Higgs Physics against the University?

Modeling of conditions soon after the Big Bang suggests the universe should have collapsed just microseconds after its explosive birth, the new study suggests.

"During the early universe, we expected cosmic inflation — this is a rapid expansion of the universe right after the Big Bang," said study co-author Robert Hogan, a doctoral candidate in physics at King's College in London. "This expansion causes lots of stuff to shake around, and if we shake it too much, we could go into this new energy space, which could cause the universe to collapse." [3]

The magnetic induction creates a negative electric field, causing an electromagnetic inertia responsible for the relativistic mass change; it is the mysterious Higgs Field giving mass to the particles. The Planck Distribution Law of the electromagnetic oscillators explains the electron/proton mass rate by the diffraction patterns. The accelerating charges 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. The self maintained electric potential of the accelerating charges equivalent with the General Relativity space-time curvature, and since it is true on the quantum level also, gives the base of the Quantum Gravity.

Contents

Preface 2
  Popular questions about the Higgs Field: 2
  How can we answer these questions? 2
The universe shouldn't exist — at least according to a new theory 3
  Missing ingredient 3
Did Gravity Save the Universe from 'God Particle' Higgs Boson? 4
The Classical Relativistic effect 5
The Relativistic Quantum Mechanics 5
The Heisenberg Uncertainty Relation 6
The General Relativity - Electromagnetic inertia and mass 6
  Electromagnetic Induction 6
  Relativistic change of mass 6
  The frequency dependence of mass 6

Electron – Proton mass rate 6
The Higgs boson 7
Higgs mechanism 7
Gravity from the point of view of quantum physics 8
What is the Spin? 8
Conclusions 8
References 8

Author: George Rajna

Preface

Popular questions about the Higgs Field:

1.) If the Higgs field is responsible for imbuing particles with mass, and mass is responsible for gravity, is it possible that the Higgs field will provide the missing link between general relativity and quantum mechanics i.e. could the Higgs field be the basis of a quantum theory of gravity?

2.) Can the theoretical Higgs Field be used as the “cause” of relativistic momentum or relativistic kinetic energy of a moving body?

3.) Does Einstein's General Relativity need to be adjusted for the Higgs field?

4.) Since the Higgs field gives most particles mass, and permeates all space, then GR needs the Higgs field to be a theory of space?

5.) So where GR is highly curved, the Higgs field is also curved? And does a highly curved Higgs field affect the way particles acquire mass? For that matter, a curved space-time would also curve electromagnetic field?

How can we answer these questions?

Another bridge between the classical and quantum mechanics in the realm of relativity is that the charge distribution is lowering in the reference frame of the accelerating charges linearly: $ds/dt = at$ (time coordinate), but in the reference frame of the current it is parabolic: $s = a/2\ t^2$ (geometric coordinate).
One origin of the Quantum Physics is the Planck Distribution Law of the electromagnetic oscillators, giving equal intensity for 2 different wavelengths on any temperature. Any of these two wavelengths will give equal intensity diffraction patterns, building different asymmetric constructions, for example proton - electron structures (atoms), molecules, etc. Since the particles are centers of diffraction patterns they also have particle – wave duality as the electromagnetic waves have. [2]

This paper explains the magnetic effect of the electric current from the observed effects of the accelerating electrons, causing naturally the experienced changes of the electric field potential along the electric wire. 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 Quantum Theories. [1]

The Electroweak Interaction shows that the Weak Interaction is basically electromagnetic in nature. The arrow of time shows the entropy grows by changing the temperature dependent diffraction patterns of the electromagnetic oscillators.

The universe shouldn't exist — at least according to a new theory

Physicists draw that conclusion from a model that accounts for the properties of the newly discovered Higgs boson particle, which is thought to explain how other particles get their mass; faint traces of gravitational waves formed at the universe's origin also inform the conclusion.

Of course, there must be something missing from these calculations.

"We are here talking about it," Hogan told Live Science. "That means we have to extend our theories to explain why this didn't happen."

One possible explanation holds that during the fiery flash after the primordial Big Bang explosion, matter raced outward at breakneck speeds in a process known as cosmic inflation. This bent and squeezed space-time, creating ripples known as gravitational waves that also twisted the radiation that passed through the universe, Hogan said.

Though those events would have occurred 13.8 billion years ago, a telescope at the South Pole known as the Background Imaging of Cosmic Extragalactic Polarization (BICEP2) recently detected the faint traces of cosmic inflation in the background microwave radiation that pervades the universe: in particular, characteristic twisted or curled waves called the B-mode pattern. (Other scientists have already begun to question the findings, saying the results may just be from dust in the Milky Way.)

But gravity wasn't the only force at play in the early universe. A ubiquitous energy field, called the Higgs field, permeates the universe and gives mass to the particles that trudge through the field. Scientists found the telltale sign of that field in 2012, when they discovered the Higgs boson and then determined it's mass.

With a greater understanding of cosmic inflation's properties and the Higgs boson mass, Hogan and his colleague, Malcolm Fairbairn, who is also a physicist at King's College London, tried to recreate the conditions of cosmic inflation after the Big Bang.

