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THE QUANCHA THEORY
Concept note on a Grain-Shell-Angel Hair structure

The objective of this essay is to imagine a particular representation of quarks and to see if this shape can explain dark matter and the particle wave duality simply and visually, and to open the door to a regrouping of relativity and quantum mechanics.

This particular shape of quarks should make it possible to give a practical interpretation in four dimensions, almost without calculations of: the arrow of time, entropy, the period of inflation of the universe, electromagnetism, the weak nuclear interaction, the strong nuclear interaction, gravity, wave-particle duality, spin, non-locality, energy quanta, the superposition of quantum states, tunnelling effect and quantum decoherence.

Let's see if it's possible!

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Prologue.

Quantum mechanics and relativistic mechanics are fantastic intellectual concepts whose predictions are of a precision never before attained but are now described by distinct formalisms.

The aim of this paper is to explore the possibility that a particular physical representation of particles may be a unique underlying mechanism for simply explaining the main results of cosmology, classical mechanics, relativistic mechanics and quantum mechanics.

This note does not seek to replace current physical theories, but to propose a conceptual framework providing an intuitive representation of phenomena already successfully described by existing formalisms.

Introduction

Our knowledge of physics leads to fantastically accurate results, but current physics presents at least three major contradictions:

1. We have two theories that work perfectly but are incompatible: relativity and quantum physics.
2. In cosmology, the matter we see is not enough to explain the functioning of our universe, we have to add energy and invisible matter that we call dark energy and dark matter.
3. A particle sometimes behaves like a point object and sometimes like a wave, this is called the particle wave duality but this elegant name does not explain the phenomenon in any way.

The objective of this essay is to imagine a simple physical form to the elementary building block that makes up protons and neutrons, the quark, and to see if this particular shape can resolve the three contradictions above.

To explain point 1, the simplest way would be to assume that a particle is not a point ball of matter, but is also quite extended.



To explain point n°2, the simplest way would be to imagine that each particle that we observe has, in addition to the central ball of matter, an extended part but which is so low in energy that it becomes almost invisible. The model then becomes:



To explain point n°3, the simplest way would be to imagine that a particle permanently has both characteristics: wave and ball of matter. The model becomes:



Cette particule composée d'une partie matérielle ponctuelle compacte et d'une partie ondulatoire trop faible pour être visible répond bien à nos trois critères mais comment expliquer cette onde sortant d'un grain de matière ?

The tunnelling effect could explain this wave that comes out of nowhere if we replace the central ball of matter with a bowl containing energy in the form of a wave.
Our model in one-dimensional representation then becomes:

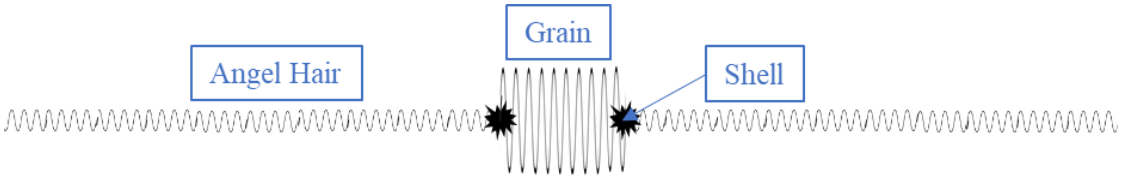


Let's simplify the diagram a bit and give names to these three parts.

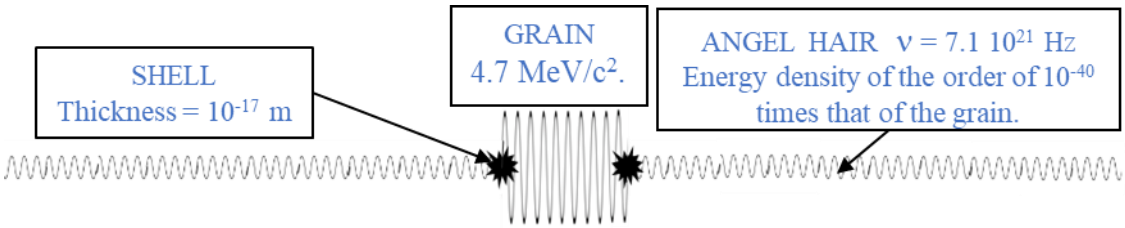
In this diagram, the matter of the quark is replaced by a very concentrated wave with a very high energy. Let's call this concentrated energy: the Grain.

This energy of the Grain is limited by a barrier that acts as a containment. Let's call it: the Shell. As it confines the energy of the Grain, its energy level is necessarily higher than that of the Grain, but its "thickness" can be very small.

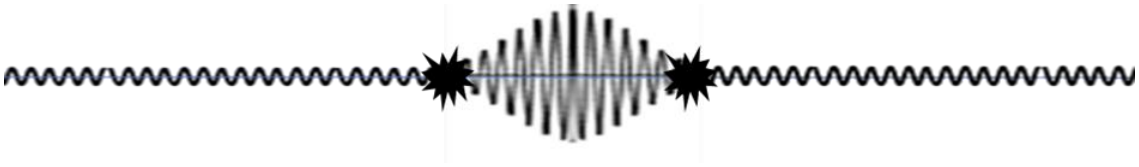
Through the tunnelling effect, the Shell constantly leaks a wave of very low energy density which is permanently in phase continuity with its Grain, is constantly growing at the speed of light and extends to the ends of the universe. Let's call this wave the Angel Hair by analogy with the "angels' share" that a barrel of cognac or whisky loses.



We will see later that we can approach the main characteristics of these three components:



Notons aussi que le Grain pourrait ressembler réellement à une fonction d'onde. Cette différence ne changerait absolument rien à tout ce qui va être décrit.





In this particle model, there is no matter: only energy.

Grain and Angel Hair

Given the difference in energy between the Grain and the Angel Hair, for all short-distance calculations we can neglect the Angel Hair in the same way that we neglect gravity in quantum mechanics. On the other hand, for calculations over large distances, such as in relativistic physics, we can no longer neglect the Angel Hair which is immense in size.

The frequency of the Grain of a quark gives it its mass, i.e. 4.7 MeV for a "Down" quark. The relationship $E= h\nu$ with $h = 6.58\ 10^{-16}$ eV gives the frequency of the emitted radiation and therefore the frequency of the Angel Hair: $\nu = (4.7\ 10^{6}) / (6.58\ 10^{-16}) = 7.1\ 10^{21}$ Hz
The energy of an Angel Hair is therefore proportional to the energy of its Grain.

The wavelength of the Angel Hair of the "Down" quark is therefore $c/\nu = 3\ 10^{8} / 7.1\ 10^{21} = 4.2\ 10^{-14}$ meters. That's $2.6\ 10^{21}$ times the Planck length ($1.6\ 10^{-35}$ meters).
The same calculation for an Up Quark (2.16 MeV) brings a wavelength of its Angel Hair at $9.1\ 10^{-14}$ m and at $2.1\ 10^{-15}$ m for a Strange Quark (93.5 MeV).

For easy reading, in all the diagrams that follow, I will represent the Grain as a sequence of sinusoids having the same frequency as the Angel Hair but in reality, the Grain of a quark having a size less than 10^{-19} m its frequency is much higher. Despite the difference in frequency, the Angel Hair escaping from the Shell by tunnel effect is permanently in phase continuity with its Grain.

In the graphics that will follow I will almost only use one-dimensional figures but you have to imagine three concentric spheres: the inner one, the Grain, the intermediate one, the Shell and the outer one, extending to the confines of the universe, the Angel Hair.

The Quancha theory and cosmology.

Does our particle model explain in a simple way the arrow of time, entropy, dark energy + dark matter and the inflation period of the early universe?

A simple physical explanation for the existence of the arrow of Time.

The Grain + Angel Hair set keeps a constant energy but the Grain transmits its energy to the Angel Hair as it grows. The Grain therefore loses its energy as the Angel Hair grows.

The Grain can't rewind his Angel Hair and therefore time can't go back, it does have an arrow.

At time zero in our universe, there were only Grains and Shells. Grains have transmitted 0% of their energy to Angel Hair.
Dark matter currently makes up 25% of our universe. In 14 billion years, the Grains have lost 25% of their energy given to their Angel Hair. This still leaves our universe 41 billion years before the Shells contain no more energy.

A Grain loses r% per year with r such as: (1-r)^(14,000,000,000) = 0.25

This gives r = 9.9 10^{-11} per year

The Grain loses about 0.000000099% of its energy per century, energy that it transmits to its Angel Hair.

The arrow of time would be linked to an irreversible evolution of the internal energy structure of the particles.

The irreversible decrease in the energy of the Grain could constitute a physical interpretation of entropy.



A simple physical explanation for the period of inflation in the universe.

During Planck's era, Angel Hair began to grow, but the enormous gravity of that time kept it concentrated around its Grain. When their growth was such that it exceeded the force that compressed them, they made the primordial universe explode. The primordial universe then expanded very quickly, which cooled it. Cosmic inflation would then simply be the period when Angel Hair suddenly unfolded.

