

Energy, force and matter

This document contains a number of questions and (provocative) ideas on the definition of energy, force and matter and a number of related subjects like cosmology. I would like to use this document as input for discussions with people, preferably with those that have substantially more knowledge on the subjects than I do.

This is version 2 of this document. The previous version was called “Questions and provocative ideas on cosmology” and was dated 20/11/2002.

I studied astronomy at the University of Groningen. I became drs in 1989, after which I started working in the ICT (www.Logica.nl, now www.LogicaCMG.com). During all these years I tried to keep up with the developments in astronomy, especially those in cosmology and related subjects as elementary particles and fundamental physics. I visit the University of Groningen on a irregular basis and am still known by part of the staff there.

The questions and ideas have the form of *axioms*, *definitions*, *statements* and *consequences*. I will number these for easier reference, the first digit of the 2-digit number references its chapter.

<p><i>This document is still draft, it still contains a number of non-settled ideas.</i></p>
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0. Starting point

My first idea is the starting point of my quest for understanding the universe.

Axiom A01: the laws of nature should not be too complex. *Consequence A01.1*: if the formulas become too complex, if real fine tuning is required, ad hoc definitions are introduced, etc, then there must be some higher level of understanding or are we are on the wrong track.

1. Force

Statement S11: forces can be seen in different views, such as:

- field, with field lines and a function formula for each point in space
- exchange of particle/energy/photon/whatever, as in elementary particle physics
- curvature of space, as in gravity

More views might be possible or definable.

Statement S12: These views are exchangeable, neither is more true than another.

Consequence S12.1: all forces can be defined in all these ways.

Gravity is an example of a force.

Consequence S12.2: As a result of the above statement, gravity can thus also be seen as exchange of energy.

Consequence S12.3: A way to measure this is that a gravity field will have a pulsating effect on a very large distance (“gravitons”).

Consequence S12.4: Another effect is that it is also possible to define a negative gravity field (“anti-gravitons”).

Mixture of mathematical formula's of the different views of force lead to complex mathematics. I doubt even whether it describes anything in the real world. On top of this, I regularly see discussions in science publications that are only mathematical and don't have a relation with the real world. An example is the description "wave function". It simply means that the probability-squared has the same mathematical format than a wave, it does not imply that for example of particle has a wave format (snare theory, brane theory: same story; waves and snares are not properties but just names). Another example is "Schrodinger's cat problem". If dice are thrown without looking, then it is not relevant to say that the system was forced into a status when the observer's eyes are opened, or to talk about the time that it took to go from a probability into this status.

Statement S14: I have the feeling that the whole discussion about the need for (substantially) more than 4 dimensions is created by the combination of combining the mathematics of the different views and discussions about non-real properties.

(Idea not yet settled:)

In existing theory, heavy mass = slow mass.

Statement S15: Since mass is the measurement of gravity-force, just like eg charge is the measurement of electrical force, there should be a similar statement "large charge = slow charge". Maybe this is related to the discussion at the start of chapter 5.

2. Ticks

Existing theory: in the vacuum, pair of virtual particles are created all the time, most of which disappear quickly after their "birth". The fact that the pair was created and "lived" for a while, is "returned to the vacuum" quickly.

Definition D21: a pair of virtual particles = 2 "ticks".

A tick has an amount of energy, it "is an energy-package". A slap with your hand on a table does have energy, but no mass – hence the name (I play djembé, www.Nugara.org).

Definition D22: "ticket" = description/properties of a tick.

Statement S21: ticks move with lightspeed.

This is really more an axiom, or a definition of lightspeed. As in General Relativity, a lightbeam does not know any time, it arrives when it leaves. As a result it also doesn't know distance and therefore it doesn't know space. To itself it's more like a transition. For an observer "in rest" it moves with the maximum possible speed, lightspeed. I assume that this paragraph is known/existing theory.

Statement S22: the fact that a particle (or energy in general) is present, enhances the probability of creation of ticks in the surrounding space.

