

# Higgs's mechanism

Source <http://www.scienceworld.cz/aktuality/nobelova-cena-za-higgsuv-boson/>

Nobel Prize for Higgs' boson

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Higgs' boson lives very shortly. Theory can't predict its mass straightaway, however for certain mass it can predict strictly and exactly the way of its decay.



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This year Francois Englert and Peter Higgs were awarded Nobel Prize for physics, for **theoretical discovery of the mechanism**. Dear Sirs, isn't it possible to replace the term „theoretical discovery“ with the „proposed hypothehis“ ??? – Thus how does **practical discovery** of that mechanism look like ? that contributed to our understanding of origin of the mass of subatomic elementary particles if „mechanism“ contributes to understanding (understanding of anything) then explain in properly, „that mechanism“ of giving out of the mass !!!! Where that mass did come from by a wave, how is it then distributed and finally, what's the way by which massless particles receive that mass to make them material ??? and that was recently confirmed by discovery of the fundamental particle in ATLAS and CMS experiments at LHC collider at CERN. So that how can some „mechanism“ be confirmed in its validity by discovery of the particle ??? ( So that does Higgs' particle C O N F I R M mechanism ??? Does bicycle confirm m-e-c-h-a-n-i-s-m of Tour de France? And if so.... how ? Higgs' boson discovery enabled completion of the last missing piece into so called standard model of microcosm. This **theory** theory of giving out masses by means of Higgs' mechanism ??? is very usefull since 60ties and 70ties years of the twentieth century. Standard model works partly with building blocks – leptons and quarks and partly with intermediate vector bosons as transmitters of interactions. Beside massless photons and gluons there are massful W and Z bosons among them. **Functional theory should be able to include all necessary masses of the particles** there's nothing to wonder that theory includes „currently existing“ masses but how that mechanism those masses gives out and where „for“ that giving collects them from, that's already „different“ theory !!! and to allow exact calculations analogous to first successful model of the quantum field theory, quantum electrodynamics.

Possible way to reach this aim was opened exactly by works of Peter Higgs and his colleagues in 1964. In this work they had **analyzed simple models for scalar and vector fields**. To analyze real nature is something crucially different than analyze „models“ on the paper (this I am able to do so as well). Critical application of the **Higgs' mechanism** experienced till Steven Weinberg and his famous work arrived into scene. In this work he unified weak and electromagnetic interactions together (1967). In addition Weinberg here **gave** by simple modification of the Higgs' **mechanism mass** How did he „gave“ it out ??? If I put quins on the top of the Mr. Kulhanek's head so will I make him to be devil ? Will I make him to be right, genuine and scientifically confirmed and from the universe coming devil by this? to for examle electron and next elementary fermions and that way he helped to standard model come to light. What does it mean „to give out“ ? What does it means that the „mechanism“ “gave“ mass to sothing or somebody ??? Mechanisms „will take“ mass from Nowhere and then in the same way like an illusionist does by a wave that mass is handed out ? ..? He took it from nowhere and hands it out. In other words is the charlatan, an illusionist that mechanism? Is it giving mass out without taking it from somewhere ? Question. Is that mechanism made up by humans or by nature ? As a result is that **by means of Higgs' mechanism** there intermediate bosons, leptons and quarks **wil get mass** but

photon remains massless. I am repeating it again: how and by means of can **mechanism** give out mass ????? As a by product there's still one more particle staying in the game, particle with mass but without charge and zero spin that interacts together with other well-known particles so that in principle it is detectable experimentally – and that's the Higgs' boson in question. I'm not excited by Higgs' boson to have mass but that it should be by product of that mechanism ??? This is what I cannot understand to. Mechanism itself giving out mass to other elementary particles including Higgs' boson itself. Is that really and genuinely truth??? What was before ? „Higgs' boson“ first **and then** those immaterial particles afterwards taking **then** their mass from the „mechanism“ of which Higgs boson is just a by product? And how much of that mass had that Higgs' boson before giving out and after giving out ? It is indeed just „a by product“ of the Higgs' mechanism What's the main product if by product is „incidental“ giving out mass ? but its significance for standard model is immense: Exactly **explicit presence** of the Higgs boson **presence in the nature** ??? or **presence in the theory – hypothesis** ????? namely guaranties above mentioned functionality of the quantum theory of the electroweak interactions. **If Higgs' boson would not have to be in theory would be also in real nature ? (or even vice versa ? )**

