Unknown Source of Positrons

A team of researchers known as the Alpha Magnetic Spectrometer (AMS) Collaboration has found evidence of a possible unknown source of positrons making their way through the universe to Earth. [9]

Roughly once a year, the smallest Large Hadron Collider (LHC) experiment, LHC-forward (LHCf), is taken out of its dedicated storage on the site near the ATLAS experiment, reinstalled in the LHC tunnel, and put to use investigating high-energy cosmic rays. [8]

An international team of astrophysicists including Russian scientists from the Space Research Institute of the Russian Academy of Sciences (RAS), MIPT, and Pulkovo Observatory of RAS has detected an abrupt decrease of pulsar luminosity following giant outbursts. The phenomenon is associated with the so-called "propeller effect," which was predicted more than 40 years ago. [7]

New observations with ESO's Very Large Telescope (VLT) in Chile have revealed alignments over the largest structures ever discovered in the Universe. A European research team has found that the rotation axes of the central supermassive black holes in a sample of quasars are parallel to each other over distances of billions of light-years. The team has also found that the rotation axes of these quasars tend to be aligned with the vast structures in the cosmic web in which they reside. [6]

This paper explains the Accelerating Universe, the Special and General Relativity from the observed effects of the accelerating electrons, causing naturally the experienced changes of the electric field potential along the moving electric charges. The accelerating electrons explain not only the Maxwell Equations and the Special Relativity, but the Heisenberg Uncertainty Relation, the wave particle duality and the electron's spin also, building the bridge between the Classical and Relativistic Quantum Theories. [6]

The Big Bang caused acceleration created the radial currents of the matter and since the matter composed of negative and positive charges, these currents are creating magnetic field and attracting forces between the parallel moving electric currents. This is the gravitational force experienced by the matter, and also the mass is result of the electromagnetic forces between the charged particles. The positive and negative charged currents attracts each other or by the magnetic forces or by the much stronger electrostatic forces. The gravitational force attracting the matter, causing concentration of the matter in a small space and leaving much space with low matter concentration: dark matter and energy.

Contents

Data from ISS Alpha Magnetic Spectrometer suggests possibility of unknown source of positrons

A team of researchers known as the Alpha Magnetic Spectrometer (AMS) Collaboration has found evidence of a possible unknown source of positrons making their way through the universe to Earth. In their paper published in Physical Review Letters, the team offers a report on cosmic ray strikes that have been reported by the AMS aboard the International Space Station and why they believe the data suggests that some of the recorded strikes could not be attributed to primary cosmic rays colliding with gas atoms in space.

Over the past five years, the AMS has been listening for cosmic ray strikes on its sensors, recording approximately 80 billion hits. Among those rays are two types of particular interest to the collaboration—primary and secondary. Primary cosmic rays are believed to be created by supernovae or other large explosions. Secondary rays are believed to come about due to primary rays colliding with gasses as they pass through the vast reaches of space. Space researchers study the two types to learn more about the nature of the universe—of particular importance is the ratio of one of the type of rays reaching us as compared to the other. They refer to this as the B/C ratio—primary rays have a carbon nuclei while secondary rays have boron nuclei. A high B/C ratio in a given energy range, for example, would suggest that the rays pass through a lot of gas as they make their long journey.

The data from the AMS is highly prized because prior to its installation, researchers had to rely on high-altitude balloon sensors, which, the team notes, had error rates as high as 15 percent. With the new data from AMS, the team has been able to see that the B/C is proportional to the energy of the nucleon raised to the -1/3 power, which is what Andrey Kolmogorov, a Russian mathematician predicted back in 1941. But the data also conflicts with other theories surrounding uncharacteristic observations that have shown more positrons (anti-electrons) striking the Earth relative to high speed electrons. The data from AMS essentially rules out the possibility that they are either primary or secondary rays though, which suggests that they must be from an unknown source, possibly dark matter or pulsars. [9]

Smallest LHC experiment has cosmic outing

Roughly once a year, the smallest Large Hadron Collider (LHC) experiment, LHC-forward (LHCf), is taken out of its dedicated storage on the site near the ATLAS experiment, reinstalled in the LHC tunnel, and put to use investigating high-energy cosmic rays.