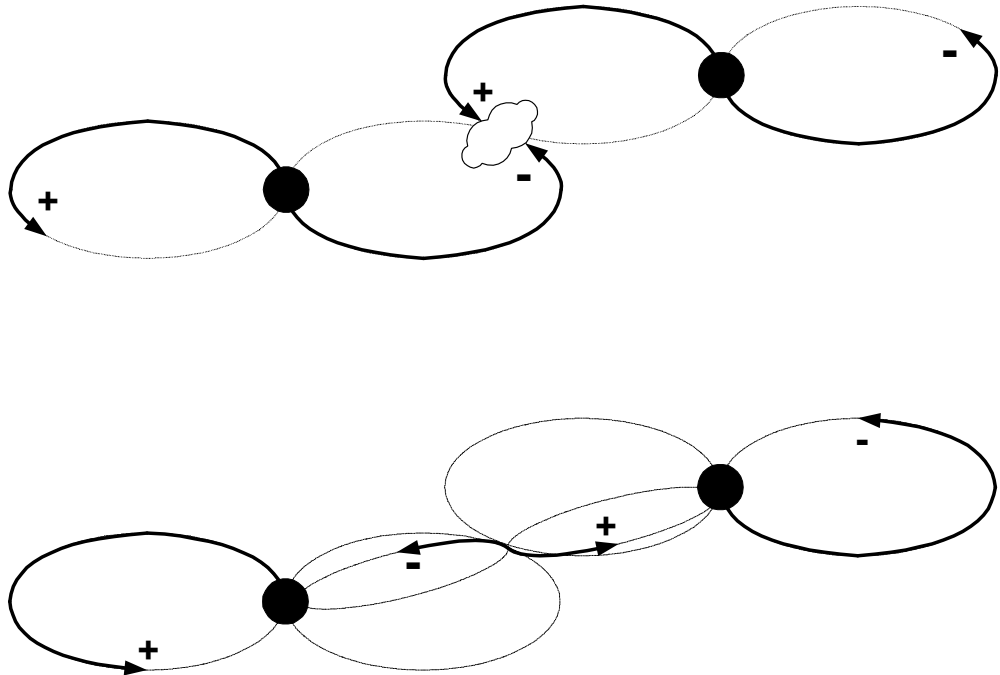
Statement S23: a particle is surrounded by a cloud of virtual particles.

(I think this is existing theory). I'll come back to this in chapter 5.

3. Force again

For the moment I'll define "particle" as a known/given thing. I'll come back on this later.

Say 2 particles are in close proximity to each other, on the left A, on the right B. Each has this cloud of ticks. At a given moment each creates a tick-combination, say both with a pair with a + to the left and a - to the right (+/- is not charge but some property). If the two particles are close enough, the A- and the B+ will annihilate, instead of the A and B sets. The two ticks react, and as a result it looks impossible to "return the energy" of the 2 sets of ticks. This results in "panic" (*Definition D31*). *Statement S32*: this "panic" is in fact a higher probability of creating new ticks-sets. It is energetically better for the system as a whole to create such a new ticks-set.



The effect is that both particles receive a net impact, instead of a net impact of 0. Both particles would not have moved if the above had not happened, but now that the annihilation happened, a new ticks-set is created in the "panic".

Statement S33: the ticks of this new ticks-set will have different properties than the ticks of the original set, since they are created in "panic" and "have to act quickly".

Consequence S33.1: There is no real exchange of energy between both particles, the net effect is that 2 ticks are replaced by 2 other ticks, resulting in an impulse-change of each particle (although the total impulse-change is 0).

Statement S34: this exchange of impulse/energy is actually the force between the 2 particles. In other words, force is created by transformation of ticks.

The closer the two particles are, the larger the probability that the above happens.

Consequence S34.1: thus force is dependent of distance.

Force is created by transformation of ticks (S34). Ticks move with lightspeed (S21).
Consequence S34.2: force is issued with lightspeed.

The net effect of force between 2 particles is an exchange of energy (in the above example: impulse). There for a tick is an transfer-energy-package (D21).

Statement S35: a photon is a tick.

The impulse of a photon only appearance upon impact on a particle. This is a direct result of definition of force given above.