What they found was bad news for, well, everything. The newborn universe should have experienced an intense jittering in the energy field, known as quantum fluctuation. Those jitters, in turn, could have disrupted the Higgs field, in essence rolling the entire system into a much lower energy state that would make the collapse of the universe inevitable.

Missing ingredient

So if the universe shouldn't exist, why is it here?

"The generic expectation is that there must be some new physics that we haven't put in our theories yet, because we haven't been able to discover them," Hogan said.

One leading possibility, known as the theory of supersymmetry, proposes that there are superpartner particles for all the currently known particles, and perhaps more-powerful particle accelerators could find these particles, Hogan said.

But the theory of cosmic inflation is still speculative, and some physicists hint that what looked like primordial gravitational waves to the BICEP2 telescope may actually be signals from cosmic dust in the galaxy, said Sean Carroll, a physicist at the California Institute of Technology and author of "The Particle at the End of the Universe: How the Hunt for the Higgs Boson Leads Us to the Edge of a New World" (Dutton Adult, 2012).

If the details of cosmic inflation change, then Hogan and Fairbairn's model would need to adapt as well, Carroll told Live Science. Carroll was not involved in the study.

Interestingly, this isn't the first time that physicists have said the Higgs boson spells doom for the universe. Others have calculated that the Higgs boson's mass would lead to a fundamentally unstable universe that could end apocalyptically in billions of years.

The mass of the Higgs boson, about 126 times that of the proton, turns out to be "right on the edge," in terms of the universe's stability, Carroll said. A little bit lighter, and the Higgs field would be much more easily perturbed; a little heavier, and the current Higgs field would be incredibly stable.

Hogan will present his findings Tuesday (June 24) at the Royal Astronomical Society meeting in Portsmouth, England, and the study was published May 20 in the journal Physical Review Letters. [3]

Did Gravity Save the Universe from 'God Particle' Higgs Boson?

The recently discovered Higgs boson, which helps give particles their mass, could have destroyed the cosmos shortly after it was born, causing the universe to collapse just after the Big Bang. But gravity, the force that keeps planets and stars together, might have kept this from happening, scientists say.

In 2012, scientists confirmed the detection of the long-sought Higgs boson, also known by its nickname the "God particle," at the Large Hadron Collider (LHC), the most powerful particle accelerator on the planet. This particle helps give mass to all elementary particles that have mass, such as electrons and protons. Elementary particles that do not have mass, such as the photons that make up light, do not get mass from the Higgs boson.

The experiments that detected the Higgs boson revealed it had a mass of 125 billion electron-volts, or more than 130 times the mass of the proton. However, this discovery led to a mystery — at that mass, the Higgs boson should have destroyed the universe just after the Big Bang.

This is because Higgs particles attract each other at high energies. For this to happen, the energies must be extraordinarily high, "at least a million times higher than the LHC can reach," study co-author Arttu Rajantie, a theoretical physicist at Imperial College London, told Space.com.

Right after the Big Bang, however, there was easily enough energy to make Higgs bosons attract each other. This could have led the early universe to contract instead of expand, snuffing it out shortly after its birth.

"The Standard Model of particle physics, which scientists use to explain elementary particles and their interactions, has so far not provided an answer to why the universe did not collapse following the Big Bang," Rajantie said in a statement.

A number of scientists had suggested that new laws of physics or as-yet-undiscovered particles might have stabilized the universe from the peril posed by the Higgs boson. Now Rajantie and his colleagues have found that gravity could solve this mystery instead.

Gravity is a consequence of masses warping the fabric of space and time. To imagine this, think of how bowling balls would deform rubber mats they sit on.

The early universe was very dense because it had not had a chance to expand much yet. This meant that space-time was greatly curved back then.

The researchers' calculations revealed that when space-time is greatly curved, the Higgs boson increases in mass. This would have also raised the amount of energy needed to make Higgs bosons attract each other, preventing any instability that might have collapsed the early universe.

Now that Rajantie and his colleagues have revealed that the interaction between gravity and the Higgs played a major role in the early universe, they want to learn more about the strength of this interaction. This could include looking at how the early universe developed using data from current and future European Space Agency missions that aim to measure the cosmic microwave background radiation, which constitute the echoes left over from the Big Bang, Rajantie said. It could also include studying gravitational waves, which are invisible ripples in the fabric of space-time given off by accelerating masses, he said.

The research is detailed in the Nov. 17 edition of the journal Physical Review Letters. [4]

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.

The Relativistic Quantum Mechanics

The same thing happens on the atomic scale giving a dp impulse difference and a dx way difference between the different part of the not point like particles.

Commonly accepted idea that the relativistic effect on the particle physics it is the fermions' spin - another unresolved problem in the classical concepts. If the electric charges can move only with accelerated motions in the self maintaining electromagnetic field, once upon a time they would reach the velocity of the electromagnetic field. The resolution of this problem is the spinning particle, constantly accelerating and not reaching the velocity of light because the acceleration is radial.