Whereas ATLAS and the three other main LHC experiments – CMS, ALICE and LHCb – study all particles produced in collisions no matter in which direction they fly out, LHCf measures the debris thrown in the 'very forward' direction.

These forward particles carry a large amount of the collision energy, and barely change their trajectories from the direction of the initial colliding beam. This makes them ideal for understanding the development of showers of particles produced when high-energy cosmic rays strike the atmosphere.

"The idea behind the LHCf experiment is to help increase our learning about the nature of high-energy cosmic rays, by measuring and interpreting the properties of the secondary particles released when these cosmic rays collide with the Earth's atmosphere," explains Lorenzo Bonechi, who leads a team for the LHCf collaboration in Florence, Italy.

The experiment's two detectors are installed 140 metres either side of the ATLAS collision point. They are not suitable to be used during normal LHC operations, and so have to wait until the machine is running with very few collisions –corresponding to a low luminosity . If the luminosity is too high, the larger number of forward, high-energy particles can heat the detector and cause permanent damage.

LHCf has been reinstalled near the ATLAS detector several times. This year, the experiment only installed one detector, which is taking data during this month's heavy-ion run, where the LHC is colliding protons with lead ions. The asymmetrical nature of the collisions means one detector would be bombarded with the remnants of the lead nuclei and could be damaged.

The amount of debris which is thrown in the forward direction during collisions in the LHC and the energy carried by these particles can be compared with the predictions of hadronic interaction models – sophisticated physics models that describe collisions between protons and nuclei and the list of particles produced in these interactions.

"Over previous runs we've found significant discrepancies between our data and the most advanced hadronic interaction models, which are used to model how cosmic rays shower down onto the earth when they interact with our atmosphere. LHCf is trying to find evidence that could help prove which of these models provide the most reliable description. Now, scientists working in this field are making an effort to integrate our results into their models, and we might see a revolution in them in the near future," says Bonechi.

The run with lead ions and protons began on 10 November 2016 with low intensity and low energy collisions (5.02 TeV) specifically for the ALICE detector to take measurements. But now it has ramped up to colliding the beams at 8.16 TeV, and LHCf has already collected several million particles and will continue its data taking in the coming days. [8]

X-ray pulsars fade as propeller effect sets in

An international team of astrophysicists including Russian scientists from the Space Research Institute of the Russian Academy of Sciences (RAS), MIPT, and Pulkovo Observatory of RAS has detected an abrupt decrease of pulsar luminosity following giant outbursts. The phenomenon is associated with the so-called "propeller effect," which was predicted more than 40 years ago. However, this is the first study to reliably observe the transition of the two X-ray pulsars 4U 0115+63 and V 0332+53 to the "propeller regime." The results of the observations, the conclusions reached by the researchers, and the relevant calculations were published in Astronomy & Astrophysics.

The two sources studied, 4U 0115+63 and V 0332+53, belong to a rather special class of transient X-ray pulsars. These stars alternately act as weak X-ray sources, undergo giant outbursts, and disappear from sight completely. The transitions of pulsars between different states provide valuable information about their magnetic field and the temperature of the surrounding matter. Such information is indispensable, as the immensely strong magnetic fields and extremely high temperatures make direct measurements impossible in a laboratory on Earth.

The name of a pulsar is preceded by a letter designating the first observatory to discover it, which is followed by a numerical code containing the coordinates of the pulsar. The "V" refers to Vela 5B, a US military satellite that was launched to spy on the Soviets. As for the "4U" in the other name, it stands for the fourth Uhuru catalog, compiled by the first observatory in orbit dedicated specifically to X-ray astronomy. Following the discovery of the first pulsar, it was originally known as "LGM-1" (for "little green men"), because it was a source of regular radio pulses, leading scientists to believe that they might have received a signal from intelligent extraterrestrials.

An X-ray pulsar is a rapidly spinning neutron star with a strong magnetic field. A neutron star can be part of a binary system. In a process that astrophysicists call accretion, the neutron star can channel gas from its normal star companion. The attracted gas spirals toward the neutron star, forming an accretion disk, which is disrupted at the magnetosphere radius. During accretion, the matter penetrates to a certain extent into the magnetosphere, "freezes into it," and flows along the lines of the magnetic field toward the magnetic poles of the neutron star. Falling toward the poles, the gas is heated to several hundred million degrees, which causes the emission of X-rays. If the magnetic axis of a neutron star is skewed relative to its rotational axis, the X-ray beams it emits rotate in a manner that resembles the way beacons work. For an "onshore" observer, the source appears to be sending signals at regular intervals ranging from fractions of a second to several minutes.