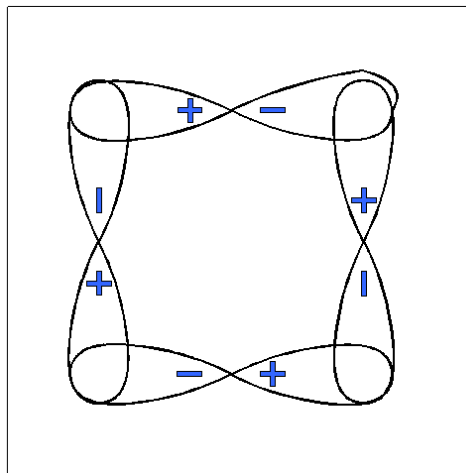
4. Particles

Existing theory: particles are composed of quarks.

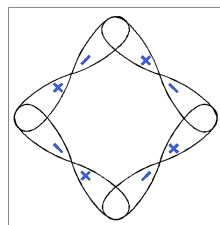
Statement S41: a quark is a cloud of ticks, in equilibrium, stable.

Such a stable self-supporting unit has for example the following form:

- 4 tick-pairs are created from vacuum, forming a square, with the tick-pairs on the edges
- the endpoints of the tick-pairs overlap in the corners of the square

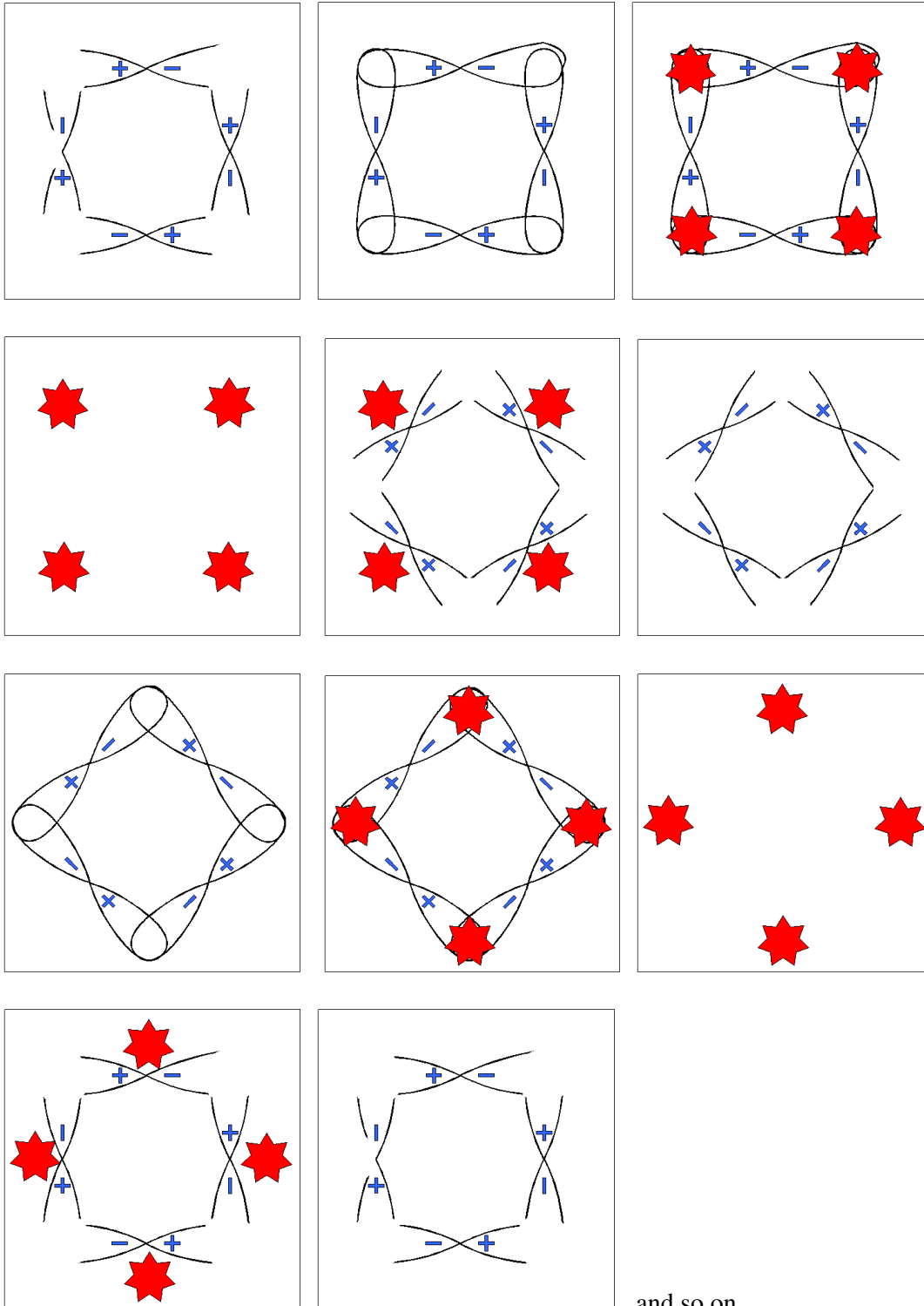


- this results in annihilation in those corners