It looks as if nature wants to be considerate toward theoretists and gave Higgs' boson closer to them in such way in order to make them performing their calculations much more easily by using of techniques developed and advanced in quantum theory of fields for more than half of the century. **It seems to me that nature depends on physicists** But nature also permitted experimenters to find already predicted Higgs' boson. Higgs' boson is alive very short interval of the time. ...but „mechanism“ instead of Higgs' boson itself lives forever. That mechanism which is giving up mass anytime and anywhere. Higgs' boson lives a very short time, it changes its appearance and turns itself into another elementary particle .... and gives to it „its own mass“. Higgs' boson lives shortly in both environments laboratory and universe. But where is it „coming“ from as a matter of fact ? And does it take that mass from ? The mass that is then given out. Does Higgs' boson give out mass or „mechanism“ ??? Thus – after Big-Bang massless particles came first, those ones then were waiting until Higgs' boson „arrived“ and this one then gave out them mass.... Yes or not ! **Theory can't** predict its mass directly but for certain mass **predicts very exactly** of what kind of decay the Higgs' Boson is concerned. **I can do this also: First I will try in which puzzles my puzzle collection will be fragmented to and then declare that I can p r e d i c t way of fragmentation in the future.**

Finding of Higgs' boson was one of the aims of particle experiments performed in highest-rating accelerators in a last few years. Success of searching new particle generally depends upon enough amount of energy and intensity of the collisions of the accelerated particles and also quality of detectors analyzing products of such collisions. Higgs' boson searching was tough a very long time. It was not found neither in LEP accelerator in CERN nor in Tevatron at Fermilab in USA. Discovery had to wait until the biggest recent accelerator LHC at CERN had been put into operation at the end of March 2010. In July 2013 experiments ATLAS and CMS had announced discovery of particle approximately 130 times heavier than proton during investigation of protons collision products. **Found decays** How is that ? „Decay“ (of the particle-proton) or „transformation“ of the proton ? What is closer to the truth? There are 3 quarks and 98% of free space inside of the proton. How somebody can be sure of which other different particles of which number will be produced as a result of collision? Does this conglomerate decay or divide or just change its inner configuration ? How can scientist be sure? Why can three quarks + space give birth to other particles of different kind and number ? There are ten's of them. Why does just one identical proton smash itself and give birth to other and other particles, or „jets = crocks“ witnessed that it could be particle there of that of Higgs' boson.

Next experimental data collected till the end of the last year 2013 gave evidence that even following decays and **properties of new particle** accord with expected properties of Higgs' boson. **So that those unknown properties of that until now not yet found particle are somehow „scheduled“ in advance** and then they are searched by scientist in those millions of collision. Can this be truth ? We project **properties first and then do we look for them.... (?)** Presently **existence** of the Higgs' boson is already **approved** in both ATLAS and CMS experiments **If we start to search properties of the particles which we want to find there those of millions and millions of collisions are the best way of how to comply with these properties. And it will bear the name the Piggs' boson then.** approximately in one of each there were three pairs of particles per one thousands decays presented. Experiment ATLAS joints over 3000 physicists coming from all parts of the world. Among them there are more than 60 physicists and

students from the Czech High Technical Institute in Prague, Institute of Physics AV CR, Charles' University and Palacky's University in Olomouc. Czechs belong to establishing members of the experiment. They participated on design of the detector and built parts of the hadron's calorimeter, inner detector of trajectories, neutron shielding and detectors of the particles scattered to small angles. At the present time they secure operation of these detectors and prepare their renovation for the next years of the work on LHC with topped service. They also deal with processing and analyzing data. Discovery of Higgs' boson involved enormous struggling of the many thousands scientists and Czech scientists contributed to this all over the world effort by means of experiment ATLAS significantly. CERN is an incubator of the new ideas and technologies. Its research program includes together with using unique accelerators also practically oriented research using technologies and methods developed originally for particle physics: scanning methods for medicine and biology, accelerators for proton therapy of the tumors, methods for manufacturing of the toxical debris, research of impact of the cosmic radiation on the climate of the Earth and more of those.

Higgs' **mechanism** had not been yet explained here purely unambiguously.

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Source: <http://www-hep2.fzu.cz/adventure/keyhole/theory/main-9.html> →

Higgs' mechanism. According to this mechanism whole space is filled in with „Higgs' field“ and by interaction with it particles obtain their mass. **Such interpretation requires much more precise interpretation. Author is to say that empty space which is still just small bullet of about  $10^{-30}$ m in size after the Big-Bang is „filled in“ with the immaterial virtual field arrived from nowhere and which doesn't express itself physically but gives away mass to immaterial particles by means of Higgs' boson . Is it so ? How can it be that immaterial particle comes from some area where Higgs' field virtually doesn't exist yet and leaps itself „into that field“ , getting mass by interaction with the Higgs' boson and flies away without need to interact with the field again? Perhaps it is possible that such „immaterial“ wave-agglomeration will swim up to Higgs' field and there it has to configure - curve itself in such way in order to get mass and then go away. Is this the case .....???**

There is at least one particle connected with the Higgs' field. It is Higgs' boson that mediates Higgs' interaction.