A neutron star is one of the possible remnants left behind by a supernova. It can be formed at the end of stellar evolution, if the original star was massive enough to allow gravitation to compress the stellar matter enough to make electrons combine with protons yielding neutrons. The magnetic field of a neutron star can be more than 10 orders of magnitude stronger that any magnetic field that could be achieved on Earth.

In a binary system, an X-ray pulsar is observed when the neutron star is accreting matter from its normal star companion—often a giant or a supergiant characterized by a strong stellar wind (ejection of matter into space). Alternatively, it can be a smaller star like our own sun that has filled its Roche lobe—the region beyond which it is unable to hold on to the matter attracted by the gravity of the neutron star companion.

The 4U 0115+63 and V 0332+53 pulsars are irregular X-ray sources (transients), owing to the fact that their stellar companions belong to the rather unusual Be star class. The axial rotation of a Be star is so rapid that it occasionally starts "bulging" at the equator, and a gas disk is formed around it, filling the Roche lobe. The neutron star starts rapidly accreting the gas from its "donor" companion, causing a sharp increase in X-ray emission called an X-ray outburst. At some point, after the matter in the equatorial bulge starts to deplete, the accretion disk becomes exhausted, and the gas can no longer fall onto the neutron star due to the influence of the magnetic field and the centrifugal force. This gives rise to a phenomenon known as the "propeller effect"—the pulsar enters a state in which accretion does not occur, and the X-ray source is no longer observed.

Astronomers use the term "luminosity" to refer to the total amount of energy emitted by a celestial body per unit time. The red line in the diagram represents the threshold luminosity for the 4U 0115+63 pulsar. Observations of the other source (V 0332+53) produced similar results. The blue lines mark the moments in time when the distance between the pulsar and the companion was at a minimum. This proximity of the companion star might cause the neutron star to go into overdrive and resume emission (see diagram), provided that sufficient amounts of matter are still available for accretion.

The Russian scientists used the X-ray telescope (XRT) on NASA's Swift space observatory to measure the threshold luminosity that marks the transition of a pulsar to the propeller regime. This parameter depends on the magnetic field and the rotational period of the pulsar. The rotational periods of the sources in this study are known based on the intervals between the pulses that we can register, 3.6 s in the case of 4U 0115+63 and 4.3 s for V 0332+53. Knowing both the threshold luminosity and the rotational period, one can calculate the strength of the magnetic field. The research findings are in agreement with the values obtained using other methods. However, the luminosity was only reduced by a factor of 200, as compared to the expected 400 times reduction.

The researchers hypothesized that there could be two possible explanations for this discrepancy. First, the neutron star surface could become an additional source of X-rays, as it cools down following an outburst. Second, the propeller effect could leave some room for matter transfer between the two stars, as opposed to sealing the neutron star off completely. In other words, an unaccounted mechanism could be enabling accretion to continue to a certain extent.

The transition of a pulsar into the propeller mode is challenging to observe, as the low luminosity state cannot be detected easily. For 4U 0115+63 and V 0332+53, this was attempted following the previous outbursts of these sources. However, the instruments available at the time were not sensitive enough to see the pulsars in the "off-mode." This study is the first to demonstrate reliably that these two sources do, indeed, "black out." Moreover, the researchers showed that knowledge of the luminosity that marks the transition of pulsars into the propeller regime can be used to learn more about the structure and intensity of the magnetic fields around neutron stars.