- as a result, the probability of creating a new tick-pair in those corners is greatly increased
- creating 4 new tick-pairs creates the same square, but then 45 degrees turned, “standing on its corner”



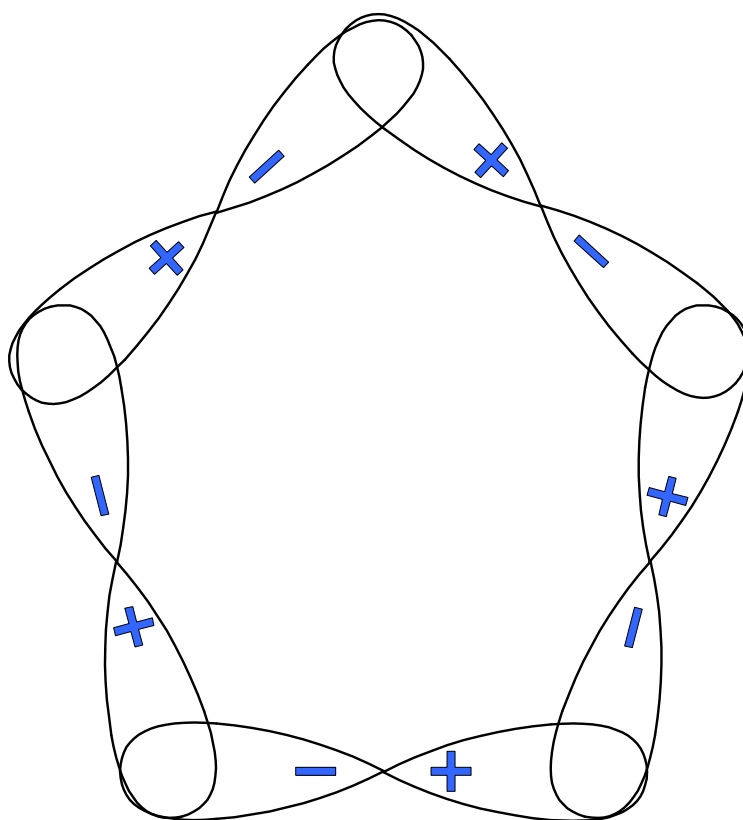
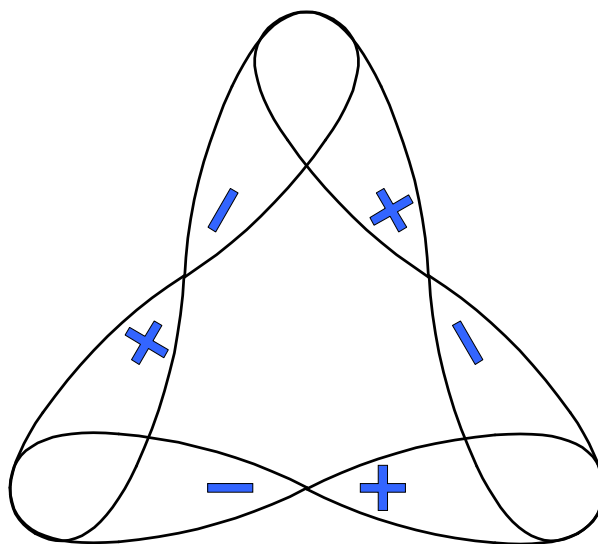
- the history repeats, with annihilation in those corners of this new square
- resulting in the creation of 4 new tick-pairs, in the form of the original square
- and so on (see the pictures on the next page)

As in the following “movie” (left to right, top to down):



