_B m_e}$$

you get $f_a = f$ (f_a is the freuquency of the exchange particle, f is the frequency of the electron). However, this means that the coupling of the photon to the orbiting electron is due to the exact superposition (coupling) of the frequency curve of both, the electron and the photon. When generating the photon, the frequency of the attracted particle is adopted.

With regard to the particle generation mechanism that was presented here, the idea of a matter asymmetry (6-8) does not apply, since antiparticles were not generated in the same quantity as particles in the Big Bang and in the expansion phase of the young universe. The presented theory is much more realistic, since thermal heat produces only one sort of particles, generally photons. In the Big Bang, due to the extreme thermal heat, d-quarks (heavy photons) instead of photons were produced.

The hypothesis that d-quarks were the only type of particle produced from thermal radiation is impressively confirmed by the following calculations: quarks are heavy bosons, this hypothesis also implies that quarks, like photons, ideally moved on a spiral path in the Big Bang, whose radius is $\lambda = h/2mc$. In addition to Wien's law, there is a second relationship between wavelength and generation temperature, namely:

$$1/2mv^2 = 3k_B T \rightarrow f \sim T^{1/2}, \lambda \sim 1/T^{1/2}; \qquad (6)$$

We know that gravity due to $E=k_BT$ is $2.2657.10^{39}$ times higher than Coulomb force, but at the time of Coulomb force generation it was equal to the Coulomb force. Shortly before, the quarks were emitted as thermal radiation. At tis time, the temperature was 3 times higher, due to the the formation of triplets. A black body emits radiation at 289.78 K with the exact wavelength of 10^-5 m. Since the temperature in early space corresponds to the square of the frequency of the particles, which has a temperature-forming effect ($1/2mv^2=nk_BT$, $v=2\pi rf$), with a known temperature of the big bang radiation ($3.894*10^{20}$ K) it can be extrapolated to the wavelength of the big bang radiation. A particle mass of 4.6441255 MeV/c2 is calculated from
hc/λ, which really corresponds exactly to the mass of the d-quark and proves the
hypothesis.

$$m_Q = \frac{hf}{c^2} = \frac{hc}{\lambda c^2} = \frac{((2.265538756 * 10^{39})^{1/2} * 3 * 2.725\,K)^{1/2}}{3(10^{-5} * \frac{289.78\,K}{2.725\,K} * 2.725^{1/2}\,K^{1/2}) * \frac{hc}{c^2}} = 4.644\,MeV/c^2 \qquad (7)$$

Times and temperatures

The temperature of the thermal radiation in the Big Bang was $3.891*10^{20}$ K, the emission of the d-quarks lasted about 10^{-5} s. At a 3 times lower temperature, after ddd triplets and the 40 times larger ddu neutrons had formed ($E=3k_BT=1/2mv^2$) and the number of particles was 3 times lower, the d-quarks split off with the formation of protrons and electrons took place. After subsequent significant expansion (at a speed of approx. $8.75*10^7$ m/s), this, 1 second later, after cooling down to $4.10159*10^{14}$ K, suddenly slowed down (end of expansion). The reason for the end of the expansion was that the quantized radius had fallen below the distance between two opposing protons and from then on there was no longer any complete opposing gravitation. This is also the time when the formation of early primordial galaxies and the mass production of UV radiation began, which was scattered (also within the galaxies) for millions of years, which could explain the excessive content of ionized hydrogen gas in many galaxies. Today we find the remains of this UV radiation in the background radiation. The collision frequency increased significantly at this time, which favored the 2rd d-quark splitting (2nd neutron decay). The primordial nucleosynthesis then took place later at about 10^{10} K. 380,000 years later the temperature dropped to 3000 K and the electrons could be captured by the protons.