Prof. Dr. Alexander Lutovinov of the Russian Academy of Sciences, Head of Laboratory at the Space Research Institute (IKI RAS) and a professor at MIPT, comments, "Knowledge of the structure of the magnetic fields of neutron stars is of paramount importance for our understanding of their formation and evolution. In this research, we determined the dipole magnetic field component, which is linked to the propeller effect, for two neutron stars. We demonstrate that this independently calculated value can be compared to the available results of magnetic field measurements based on the detection of cyclotron lines in the spectra of sources. By doing this, it is possible to estimate the contribution of the other, higher-order components in the field structure." [7]

Spooky Alignment of Quasars across Billions of Light-years

New observations with ESO's Very Large Telescope (VLT) in Chile have revealed alignments over the largest structures ever discovered in the Universe. A European research team has found that the rotation axes of the central supermassive black holes in a sample of quasars are parallel to each other over distances of billions of light-years. The team has also found that the rotation axes of these quasars tend to be aligned with the vast structures in the cosmic web in which they reside.

Quasars are galaxies with very active supermassive black holes at their centres. These black holes are surrounded by spinning discs of extremely hot material that is often spewed out in long jets along their axes of rotation. Quasars can shine more brightly than all the stars in the rest of their host galaxies put together.

A team led by Damien Hutsemékers from the University of Liège in Belgium used the FORS instrument on the VLT to study 93 quasars that were known to form huge groupings spread over billions of light-years, seen at a time when the Universe was about one third of its current age.

“The first odd thing we noticed was that some of the quasars’ rotation axes were aligned with each other — despite the fact that these quasars are separated by billions of light-years,” said Hutsemékers.

The team then went further and looked to see if the rotation axes were linked, not just to each other, but also to the structure of the Universe on large scales at that time.

When astronomers look at the distribution of galaxies on scales of billions of light-years they find that they are not evenly distributed. They form a cosmic web of filaments and clumps around huge voids where galaxies are scarce. This intriguing and beautiful arrangement of material is known as large-scale structure.

The new VLT results indicate that the rotation axes of the quasars tend to be parallel to the large-scale structures in which they find themselves. So, if the quasars are in a long filament then the spins of the central black holes will point along the filament. The researchers estimate that the probability that these alignments are simply the result of chance is less than 1%.

"A correlation between the orientation of quasars and the structure they belong to is an important prediction of numerical models of evolution of our Universe. Our data provide the first observational confirmation of this effect, on scales much larger that what had been observed to date for normal galaxies," adds Dominique Sluse of the Argelander-Institut für Astronomie in Bonn, Germany and University of Liège.

The team could not see the rotation axes or the jets of the quasars directly. Instead they measured the polarisation of the light from each quasar and, for 19 of them, found a significantly polarised signal. The direction of this polarisation, combined with other information, could be used to deduce the angle of the accretion disc and hence the direction of the spin axis of the quasar.

"The alignments in the new data, on scales even bigger than current predictions from simulations, may be a hint that there is a missing ingredient in our current models of the cosmos," concludes Dominique Sluse. [6]