Figures do not contradict this hypothesis:
Seen from the outside, the universe existed for an infinitesimal amount of time before cosmic inflation, around 10^{-33} seconds. But seen inside the ball of energy that was the universe at that time, time was terribly compressed. During this brief period of inflation, the universe

increased in size by 10^{50}. Time inside the universe was then contracted by its square root, a factor of 10^{25}.

Angel Hair inside the universe grows at the speed of light, or 3 10^{8} m/s. In 10^{-33} seconds x 10^{25}, or 10^{-8} seconds, the Angel Hair compressed in the energy ball grew 3 meters. When they unfolded, the universe almost instantly reached the size of 3 meters, which is the estimated size of the universe at the end of inflation.

Cosmic inflation is the short span of time when Angel Hair that was compressed suddenly unfurled.



A simple physical explanation for dark matter and dark energy.

The ordinary visible matter is made up of the Grains and Shells which have a very high energy density and the invisible dark matter is made up of the Angel Hair which has a very low energy density and is therefore almost invisible.

What is the energy ratio between a Grain and its Angel Hair?

If we close the two concentric spheres of a Grain and its Angel Hair along a line, like a handheld fan that we close, we obtain two lines sharing the same centre. Since the surface of the sphere πr^2 has become the surface of a rectangle r*h, the decrease in gravity as a function of the square of the distance disappears and the gravitational energy density is constant.



In this diagram, the force of attraction of the left part of the hadron is denoted F_{1G}, that of the right part of the hadron F_{1D}. And the same goes for Angel Hair with F_2. Each half of the hadron pulls the universe toward its centre, and each half of Angel Hair pulls the universe away from the hadron.

If the universe was in equilibrium we would have $F_{1G} = F_{2D}$ and $F_{1D} = F_{2G}$, i.e. $F_1 = F_2$.
The strength of attraction is proportional to the mass therefore to the energy and we get $E_1 = E_2$.

The energy of a hadron is about 100 times the energy of its grains: $E_1 = 100\ E_{Grain}$

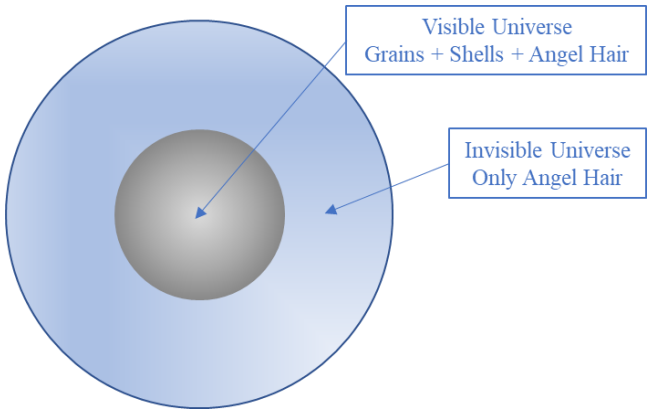
The energy density of a hadron is homogeneous and 100 times that of its Grains: $\mathcal{E}_1 = 100\ \mathcal{E}_{Grain}$
The energy density of an Angel Hair is x times that of its Grain: $\mathcal{E}_2 = x\ \mathcal{E}_{Grain}$
The L_H length is the size of a proton or a neutron, the main constituents of the universe.
The L_U length is the size of the universe.

The total energy of a Grain is equal to its energy density multiplied by its length.
The total energy of an Angel Hair is equal to its energy density multiplied by its length.

The equality of energies thus becomes: $\mathcal{E}_1 L_H = \mathcal{E}_2 L_U$
That is, with the lengths in meters: $100\ \mathcal{E}_{Grain}\ 8.4\ 10^{-16} = x\ \mathcal{E}_{Grain}\ 8.8\ 10^{26}$
So: $x = 0.95\ 10^{-40}$

If the visible universe were in static equilibrium, Angel Hair, whose energy density would be 10^{-40} times that of their Grain, would perfectly explain this balance.
As the universe is expanding, the energy density of an Angel Hair must therefore be slightly greater than 10^{40} times that of its Grain.

It must be noted that invisible universe filled only with Angel hair can extend beyond the visible universe.



There is no such thing as repulsive dark energy, it is the Angel Hair that ensures the expansion of the universe.

Angel Hair might replace dark matter and dark energy.

The Quancha theory and the four fundamental forces of the universe.

Current physics is based on only four fundamental interactions acting at a distance between them via fields : Newton's gravity, the Coulomb + Lorentz electromagnetic force, the strong nuclear force, and the weak nuclear force.

Our particle model allows us to find these four sets of equations but without remote interactions, only with contact interactions.
Let's see together how.

A simple physical explanation for Newtonian gravity.

Newtonian gravity is due to the contact interaction between Angel Hair and Shells.

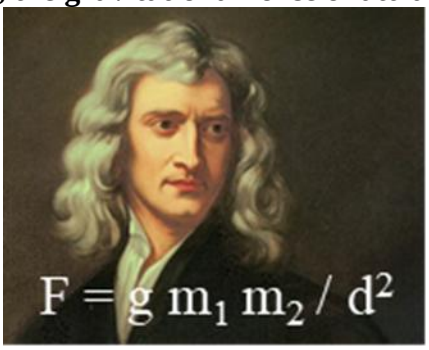
In a first approximation, the attraction between two quarks comes from the contact between the Angel Hair of Grain 1 with the Shell of Grain 2, and vice versa. The Shell #2 will seek to contain Angel Hair #1. Let us consider two Grains distant from the distance "d"

The energy of the Shell of Grain 2 is proportional to the energy of its Grain:
$E_{Shell2} = \mathcal{P}\ E_{Grain2}$ If we convert to masses (M) : $E_{Shell2} = \mathcal{P}\ M_{Grain2}\ c^2$

The energy of the Angel Hair decreases according to the square of its distance from the Grain and if we call α the ratio between the energy density of the Angel Hair and that of the Grain with α in the order of magnitude of 10^{-40}.
The energy of Angel Hair 1 at the point of meeting with Grain 2 is therefore equal to:
$E_{Angel\ Hair1} = \alpha\ E_{Grain1} / d^2$. And if we convert to mass = $\alpha\ M_{Grain1}\ c^2 / d^2$.

The force of attraction between Angel Hair 1 and Shell 2 is therefore:
E_{Shell2} x $E_{Angel\ Hair1} = \mathcal{P}\ M_{Grain2}\ c^2\ \alpha\ M_{Grain1}\ c^2 / d^2$.
So, attractive force between the two grains = $(\mathcal{P}\ c^4\ \alpha)\ M_{Grain1}\ M_{Grain2} / d^2$.
If we call "g" the constant $(\mathcal{P}\ c^4\ \alpha)$ the formula becomes: $g\ M_{Grain1}\ M_{Grain2} / d^2$

As a first approximation, the gravitational force of attraction = $g\ M_{Grain1}\ M_{Grain2} / d^2$



As a first approximation, the results of our particle model lead to results similar to Newton's for gravity.

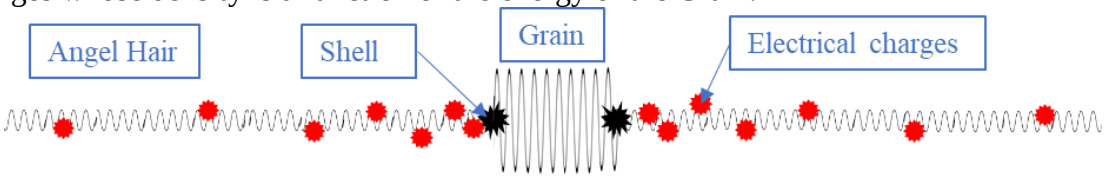
As we will see later, the actions/reactions of two particles in contact through their Angel Hair are instantaneously transmitted from one to the other, as Newton thought.

A simple physical explanation for electrostatic force.

The electrostatic force is due to the contact interaction between several Angel Hair.

Coulomb's law is stated as follows: "The intensity of the electrostatic force between two electric charges is proportional to the product of the two charges and is inversely proportional to the square of the distance between the two charges. The force is carried by the straight line passing through the two charges. »

In our particle model, the Angel Hair carries, glued to it, point particles carrying electric charges whose density is a function of the energy of the Grain.



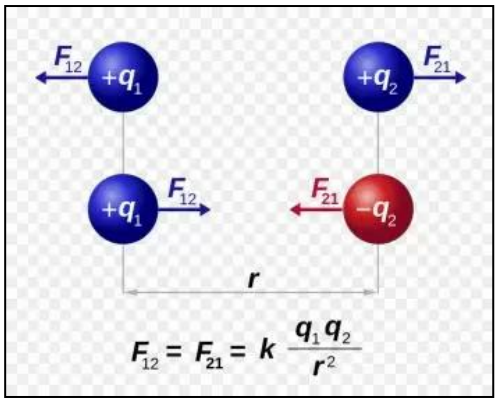
Gravity does extend to the end of the universe, but even a very powerful coil like the one of an MRI does not affect its environment beyond a few meters. In our particle model, this is due to the fact that the lifetime of these electrically charged particles does not exceed a few tenths of a nanosecond, allowing them at the speed of light to have an influence on only a few meters.