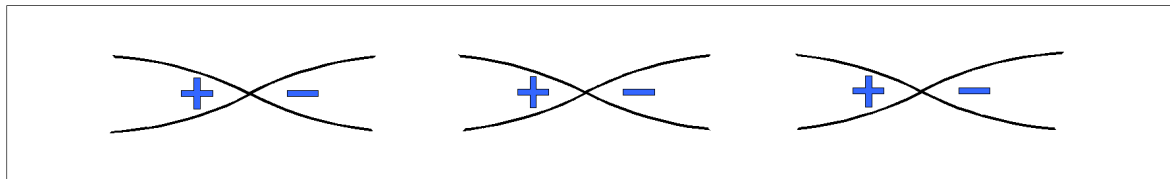
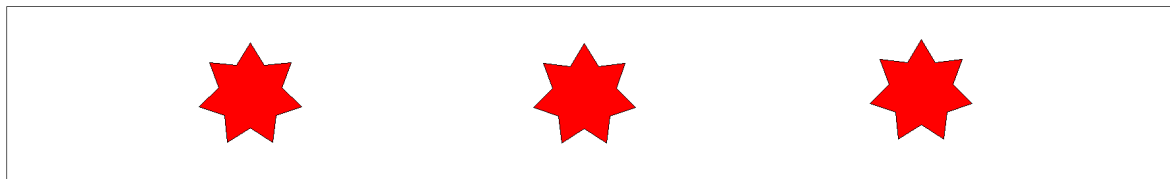
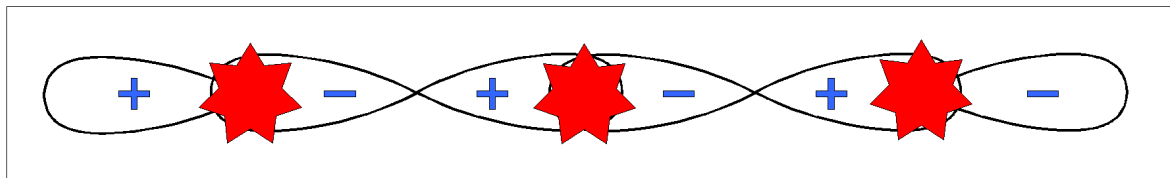
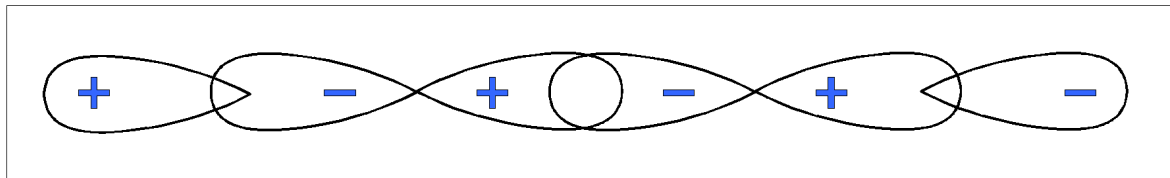
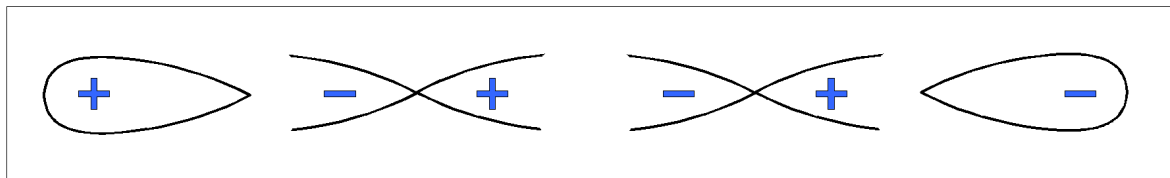
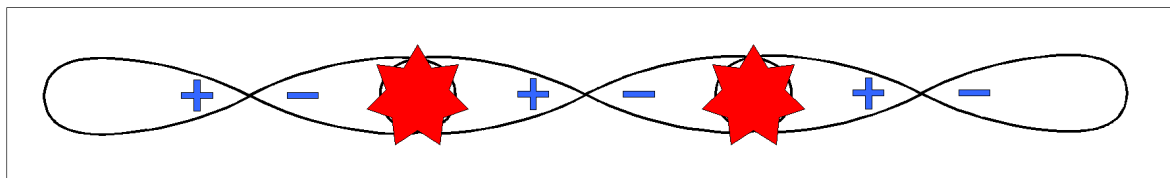
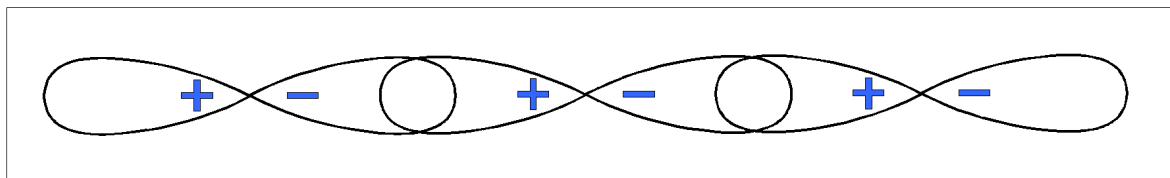
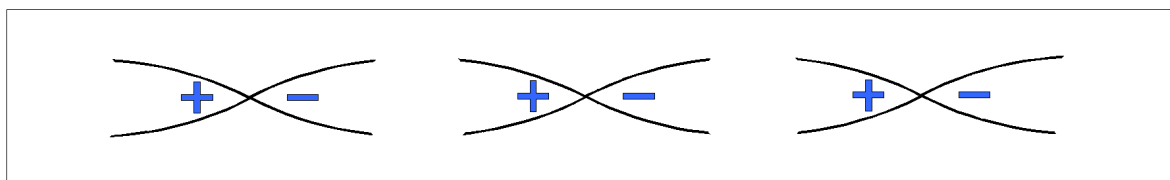
and so on.