Fundamental forces

The first fundamental force is therefore the decay of an unstable (ddd)-Δ(-)-baryon into neutrons or protons. The new baryon structure is stable. The resulting neutrons then rotate and fly at a speed of $0.71.10^8$ m/s. The second basic force is the splitting off of a d-quark in a neutron caused by collision, the u-quark that is created is the exchange particle of this force. We called this force splitt off force. In the 1st neutron decay, the collision energy of the neutrons is able to break the quark bond. A third unknown force occurs here, the muon emission, in order to fulfill the law of conservation of energy regarding the breaking of the stable quark compound. The muon is emitted simultaneously with the split off d-quark, decaying into an electron, an electron antineutrino and a muon neutrino. In the decay, the electron acquires the kinetic energy of the d-quark and the charge -1, while the proton acquires the charge +1. The 4th basic force, the Coulomb force, occurs between the newly created charged proton and the electron and is slightly (0.11%) smaller than the 2nd basic force due to the slightly smaller mass of the proton compared to the neutron. The proton flies further with a speed of $1.0466.10^8$ m/s. In the 2nd neutron decay, a d-quark is split off again, which is replaced by a u-quark through the 2nd basic force, and a 3th basic force occurs, the W(-) boson emission.
The W-boson and the d-quark also decay into an electron and an antineutrino. As the 6th basic force, gravity remains temperature-dependent and decreases at most to the temperature value of the basic radiation. Since the kinetic energy of the split off d quark is equal to the kinetic energy of the split off u quark in ß(+) decay, the mass of the positron is equal to the mass of an electron with the opposite charge.
Quark bonds in neutrons and protons can be broken by the strong force. W bosons are created by the decay of electrons. This represents the reverse reaction of the process of converting the W boson into an electron. Neutrinos are the decay product of W bosons and muons: W<=>e (+n_e).
The W boson and muon decay is not subject to the strong nuclear force, in contrary to the

emission of these exchange particles is, however, subjected to this force.

List:

Force (exchange particle), new, former

1) Decay of the ddd-Δ(-)-baryon into protons and neutrons (gluons), new

2) quark bond breakage in a neutron, 1. and 2. neutron decay (muon emission, theoretic mass $1.88315.10^{-28}$ kg or W(-)-boson emission, theoretic mass 80433.6 MeV/c^2 + d-quark), quark bond breakage in a proton (W(+)-boson, theoretic mass 80433.6 MeV/c^2 + u-quark), new: 1. force, former 3. force

3) Splitt off of a d-quark in a neutron (u-quark, theoretic mass 2.1512118 MeV/c^2), new: 2a. splitt off force, 0.11% greater than the Coulomb force

4) Coulomb force (photon, theoretic relative mass $4.85.10^{-36}$ kg), 2b. force

5) week interaction (ß(-)-radiation, decay of W-bosons, (neutrinos), theoretic mass $1.4337.10^{-38}$ kg), 3. force

6) Gravitation (gravitational wave, hypothetical graviton, spin 2, theoretic mass $8.46.10^{-64}$ kg), 4. force

Discussion

Space and time were created in the Big Bang, along with a great deal of matter. Not just the one namely matter, but in equal parts, so the beliefe of scientists, its counterpart - antimatter. However, this seems to have completely disappeared, as the most extensive search for this substance to date has shown.

Like ordinary matter, antimatter is made up of elementary particles, each of which has the same mass as its counterpart but the opposite charge. When the two forms of matter meet, they annihilate each other and emit energy according to Einstein's equation $E=mc^2$.
This process led to the disappearance of antimatter shortly after the birth of the universe, scientists believe. Since there was one and a billionth particle for every antiparticle, the universe

that we can see today was able to form. Theoretically, however, it would also be possible for accumulations of matter and antimatter to be so far apart that their distance exceeds the universe visible to us, reports Gary Steigman from Ohio State University (9). So we would never see them collide with each other and the antimatter would go unnoticed.

The properties of the antiparticles correspond exactly to those of the corresponding particles, only they carry the opposite charge. But what happens when antimatter collides with ordinary matter? The particles destroy each other and generate energy, mostly in the form of gamma rays. Secondary particles are also formed. The physicist speculates that they may also have been separated on smaller scales – roughly on the scale of galaxy clusters, the largest gravitationally bound structures in the universe. In this case, the collision of two such systems should unmask antimatter, since particles and antiparticles would annihilate when they penetrated each other. This scenario should be accompanied by conspicuous gamma rays.