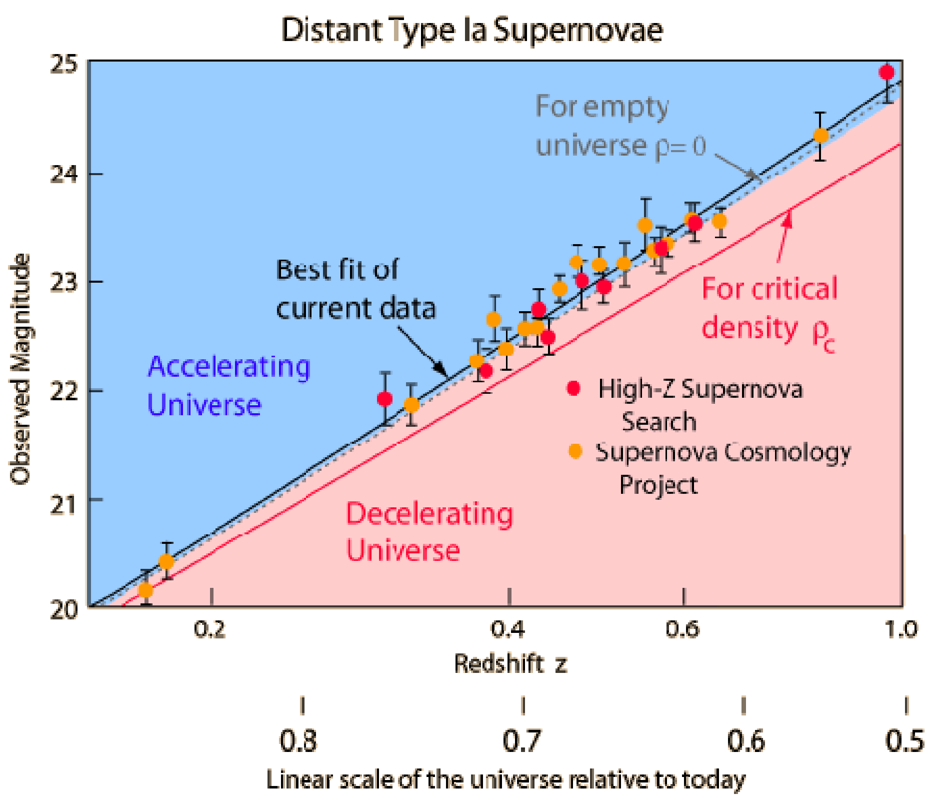
The Big Bang

The Big Bang caused acceleration created radial currents of the matter, and since the matter is composed of negative and positive charges, these currents are creating magnetic field and attracting forces between the parallel moving electric currents. This is the gravitational force experienced by the matter, and also the mass is result of the electromagnetic forces between the charged particles.
The positive and negative charged currents attracts each other or by the magnetic forces or by the much stronger electrostatic forces!?
The gravitational force attracting the matter, causing concentration of the matter in a small space and leaving much space with low matter concentration: dark matter and energy.
There is an asymmetry between the mass of the electric charges, for example proton and electron, can understood by the asymmetrical Planck Distribution Law. This temperature dependent energy distribution is asymmetric around the maximum intensity, where the annihilation of matter and antimatter is a high probability event. The asymmetric sides are creating different frequencies of electromagnetic radiations being in the same intensity level and compensating each other. One of these compensating ratios is the electron – proton mass ratio. The lower energy side has no compensating intensity level, it is the dark energy and the corresponding matter is the dark matter.

Evidence for an accelerating universe

One of the observational foundations for the big bang model of cosmology was the observed expansion of the universe. [4] Measurement of the expansion rate is a critical part of the study, and it has been found that the expansion rate is very nearly "flat". That is, the universe is very close to the critical density, above which it would slow down and collapse inward toward a future "big crunch". One of the great challenges of astronomy and astrophysics is distance measurement over the vast distances of the universe. Since the 1990s it has become apparent that type Ia supernovae offer a unique opportunity for the consistent measurement of distance out to perhaps 1000 Mpc. Measurement at these great distances provided the first data to suggest that the expansion rate of the universe is actually accelerating. That acceleration implies an energy density that acts in opposition to gravity which would cause the expansion to accelerate. This is an energy density which we have not directly detected observationally and it has been given the name "dark energy".

The type Ia supernova evidence for an accelerated universe has been discussed by Perlmutter and the diagram below follows his illustration in Physics Today.



The data summarized in the illustration above involve the measurement of the redshifts of the distant supernovae. The observed magnitudes are plotted against the redshift parameter z. Note that there are a number of Type 1a supernovae around z=.6, which with a Hubble constant of 71 km/s/mpc is a distance of about 5 billion light years.

Equation

The cosmological constant Λ appears in Einstein's field equation [5] in the form of

$$R_{\mu\nu} - \frac{1}{2}R\,g_{\mu\nu} + \Lambda\,g_{\mu\nu} = \frac{8\pi G}{c^4}T_{\mu\nu},$$

where R and g describe the structure of spacetime, T pertains to matter and energy affecting that structure, and G and c are conversion factors that arise from using traditional units of measurement. When Λ is zero, this reduces to the original field equation of general relativity. When T is zero, the field equation describes empty space (the vacuum).

The cosmological constant has the same effect as an intrinsic energy density of the vacuum, ρ_{vac} (and an associated pressure). In this context it is commonly moved onto the right-hand side of the equation, and defined with a proportionality factor of 8π: $\Lambda = 8\pi\rho_{vac}$, where unit conventions of general relativity are used (otherwise factors of G and c would also appear). It is common to quote values of energy density directly, though still using the name "cosmological constant".

A positive vacuum energy density resulting from a cosmological constant implies a negative pressure, and vice versa. If the energy density is positive, the associated negative pressure will drive an accelerated expansion of the universe, as observed. (See dark energy and cosmic inflation for details.)