This alternating square figure is just an example, much more other forms are possible, for example:



(Note that the tick-pairs in the above picture are typically different than those in the lower picture.)

Or in a line (again a “repeating movie”):



But all of this is 2 dimensional, but 3 dimensional forms are of course more likely (but also more difficult to draw and to comprehend).

Lots of forms of particles are possible, because lots of stable configurations can be created.

Statement S42: “survival of the fittest” will result in standard quarks.

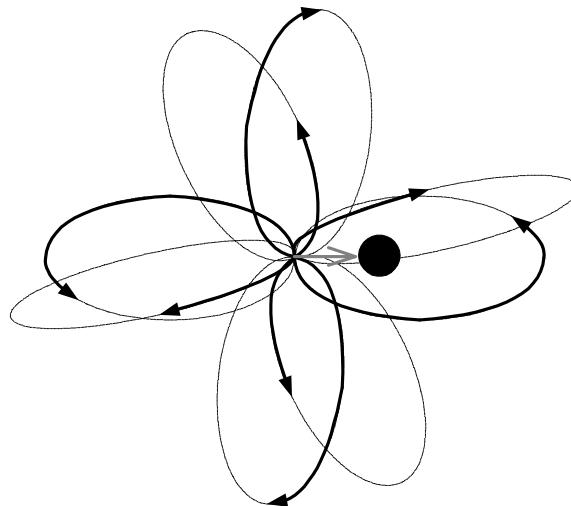
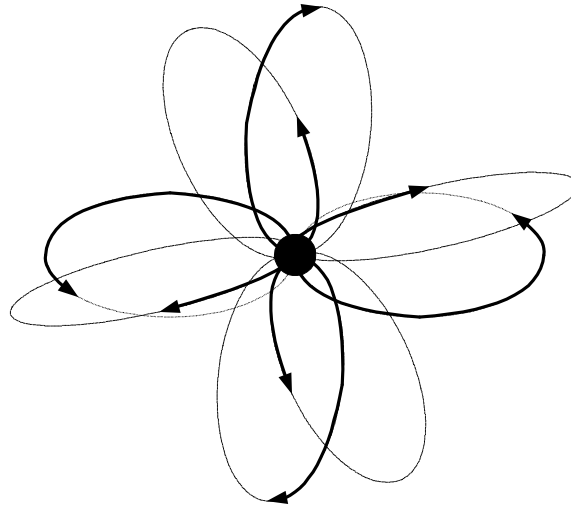
It is possible to create a large diversity of quarks, that will eventually run into eachother and react. Quarks made of ticks with the same properties (“tickets”) are likely to produce stable reaction products than quarks that are composed of different ticks. It is therefor statistically likely that only a limited number of quarks will “survive”. Which will survive is more a question of coincidence than that it can be calculated/predicted.