The moment an individual particle leaves the Shell, it retains its energy unchanged throughout its short life. But, geometrically, the surface area of the front of the wave sphere carrying these charged particles increases as a function of the square of its distance from the Grain = $4\pi r^2$. The local attractive energy density therefore decreases as a function of the square of the distance from its Grain.

The intensity of the electrostatic force is a function of the energy of the Grain that produced it and varies inversely as a function of the square of the distance from the Grain. The force of attraction or repulsion between two Grains is therefore proportional to the product of the energy of these Grains and inversely proportional to the square of their distance from each other.

Our particle model brings similar results to those of Coulomb for the electrostatic force.





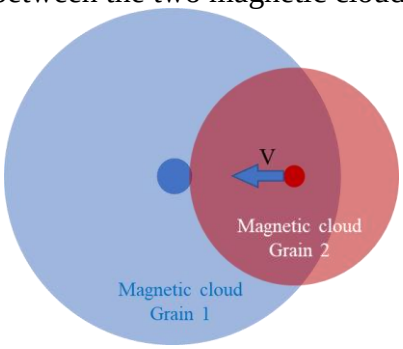
The electromagnetic force has two components: the electrostatic force, which we have just seen, and the magnetic force, known as the Lorentz force, which acts only on charged particles in motion, and which we will see.

A Simple Physical Explanation for the Electromagnetic Force.

The electromagnetic force is due to the contact interaction between several Angel Hair.

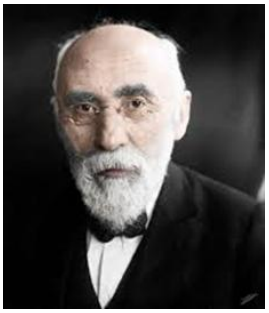
Consider two Grains #1 and #2 animated by a velocity V between them. The classical expression of the Lorentz force acting on Grain #1 is: $F_{Lorentz} = q_1 V B$ where B is the energy at this point of the field created by Grain #2.
The scalar value of $B = (\mu_0/4\pi) (q_2 V/d^2)$
We therefore find: $F_{Lorentz} = (\mu_0/4\pi) q_1 q_2 V^2 / d^2$

In our particle model, this force arises from the interaction between the clouds of charged particles carried by the Angel Hair. When two Grains move relatively to each other, their magnetic clouds move with them, and this creates an interaction comparable to friction between the two magnetic clouds.



The friction between the two clouds is turbulent because it is created by particles that move very quickly and disappear before being replaced by new ones. When two fluids (or two layers of the same fluid) slide over each other in a turbulent manner, the coefficient of friction is proportional to the square of the flow velocity: $k'V^2$.

We saw in the chapter on electrostatic force that the magnetic force of attraction/repulsion of these two clouds is proportional to $q_1 q_2 /d^2$.
The frictional force between these two moving clouds creates an attraction/repulsion of value equal to: $k' q_1 q_2 V^2 /d^2$.



Our particle model brings results similar to those of Lorentz for the magnetic force.

Electrostatic force + magnetic force, in total the results of our particle model bring results similar to the formulas of the electromagnetic force.

It should be noted that a similar hypothesis but with particles carrying gravity and an infinite lifespan could also be an explanation for gravity instead of the hypothesis of a contact between Angel Hair and Shell.
More generally, could we also conceive that Angel Hair is a carrier of all gauge bosons and the Higgs boson?

A simple physical explanation for the strong nuclear interaction.

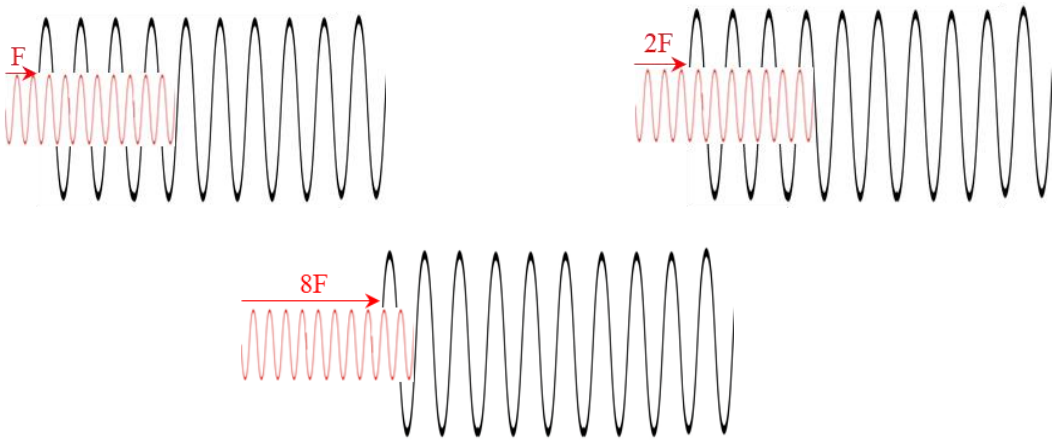
The strong nuclear interaction is due to the contact interaction between the Shell and the Grains.

The Shell keeps its Grain inside its sphere.
We can consider that the size of the Grain of a quark is proportional to its energy. A Down quark has more than twice the energy of an Up quark, so its Shell is more than twice as large.

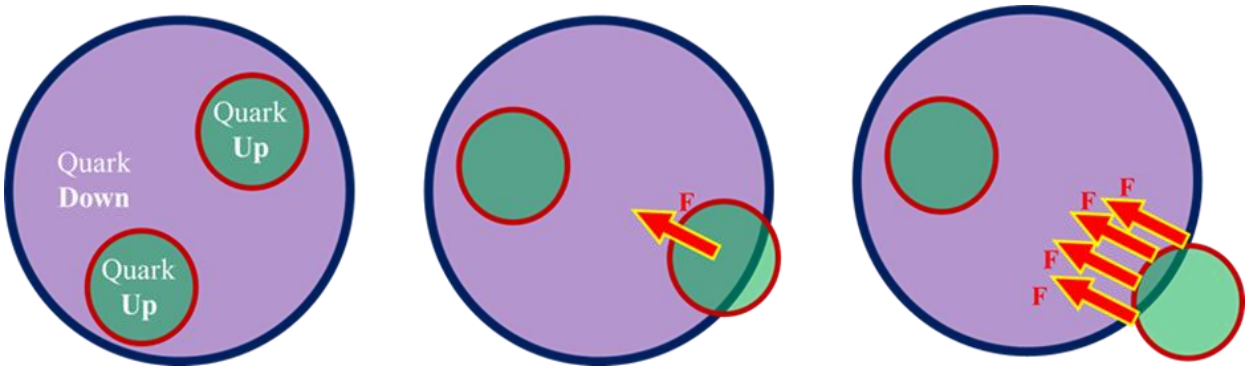
Given the difference in size, two Up quark Grains can move freely into the Shell of a Down quark Grain.

When a Grain Up is inside a Shell Down, it can move almost freely, but if one of the sinusoids of Up comes out of the Shell Down, then a force F calls this sinusoid back inside.

If the Grain Up comes out more and that two Up sinusoids are outside of Down, then, the distances being extremely small, two forces F call them back to the inside of Down, etc. If 8 sinusoids of Up have come out of Down, then 8 forces F call them inwards: the greater the distance between the centres of the grains, the greater the retracting force.



The retracting force of a Hadron Grain increases as the distance between the centres of the Grains increases.



Our particle model brings results similar to those of the formulas of the strong nuclear interaction.

A simple physical explanation for the weak nuclear interaction.

The weak nuclear interaction is due to the contact interaction between Shells.

The weak interaction force acts over a very small distance: 10^{-17} m, i.e. a length 50 times smaller than the wavelength of the grain. In Quancha theory it is the Shell, which is 10^{-17} m in size and connects the Angel Hair to its Grain, which is responsible for this weak interaction force.

When two quarks are close enough, their Shells touch and behave like two spots of glue or weld in the macroscopic world. In our ordinary life, if we approach two non-dry glue or weld spots, they interact to form one. When they touch each other they stick very strongly together and it becomes extremely difficult to separate them, but if they are apart, even from a very small distance, they do not interact with each other at all.

This behaviour is typical of weak interaction. Since the interaction range of the weak force is 10^{-17} m, it can be deduced that the physical thickness of a Shell is also = 10^{-17} m.
The energy of a Shell is proportional to the energy of its Grain. The proportionality factor is called $\mathcal{P}$, read « Pota » : $E_{Coque} = \mathcal{P}\, E_{Grain}$

Our particle model brings results similar to those of the formulas of the weak nuclear interaction.

Our particle model brings results similar to those of the four fundamental forces of the universe.