So that there wonders field named as a Higgs' field in empty space waiting for immaterial particle. Immaterial particle will come and touch this field which cause Higgs' boson to be released. This boson then mediates interaction between such single immaterial particle and field giving away mass to this particle . (Only God does know what it means really). If you will tell such story to the aliens some time in the future , for example in another modification, they will stare at it.

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Source: [http://kjende.web.cern.ch/kjende/netzwerk/cz/wpath\\_higgs.htm](http://kjende.web.cern.ch/kjende/netzwerk/cz/wpath_higgs.htm)

Among new particles that are targeted to be discovered in experiments on LHC the Higgs' particle is probably the most famous and discussed. Its discovery can contribute to final confirmation of **theory originated in 60ties of the 20tieth century which describes mechanism of how all particles of the standard model give their mass.** In accordance with **theoretical conceptions all particles had had zero mass immediately after the Big-Bang.** Shortly after the Big-Bang universe was penetrated with special **medium called as a Higgs' field.** **At last** we can see now of what kind of naive story is this. Story of how particles were gifted with mass is naive. **Let's repeat the situation:** All particles of the matter well known until now were originated in the Big-Bang at the same time. (Reportedly at the same time all matter was originated i.e some about  $10^{53}$  kg perhaps in the form of radiation .... or in the form of other particles different from those of photons .... ?) Neither matter was originated before Big-Bang nor

additional one after that. All of matter had been originated instantly and as unmaterial one, with zero mass. Mass was given to it by „Higgs“. ( It is said that in that Big-Bang / singularity there was extremely hot environment = energy but energy without mass?? It evidently doesn't make sense. How can it be there plasma of particles without mass ?? *Singularity of extreme energy with no mass??* ) And after the moment of the Big-Bang the story is that into this plasmatic universe already full of energy but without mass suddenly medium was „inserted“ that people named as a Higgs' field. ((( Milan Petricek named it „aether“ and others gave it designation space-time foam))) ... but famous physicists gave it title „Higgs' medium“. Nobody knows whether or not this medium has got the mass and if so of which form that mass is about but each of these physicists knows mechanism. Mechanism of how this field will interact with massless particles. They know that this hypothetical field will give away mass to anybody who comes from somewhere through Higgs' boson. Nothing is possible without interchange particle which must be at the place all the time. Ironically - everything is already sorted out. There is need of interchange particle for any interaction. All matter was originated in the moment of the Big-Bang (since then nothing was originated additionally). This matter was massless until mysterious field arrived at the scene. This medium (Higgs' field) begun to give away mass to the massless particles... perhaps on the base of request, maybe stepwise, maybe particles put themselves into queue waiting for gift of the mass and maybe it was shocking booom because they all were mass given „simultaneously“. Why did universe did it in such way? Thus - that first it made massless matter from nothing and then begun give away mass to this virtual matter by means of medium originated also from nothing but a little bit later. Or a condensate. Since that point on particles have got non-zero mass. Whole **mechanism we can imagine** in that way Can we do it or have to do it ???

My mechanism is nearly identical but still different, more meaningful. Before Big-Bang there was only space-time 3+3 dimensional. This state was plane, infinite, without matter and fields. Big-bang itself was nothing else but change of the state. From current one to the next one. So that Big-Bang is only conversion, changeover in which time begun to run. ( Time, of course, existed as a quantity even before Big-bang but it „was not running“.) Expansion of the space begun to run alongside with time unwinding. Big-Bang is a beginning of the space-time curving process and as such this principle of space-time curving is a principle of the realization of the matter composed of the space-time quantities themselves. After the Big-Bang 3+3 plane space-time passes into the state full of space-time foam. → which is a plasma. Phenomenon of „curving“ of the space-time quantities is the phenomenon which gives birth to the matter and fields. Curving, undulating and wave-agglomeration are phenomemons giving birth to both matter and mass as well. Mass is then the „property“ of the matter. Next evolution of the universe is directed by principle of alternation of the symmetries with asymmetries. Next my visions about universe are included in my hypothesis. ....that this medium offers to most of the particles **some kind of resistance** (this resistance differs according to types of the particles) so that there is necessity of the force to accelerate them. The language by which elementary particles are described in present physics are so called **quantum fields**. Quantum fields are nothing else but space-time foam on the Planck's scales and with this foam whole universe is filled up. On the big scales this foam passes into other curvatures of dimensions – other fields ! Thus even with Higgs' field there must be at least one particle connected to it. And this particle is just the Higgs' boson. It has enormous mass and short period of life. It's decaying very fast into other ones. It's possible to observe it but only by means of its decay products. It is highly depending on its mass of which kind of particles it will decay in preference. This mass unfortunately is not know yet. This is also a reason why physicists search all sorts of signals related to all possible decay modes of the Higgs' particle. Following chart based upon theoretical calculations shows relations where different processes contribute to decay of the Higgs' particle in relation to its mass. Mass values are displayed on axis x, values of ratio (in logarithmic scale) are displayed on axis y. It's evident that significance of which decay process will be observed highly depends on mass of the Higgs' particle.