Statement S43: it is conceivable that a completely other set of other quarks (or whatever) can be produced in the same way. Such a set would create a very different universe with very different forces and matter. It is unlikely that such a different universe would somehow intersect with our known universe, since this would imply mass scale collisions (of ticks), resulting in huge “panic” which would most probably quickly annihilate the both incompatible universes (and maybe create one big Einstein-Bose condensate in the process, see S67).

5. Relativity

A particle is surrounded by a cloud of virtual particles (S23), in fact a tick-pair cloud.

Statement S51: A moving particle is slowed down by this cloud, because of the "panic" caused by the fact that the particle has moved (due to its velocity) during the time that the ticks were "making their track".



Ticks move with the speed of light (S21). *Consequence S51.1:* the drag effect becomes stronger when velocity approaches the speed of light (because this is the speed of the ticks).

Consequence S51.2: as a result, the maximum speed of a particle is the speed of light, more precise: a particle can only approach lightspeed.

Consequence S51.3: another result is that a higher speed of a particle lead to more "panic", which leads to more energy in extra ticks-sets. A fast moving particle thus acquires more energy by the movement itself. This is the effect of relativity.

Consequence S51.4: If the velocity of a particle approaches lightspeed, eventually the only way to return the "borrowed" energy in time is to shrink time and space. This is another effect of relativity.

Consequence S51.5: High temperature means high velocity of separate particles. This implies a high drag and thus a high curvature of space and time. This effect is increased by the greater probability for collisions between particles, which in turn also increase the "panic", especially when there is a high density of particles (= high pressure). So a high temperature high pressure system of heavy particles (eg large atoms) should result in relativistic effects.

If the combination of temperature and pressure become higher and higher, it is less likely that complex sets of tick-pairs will remain stable, since the probability of "hitting others" (and subsequently reacting with these others) increases.

Consequence S51.6: in more extreme environments, only the simpler forces (= interactions via tick-pairs) remain.

When the combination of temperature and pressure becomes even more extreme, a "soup" of tick-pairs emerges. Since this "soup" has a high "panic", it becomes increasingly possible that "larger" ticks are born (= ticks with more energy). This in turn increases the "panic", making rapid move to "very large" ticks possible.

Consequence S51.7: in very extreme environments, "extremely large quarks" will arise. This very much resembles the formation of an Einstein-Bose condensate.

About tunneling.

Statement S52: a normal/real particle (eg a quark) does not tunnel, but simply gets re-created on the other side of the "wall". As soon as a particle comes in close proximity to a wall (can be a physical wall, can be a potential wall), part of its ticks (that are part of tick-pairs of its ticks-cloud) will have enough energy to cross this wall. Eventually the probability will be high enough that most of the ticks of the particle have crossed the border, which in effect means that a particle has crossed the border as a whole.

About particle decay. Particles are surrounded by a tick-pair cloud (S23). In the vacuum, tick-pairs are created constantly (*beginning of chapter 2*).

Statement S53: particle decay is caused by the breaking up of a quark in that particle by the creation of a tick-pair that is coincidentally created almost on-top-of that quark.

This new tick-pair disrupts the equilibrium that the quark is. Once that quark is disrupted, a small cloud of tick-pairs remains, which results in "panic", resulting in the increased possibility that even more quarks in the neighbourhood are also destabilised. In any way, the net effect is that the original particle is torn apart (= decays).

Statement S54: some particles have tick-pair-clouds that consists of ticks with such properties that the probability of the creation of a new tick-pair in the vacuum nearby is very unlikely. These quarks have a relatively long decay time.

About Heim Theory (http://en.wikipedia.org/wiki/Heim_Theory) and the resulting ideas around space propulsion. When a very large field is created, like the magnetic field generated by the rotating torus in the "Gravitophoton Field Propulsion" device", "panic" is increased, making the creation of high-energetic tick-pairs more probable.