The Heisenberg Uncertainty Relation

I think that we have a simple bridge between the classical and quantum mechanics by understanding the Heisenberg Uncertainty Relations. It makes clear that the particles are not point like but have a dx and dp uncertainty.

The General Relativity - 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

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 frequency dependence of mass

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.

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. [2]

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.

The Higgs boson

By March 2013, the particle had been proven to behave, interact and decay in many of the expected ways predicted by the Standard Model, and was also tentatively confirmed to have + parity and zero spin, two fundamental criteria of a Higgs boson, making it also the first known scalar particle to be discovered in nature, although a number of other properties were not fully proven and some partial results do not yet precisely match those expected; in some cases data is also still awaited or being analyzed.

In my opinion, the best explanation of the Higgs mechanism for a lay audience is the one invented by David Miller. You can find it here: http://www.strings.ph.qmul.ac.uk/~jmc/epp/higgs3.html .
The field must come first. The boson is an excitation of the field. So no field, no excitation. On the other hand in quantum field theory it is difficult to separate the field and the excitations.
The Higgs field is what gives particles their mass.
There is a video that gives an idea as to the Higgs field and the boson. It is here: http://www.youtube.com/watch?v=RIg1Vh7uPyw . Note that this analogy isn't as good as the Miller one, but as is usually the case, if you look at all the analogies you'll get the best understanding of the situation.

Since the Higgs boson is necessary to the W and Z bosons, the dipole change of the Weak interaction and the change in the magnetic effect caused gravitation must be conducted. The Wien law is also important to explain the Weak interaction, since it describes the T_{max} change and the diffraction patterns change. [2]

Higgs mechanism

The magnetic induction creates a negative electric field, causing an electromagnetic inertia. Probably it is the mysterious Higgs field giving mass to the charged particles? We can think about the photon as an electron-positron pair, they have mass. The neutral particles are built from negative and positive charges, for example the neutron, decaying to proton and electron. The wave – particle duality makes sure that the particles are oscillating and creating magnetic induction as an inertial mass, explaining also the relativistic mass change. Higher frequency creates stronger magnetic induction, smaller frequency results lesser magnetic induction. It seems to me that the magnetic induction is the secret of the Higgs field.

In particle physics, the Higgs mechanism is a kind of mass generation mechanism, a process that gives mass to elementary particles. According to this theory, particles gain mass by interacting with the Higgs field that permeates all space. More precisely, the Higgs mechanism endows gauge bosons in a gauge theory with mass through absorption of Nambu–Goldstone bosons arising in spontaneous symmetry breaking.

The simplest implementation of the mechanism adds an extra Higgs field to the gauge theory. The spontaneous symmetry breaking of the underlying local symmetry triggers conversion of components of this Higgs field to Goldstone bosons which interact with (at least some of) the other fields in the theory, so as to produce mass terms for (at least some of) the gauge bosons. This mechanism may also leave behind elementary scalar (spin-0) particles, known as Higgs bosons.

In the Standard Model, the phrase "Higgs mechanism" refers specifically to the generation of masses for the $W^{\pm}$, and Z weak gauge bosons through electroweak symmetry breaking. The Large Hadron

Collider at CERN announced results consistent with the Higgs particle on July 4, 2012 but stressed that further testing is needed to confirm the Standard Model.

Gravity from the point of view of quantum physics

What is the Spin?

So we know already that the new particle has spin zero or spin two and we could tell which one if we could detect the polarizations of the photons produced. Unfortunately this is difficult and neither ATLAS nor CMS are able to measure polarizations. The only direct and sure way to confirm that the particle is indeed a scalar is to plot the angular distribution of the photons in the rest frame of the centre of mass. A spin zero particles like the Higgs carries no directional information away from the original collision so the distribution will be even in all directions. This test will be possible when a much larger number of events have been observed. In the mean time we can settle for less certain indirect indicators.

Conclusions

Now that Rajantie and his colleagues have revealed that the interaction between gravity and the Higgs played a major role in the early universe, they want to learn more about the strength of this interaction. This could include looking at how the early universe developed using data from current and future European Space Agency missions that aim to measure the cosmic microwave background radiation, which constitute the echoes left over from the Big Bang, Rajantie said. It could also include studying gravitational waves, which are invisible ripples in the fabric of space-time given off by accelerating masses, he said.

The electric currents causing self maintaining electric potential is the source of the special and general relativistic effects.

References

[1] The Magnetic field of the Electric current and the Magnetic induction

http://academia.edu/3833335/The_Magnetic_field_of_the_Electric_current

[2] 3 Dimensional String Theory

http://academia.edu/3834454/3_Dimensional_String_Theory

[3] Universe Shouldn't Be Here, According to Higgs Physics

http://www.livescience.com/46478-universe-should-have-collapsed.html

[4] http://www.space.com/28181-gravity-higgs-boson-universe-destruction.html?adbid=10152572435491466&adbpl=fb&adbpr=17610706465&cmpid=514630_20150107_38407027