Explanatory models

Models attempting to explain accelerating expansion include some form of dark energy, dark fluid or phantom energy. The most important property of dark energy is that it has negative pressure which is distributed relatively homogeneously in space. The simplest explanation for dark energy is that it is a cosmological constant or vacuum energy; this leads to the Lambda-CDM model, which is generally known as the Standard Model of Cosmology as of 2003-2013, since it is the simplest model in good agreement with a variety of recent observations.

Lorentz transformation of the Special Relativity

In the referential frame of the accelerating electrons the charge density lowering linearly because of the linearly growing way they takes every next time period. From the referential frame of the wire there is a parabolic charge density lowering.

The difference between these two referential frames, namely the referential frame of the wire and the referential frame of the moving electrons gives the relativistic effect. Important to say that the moving electrons presenting the time coordinate, since the electrons are taking linearly increasing way every next time period, and the wire presenting the geometric coordinate. The Lorentz transformations are based on moving light sources of the Michelson - Morley experiment giving a practical method to transform time and geometric coordinates without explaining the source of this mystery.

The real mystery is that the accelerating charges are maintaining the accelerating force with their charge distribution locally. The resolution of this mystery that the charges are simply the results of the diffraction patterns, that is the charges and the electric field are two sides of the same thing. Otherwise the charges could exceed the velocity of the electromagnetic field.

The increasing mass of the electric charges the result of the increasing inductive electric force acting against the accelerating force. The decreasing mass of the decreasing acceleration is the result of the inductive electric force acting against the decreasing force. This is the relativistic mass change explanation, especially importantly explaining the mass reduction in case of velocity decrease.

The Classical Relativistic effect

The moving charges are self maintain the electromagnetic field locally, causing their movement and this is the result of their acceleration under the force of this field.
In the classical physics the charges will distributed along the electric current so that the electric potential lowering along the current, by linearly increasing the way they take every next time period because this accelerated motion.

Electromagnetic inertia and Gravitational attraction

Since the magnetic induction creates a negative electric field as a result of the changing acceleration, it works as an electromagnetic inertia, causing an electromagnetic mass.

It looks clear that the growing acceleration results the relativistic growing mass - limited also with the velocity of the electromagnetic wave.

Since $E = hv$ and $E = mc^2$, $m = hv/c^2$ that is the m depends only on the v frequency. It means that the mass of the proton and electron are electromagnetic and the result of the electromagnetic induction, caused by the changing acceleration of the spinning and moving charge! It could be that the m_o inertial mass is the result of the spin, since this is the only accelerating motion of the electric charge. Since the accelerating motion has different frequency for the electron in the atom and the proton, they masses are different, also as the wavelengths on both sides of the diffraction pattern, giving equal intensity of radiation.

If the mass is electromagnetic, then the gravitation is also electromagnetic effect caused by the accelerating Universe! The same charges would attract each other if they are moving parallel by the magnetic effect.

The Planck distribution law explains the different frequencies of the proton and electron, giving equal intensity to different lambda wavelengths! Also since the particles are diffraction patterns they have some closeness to each other – can be seen as a gravitational force.

Electromagnetic inertia and mass

Electromagnetic Induction

Since the magnetic induction creates a negative electric field as a result of the changing acceleration, it works as an electromagnetic inertia, causing an electromagnetic mass. [1]

Relativistic change of mass

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The frequency dependence of mass

Since ***E = hν*** and ***E = mc²***, ***m = hν /c²*** that is the ***m*** depends only on the ***ν*** frequency. It means that the mass of the proton and electron are electromagnetic and the result of the electromagnetic induction, caused by the changing acceleration of the spinning and moving charge! It could be that the m_o inertial mass is the result of the spin, since this is the only accelerating motion of the electric charge. Since the accelerating motion has different frequency for the electron in the atom and the proton, they masses are different, also as the wavelengths on both sides of the diffraction pattern, giving equal intensity of radiation.