Statement S55: Heim's gravitophotons (and the like) are particles created in the mentioned "panic". It is however in my opinion not a good idea to use these particles to move the rotating torus. The gravitophotons are created from one half of the tick-pairs created in the "panic" field. The other half of the tick-pairs will eventually – what?

Two things might happen. It might be that this beam of anti-gravitophotons have a large disruptive effect on whatever particles they collide into, creating an propulsion device with a “devastating exhaust”. But it might also happen that those other halves manage to recombine (after some in-between steps) with their original “brothers”, with as net effect that the rotating torus will not move at all.

Statement S56: Heim’s space propulsion device will either not work or have a “devastating exhaust” (or a bit of both).

It seems to me that another practical problem with the space propulsion device is the huge magnetic field that it creates – shielding the space ship payload properly from it might provide quite a problem.

However, I do welcome Heim’s ideas on the unification of forces. They very much resemble my statements in chapter 1. The term “metron” (a new term, coined by Heim) resembles my “tick” somewhat.

I do not agree, however, with Heim’s idea of quantized space (existing of metrons). Splitting up space is not necessary in my theory. Due to a limited number of existing ticks (resulting from the “survival of the fittest” of *S42*), it might look like everything is quantized, but it’s not logical (necessary) that space is. On the contrary, such quantization would limit interactions and generation of ticks from vacuum.

6. Universe

Existing theory: the universe started with the Big Bang, which contained an inflation period.

Statement S61: inflation = "panic" with very much ticks-pairs.

Statement S62: inflation stops when for regions it is energetically better (due to expansion) to stabilise than to create new ticks-pairs.

Statement S63: this rather random stop of expansion is the cause of the cosmic background.

Statement S64: since it all started with a “panic” of very much ticks-sets (*S61*), the ground total of all the energy in the universe is 0.

Statement S65: Energy in the universe is also present in ticks, for example in the form of the various force fields.

Consequence S65.1: this energy in these fields gives rise to a larger probability of the creation of extra tick-pairs from vacuum, which in turn might explain part of the dark matter.

Consequence S65.2: the quest to find enough matter to close universe is non-relevant, because part of the energy is in ticks.

Statement S66: since it all started with tick-pairs (*S61*) and the total amount of energy is 0 (*S64*), it all eventually will want to cancel back again into annihilation (= the universe is “closed”).

Statement S67: in this “Big Crunch” it is conceivable that, due to the very extreme environments, one large Einstein-Bose condensate will arise (see *Consequence S51.7*). This condensate might in turn eventually become instable, leading to a new Big Bang.

Existing quantum mechanics theory states that somewhere for some elementary particles, there is a asymmetry in annihilation (I think it was K^+/K^- particles, but I can't remember). According to this existing theory, this was the cause why not all anti-matter was annihilated against ordinary matter quickly after the birth of the universe.

Statement S67: this asymmetry caused by the fact that those particles are quite complex, existing of many ticks. During annihilation it is therefore quite probable that some tick-pairs do not annihilate but instead react with fresh vacuum tick-pairs (that are more likely to appear, since the particle annihilation causes quite some “panic”), forming new residu particles. The net result is that the original particle annihilation is not complete.

Statement S68: gravity is defined by low-energy ticks.

Consequence S68.1: Low-energy implies longer time to "return" the energy of ticks-sets (to vacuum, *see the beginning of chapter 2*), which thus makes it possible for gravity to travel larger distances (= for the gravity force to work on larger distances).

Consequence S68.2: Since all normal particles create gravity-ticks-sets, gravity still is a substantial force for larger bodies even on larger distances (due to the sheer amount of particles).

Consequence S68.3: If gravity-ticks travel a large distance, they have a greater probability of "hitting something", notably another gravity-tick, resulting in annihilation. This would imply that the force of gravity gets less over larger distances.

(Idea not yet settled: It would even be possible that this eventually leads to a negative gravity effect, which might be the same as the repulsion by Einstein's cosmological constant.)

Consequence S68.4: Since gravity is caused by ticks, it is “pulsating” over long distances, it has a quantum-like behaviour. (= *S12.3*)

7. Closing remarks

Author C. Clarke's Third Law:

Any sufficiently advanced technology is indistinguishable from magic

Aaron Allston's corollary to Clarke's Third Law:

Any sufficiently badly-written science is indistinguishable from magic

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