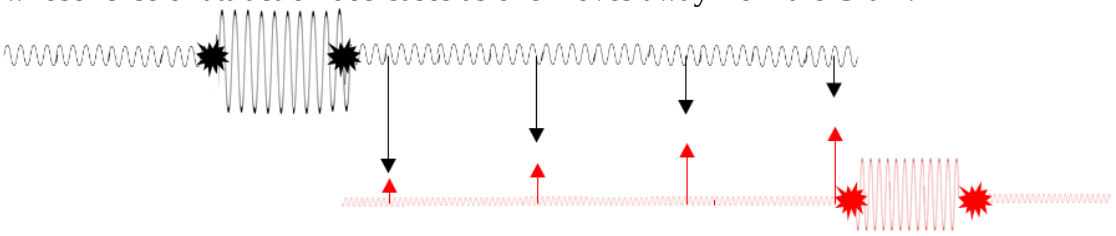
But without remote actions, so they are easier to visualize.

The Quancha theory and special and general relativity.

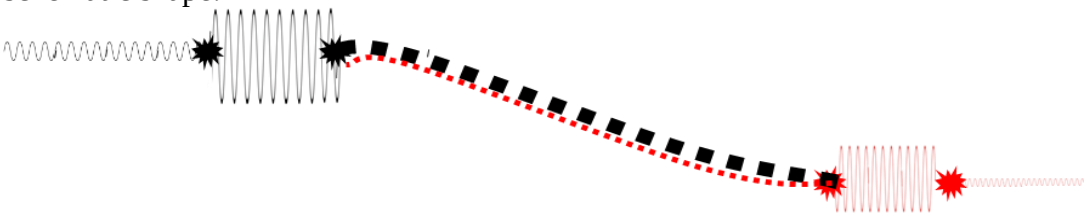
Our particle model explains the fact that light, gravity, and time bend in the vicinity of a large mass, and that the greater the mass, the greater the curvature.

A simple physical explanation for the curvature of light around a large mass.

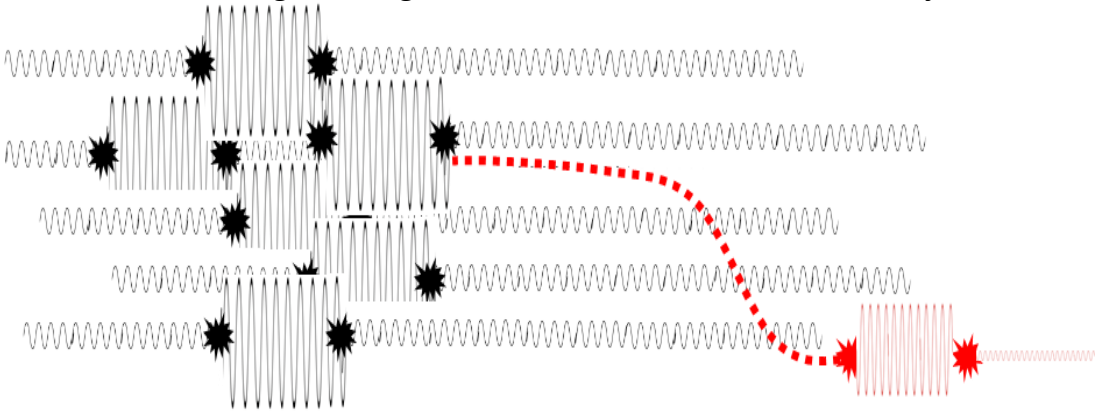
The previous calculation based on the overall energy of an Angel Hair and its particles over a distance d does not take into account the evolution of the attractive force. As the energy density of an Angel Hair decreases as a function of the square of its distance from the Grain, here is a diagram of the different intensities of the attractive force along the Angel Hair, whose force of attraction decreases as one moves away from the Grain:



Angel Hair is incompressible but it is deformable perpendicular to its direction of progression. Angel Hair subjected to such a perpendicular force will no longer be straight, here is its schematic shape:



It is not a straight line but it is very close.
If we now consider the influence of millions of very close black Angel Hair on a red isolated Angel Hair, we can overlook the influence of red isolated Angel Hair on black Angel Hair and only consider the influence of millions of black Angel Hair on red. The shape of the Red Angel Hair is then no longer a straight line at all and resembles schematically this one:



The isolated Angel Hair and therefore the electromagnetic waves bend around the large clusters of Angel Hair.

If there are many Angel Hair, there are also many Grains, and the more Grains in the attractor, the more curled the Angel Hair passing by. So, if we come back to the mass of these Grains, the higher the mass of the attractor, the more the electromagnetic waves bend towards it:

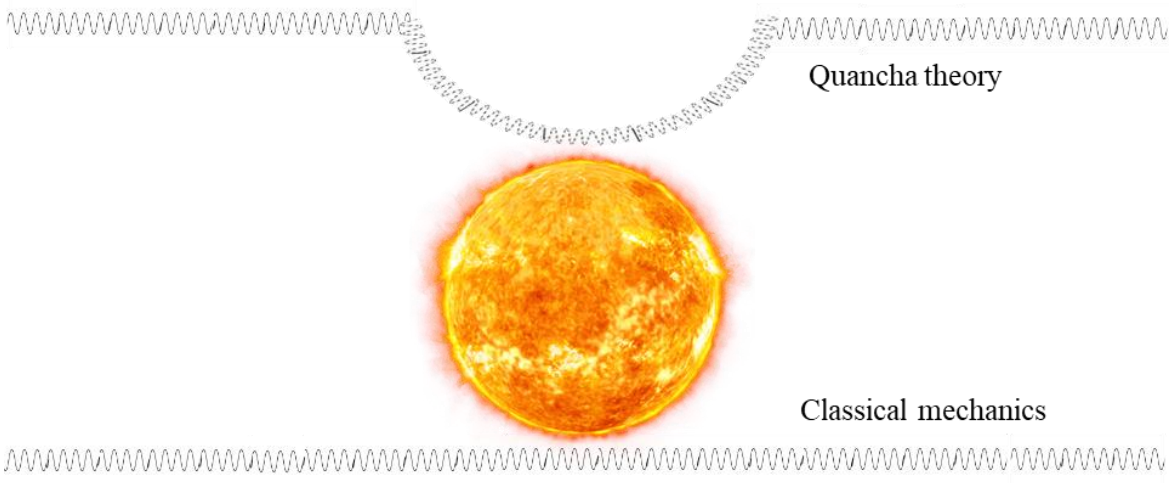
Light bends around a large mass and the greater the mass, the more light bends.

A simple physical explanation for the curvature of space and time

In the first approximation of gravity, we considered only the contact interaction between the Angel Hair and the Shell. But the interaction between Angel Hair has been neglected.

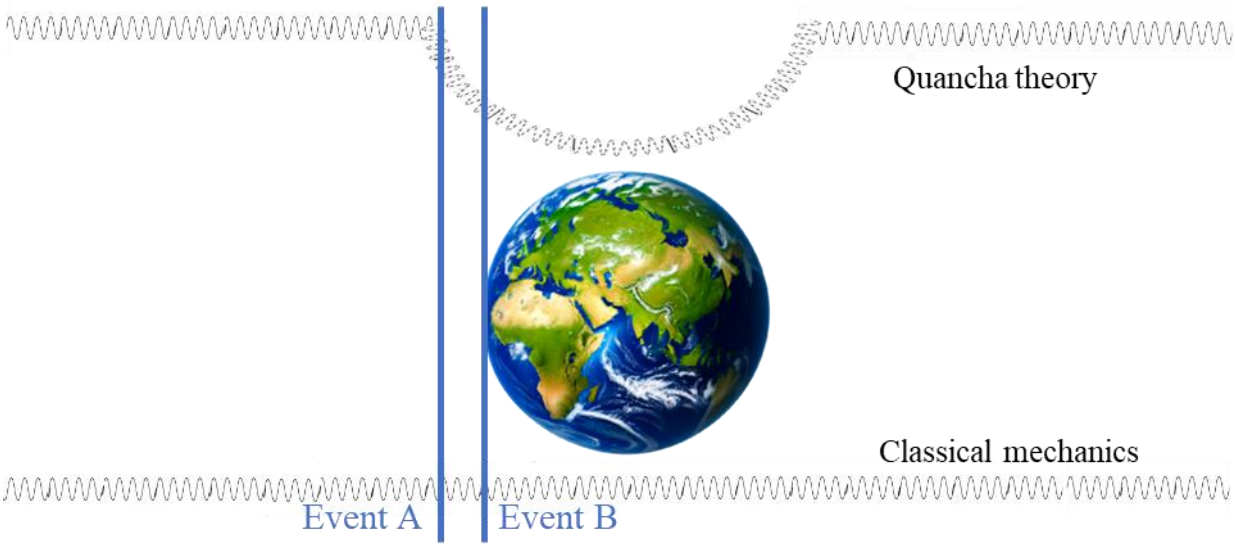
The force of gravity carried by Angel Hair decreases according to the energy of the Angel Hair, i.e. according to the square of the distance from its Grain. The reasoning on the interaction between Angel Hair is therefore exactly the same as for light.
The contact interaction between two Angel Hair leaves them almost straight, but if there is a large cluster of Grains, gravity bends. And if we talk in terms of mass:

Gravity curves around a large mass.