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Source: <http://www.ceskatelevize.cz/ct24/svet/245261-nobelova-cena-za-fyziku-udelena-za-objev-bozske-castice/>

Scientists are convinced belief is not subject of Mr. V.Hala's acceptance, a leader of the Czech pedagogic physics. That guy throw off to the black hole everybody who „believes“ or is „convinced“ about something and this throwing off is very often accompanied with ridiculous humiliation... that within period of first billionth of second after the Big-Bang whole universe was filled with huge mixture of particles without mass flying all around with speed of light. They got mass until interaction with Higgs' field came into the scene. This field as a medium came from nothing which is that „mechanismus“ in question. Simply these unmaterial particle „got – received“ mass „suddenly“ from the field. What similarity to this my hypothesis is this about! My explanation is that the „field“ is represented – according to my conviction - by curved space-time ( already  $n+m$  dimensional ) in the form of certain foam and there are wave-agglomerations „bouncing out“ of this foam. These wave-agglomerations are composed of dimensions of quantities lenght and time and represented already as born of elementary particles. They've got already mass because every state of the space-time curvature is substantial state regardless whether it is field or mass particle. By this mechanism universe was created as is known to us.

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Source: [https://is.muni.cz/el/1441/jaro2013/CH2BP\\_2P6P/um/Einstein.txt](https://is.muni.cz/el/1441/jaro2013/CH2BP_2P6P/um/Einstein.txt)

Disturbed symmetry of the space. Unification of elecroweak interaction is caused by mysterious Higgs' particles that „spontaneously disturb“ symmetry of the empty space. In quantum physics even vacuum is not completely empty. In accordance with uncertainty principle vacuum is fully filled with contemporary arriving pairs of particles and antiparticles which are in short period of time also simultaneously disappearing. Higgs' particles imprint the certain structure to the empty space – i.e. Higg's field – which we can distantly imagine as waves on the inner side of the plate made from the cardboard.

Missing Higgs. Particles obtain their mass via Higgs' mechanism that affects everything – even vacuum – and in specific way disturbs relevant electroweak symmetry. ( see page 66 ). Relevant Higgs' particles are absorbed by electroweak particles that will get „more heavy“ in this way.

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<https://www.google.cz/#q=higgs%C5%AFv+mechanismus+jak+z%C3%ADsk%C3%A1vaj%C3%AD+%C4%8D%C3%A1stice+hmotnost>

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[http://www.aldebaran.cz/bulletin/2010\\_28\\_uni.php](http://www.aldebaran.cz/bulletin/2010_28_uni.php)  
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Zdroj : [http://www.bosonhiggs.8u.cz/?page\\_id=2](http://www.bosonhiggs.8u.cz/?page_id=2)

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<https://www.google.cz/#q=higgs%C5%AFv+mechanismus+jak+z%C3%ADsk%C3%A1vaj%C3%AD+%C4%8D%C3%A1stice+hmotnost>

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[http://www.aldebaran.cz/bulletin/2010\\_28\\_uni.php](http://www.aldebaran.cz/bulletin/2010_28_uni.php)  
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Source: [http://www.bosonhiggs.8u.cz/?page\\_id=2](http://www.bosonhiggs.8u.cz/?page_id=2)

Higgs' mechanism

Simply put according to Higgs' mechanism whole space-time is filled in with so called Higgs' field. I cannot understand why my hypothesis became subject of mockery and ridiculous humiliation if it is so far similar and even more logical in comparison with other proposals and hypotheses namely with that of Higgs' mechanism. According to my hypothesis „whole space-time“ represents such field like that of the Higgs' one. It differs just in accordance with type of curvature on different levels of the scales.