Using the X-ray satellite Chandra and the Compton Gamma Ray Observatory, Steigman searched in the so-called bullet cluster, in which two huge clusters of galaxies once collided at extremely high speeds, but in vain for telltale signs. He concludes that there are fewer than three antiparticles for every million particles in the bullet cluster. Previous measurements in individual galaxy clusters had even shown an upper limit that was a thousand times lower (9).

Conclusion

From the down quarks emitted in the big bang at 3.9 .10^20 K, dd doublets, ddd tripets and then ddd Δ(-) baryons were formed, which are not stable and deayed at 1/3 (three times fewer particles) of the original temperature into protons and neutrons. At these temperatures, the stable structure in nucleons can be broken up by collisions. In response to this quark bond breakage, a muon is emitted together with a split-off d-quark. The separation of the d quark is mediated by an u quark, which forms a proton together with the remaining quarks. The unstable muons decay into electrons and neutrinos, the exchange particles of the weak interaction. The universe then expanded rapidly and cooled significantly. When the collisions increased again, there was a further decay of neutrons, the W boson emission also mediates the breaking of the quark connection, the strong force. W bosons also decay into electrons and neutrinos. The gravitation is generated by neutrons and protrons (7), the hypothetical graviton has a theoretical mass of about 10^{-64} kg. The connection between the electromagnetic interaction and gravitation arises when the Coulomb force (=gravitation) and the electric charge is decoupled after the muon decays into an electron. Due to the 40 times smaller distance between the quarks compared to the proton radius, the structure in a neutron or proton is 40*5/2=100 times stronger than the gravitation between nucleons at the decoupling temperature of the Coulomb force. The prerequisite is that point-like, extremely hot matter was present in the Big Bang.

With the theory presented here, antimatter was not created in the same amount as matter particles, hence, the symmetrie and existance of a relevant amount of antimatter is not relevant. The d-quark splitt of and the decay of neutrons, the core of this theory, led to the most common particles known today. More exotic particles were formed in other contexts, like in the presence of higher heat inside of suns. The mass correction factor for the muon leads exactly to the anomalous magnetic moment of the muon, making arithmetic rows in the Standard Model and other corrections become irrelevant. The exact mass of the u- and d-quark can be determined using the anomalous magnetic moment of the muon, proton and neutron. It is: 4.664125534 MeV/c^2 (d-quark) and 2.1511 MeV/c^2 (u-quark), which fits with the newer exact measurements (4.67 MeV/c^2 and 2.15 MeV/c^2). More than four fundamental forces were identified (all together 7 fundamental forces), with temporarilly generation of leptoquarks. The temperature in the Big Bang with its heat radiation was lower than assumed ($3.891.10^{20}$ K). The power of emission was $1.30367.10^{75}$ W/m^2.

Together with the model that gravity is generated at the proton and neutron level (7), has a finite range (for a proton it is of the order 10^5 m) and the fact that galaxies attract each other with 2G (7), which fulfills the lack of the Standard Model, which led to the dark matter principle, Nova Quantum Gravity meets all expectations placed on a TOE theory.

Chronological table:

• Big Bang

• Emission of the Big Bang energy as heat radiation and emission of the down-quarks, which do not yet have a charge

• Increase in collisions

• Formation of quark multiplets up to conglomerates of the size of a billiard ball

• Dissolution of the conglomerates

• formation of quark pairs

• Temperature drops by half

• Formation of ddd triplets forming (ddd)-Δ(-)-baryons

• Temperature dropps by 1/3

• Decay of the ddd Δ(-)-baryons into protons and neutrons

• Formation of up to 100 gluons per nucleon

• Separation of initial Nuclear Force and Color Charge

• Formation of neutrons (and protons) with a considerably larger radius than that of quarks