The value of the time elapsed between two events is measured by counting the number of sinusoids of a Angel Hair. A Down Quark Angel Hair vibrates with a frequency of $33{,}10^{27}$ Hz: in one second it beat $33{,}10^{27}$ times. Each beat of the Angel Hair emits a complete sinusoid and in one second a Down quark has emitted $33{,}10^{27}$ sinusoids. The wavelength of the Angel Hair emitted by a Down quark is $4.2\ 10^{-14}$ m and in one second the Down quark will have emitted $1.38\ 10^{11}$ meters of Angel Hair.

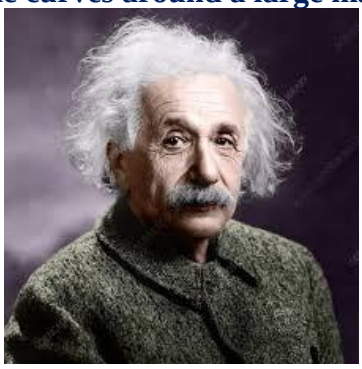
In classical mechanics a wave goes in a straight line but with our particle model we have seen that, near a large mass, the Angel Hair does not go in a straight line but describes a curve. Since the curve has more complete sinusoids than the straight line, we will not measure the same time around a large mass in Quancha theory as in classical physics.



Where a typical observer measures one meter of straight Angel Hair that passed between the two events A and B, a Quancha observer on a curved Angel Hair will measure more than one meter of Angel Hair.
For the Quancha observer, more time will pass than for the classical observer between the same two events: time passes more slowly for the Quancha observer than for the classical observer.

As in relativistic mechanics, Quancha time flows more slowly near a large mass: the more intense the gravity, the slower the time flows relative to an observer located in a zone of lower gravity.

Time curves around a large mass.



Light, gravity, and time curve around a large mass.

Our particle model brings results similar to those of Einstein's relativity.

But easier to visualize.

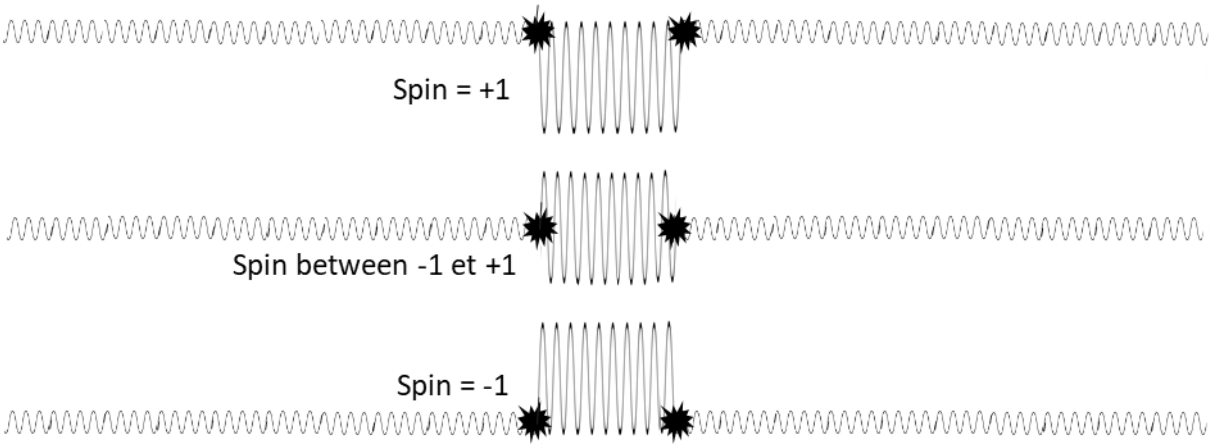
The Quancha theory and quantum physics.

In current quantum physics, gravity is not taken into account for calculations because its strength is derisory on particles. In the same way, we can neglect Angel Hair in Quancha calculations. The Shell is a little more energetic than Grain but is so thin that we can also neglect it and keep only Grain.
Quancha will therefore naturally find all the results of quantum physics, completely unchanged.

The results of quantum physics are fabulously precise, but their interpretation in terms understandable by our human experience is impossible. It is on this point that the particle model of the Quancha theory becomes really interesting and I hope that this visualization of quantum phenomena can lead to new questions or intuitions.

A simple physics explanation of spin.

The Grain has all the characteristics of a regular particle, but a Quancha particle has more characteristics, one of which being the phase of the Grain at the moment when it transforms into Angel Hair. This characteristic can be interpreted as the spin.



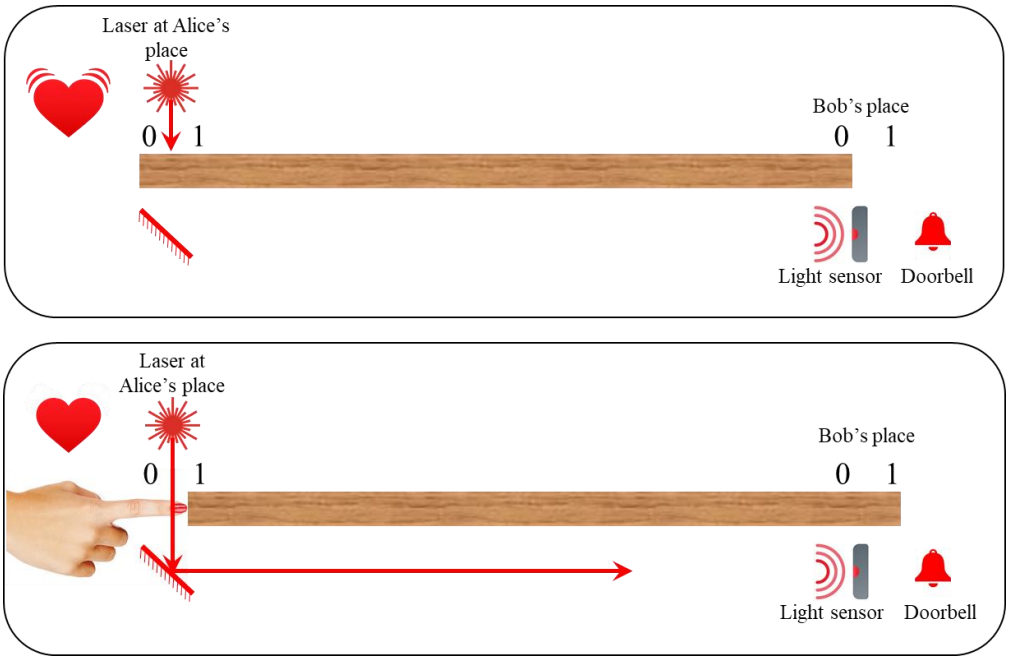
A simple physical explanation for non-locality: information can be transmitted instantaneously, faster than light.

Alice's cat is very sick and Bob, who loves this cat very much, wants to know at all times if the cat is alive or dead. Thus, Alice and Bob install a simple device: a large stick is placed between their two houses. As long as the cat is alive, the stick remains in its position to the left, marked 0, and if the cat dies, Alice will push the stick to the right to position 1 in her house.
The stick would also move instantly in Bob's house, and Bob only has to look at the stick position to know if the cat is alive or not.
Since Bob is not always near the stick, Alice installs a laser at her home above the end of the stick that is directed at a 45° mirror installed under the stick. When the cat is alive, the laser only illuminates the stick, but when the cat is dead and the stick on the right, the laser beam

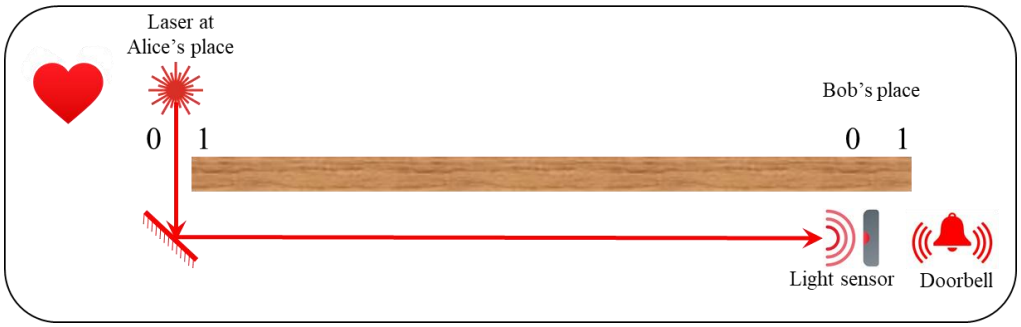
will hit the mirror and will be sent parallel to the stick to Bob's house. Bob installs a light detector connected to a doorbell, and if the detector is illuminated by the laser beam, the doorbell will warn him.