On Planck's level space-time has got foam structure and very curving of the space-time dimensions already represents according to principle of the universe „realization of the mass artefacts“ in both field and elementary particles modes (wave-agglomerations) where mass is a property of the elementary particles. Why and what is the reason that hypotheses of physicists are more true than that of the laik like me? and by interaction with this field particles obtain their mass. I think that by principle both of hypotheses in the same proportion point to the similar vision and converge to the right principle of the world. Why should different ideas like that of mine be humiliated ? That's then process which enables certain types of particles ( $W^+$ ,  $W^-$  a  $Z$ ) to have mass and at the same time gives photon possibility to stay massless. Exactly in the case of the Higgs' mechanism there is usage of spontaneous disturbance of symmetry in standard model. Higgs' mechanism represents extension of so called Goldstone's mechanism.

Goldstone theorem says that spontaneous disturbance of the symmetry occurs when system of the symmetric state of the lowest energy will change itself in that way that it is not symmetrical any more and this is the moment when unmaterial particles are coming at the scene. They are named as Goldstone or also Nambu bosons. In particle physics Goldstone bosons are unmaterial elementary particles with spin 0. In theory of supersymmetry there is right Goldstones presented as mediators of interactions which can be compared to Higgs' field that gives mass to  $W$  and  $Z$ .

Spontaneous disturbance of symmetry occurs when certain symmetry which is maintained in some energetic state changes that state. During this process of change of the energetic state (for example when particle goes into lowest state as a vacuum is) this symmetry is disturbing. Basic problem of this theory consists in that fact that according to this theory all four mediating particles have zero mass.  $W^+$  and  $Z$  have steady mass of 80 GeV and 91 GeV. It means that this symmetry has to be disturbed. Therefore that theory bears the title „spontaneous disturbance of the symmetry.“ Without introduction of Higgs' mechanism there is nothing in theory able to explain their mass but necessity to include another particle – Higgs' boson. What is going on is that unmaterial particles interact with the Higgs' field in order to be contacted with H-boson. This interaction acts as a „barrier“ of their motion which is expressed externally as if particles have been equipped with mass.

Quantity of interaction with the Higgs' field determines mass of the particles. As a result it is that because of Higgs' mechanism intermediate bosons, leptons and quarks will get mass whereas photon will remain massless.

The most important and until now still not resolved problem is origin of [the dark energy](#).

It seems as the most likely that reason is vacuum itself that must have to carry unusual properties and never can be absolutely empty. There are all the time some fluctuations of the various fields in vacuum and pairs of particles and antiparticles are arriving as though from nowhere and very fast and unexpectedly disappearing again. Quantum vacuum has non-zero energy, it should be within the frame of the universe homogenous and density of its energy should be remained the same during expansion. In addition, mediate value of energies of these quantum fluctuations contributes to density of the energy in the universe which is the same formula as the famous [cosmological constant](#) in Einstein's equations of general theory of relativity. Thus – it is possible the circle is starting to close and origin of the cosmological member in general relativity rests upon quantum processes in vacuum. But there is a problem. Density of energy of the vacuum is about many orders higher than density of observed dark energy. Maybe our world is more dimensional and this excessive energy is distributed into these extra-dimensions that we do not perceive. Maybe we are not right and dark energy is not connected with energy of vacuum in any way and it's just expression of the next until now unknown interaction so called as fifth essence – or [kvintesence](#). And maybe everything is entirely different and gravity on huge scales expresses itself in different way that we think about. As the key to understanding of fundament of the dark energy should be so called state equation of the dark energy that links pressure and density of energy together. There should be valid simple linear relation as:  $p = wp$ . Everything is deriving from the value of [parameter w](#). If value of this parameter is less than  $-1/3$  the universe is expanding with acceleration. Value  $-1$  would correspond with quantum expressions of the vacuum thus with the cosmological constant. Value less than  $-1$  that would mean so called *big disruption* of the universe in the future and that would lead to desintegration of all basic building blocks of the matter seems to be excluded experimentally. Great prospect to get more exact value of the parameter  $w$  presents probe [Planck](#) investigating fluctuations of the relict radiation. We could learn

more about quantum properties of vacuum from experiments on the biggest accelerator in the world [LHC](#). Dark energy and its manifestation is subject of the other research projects.



pěnovitý časoprostor

Quantum vacuum and its omnipresent fluctuations constitute basic **fibre** of the universe. Are these fluctuations identical with the observed dark energy ?

Source: Lee Brain, Simon Fraser University, 2008

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