• Decay of the neutrons into protons, electrons and anti-neutrinos, emitting a muon to satisfy the energy conservation principle. The muon is emitted together with the separated d-quark decays, while the d-quark decelerates from 0.994c to $8.75.10^7$ m/s, which looses 88.99% of its mass, creating an electron

• Attachment to the protons and detachment of the electrons from this place by collisions

• Separation of Electric Charge and Coulomb Force

• more significant temperature reduction

• Renewed decay of the neutrons due to larger energy and temperature fluctuations, splitting off of bosons, which decay into an electron and an anti-neutrino, and ß+ decay of protons, which decay into a neutron, positron and a neutrino. Emission of a W+-boson (borrwoed energy from the neutron), which behave like the muons, deccelarating the d-quark, which becomes an electron

• Separation of the weak interaction

• electrons are recaptured on the s-orbitals, a larger number of neutrons remain

• Universe cools down to 2,725 K. Gravitation remains the only variable dependent on temperatureγ

Calculations of the mass of the echange particle from the formula nova=1

1) $m_{muon}=\frac{h\alpha}{4*0{,}9976\,cr_p}*100*(\frac{2}{5})-8{,}27799*10^{-30}kg=1{,}883531627*10^{-28}kg$ (3,834523547*10^-30^ kg is the mass of d quark; $v=\frac{s}{\sqrt{(c^2t_0^2+s^2)}}=0.9976\,c$; t_0=2,1969803*10^{-6} s; s = γ*c*t_0,

γ=14.4424, r_p is the radius of the proton, 2/5 is an inertia factor of the neutron

2) $m_{W\,boson}=\frac{h\alpha}{2*0{,}9976\,cs}*100*(\frac{2}{5})=1.43378866*10^{-25}kg$ (s is the range of the W boson = 2,25531*10^{-18} m)

3) $m_{u\,quark}=\frac{h\alpha}{2\,cr_n}*1{,}0011*(\frac{2}{5})=3{,}8397468774*10^{-30}kg;$ m_n/m_p = 1,0011; r_n is the radius of the neutron

4) $m_{photon}=\frac{h\alpha}{4\,\pi cr_B}*1*(\frac{2}{5})=4.85085234*10^{-36}kg$; r_B is the Bohr radius

5) $m_{neutrino}=\frac{h\alpha}{2\,cs}*10^{-11}*(\frac{2}{5})=1.4337249*10^{-38}kg$

6) $m_{graviton}=\frac{h\alpha}{2\,cr_n}*\frac{1}{2.2658*10^{39}}*(\frac{2}{5})=8.4121166*10^{-64}kg$

References

(1) J.F. Donoghue; E. Golowich; B.R. Holstein. Dynamics of the Standard Model. Cambridge University

Press 1994.

(2) P. Millette, The Heisenberg Uncertainty Principle and the Nyquist-Shannon Sampling Theorem, Progress in Physics, arXiv:1108.3135, http://doi.org/10.48550/arXiv.11083135 (2011)

(3) M.B. Blau, M.B, And yet they turn, database docdroid.com. https://docdro.id/fs1XAwM Accessed 19 March 2022

(4) CFD Collaboration, T. Aaltonens […] S. Zucchelli. High-precision measurement of the W boson mass with the CDF II detector. Vol. 376, No. 6589, pp.170-176, Doi: 10.1126/science.abk1781. 7. Apr. 2022

(5) T. Aoyama et al. The anomalous magnetic moment of the muon in the Standard Model, arXiv:2006.04822 [hep-ph]

(6) M.B. Blau, Big Bang and the expansion phase, database docdroid.com https://docdro.id/BQpqgWq Accessed 16 March 2022

(7) M.B. Blau, Und sie drehen sich doch, first edn. (United p.c.-Verlag, 2022). pp. 87-96

(8) M.B. Blau, The spin of particles. Database docdroid.com https://docdro.id/K5E3aVu. Accessed 14 Febr 2022

(9) G. Steigman. Antimaterie aus dem Urknall unauffindbar. Spectrum.de. 11.2008
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