When the cat dies, Alice pushes the stick into position 1 and Bob, who was near the stick, sees his end of the stick move into position 1 at the same time as Alice pushes him. A few moments later, the doorbell rang but Bob already had the information. With its continuous physical contact, the stick transmitted information instantaneously, faster than light, which, not having continuous contact with its two ends, must travel between the two points.

The information did not travel inside the stick by displacement of constraints, which would only go at the speed of sound. It is the movement of the stick itself that IS the information.



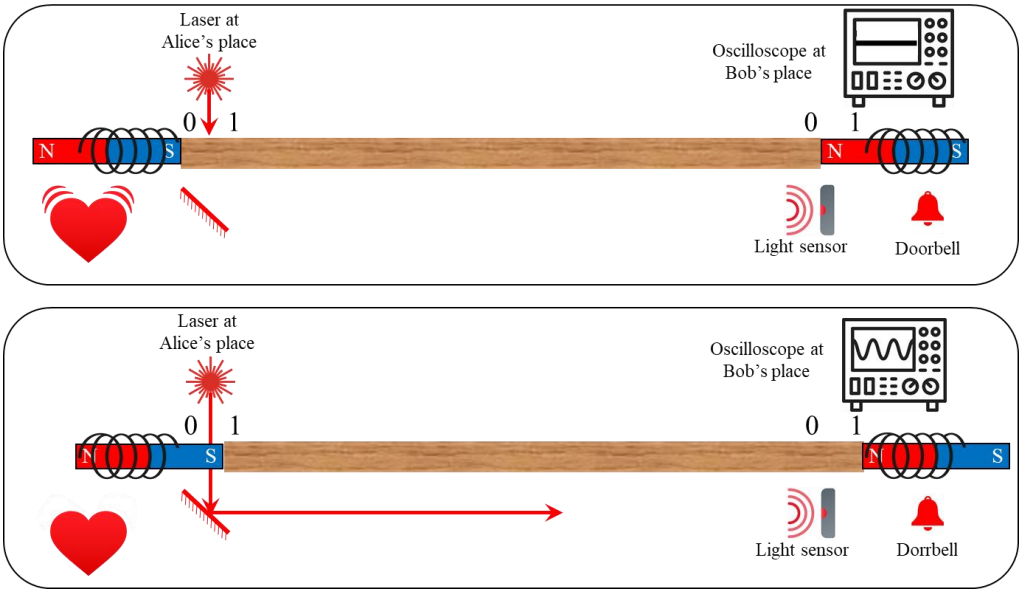
The stick transmitted the information faster than light.



As Alice is not permanently with the cat, she decides to install a listening device in the cat's box to find out if it is alive or not. This device is connected to a coil installed near the end of the stick and inside the coil there is a large magnetic core that is in contact with the stick. Bob installs the same device on his stick end and connects the terminals of his coil to a storage oscilloscope.
When the cat's heart stops beating, the current flows through Alice's coil, the core centres itself within its coil and causes the stick to move to the right. In Bob's place, the end of the

stick moves instantaneously and the core moves inside the coil, creating a current that is recorded by the oscilloscope.

The stick not only transmitted the 0/1 information but also the exact time of the action, the acceleration and speed values of the stick and in addition it transmitted energy. And this instantaneously, faster than light.

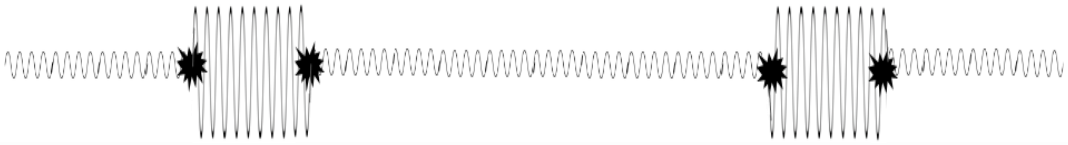


The stick transmitted information and energy faster than light.

The transmission of information without contact cannot go faster than the speed of light, but the transmission of information by physical contact can.

A simple physical explanation for quantum entanglement

In Quancha theory, two particles are said to be entangled when they share the same Angel Hair.



All you have to do is replace the stick of the previous experiment with an Angel Hair and the change of state of one particle has repercussions on the other instantaneously and continuously, regardless of distance.

Angel Hair transmits information instantaneously between two entangled particles.



Schrödinger's cat.

In Schrödinger's cat experiment, the change in state of the radioactive particle induces a change in its Angel Hair. With its very high frequency and very low energy, Angel Hair interacts very little with the matter in the cat's box and therefore passes through it without interaction. The cat is either alive or dead but not in both states simultaneously because, despite the box being closed, the state of the radioactive particle is known instantaneously and permanently by observers throughout the universe.

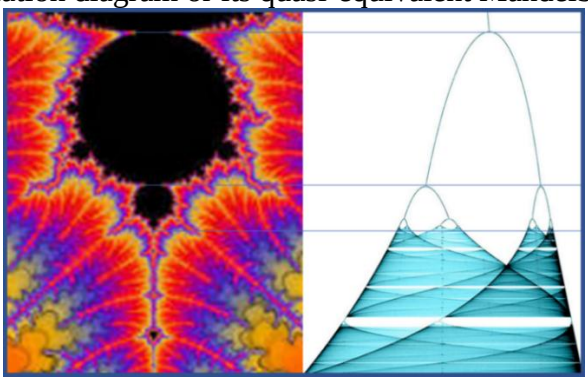


A simple physical explanation for the existence of energy quantum.

We are used to considering that we can obtain waves of the frequency we want at the amplitude we want and that we can keep them at these stable values indefinitely. This is quite true in our usual orders of magnitude. But if we increase the frequency to really very high values or if we decrease the amplitude to very low values, then, as with a fluid that goes from a laminar flow to a turbulent flow when its speed increases, when we have left the usual stable zone, we will get chaos and, in the middle of the chaos, a few islands of stability.

The gigantic frequency of a Grain and the ridiculously small amplitude of Angel Hair are not steady: the quark constantly bounced between chaotic values and islands of stability.

To illustrate this phenomenon of chaos between stability ranges, a good representation could be a Feigenbaum bifurcation diagram or its quasi-equivalent Mandelbrot fractal:

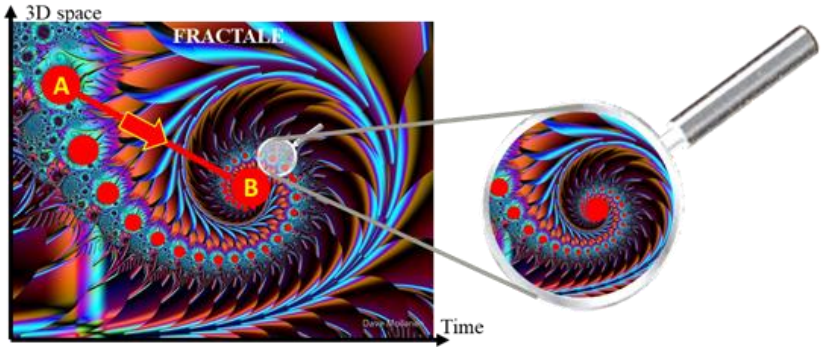


In such a Feigenbaum diagram there are only a few stability wells corresponding to a few permissible frequencies. No other values are stable.
Only a few values that are far from each other are stable. After quantum decoherence, when a particle has emerged from chaos and remains stable, its energy cannot take all the values continuously, only a few values are possible: the energy is quantified.

Our particle model brings results similar to those that describe the quantum behaviour of energy.

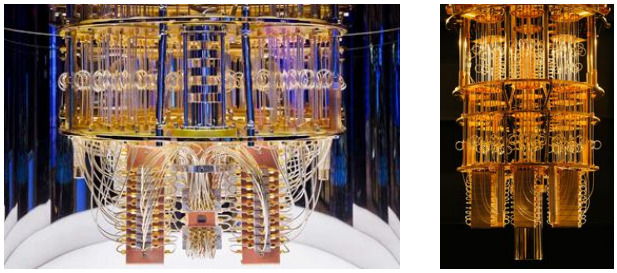
A simple physical explanation for the superposition of quantum states.

In Quancha theory, a quantum object does not necessarily change by well-defined and regular quanta. When it leaves one island of stability, it eventually arrives at another by wandering randomly between the two through the totally unstable fractal points that fill the chaotic space.
In the diagram below, each colour represents a different state of the particle, and only the red dots are stable states. This diagram gives the impression that, in order to go from A to B in straight line, the particle will pass through a finite number of states. But in reality, due to scale invariance, there is no real point of one colour on the diagram of a fractal: we can zoom in on each point and it will then be represented by the full fractal figure.
Mathematically there is no limit; physically, the Planck length is the limit, but we calculated at the beginning that the wavelength of the grain of a "Down" quark is 2.6 10^{21} the Planck length, so there is room to zoom in.