Electron – Proton mass rate

The Planck distribution law explains the different frequencies of the proton and electron, giving equal intensity to different lambda wavelengths! Also since the particles are diffraction patterns they have some closeness to each other – can be seen as a gravitational force. [1]

There is an asymmetry between the mass of the electric charges, for example proton and electron, can understood by the asymmetrical Planck Distribution Law. This temperature dependent energy distribution is asymmetric around the maximum intensity, where the annihilation of matter and antimatter is a high probability event. The asymmetric sides are creating different frequencies of electromagnetic radiations being in the same intensity level and compensating each other. One of these compensating ratios is the electron – proton mass ratio. The lower energy side has no compensating intensity level, it is the dark energy and the corresponding matter is the dark matter.

Gravity from the point of view of quantum physics

The Gravitational force

The gravitational attractive force is basically a magnetic force.

The same electric charges can attract one another by the magnetic force if they are moving parallel in the same direction. Since the electrically neutral matter is composed of negative and positive charges they need 2 photons to mediate this attractive force, one per charges. The Bing Bang caused parallel moving of the matter gives this magnetic force, experienced as gravitational force.

Since graviton is a tensor field, it has spin = 2, could be 2 photons with spin = 1 together.

You can think about photons as virtual electron – positron pairs, obtaining the necessary virtual mass for gravity.

The mass as seen before a result of the diffraction, for example the proton – electron mass rate Mp=1840 Me. In order to move one of these diffraction maximum (electron or proton) we need to intervene into the diffraction pattern with a force appropriate to the intensity of this diffraction maximum, means its intensity or mass.

The Big Bang caused acceleration created radial currents of the matter, and since the matter is composed of negative and positive charges, these currents are creating magnetic field and attracting forces between the parallel moving electric currents. This is the gravitational force experienced by the matter, and also the mass is result of the electromagnetic forces between the charged particles. The positive and negative charged currents attracts each other or by the magnetic forces or by the much stronger electrostatic forces!?

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The Graviton

In physics, the graviton is a hypothetical elementary particle that mediates the force of gravitation in the framework of quantum field theory. If it exists, the graviton is expected to be massless (because the gravitational force appears to have unlimited range) and must be a spin-2 boson. The spin follows from the fact that the source of gravitation is the stress-energy tensor, a second-rank tensor (compared to electromagnetism's spin-1 photon, the source of which is the four-current, a first-rank tensor). Additionally, it can be shown that any massless spin-2 field would give rise to a force indistinguishable from gravitation, because a massless spin-2 field must couple to (interact with) the stress-energy tensor in the same way that the gravitational field does. This result suggests that, if a massless spin-2 particle is discovered, it must be the graviton, so that the only experimental verification needed for the graviton may simply be the discovery of a massless spin-2 particle. [2]

Conclusions

"The alignments in the new data, on scales even bigger than current predictions from simulations, may be a hint that there is a missing ingredient in our current models of the cosmos," concludes Dominique Sluse. [6]

The accelerating Universe fits into the accelerating charges of the electric currents, because the Bing Bang caused radial moving of the matter.

Needless to say that the accelerating electrons of the steady stationary current are a simple demystification of the magnetic field, by creating a decreasing charge distribution along the wire, maintaining the decreasing U potential and creating the **A** vector potential experienced by the electrons moving by **v** velocity relative to the wire. This way it is easier to understand also the time dependent changes of the electric current and the electromagnetic waves as the resulting fields moving by c velocity.
It could be possible something very important law of the nature behind the self maintaining **E** accelerating force by the accelerated electrons. The accelerated electrons created electromagnetic fields are so natural that they occur as electromagnetic waves traveling with velocity c. It shows that the electric charges are the result of the electromagnetic waves diffraction.
One of the most important conclusions is that the electric charges are moving in an accelerated way and even if their velocity is constant, they have an intrinsic acceleration anyway, the so called spin, since they need at least an intrinsic acceleration to make possible they movement .
The bridge between the classical and quantum theory is based on this intrinsic acceleration of the spin, explaining also the Heisenberg Uncertainty Principle. The particle – wave duality of the electric charges and the photon makes certain that they are both sides of the same thing. Basing the

gravitational force on the accelerating Universe caused magnetic force and the Planck Distribution Law of the electromagnetic waves caused diffraction gives us the basis to build a Unified Theory of the physical interactions.

The electric currents causing self maintaining electric potential is the source of the special and general relativistic effects. The Higgs Field is the result of the electromagnetic induction. The Graviton is two photons together. [3]

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