The particle goes in a straight line from A to B but the path from the stable point A to the stable point B passes through a high number of different point states and it is equivalent to consider that it passes through a high number of different paths in a non-chaotic uniform space.

The best way to predict the future of a particle is therefore to imagine all the possible paths, integrate them and average them.



A simple physical explanation for tunnelling effect.

A quantum particle can have different states characterized by what is called spin, flavour, colour... A Quancha particle has all these characteristics but it also adds one: the vibration frequency of the Shell.

You have certainly seen these videos of bridges twisting in all directions when they are subjected to a vibration of frequency equal to their natural frequency and they resonate.

This resonance phenomenon also exists for a particle Shell. As long as the particle is at a temperature above absolute zero, the Shell is constantly subjected to vibrations. In some cases, this vibration frequency will be equal to the resonant frequency of the Shell.

Then the Shell will start to increase the amplitude of its vibrations which will increase its energy level enormously. If this particle is enclosed in an energy cage, it will briefly acquire more energy than the cage, and then come out of it above its top.

As the Shell is welded to the Grain and the Angel Hair, it is the entire particle that will benefit from this tunnelling effect.



A simple physical explanation for quantum decoherence.

Any particle whose temperature is above absolute zero vibrates constantly. When a particle is isolated or in contact with very few other particles, the Shell is in a state of thermal agitation. It vibrates and this unstable state causes the Grain, its Shell and its Angel Hair to go into chaos and come out of it, remain stable for a moment and plunge back into chaos.

As soon as there is physical contact between an isolated particle and an Angel Hair, this Angel Hair will absorb some energy from the affected particle. If this number of interactions is large enough, these Angel Hair will play the role of a shock absorber and the Shell of the isolated particle will no longer be able to vibrate freely.
The Shell of a particle subjected to a large number of interactions with a cluster of stable particles can no longer vibrate anarchically, but only in the same way as the other particles. The close presence of many particles therefore forces an isolated particle to remain in a stable state, which consumes little energy. This is decoherence.

Angel Hair is a spherical wave. The area of a sphere ($4\pi r^2$) increases as a function of the square of its distance from its Grain. The energy of each sphere being constant, its energy density decreases according to the square of its distance from its Grain. For the decoherence of a particle that does not belong to a cluster to happen, it must be very close to a large cluster of stable particles.

It is this phenomenon of decoherence that occurs when observing a quantum particle: a cluster of stable particles interferes with a particle that continuously passed between zones of chaos and zones of stability, and the contact of the stable observer mechanism forces the observed particle to remain in one of its stable states.

Quantum decoherence of a particle occurs when it comes into contact with a cluster of stable particles whose Angel Hairs dampens the vibrations of the particle's Shell.

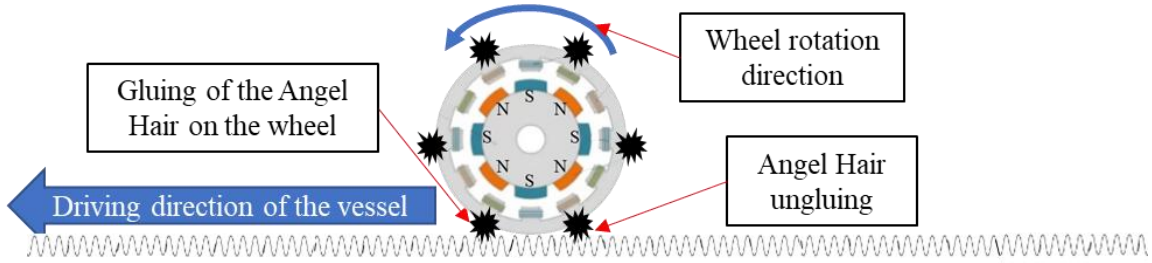


Two practical applications of the Quancha theory: the space engine and the warp engine.

The "void" between the stars is filled only with Angel Hair.
When we will know how to easily glue and take off the Shells from an Angel's Hair, we will be able to make engines to power vessels into the void.

The space engine:

We could make a space engine on the principle of snow tires, with Shells acting as studs. This wheel would be driven on the same principle as a permanent magnet synchronous motor. The limitation of this motor is related to the maximum rotational speed of the ball bearings.



The principle could be refined by eliminating the friction of the wheel hub and rotating the wheel into vacuum on a magnetic bearing. The theoretical speed limit is now only limited by the laws of relativity: the wheel becomes infinitely heavy as it comes close to the speed of light.

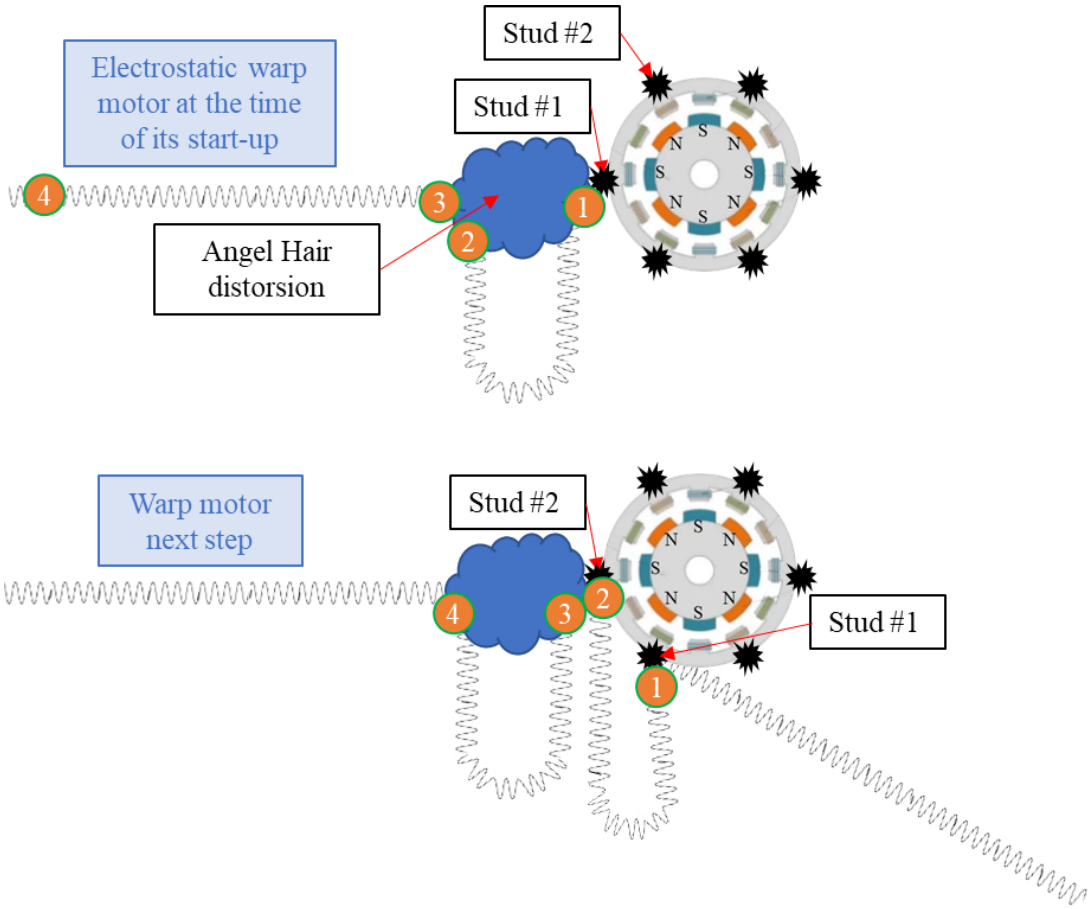
The warp motor:

No element of the wheel can go faster than the speed of light, but if we manage to create a distortion of the Angel Hair just before the gluing, there will be a very long length of Angel Hair between each Shell of the wheel. The wheel rotates at a speed below the speed of light, but the length of Angel Hair between two propulsion studs is much greater than the distance between these studs.

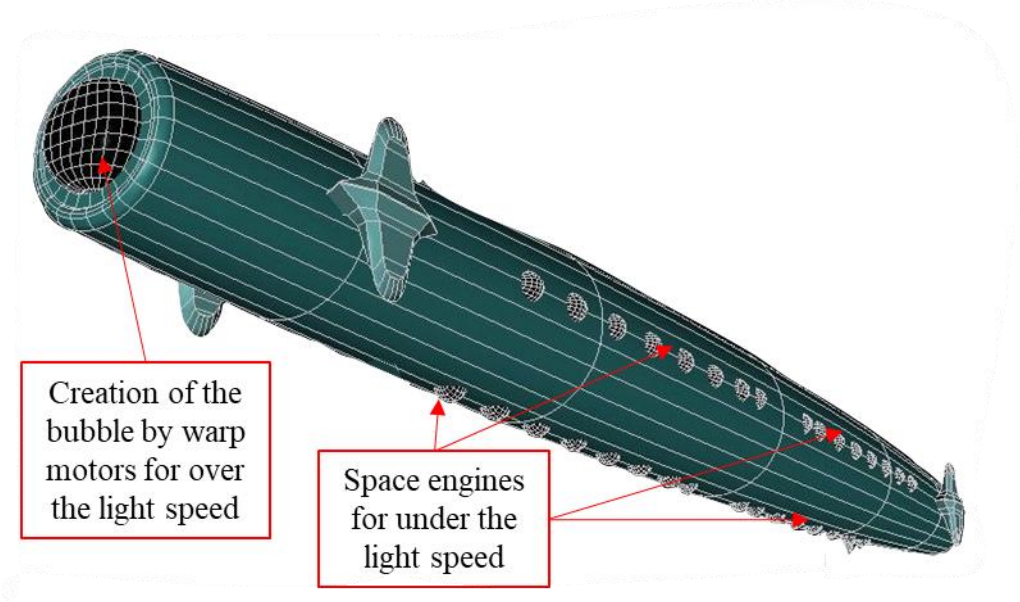
We have seen that Angel Hair bends under the force of gravity but also under electrostatic force. Gravity is difficult to reproduce but electrostatic force is not.
It would therefore be simpler to create the distortion by using the electrostatic properties of Angel Hair.
If you put enough wheels wide enough at the front of the vessel, all the Angel Hair that was in front of the vessel will move to the sides, which creates a bubble around the vessel.

Inside the bubble, the vessel remains stationary in relation to its local space. In this configuration the vessel does not really move, it takes space in front of it and sends it behind it.
The space sent behind the vessel depends on the warp factor, but there is nothing to prevent this value from being large enough for the space around the vessel to move faster than light.

Here is an electrostatic warp motor at the time of its start-up:



Here's how you could install these wheeled and electrostatic distortion motors on a "cigar" to travel between the stars:



Conclusion

The Quancha theory shows that with a very brief hypothesis that is easy to represent in four dimensions, we can give a simple physical explanation to many phenomena of quantum physics, relativity or cosmology that we know to be exact and that we can calculate perfectly well but that we do not know how to describe well.

The Quancha theory has not been confronted with the reality of experimentation. In this incomplete state, the Quancha theory leaves questions unaddressed, in particular on waves whose interaction properties and certain characteristics need to be replaced or completed.

The purpose of this Quancha hypothesis is only to provide a simple visual representation of known phenomena in quantum or relativistic physics in the hope that this simple representation can inspire future theoretical and experimental developments.

FECI QUOD POTUI, FECIANT MELIORE POTENTES.

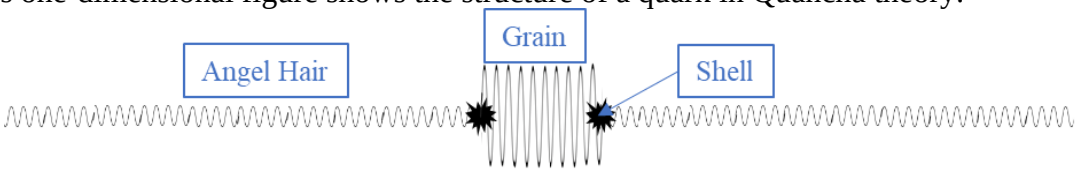
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Initial idea written in Salvador De Bahia in October 2004
Extensively supplemented and reformatted in Hua Hin in June 2026
Original version in French.

Summary: Hypotheses and main results

HYPOTHESES :

The "Quancha" theory assumes that matter does not exist, only energy exists.

This one-dimensional figure shows the structure of a quark in Quancha theory:



Fundamental postulates:
Postulate 1: Every material structure is the result of a particular organization of energy.
Postulate 2: Each Grain is associated with a Shell and an Angel Hair.
Postulate 3: The observed interactions result from the interactions between these three fundamental components.
Postulate 4: Complex physical phenomena can emerge from a small number of elementary mechanisms.

The Grain

The size of a quark's Grain is proportional to its energy.

Quantum formalism applies to Grains in the same way that it currently applies to a particle of matter.

When a Grain Up is inside the Shell of a Grain Down, it can move almost freely, but if one of the sinusoids of Up comes out of Down, then a force F recalls this sinusoid inwards.

The gigantic frequency of a Grain is not stable, it is chaotic and in the midst of chaos there are only a few islands of stability.

An isolated particle that has been hit by a cluster of particles can no longer vibrate freely, but only in the same way as the cluster that is stable. The isolated particle then joins the cluster in its stability zone and remains there.

The Shell

The Shell permanently leaks a wave of very low energy density through tunnel effect, this wave is constantly growing, extending to the far reaches of the universe at the speed of light: the Angel Hair.

The spin of a particle is the phase of the Grain on which the Shell is located.

The "Shell" has a height of 10^{-17} m.
Two Shells that touch each other stick together.

The attraction between two quarks comes from the contact between the Angel Hair of Grain 1 and the Shell of Grain 2, these two elements trying to "stick" together.

The function of the Shell is to confine the Grain. If a small Grain is inside the Shell of a larger Grain and is trying to move away, the Shell forces it to come back.

Angel Hair

Angel Hair is constantly produced by the Grain and progresses at the speed of light.

Angel Hair began to grow at the beginning of the universe, during the Planck Era, but the enormous gravity of that time kept it compressed around its Grain.

Angel Hair is incompressible but it is deformable perpendicular to its direction of progression.

Angel Hair bears, glued to it, point charged particles, whose density is a function of the energy of the Grain and whose lifespan is measured in nanoseconds.

Two charged clouds of Angel Hair that move relative to each other interact together like two turbulent fluids that touch each other and generate friction.

KEY RESULTS:

In cosmology:

The Grain loses about 0.000000099% of its energy per century, which it transmits to its Angel Hair.
The irreversible decrease in the energy of the Grain could constitute a physical interpretation of entropy.

Cosmic inflation is the short time that Angel Hair that was compressed suddenly unfurled.

The ordinary visible matter is made up of the Grains and the invisible dark matter is the Angel Hair.
There is no such thing as repulsive dark energy, it is the Angel Hair that ensures the expansion of the universe.
Angel Hair might replace dark matter and dark energy.

For the four fundamental forces of the universe:

The strong nuclear interaction is due to the contact interaction between the Shell and the Grains.
The weak nuclear interaction is due to the contact interaction between Shells.
The electrostatic force is due to the contact interaction between Angel Hair.
The electromagnetic force is due to the contact interaction between Angel Hair.
Newtonian gravity is due to the contact interaction between Angel Hair and Shells.

The force that calls back a small hadron Grain towards the interior of a larger grain increases as the distance between the centres of the grains increases.
Quancha's results are similar to the formulas of the strong nuclear interaction.

The force that unites two Grains acts over a very small distance: 10^{-17} m.
Quancha's results are similar to the formulas of the weak nuclear interaction.

The force of attraction or repulsion between two Grains is proportional to the product of the magnetic energy of these Grains and inversely proportional to the square of their distance from each other.
Quancha's results are similar to Coulomb's formula for electrostatic force.

The frictional force between the two magnetic clouds surrounding moving quarks creates an attraction/repulsion of value equal to: $k'q_1\ q_2\ V^2\ /d^2$.
Quancha's results are similar to Lorentz's formula for magnetic force.

Electrostatic force + magnetic force, Quancha's results are similar to the formulas of electromagnetic force.

As a first approximation, the gravitational force of attraction = $g\ M_{Grain1}\ M_{Grain2}\ /\ d^2$
As a first approximation, Quancha's results are similar to Newton's formula for the gravitational force of attraction.

In relativistic physics:

Light bends around a large mass and the greater the mass, the more the light bends.

The interaction between two Angel Hairs leaves them almost straight, but if there is a large cluster of Grains, the Angel Hair and therefore gravity bends. And if we talk in terms of mass:
Gravity curves around a large mass.

As in relativistic mechanics, Quancha time flows more slowly near a large mass: the more intense the gravity, the slower the time flows relative to an observer located in a zone of lower gravity.
Time curves around a large mass.

Light, gravity, and time bend around a large mass.

In quantum physics:

Two particles are said to be entangled when they share the same Angel Hair.
The Angel Hair transfer information instantly between two entangled particles.

With its very high frequency (7.1, 10^{21} Hz) and its very low energy (10^{-40} that of the Grain), Angel Hair interacts very little with the matter of the Schrödinger's cat's box and therefore passes through it without interaction, transmitting the information out of the box.
Schrödinger's cat is either alive or dead.

When a particle is stable, its energy cannot take all the values continuously, only a few stable values in the middle of chaos are possible: the energy is quantified.

Quancha qualitatively reproduces the quantum behaviour of energy.

Quantum decoherence occurs when a quantum particle is in contact with a cluster of stable particles.

A quancha particle goes in a straight line from A to B but the path from the stable point A to the stable point B passes through a high number of different point states and it is equivalent to consider that it passes through a high number of different paths in a non-chaotic uniform space.

The best way to predict the future of a particle is therefore to imagine all the possible paths, integrate them and average them.